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AN ECONOMETRIC ANALYSIS OF ATLANTIC SEA SCALLOP MARKETS

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INTRODUCTION

The Atlantic sea scallop (*Placopecten magellanicus*) is harvested in the waters off the coast of the northeastern United States and Canada by vessels from both countries. The Atlantic sea scallop fishery has been an important fishery in the Northeastern U.S. in recent decades. This is particularly true for New England where, during the quarter-century ending in 1976, over 10 percent of the value of all fish and shellfish landed was attributable to the harvest of sea scallops.

United States landings during the last quarter-century, imports and apparent U.S. consumption are shown in Figure 1. While each of these measures was subject to annual fluctuations, a definite pattern is evident. U.S. landings have trended downwards since 1961 and have been gradually replaced by imports, which trended upwards, as the primary source of supply for U.S. consumption, although there was a substantial recovery in U.S. landings at the end of the period. Consumption exhibited less trend than the other two measures, as it increased during the first 10 years of the period, then decreased to its beginning level in the late 1960's and early 1970's, and then finally increased sharply at the end of the period.

The changes indicated in Figure 1 stem in part from a gradual replacement of U.S. fishing activity by Canadian fishing activity on Georges Bank, which was the principal source of sea scallops for the New England fleet in the 1950's and early 1960's. This, coupled with an apparent decrease in natural abundance on Georges Bank, resulted in a diversion of New England scallopers to the Middle Atlantic banks which had previously supported only a small fishery operating out of ports from New York south to North Carolina. Since 1965, Georges Bank has yielded a U.S. catch of between two and four million pounds of edible meats each year, compared with over 20 million pounds in earlier peak years. The total U.S. catch, which was over 27 million pounds in 1961, had decreased to a little over five million pounds by 1973. An unusually large abundance on the Middle Atlantic banks pushed the U.S. catch back to nearly 20 million pounds in 1976. Meanwhile, the Canadian catch which was relatively low until the early 1960's exceeded the U.S. volume in 1966, and has been double the U.S. volume since 1969 (except for 1976). The Canadians have exported over 80 percent of their landings to the U.S. in most years since 1960. Canada was the source of nearly all U.S. scallop imports in the 1960's. In the 1970's, other important foreign sources emerged (the United Kingdom, Australia, Iceland and Mexico), but Canada has continued to supply half or more of U.S. imports in the 1970's.

The U.S. Fishery Management and Conservation Act of 1976 created an exclusive U.S. fishing zone to 200 miles off the U.S. coast. Included in this zone is all of Georges Bank, although the eastern part is a disputed area since it also falls within 200 miles of Canada, and all of the Middle Atlantic banks where scallops are harvested. A management plan is in the process of development for the Atlantic sea scallop fisheries. It is likely that the plan will affect the total quantities of scallops harvested by establishing a catch quota or minimum individual scallop size or both in an effort to rebuild the stock. It is also likely that the distribution of catch between Canada and the U.S. will be changed, since much of the Canadian catch comes from waters claimed exclusively by the U.S. In order to assess the economic impact of various alternative management plans upon U.S. fishermen, marketing firms, and consumers, it is necessary to develop quantitative models of the market for Atlantic sea scallops. the market models that will be described here were constructed with the primary purpose of evaluating the impact on U.S. fishermen's incomes and U.S. consumers' expenditures of changes in: (1) U.S. Atlantic sea scallop landings and (2) Canadian exports of sea scallops to the U.S.

Since our concern extends to all market levels, it is of interest to note that U.S. ex-vessel prices and wholesale and retail prices for raw scallops moved together closely during the period 1953-1976 (Figure 2). The scallop harvesters' share of the consumer food dollar was high compared to many food products — over half in all years except 1976 — because scallops are shucked at sea and 100 percent edible meat is sold by the fishermen.

MODEL SPECIFICATION

In order to project impacts of policy options in the management of the fishery, econometric estimation of the important relations was necessary. Initial efforts were devoted to updating the earlier work of Altobello, Storey and Conrad [1977] which had used a simultaneous equations approach to model demand and supply characteristics of the ex-vessel or landings market. However, a 1972 study of shrimp prices by Doll provided an alternative formulation which explicitly linked the three market levels and which appeared applicable with minor modifications to the scallop markets, since shrimp and scallop markets appeared to have similar characteristics.

