($Y,\Delta L_{-1},\Delta Y_{-1},S'$) first, then anticipatory initial-data variables ($\hat{E},O,\hat{E}_5$), then intervening variables ($\Delta Y,\Delta Y_t,H_{01},H_{10},H_{11}$), and finally, buying-intentions variables ($\hat{P},\hat{P}_c,Z\hat{P}_c$). Columns 1 through 3 show net regression coefficients with standard buying intentions ($\hat{P}$) as the dependent variable; in column 1 coefficients are shown for the four objective initial-data variables; in column 2, for the three anticipatory and the four objective variables; and in column 3, for the five intervening variables plus the objective and anticipatory initial-data variables. These three regressions are designated as $X_1, \ldots, X_4$, $X_1, \ldots, X_7$, and $X_1, \ldots, X_{12}$, respectively, corresponding to the variables included in each. The significance levels for regression coefficients are indicated by asterisks—** = 0.01 level; * = 0.05 level.[11] The constant term and the multiple correlation coefficient are shown at the bottom of the table.

In addition to the net regression coefficients, F ratios are shown both for groups of variables and for some individual variables; all these F ratios are net of all variables included in the respective regression equations. In the first column of Table 42, for example, the joint F ratio for objective initial-data variables is 9.0, based on the variance explained by these four variables. In the second column, the joint F ratio for anticipatory initial-data variables is 15.9, based on the (incremental) variance explained by these three variables. A new joint F ratio (7.7) for the objective variables net of the anticipatory ones is also shown in the second column; but this measure is an approximation.[12]

Columns 4–7 show regression coefficients and F ratios for equations having durable goods purchases as the dependent variable. Columns 4, 5, and 6 are comparable to columns 1, 2, and 3, respectively, in that a common set of independent variables is used. Column 7 has net regression coefficients for all fifteen independent variables; thus, columns 6 and 7 differ only in that the latter includes the three buying intentions variables while the former excludes them. The F ratios in columns

[11] Because some degrees of freedom have been used up in preliminary regressions, somewhat conservative t tests were used. The 0.05 level thus means a t ratio of at least 2; the 0.01 level, a t ratio of at least 3.

[12] The computer program did not yield the incremental variance explained by, $X_1, \ldots, X_4$ net of $X_5, \ldots, X_7$. Joint F ratios that could not be computed directly from the incremental explained variance were estimated from t ratios; in the second column of Table 42, for example, the joint F ratio of 7.7 for objective variables is the mean of the squared t ratios for the four variables. This procedure gives a biased estimate of the true F ratio for a group of variables to the extent that intercorrelation exists among the variables in the group; if the within-group intercorrelations are all zero, the mean F ratio, as estimated from the t ratios, is identical to the joint F ratio. Since the relevant intercorrelations are actually quite small, all joint F ratios shown in these tables are close approximations to the true numbers.

4 through 7 are again exact estimates for incremental groups of variables, approximations for groups of variables previously included in the regression. The last two columns show F ratios for each of the fifteen independent variables against both intentions (column 8) and purchases (column 9); these ratios were computed from zero-order correlation coefficients.[13]

Empirical Results

SUMMARY

On the whole the data provide rather impressive support for the basic hypotheses. In all nine subgroups, the partial correlations of both groups of initial-data variables (objective and anticipatory) are stronger with buying intentions than with purchases, measuring the partial correlation by the joint F ratio. The contrast is strongest for the subgroups (C_1, C_2, and C_3) with an intentions question that, since it maximizes the correlation between intentions and purchases, is the closest available proxy for purchase probability. Also, about two-thirds of the regression coefficients for the seven initial-data variables are larger when buying intentions rather than purchases are the dependent variable. For the intervening variables, twenty-two of the twenty-seven partial correlations (ΔY and ΔY_i jointly, H_{10} and H_{01} separately, within each of nine subgroups) are stronger with purchases than with intentions, as predicted. The data for H_{11} are less consistent: the partial correlations are about the same with intentions as with purchases, and the regression coefficients are also about the same. Special circumstances are relevant here, and this problem is discussed below. (All these statements are based on comparisons of columns 3 and 6 in Tables 42–44, that is, on regressions that do not include buying intentions as an independent variable but regress both purchases and intentions on a common set of initial-data and intervening variables.)

