An interesting aspect of the above estimates is that the effects of new orders, O, on shipments, S, first increases then decreases with the increase in lags. The coefficients for O_{t-3} and O_{t-4} indicate that the largest proportions of new orders placed during a given period result in shipments three and four quarters later. The coefficients for O_{t-7} and O_{t-8} are respectively .0190 and .0024 suggesting that current shipments are derived from a very small proportion of new orders placed more than seven or eight quarters ago. In other words, most of the new orders placed in a given period were filled within a period of six quarters. From another viewpoint, the results indicate that the duration of the impacts of a given order for defense products is approximately a year and 6 months.

As expected, the extent of capacity utilization is inversely related to shipments: The fuller the capacity is utilized, the smaller the size of shipments will be and vice versa.

The estimates for equation (11) are summarized in table 2.

TABLE 2

Variables	Coefficients and standard errors	Variables	Coefficients and standard errors
Constant	26.2834	O_{t-6}	.0889+.1277 P_{t-6}
O_{t-1}	.0490+0001 P_{t-1} (.0566)(.0422)	O_{t-7}	(.0564)(.1114) .0278+.2335 P_{t-7}
O_{t-2}	.0642+.0001 P_{t-2} (.0626)(.0422)	O_{t-8}	(.0514)(.0906) −.0088+.2335 P_{t-8}
O_{t-3}	.0903−.0452 P_{t-3} (.0569)(.0931)	R_t	(.0451)(.0906) −1.4559
O_{t-4}	.0708−.0452 P_{t-4} (.0642)(.0931)	R^2=.9019	(1.2900) df=26
O_{t-5}	.0573+.1277 P_{t-5} (.0608)(.1114)	S_e=26.28	d=1.025

The addition of product mix P_t as an explanatory variable raises the R^2 from .8189 (table 1) to .9019 (table 2). This change in the R^2 of .0830 is highly significant statistically.

The estimated value of α's are illustrated for P_t=.05, .10, .15, .20, .25, .30, .35, .40, and .45 in table 3.

TABLE 3

P	O_{t-1}	O_{t-2}	O_{t-3}	O_{t-4}	O_{t-5}	O_{t-6}	O_{t-7}	O_{t-8}
0.05	0.0490	0.0642	0.0880	0.0685	0.0637	0.0953	0.0395	0.0029
.10	.0490	.0642	.0858	.0663	.0701	.1017	.0512	.0146
.15	.0490	.0642	.0835	.0640	.0765	.1081	.0628	.0262
.20	.0490	.0642	.0813	.0618	.0828	.1144	.0745	.0379
.25	.0490	.0642	.0790	.0595	.0892	.1208	.0862	.0496
.30	.0490	.0642	.0767	.0572	.0956	.1272	.0979	.0613
.35	.0490	.0642	.0745	.0550	.1020	.1336	.1095	.0729
.40	.0490	.0642	.0722	.0527	.1084	.1400	.1212	.0846
.45	.0490	.0642	.0700	.0505	.1148	.1464	.1329	.0963

Tables 2 and 3 show that the changes in product mix as indicated by P_t does not have any effect on the relationship of O_{t-1} and O_{t-2} to S_t. Most of the new orders that result in shipments within a short period, say 6 months, are those for component parts of defense products. It is reasonable to assume that change in product mix will have little effects on the relationship between new orders and shipment of these products.

Changes in product mix, however, have effects on the relationships of O_{t-3}, O_{t-4}, . . . , O_{t-8}, to S_t. The magnitude of coefficients for