In studying shrimp markets, Doll [p. 432] concluded " . . . annual fluctuations in landings reflect changes in abundance of shrimp rather than in fishing effort . . . the biological factors causing shrimp abundance are not clearly identified and cannot be forecast; thus, domestic landings are both variable and unpredictable and are regarded as exogenous in the model." Very similar reasoning seems to apply to scallop landings. In fact, the failure of the Altobello models to identify supply functions consistent with economic theory (i.e., functions where quantity is positively related to price) gives further basis for concluding that landings should be considered exogenous in the model.[1] Imports

[1]There is statistical support for this conclusion for the sea scallop industry as well. If landings and price were truly jointly dependent, then ordinary least squares estimation of landings price as a function of landings and several exogenous variables should for the usual reasons lead to biased estimates of the parameters. To the contrary for the present application, the use of an instrumental variable technique to remove this possible bias resulted in nearly identical estimates of the unknown parameters.

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were also regarded as exogenous in the Doll model. The Doll model is basically a demand model specified so that predetermined domestic landings, imports and consumer income determine prices which in turn determine consumption at the retail level and end-of-year stocks held in cold storage. Ours is a modified version of this formulation.

Variables in the Model

The five jointly determined variables are:

P_{BR} — Annual average retail price per pound for raw fresh or frozen sea scallops in Baltimore, Maryland (in cents).

P_W — Annual average wholesale price per pound for raw frozen sea scallops sold in five pound boxes in Boston, Massachusetts (in cents).

P_{AT} — Annual average ex-vessel price per pound for Atlantic sea scallops (in cents).

C_T — Apparent total U.S. annual consumption of sea scallops except for Pacific sea scallops (in hundreds of thousands of pounds).

$S_{B_{t+1}}$ — End-of-year cold storage stocks of scallops (the same as beginning-of year stocks in year t + 1) (in hundreds of thousands of pounds).

The predetermined (exogenous and lagged endogenous) variables included in the model are:

Q_{AT} — Annual U.S. landings of Atlantic sea scallops (in hundreds of thousands of pounds).

S_B — Beginning-of-year cold storage stocks of scallops (in hundreds of thousands of pounds).

I_C — Total annual U.S. imports of scallops from Canada (in hundreds of thousands of pounds).

I_O — Total annual U.S. imports of scallops from countries other than Canada (in hundreds of thousands of pounds).

Y — Annual total disposable income in the U.S. (in billions of dollars).

P_{FRI} — Annual B.L.S. consumer price index for fish (an index of the prices of frozen shrimp, frozen ocean perch fillets, frozen haddock fillets, canned tuna and canned sardines in 39 standard metropolitan statistical areas and 17 small cities, 1967 = 100).

$P_{AT_{t-1}}$ — Annual average ex-vessel price per pound for Atlantic sea scallops, lagged one year (in cents).

Formulation of the Model

Four behavioral equations and one identity equation comprise the model. The disturbance for each equation is indicated as u_i where i is the equation number. The subscript t is omitted on all current variables.

Retail Demand. The retail demand equation is:

(1) $C_T = a_0 + a_1 P_{BR} + a_2 Y + a_3 P_{FRI} + u_1$

The retail consumption variable C_T measures apparent consumption of domestically landed Atlantic sea scallops plus imports and does not include Pacific sea scallops. The Baltimore retail price P_{BR}, the only continuously reported retail price for sea scallops, is used as a proxy for a weighted average of retail prices in all consumption areas. The disposable income variable Y is a demand shifter which should measure the effect of changes in per capita disposable income, population, and time trends. The retail price index for fish P_{FRI} is included as a measure of prices of substitute seafoods.

Wholesale Demand. The wholesale demand equation is:

(2) $P_W = b_0 + b_1 S_B + b_2 Q_{AT} + b_3 I_C + b_4 I_O + b_5 Y + u_2$

The Boston wholesale price is the only continuously reported wholesale price for sea scallops, and is used as a proxy for a weighted average of wholesale prices in all marketing centers. Beginning-of-year stocks S_B, domestic landings Q_{AT}, Canadian imports I_C, and imports from countries other than Canada I_O, are used as indicators of the non-measured variable "wholesale quantity." Since wholesale demand should be derived from retail demand, it should respond to the same demand shifters as retail demand, so the income variable Y is included to measure those effects.