The data also clearly evidence the predicted differential influence of buying intentions on the relation between initial-data or intervening variables and purchases. Given nine subgroups, the total numbers of observations on (seven) initial-data and (four) intervening variables are sixty-three and thirty-six, respectively, again excluding the H_{11} variable.

[13] The means of the F ratios in columns 8 and 9 for any group of variables are the joint F ratios that would have been observed if there were in fact zero intercorrelation not only among variables within a group but among all independent variables shown. A comparison of such mean F ratios—for example, as computed from column 8 with the joint F ratio in column 1 for the objective group of variables, or as computed from column 9 with the joint F ratio in column 4—indicates that intercorrelation within this group of variables is in fact close to zero.

Table 32 summarizes the total number of cases in which variables in these respective categories have the predicted algebraic sign and a significance level of 0.05 or the predicted sign and a significance level of 0.01, before and after buying intentions are held constant. Summary data are shown

TABLE 32

SUMMARY OF RESULTS FROM MULTIVARIATE REGRESSION ANALYSIS: NUMBERS OF STATISTICALLY SIGNIFICANT REGRESSION COEFFICIENTS AND MEAN OF F RATIOS

SUBGROUP	NUMBER OF NET REGRESSION COEFFICIENTS THAT HAVE PREDICTED SIGN AND HAVE t RATIO *Greater than 2* Before Intentions	*Greater than 2* After Intentions	*Greater than 3* Before Intentions	*Greater than 3* After Intentions	*Mean of F Ratios* Before Intentions	*Mean of F Ratios* After Intentions
OBJECTIVE INITIAL-DATA[a]						
A_1, B_1, C_1	6	3	6	2	9.4	4.4
A_2, B_2, C_2	6	6	6	3	11.6	4.7
A_3, B_3, C_3	6	4	4	2	7.8	4.1
Total or mean	18	13	16	7	9.6	4.4
ANTICIPATORY INITIAL-DATA[b]						
A_1, B_1, C_1	4	3	3	1	8.0	4.4
A_2, B_2, C_2	3	3	3	1	7.2	3.7
A_3, B_3, C_3	4	2	1	0	4.1	2.1
Total or mean	11	8	7	2	6.4	3.4
COMBINED OBJECTIVE AND ANTICIPATORY INITIAL-DATA						
Total or mean	29	21	23	9	8.2	4.0
INTERVENING[c]						
A_1, B_1, C_1	4	5	3	4	8.3	7.7
A_2, B_2, C_2	5	5	2	2	5.0	5.5
A_3, B_3, C_3	2	3	1	1	3.2	3.1
Total or mean	11	13	6	7	5.5	5.4

SOURCE: Tables 42–44.

[a] Variables included are normal family income (Y), change in liquid assets (ΔL_{-1}) and in family income (ΔY_{-1}) prior to the survey, and stock adjustment (S').

[b] Variables included are expectations index ($\hat{E}$), opinion about buying conditions (O), and long-range financial prospects ($\hat{E}_6$).

[c] Variables included are income change during the forecast periods (ΔY), transitory income (ΔY_t), unexpected housing purchase (H_{01}), and unfulfilled plan to buy house (H_{10}).

for the three life-cycle groups. The mean of the joint F ratios is also shown, both before and after the inclusion of buying intentions.

A number of points stand out clearly. First, the F ratios for both categories of initial-data variables decline sharply when buying intentions are included in the regression, while the F ratios for intervening variables are hardly affected at all. In fact, the joint F ratios for both categories of

initial-data variables decline in every one of the nine subgroups when buying intentions are added to the regression. In only about 10 per cent of the 63 cases does the partial correlation between purchases and any initial-data variable show an increase when intentions are held constant. In contrast, both correlation and regression coefficients for intervening variables increase in about half the cases when buying intentions are held constant.

Secondly, the number of initial-data variables with a statistically significant relation to purchases differs sharply depending on whether or not intentions are held constant; this is not the case for intervening variables. The contrast is most evident from a comparison of the third and fourth columns in Table 32. Before intentions are included in the regression, initial-data variables are significantly related to purchases at the 0.01 level in twenty-three cases (sixteen objective and seven anticipatory); intervening variables have this strong an association with purchases in six cases. After the inclusion of buying intentions, only nine of the original twenty-three cases involving initial-data variables still show significance at the 0.01 level, while seven intervening variables—a net increase—now show an 0.01-level association with purchases.[14]

Finally, there is some indication that the relative importance of objective and anticipatory initial-data variables differs among life-cycle groups. The anticipatory variables are clearly more important for households with relatively young heads, judging both from the joint F ratios and from the number of cases that show a statistically significant relation to purchases at the 0.01 level. However, it does not appear from these data that objective variables are more important for households with older heads; rather, there seems to be no pattern at all in this regard. But data to be presented later suggests that objective variables may in fact be more important for households with older heads.

A more detailed summary of results from the multivariate analysis is given by Table 33, which shows the algebraic sign and significance level for each variable in all nine subgroups, based on regressions from columns 3 and 7 of Tables 42–44.

Looking first at the regression with buying intentions dependent, it

[14] Although the intervening variables that show a significant association with purchases at the 0.01 level are all housing dummy variables (H_{01} and H_{10}), the other intervening variables show the same pattern. For example, there are four cases in which income change or transitory income are significantly related to purchases (0.05 level) before inclusion of buying intentions; all four of these cases are still significant at the 0.05 level after inclusion of intentions, and the regression coefficients are practically unchanged.

TABLE 33

SUMMARY OF RESULTS FROM MULTIVARIATE REGRESSION ANALYSIS: ALGEBRAIC SIGNS OF ALL NET REGRESSION COEFFICIENTS AND t RATIOS

Independent Variables	*Subgroup Designation* A_1	A_2	A_3	B_1	B_2	B_3	C_1	C_2	C_3	*Number of Net Regression Coefficients* +	* or **	**
REGRESSIONS WITH BUYING INTENTIONS DEPENDENT												
Initial-data												
Objective												
Y	+	**	+	**	**	**	**	*	**	9	7	6
ΔL_{-1}	+	0	+	+	*	*	+	+	+	8	2	0
ΔY_{-1}	+	+	0	+	0	+	**	+	*	7	2	1
S'	**	**	**	**	**	**	**	**	**	9	9	9
Anticipatory												
$\hat{E}$	+	0	+	0	+	*	+	*	0	6	2	0
O	**	**	**	**	**	**	**	**	**	9	9	9
$\hat{E}_5$	*	+	**	+	+	+	*	0	+	8	3	1
Intervening												
Income change												
ΔY	0	+	+	0	0	+	0	*	+	5	1	0
ΔY_t	0	+	0	+	+	+	+	+	0	6	0	0
Housing												
H_{01}	*	*	+	+	+	+	*	+	+	9	3	0
H_{10}	+	**	0	**	**	**	**	**	**	8	7	7
H_{11}	**	+	**	**	**	**	**	**	+	9	7	7
REGRESSIONS WITH PURCHASES DEPENDENT												
Initial-data												
Objective												
Y	**	*	**	**	**	**	+	**	*	9	8	6
ΔL_{-1}	0	+	+	+	0	+	+	+	0	6	0	0
ΔY_{-1}	0	0	+	+	0	+	0	0	+	4	0	0
S'	+	*	+	*	**	*	+	*	+	9	5	1
Anticipatory												
$\hat{E}$	0	0	0	+	+	0	+	+	+	5	0	0
O	**	+	*	+	**	+	*	*	*	9	6	2
$\hat{E}_5$	0	0	+	+	0	+	*	*	+	6	2	0
Intervening												
Income change												
ΔY	*	*	+	0	+	+	0	+	+	7	2	0
ΔY_t	+	*	+	+	0	*	+	+	+	8	2	0
Housing[a]												
H_{01}	**	+	+	**	**	**	**	**	+	9	6	6
H_{10}	0	0	+	0	*(0)	0	**(0)	0	*(0)	1	3	1
H_{11}	**	**	*	**	**	**	*	**	+	9	8	6
Buying intentions[b]												
$\hat{P}$	**	**	**	**	**	**	**	**	**	9	9	9
$\hat{P}_c$, $Z\hat{P}_c$	**	**	+	*	+	0	*	+	+	8	4	2