Ex-Vessel Demand. The ex-vessel demand equation is:

(3) $P_{AT} = c_0 + c_1 S_B + c_2 Q_{AT} + c_3 I_C + c_4 I_O + c_5 Y + u_3$

The ex-vessel demand equation contains the same variables as the wholesale demand equation. The ex-vessel price P_{AT} should respond not only to changes in domestic landings Q_{AT} but also to supplies available from other sources, including beginning-of-year stocks S_B and imports I_C and I_O. Ex-vessel demand should be derived from retail and wholesale demand; hence the demand shifter Y was again included.

Price Level. Prices at the three market levels move together extremely closely. While equations 2 and 3 ensure that predicted wholesale and predicted ex-vessel prices will move together, since they are expressed as functions of the same exogenous variables, it is necessary to include a price level relation (4) to ensure that predicted retail prices and predicted wholesale prices will also move together.

(4) $P_{BR} = d_0 + d_1 P_W + d_2 P_{AT_{t-1}} + u_4$

The use of current retail and wholesale prices and lagged ex-vessel prices in the relation was suggested by a principal component analysis which is available upon request.

Stock Balance

(5) $S_{B_{t+1}} = S_B + Q_{AT} + I_C + I_O - C_T$

Finally, end-of-year stocks $S_{B_{t+1}}$ are identically equal to Beginning-of-year stocks S_B plus domestic landings Q_{AT} plus imports I_C and I_O minus apparent total consumption C_T.

MODEL RESULTS

All five equations in the model just described are identified. Since the landings and the wholesale demand equations each contain only a single endogenous variable, they were estimated using ordinary least squares. Three-stage least squares procedures were employed to estimate the other three equations.

Structural Equations

Estimates of the parameters of the five structural equations are provided in Table 1. The standard errors of the coefficients are in parentheses. While the conventional tests of significance are not precise for most methods of estimating simultaneous equations, the standard error size relative to the parameter estimate is generally a useful guide. Durbin-Watson and R^2 statistics were not provided for the structural equations estimated by three-stage least squares for the usual reasons.