\+ = positive net regression coefficient, t ratio <2
0 = negative net regression coefficient, t ratio <2
* = positive net regression coefficient, t ratio >2
*(0) = negative net regression coefficient, t ratio >2
** = positive net regression coefficient, t ratio >3
**(0) = negative net regression coefficient, t ratio >3

SOURCE: Tables 42–44. Independent variables are defined above, in "Description of Variables."

[a] The predicted regression coefficient of H_{10}, net of buying intentions, is negative.

[b] Algebraic sign for $\hat{P}_c$, $Z\hat{P}_c$ is taken from the regression that includes $\hat{P}_c$ only and not $Z\hat{P}_c$; significance level is that for $\hat{P}_c$ before adding $Z\hat{P}_c$ or that for $Z\hat{P}_c$, whichever is higher.

appears that five of the twelve independent variables are significantly related to intentions in almost every subgroup, usually at the 0.01 level. These include normal family income, desired stock adjustment, opinion about buying conditions, unfulfilled plans to buy a house, and anticipated purchases of housing. Four others (income and liquid-asset change prior to the survey, the expectations index, and long-range financial prospects) generally have the predicted algebraic sign and are significant in at least two of the nine groups; these variables, especially the first two, are generally significant at the 0.01 level in a zero-order regression but are redundant to other variables—notably, to opinion about buying conditions. Of the remaining three variables, the hypotheses tested do not predict the sign of one (unexpected housing purchases), although the signs are all positive; the other two (intervening income changes) are predicted not to have any net association with buying intentions. On the whole, therefore, the results accord quite well with the hypotheses.

Turning to the regressions with durable goods purchases dependent, the strongest and most consistent variables are normal family income, unanticipated housing purchases, anticipated housing purchases, and standard buying intentions. Two others—desired stock adjustment and opinion about buying conditions—always have the predicted sign and are generally significant at the 0.05 level, though not at the 0.01 level. The two intervening income-change variables, as well as contingent buying intention, long-range financial prospects, and unfulfilled house-buying intentions, usually have the predicted sign (positive for the first four, negative for H_{10}), and are significant in at least two of the subgroups. Finally, three variables seem to be essentially unrelated to purchases—change in income and change in liquid assets prior to the survey date and the expectations index.

In terms of the classification via initial-data, intervening, and buying-intentions variables, standard buying intentions are clearly the strongest variable of the fifteen; this variable accounts for close to half the total explained variance. The intervening housing variables are consistently significant, and the intervening income-change variables are consistent with respect to algebraic sign though they are generally not statistically significant. Some of the initial-data variables continue to exert a strong influence on purchases net of buying intentions, although in every case their influence is sharply reduced when intentions are included in the regression.

It should be noted that the subgroups differ markedly in the degree to which the respective intentions questions constitute an adequate proxy

for purchase probability. The regression analysis confirms the earlier finding (Chapter 2) that the intentions questions in the C subgroups are the best of those available in the CU data; both the simple and partial correlation between intentions and purchases is consistently stronger in the C groups. As a consequence, initial-data variables ought to be less strongly associated with purchases net of intentions in the C subgroups than elsewhere, while the influence of intervening variables ought to be about the same. It appears from Table 33 (and from the basic data tables) that this is in fact the case: for example, the net relation between the income or stock adjustment variables and purchases is clearly less strong in C_1, C_2, and C_3 than elsewhere, while the intervening housing variables H_{10} and H_{01} are at least as strong net of buying intentions in the *C* groups as in other groups.