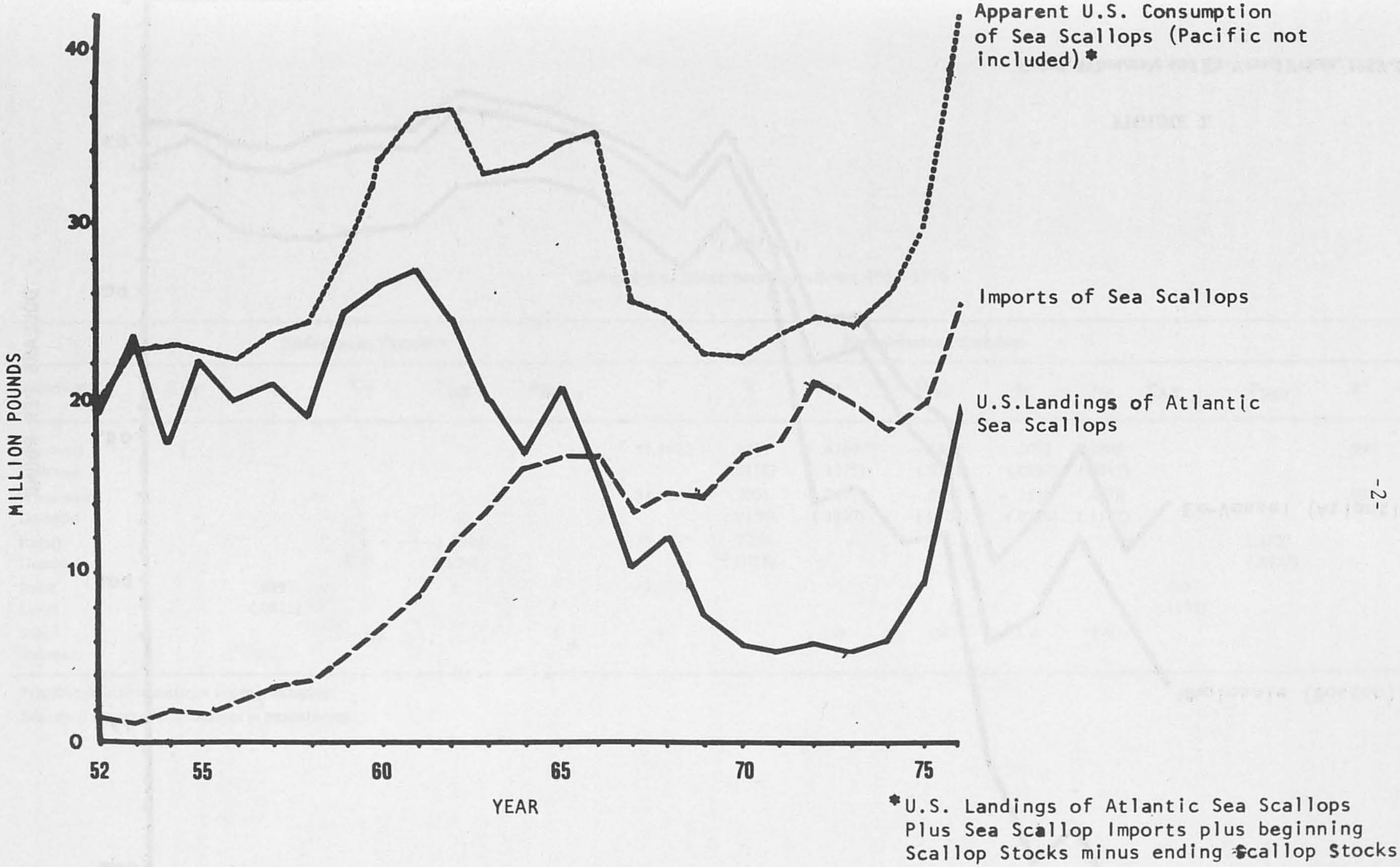

FIGURE 1.

U.S. Landings of Atlantic Sea Scallops, Imports, and Apparent U.S. Consumption of Sea Scallops (Pacific not Included), 1952-1976.

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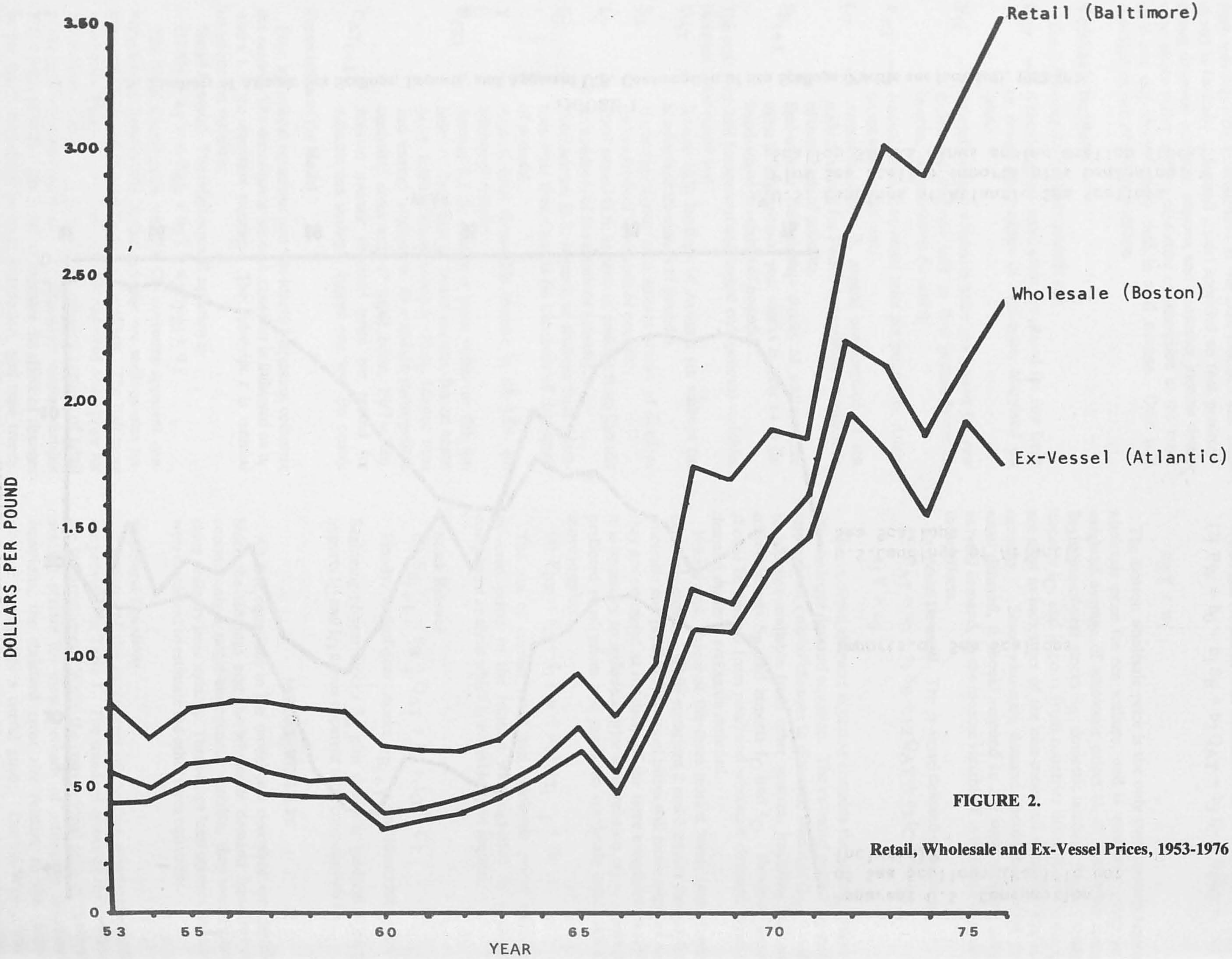