Finally, Table 33 provides an additional test of the proposition that initial-data variables will be more strongly related to buying intentions than to purchases, and that the converse ought to be true with respect to intervening variables. A glance at the summary statistics on the right-hand side of Table 33 confirms that this is the typical pattern. For every variable in the initial-data category the same or more subgroups have the predicted sign in the intentions regression than in the purchases regression, and the same or more subgroups have both the predicted sign and any given level of statistical significance (with one exception—family income, 0.05 significance level). For every variable in the intervening category, the converse is true.[15]

The data in Table 33 indicate that a number of variables have a negligible net influence on both intentions and purchases. One last general summary—Table 34—is therefore presented; regression coefficients and *F* ratios before and after buying intentions are held constant are shown for those initial-data and intervening variables that are significantly related to purchases (0.05 level) in at least two of the nine groups, net of all independent variables. Data from only the A and C subgroups are presented, since the results are about the same in the B groups as in A. The independent variables comprise two objective initial-data variables

[15] There appear to be two exceptions to this statement: H_{10} shows a preponderance of plus signs and coefficients significant at the 0.01 level in the intentions regression; this is as predicted, since those with (unfulfilled) house-buying intentions ought to have relatively more durable goods buying intentions than other households. In the purchases regression, H_{10} generally has negative coefficients, a few of which are significant; but this is again as predicted, since households in this category (planned to buy a house but did not purchase) are expected to buy relatively fewer durables, holding buying intentions constant, than others, because they must have experienced unfavorable intervening events. The other apparent exception is H_{11}, which is analyzed below.

TABLE 34

SUMMARY OF RESULTS FROM MULTIVARIATE REGRESSION ANALYSIS: EFFECT OF ADDING DURABLE GOODS BUYING INTENTIONS TO REGRESSIONS OF PURCHASES ON SELECTED VARIABLES
(mean F ratios are shown in brackets)

Independent Variables	*Net Regression Coefficients*					
	Before	After	Before	After	Before	After
	A_1		A_2		A_3	
Initial-data						
Objective	[13.4]	[7.7]	[21.1]	[6.3]	[11.0]	[6.2]
Y	0.048**	0.039**	0.035**	0.021*	0.035**	0.033**
S'	0.106**	0.020	0.168**	0.078*	0.114*	0.042
Anticipatory	[16.3]	[10.1]	[6.2]	[1.8]	[6.5]	[3.2]
O	0.383**	0.291**	0.247**	0.131	0.281*	0.214*
$\hat{E}_5$	0.043	−0.010	0.030	−0.022	0.262*	0.166
Intervening						
Income Change	[3.7]	[4.3]	[5.8]	[5.8]	[0.6]	[0.4]
ΔY	0.126*	0.125*	0.152*	0.148*	0.100	0.077
ΔY_t	0.252	0.289	0.494*	0.488*	−0.005	0.051
Housing	[16.9]	[14.8]	[3.1]	[2.5]	[2.2]	[2.2]
H_{01}	1.196**	1.055**	0.664*	0.488	0.679	0.657
H_{10}	−0.094	−0.234	−0.013	−0.312	0.541	0.540
Housing	[39.7]	[19.4]	[14.4]	[10.2]	[14.4]	[6.8]
H_{11}	1.519**	1.053**	1.253**	1.027**	2.038**	1.388*
	C_1		C_2		C_3	
Initial-data						
Objective	[15.5]	[2.5]	[24.1]	[9.3]	[12.1]	[2.6]
Y	0.038**	0.022	0.041**	0.032**	0.030*	0.020*
S'	0.151**	0.043	0.186**	0.072*	0.158**	0.045
Anticipatory	[16.2]	[8.4]	[11.9]	[5.6]	[7.3]	[3.2]
O	0.308**	0.192*	0.334**	0.190*	0.324**	0.212*
$\hat{E}_5$	0.273**	0.208*	0.172	0.176*	0.134	0.086
Intervening						
Income Change	[2.3]	[1.6]	[1.5]	[0.8]	[0.3]	[0.4]
ΔY	−0.082	−0.066	0.108	0.060	0.032	0.013
ΔY_t	0.262	0.208	0.201	0.184	0.163	0.198
Housing	[18.8]	[19.9]	[10.2]	[12.8]	[1.2]	[2.8]
H_{01}	1.387**	1.100**	1.274**	1.320**	0.448	0.396
H_{10}	−0.397	−0.893**	−0.060	−0.402	−0.456	−0.859*
Housing	[24.0]	[7.8]	[24.0]	[11.6]	[0.8]	[0.6]
H_{11}	1.384**	0.785*	1.940**	1.328**	0.616	0.514

* = t ratio >2.
** = t ratio >3.