FIGURE 2.

Retail, Wholesale and Ex-Vessel Prices, 1953-1976

TABLE 1.

Estimates of Structural Equations, 1953-1976

	Endogenous Variables					Predetermined Variables									
Equation	P_{AT}	P_W	C_T	P_{BR}	$S_{B_{t+1}}$	1	Y	S_B	Q_{AT}	I_C	I_O	$P_{AT_{t-1}}$	P_{FRI}	R^2	d
Ex-vessel	1					57.1822	.1417	−.6760	−.1569	−.1093	.3898			.990	2.401*
Demand							(.0115)	(.1339)	(.0281)	(.0392)	(.0817)				
Wholesale		1				31.7604	.2001	−.7175	−.0857	−.1534	.4378			.987	1.366*
Demand							(.0158)	(.1839)	(.0386)	(.0538)	(.1122)				
Retail			1	−1.6294		137.9425	.2234						2.2728		
Demand				(.1741)			(.0755)						(.4453)		
Price		.8997		1		−2.7374						.6157			
Level		(.0872)										(.1104)			
Stock			−1.0		1	0		1.0	1.0	1.0	1.0				
Balance															

*Durbin-Watson statistics are inconclusive.

Standard errors of coefficients in parentheses.

TABLE 2.

Estimates of Reduced Form Equations, 1953-1976

Dependent Variable	Predetermined Variables 1	Y	S_B	Q_{AT}	I_C	I_O	$P_{AT_{t-1}}$	P_{FRI}
P_{AT}	57.1822	.1417	−.676	−.1569	−.1093	.3898		
P_W	31.7604	.2001	−.7175	−.0857	−.1534	.4378		
C_T	95.8430	−.0699	1.0518	.1256	.2249	−.6418	−1.003	2.2728
P_{BR}	25.8374	.1800	−.6455	−.0771	−.1380	.3939	.6160	
$S_{B_{t+1}}$	−95.8430	.0699	−.0518	.8744	.7751	1.6418	1.003	−2.2728

The estimated coefficients have signs which are consistent with prior theoretical beliefs except for other imports, I_O.[2] In the interests of brevity, we focus on several important findings only. First, at the most recent levels of retail price and consumption, the price elasticity of demand is estimated to be −1.36, and, again at current levels, income elasticity is measured as 0.63. The ex-vessel and wholesale price flexibilities for 1976 price and quantity levels are estimated at −0.18 and −0.07.

At the mean levels of prices and quantities, retail price and income elasticities are estimated to be −0.82 and 0.43 and landings and wholesale price flexibilities are calculated at −0.28 and −0.13, respectively.

Reduced Form Equations

The estimates of the reduced form equations are given in Table 2. These estimates were derived from the estimates of the structural equations rather than estimating them independently. One advantage of using this approach is that it avoids the adverse statistical consequences of the correlations between P_{FRI} and the other predetermined variables in the final three equations.

Note that since the ex-vessel and wholesale demand equations contained only a single endogenous variable, those reduced form coefficients are identical to their structural equation counterparts. Again, the signs of the coefficients are consistent with prior expectations. The reduced form estimations indicated that the five equations (P_{AT}, P_W, C_T, P_{BR}, and $S_{B_{t+1}}$) explained 99, 98.7, 98.7, 98.6, and 67.1 percent of the variation in their respective dependent variables.

The section which follows uses these estimates to analyze various impacts of changes in several of the exogenous variables on levels of the five dependent variables.

ANALYSIS

Several types of projected impacts of changes in predetermined variables on the five endogenous variables can be explored. In this section three types of impacts are analyzed, where the illustrations focus upon impacts due to changes in landings and Canadian imports. These impacts are classified below as: short-run impacts, long-run stationary, and long-run historical.

[2]The expected sign for I_O is negative, but the coefficient estimate had a positive sign. A similar result occurred in the Altobello, et al. [1977] analysis.

Short-run Impacts

The effects of a unit change in an exogenous variable on the value of a given endogenous variable in the same period can be measured by the estimated reduced form coefficients of the exogenous variable, the impact multipliers. Of immediate interest is the impact on retail, wholesale, and ex-vessel prices of changes in landings and Canadian imports. Referring to Table 2, landings appear to have a greater immediate impact on ex-vessel prices than imports (the landings coefficient is −0.1569 compared with the Canadian imports coefficient of −0.1093[3]). The opposite appears to be true at the wholesale and retail levels. At the wholesale level, the landings coefficient is −0.0857 and the Canadian imports coefficient is −0.1534 and at the retail level these estimates are respectively −0.0771 and −0.1380. Notice further that Canadian imports have a relatively strong impact on ending stocks (0.7751). This suggests that some of these imports flow directly into storage and thus have a smaller direct impact on landings prices than landings, which move more directly through the marketing levels. To the extent this is true, Canadian imports have a further effect on prices and consumption through their impacts on beginning stocks.

To compare the direct effects of landings and imports within the same year on prices, some further analysis is useful. A simple marginal analysis was used to show the year-to-year impacts on prices directly attributable to landings and to Canadian imports. This was done by multiplying the change in each of these two variables for the year in question by its coefficient at the various market levels.

The results of this analysis are reported in Table 3. It is clear from these figures that in fact, due to the greater variability of landings than imports, landings fluctuations have accounted for a greater effect on price at all market levels than imports. Not only are the fluctuations in price attributable to changes in landings of greater absolute magnitudes, they also change directions more often. At the ex-vessel level, for example, landings fluctuations accounted for fluctuations in price which ranged from a reduction of 16 cents to an increase of over 9 cents. On the other hand, fluctuations due to imports ranged from a maximum reduction of 6 cents to less than a 4 cent increase. Sign reversals occurred 14 times for the landings series and only 10 times for the import series.

[3]These figures suggest that a one hundred thousand pound increase in landings and Canadian imports, respectively, would be estimated to lead to a .16 and .11 cent per pound reduction in ex-vessel price in the same year.

TABLE 3.
Predicted Marginal Changes in Price Levels Resulting from Changes in Landings and Canadian Imports

Period	Changes Attributable to Landings Fluctuations			Changes Attributable to Canadian Imports Fluctuations		
	ΔP_{AT}	ΔP_{W}	ΔP_{BR}	ΔP_{AT}	ΔP_{W}	ΔP_{BR}
1953	−7.82	−4.27	−3.85	−.31	−.43	−.39
1954	9.39	5.13	4.62	−.49	−.69	−.62
1955	−7.05	−3.85	−3.46	.48	.67	.61
1956	3.23	1.76	1.59	−.65	−.91	−.82
1957	−1.45	−.79	−.72	−1.29	−1.82	−1.64
1958	3.16	1.72	1.56	.09	.13	.12
1959	−8.89	−4.85	−4.37	−.97	−1.36	−1.23
1960	−3.06	−1.67	−1.51	−3.36	−4.71	−4.24
1961	−1.35	−.73	−.66	−2.42	−3.39	−3.06
1962	4.43	2.42	2.18	−3.07	−4.31	−3.88
1963	7.36	4.02	3.62	−2.03	−2.85	−2.57
1964	4.74	2.59	2.33	−2.50	−3.51	−3.17
1965	−5.94	−3.24	−2.92	.23	.32	.29
1966	7.41	4.04	3.64	−1.39	−1.95	−1.76
1967	8.99	4.91	4.42	3.78	5.30	4.78
1968	−2.86	−1.56	−1.41	−.05	−.07	−.07
1969	7.31	3.99	3.59	.20	.28	.26
1970	2.44	1.33	1.20	1.40	1.97	1.78
1971	.69	.38	.34	1.53	2.15	1.94
1972	−.69	−.38	−.34	2.22	3.12	2.81
1973	.87	.47	.43	−2.56	−3.60	−3.24
1974	−1.13	−.62	−.56	−1.65	−2.31	−2.08
1975	−5.19	−2.84	−2.56	−3.12	−4.38	−3.95
1976	−16.07	−8.77	−7.90	−6.08	−8.53	−7.68

Long-run Impacts (Stationary)

While some insights can be gained by examining the effects within a single period, it is perhaps more important to know the likely impacts of a change in the level of one exogenous variable, with the others held constant, on levels of the endogenous variables in future periods. Table 4 reports projections[4] for five year increments for three different scenarios. The first is that the levels of the exogenous variables (Y, Q_{AT}, I_C, I_O, P_{FRI}) remain at 1976 levels in the future; the second is that a policy is instituted which reduces landings in the future by twenty percent of 1976 levels (to 156.6 hundred thousand pounds annually) assuming all other exogenous variables remain constant; and the third presumes a policy which reduces Canadian imports by twenty percent of 1976 levels (to 164.34 hundred thousand pounds) while holding all other independent variables constant.

In Table 4, the first column lists 1976 levels of the endogenous variables. The next four columns project these levels 5, 10, 15 and 20 years into the future given the respective scenario assumptions. The final column is the long-run equilibrium positions of the variables given no further changes in any of the exogenous variables and sufficient time for the system to converge. For example, under scenario one, the 1976 ex-vessel price of $1.75/pound is projected to rise to $2.11/pound in a five year period, thence to $1.53, $1.57, and after twenty years, converging to within two cents of the long-run stationary equilibrium level of $1.63 per pound.

[4] The methodology for making these projections is reported in Goldberger.

A comparison of long-run equilibrium levels of the endogenous variables for the three scenarios is somewhat revealing. For example, compared with the "no-change" scenario, a cut in landings of twenty percent would ultimately lead to a long-run equilibrium increase in ex-vessel price of 17 cents per pound (180 less 163), of wholesale price by 15 cents and of retail price by 24 cents per pound. Consumption would decline an estimated 3.9 million pounds.

Similar impacts are estimated for the case in which Canadian imports are reduced by twenty percent. Again compared with the situation in which the exogenous variables all remain at 1976 levels, the projected increase in long-run equilibrium ex-vessel price is 9 percent, in wholesale price 8 percent, and in retail price 9 percent. Consumption is projected to decline by 9 percent. For both the reduced landings and reduced imports cases, projected ending stocks are slightly above 1976 levels but substantially below the levels projected for the "status quo" situation.

Long-run Impacts (Historical)

While it is unrealistic to expect the levels of all exogenous variables to remain constant over time, the previous relative comparisons of stationary equilibrium levels among the scenarios are of some value. The more nearly realistic setting, which Samuelson terms the *historical* system, permits all exogenous variables to vary. For simplicity, we assume here that the exogenous variables Y, Q_{AT}, and P_{FRI} vary over time at a constant rate and that I_C and I_O are restricted to their 1976 levels.

TABLE 4.

Projected Stationary Equilibria

Scenario	Variable	1976 Levels	5-Year Lag	10-Year Lag	15-Year Lag	20-Year Lag	Long-run Equilibria
Exogenous Variables at 1976 Levels	P_{AT}	174.94	211.49	153.54	157.32	165.18	163.12
	P_W	238.00	263.56	202.05	206.06	214.40	212.21
	C_T	419.19	353.04	442.08	462.68	447.46	448.28
	P_{BR}	351.00	347.07	292.43	279.79	289.13	288.62
	$S_{B_{t+1}}$	20.18	63.21	59.90	33.71	37.30	39.53
Landings Decline by 20 Percent	P_{AT}	174.94	234.66	171.51	173.46	182.29	180.23
	P_W	238.00	284.98	217.95	220.02	229.39	227.21
	C_T	419.19	308.66	398.64	424.79	408.78	409.13
	P_{BR}	351.00	374.32	319.09	303.04	312.87	312.65
	$S_{B_{t+1}}$	20.18	43.26	46.70	17.66	20.62	23.30
Canadian Imports Decline by 20 Percent	P_{AT}	174.94	232.10	169.60	171.60	180.33	178.29
	P_W	238.00	286.97	220.63	222.76	232.02	229.85
	C_T	419.19	307.65	396.94	422.70	406.83	407.20
	P_{BR}	351.00	374.93	320.13	304.32	314.06	313.84
	$S_{B_{t+1}}$	20.18	43.68	46.84	18.12	21.08	23.73

Table 5 provides the 1981 projections for the five endogenous variables based on the exogenous variables projections, where income is assumed to increase approximately 34 billion dollars per year, landings decline 1/2 million pounds annually, and P_{FRI} increases 4-1½ cents per pound per year, for three scenarios.[5] The first is this base case. The second deviates only in that landings are reduced to 80 percent of these assumed landings levels. The third limits Canadian imports to 80 percent of the 1976 level.

The receding equilibrium levels are the values that could be obtained by allowing sufficient time for the system to stabilize after a change in the exogenous variables. These values are similar to stationary equilibrium levels for the various levels of the exogenous variables. Since this time for adjustment is not available in a realistic setting, there is a permanent disequilibrium so long as the explanatory variables are continuously changing. The final column reports actual projections which differ from the receding equilibria since they presume that the relevant exogenous variables do change continuously over time.

It is of interest to compare the actual equilibrium projections in Table 5 with the long-run stationary equilibria. For the first scenario, they are surprisingly similar except that consumption in the second case is significantly lower. This is expected since we projected a decline in landings and held imports constant. Similar observations can be made about the second and third scenarios. It should be noted, however, that for this illustrative setting, the imports and landings reductions are not equivalent since 20 percent of a constant level of imports is a greater relative reduction than 20 percent of a declining landings forecast.

Next, for Table 5, it is useful to compare the projected equilibrium levels among scenarios. Compared with the base case projected equilibrium landings price of $1.67/pound, landings restriction would increase this to $1.78, and Canadian import restrictions to $1.82. The other comparisons are readily made and are consistent with the ex-vessel price comparison.

[5] Projections to other periods have been eliminated in the interests of brevity — these are available upon request.

TABLE 5.

Projected Historical 1981 Equilibrium Levels

Scenario	Variable	1976 Levels	Receding Equilibrium Values	Actual Projections
Exogenous Variables Trend from 1976 Levels	P_{AT}	174.94	165.57	166.56
	P_W	238.00	204.21	205.26
	C_T	419.19	388.03	389.14
	P_{BR}	351.00	282.99	279.81
	$S_{B_{t+1}}$	20.18	25.63	27.14
Landings Decline to 80 Percent of Projected Levels	P_{AT}	174.94	177.42	178.41
	P_W	238.00	214.59	215.64
	C_T	419.19	360.93	362.04
	P_{BR}	351.00	299.62	296.44
	$S_{B_{t+1}}$	20.18	14.40	16.18
Canadian Imports Decline to 80 Percent of 1976 Levels	P_{AT}	174.94	180.74	181.73
	P_W	238.00	221.85	222.90
	C_T	419.19	346.95	348.06
	P_{BR}	351.00	308.20	305.20
	$S_{B_{t+1}}$	20.18	9.83	11.61

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