SOURCE: Tables 42–44; regression coefficients are from columns 6 and 7. The independent variables are defined above, in "Description of Variables."

(normal family income, Y, and desired stock adjustment, S'); two anticipatory initial-data variables (opinion about buying conditions, O, and long-range financial prospects, $\hat{E}_5$); two intervening income-change variables (change in income during the forecast period, ΔY, and transitory income, ΔY_t); two intervening housing variables (H_{01}, unanticipated housing purchase, and H_{10}, unfulfilled plans to buy a house); and the one variable that has a pronounced element of both intervening and initial-data considerations (H_{11}, anticipated purchase of a house). Mean F ratios for the four pairs of variables and the F ratio for H_{11} are shown in brackets.

The differential impact of buying intentions on the relation between purchases and initial-data or intervening variables is strikingly evidenced in Table 34. In subgroup A_2, for example, the objective initial-data variables Y and S' have a mean F ratio of 21.1 before intentions are held constant; the anticipatory initial-data variables O and $\hat{E}_5$, a mean F ratio of 6.2. After intentions are held constant, these F ratios fall to 6.3 and 1.8, respectively. But the intervening variables ΔY and ΔY_t have the same mean F ratio (5.8) both before and after. In the subgroup C_1 the same objective and anticipatory initial-data variables have mean F ratios of, respectively, 15.5 and 16.2 before, 2.5 and 8.4 after; the intervening income-change variables, in contrast show a small decline—from 2.3 to 1.6.[16]

[16] The difference between the A and C subgroups in the relative influence of buying intentions on the relation between purchases and initial-data variables should again be noted. This difference must be due to the buying intentions questions asked of households in these groups, sampling variation aside. The before-intentions and after-intentions mean F ratios for the specified initial-data variables are:

	Y, S'		$O, \hat{E}_5$	
	Before	After	Before	After
A_1	13.4	7.7	16.3	10.1
A_2	21.1	6.3	6.2	1.8
A_3	11.0	6.2	6.5	3.2
Mean of A Subgroups	15.2	6.7	9.7	5.0
C_1	15.5	2.5	16.2	8.4
C_2	24.1	9.3	11.9	5.6
C_3	12.1	2.6	7.3	3.2
Mean of C Subgroups	17.2	4.8	11.8	5.7

On the basis of these data the initial-data variables apparently are somewhat more strongly related to purchases in the C subgroups than in A, *prior* to the introduction of intentions. This is presumably a sampling phenomenon, since these variables are identical in each subgroup and the subgroups themselves were selected at random. Net of buying intentions, however, the Y and S' variables have *less* influence in the C

The two housing variables that are mainly intervening are not influenced much by the inclusion of buying intentions. In three of the six groups the mean F ratio for H_{01} and H_{10} increases when buying intentions are held constant, and in the other three groups the change is either nil or a negligible decline. For H_{11}, which is partly an intervening and partly an initial-data variable, the F ratio declines in all six groups, although in no case does the addition of buying intentions reduce a statistically significant H_{11} coefficient to a nonsignificant one. Nonetheless, the H_{11} coefficients all drop considerably and the F ratios are roughly halved, comparing the situation before and after buying intentions are included in the regression on purchases.

Further, it is clear from both Table 34 and the basic data tables that the regression coefficient of H_{11} (anticipated housing purchases) is generally *larger* than that of H_{01} (unanticipated housing purchases) net of intentions to buy durables. Ordinarily, H_{11} has a much larger regression coefficient than H_{01} before durable goods intentions are included in the regression, a slightly larger one after intentions are held constant; that is, holding intentions constant reduces the H_{11} coefficient much more than that of H_{01}, but not enough more to reverse the direction of difference. Since favorable intervening events must have been more frequent or more important in H_{01} than in H_{11} (see above), this result is inconsistent with predictions of the probability model. Because the problem is complicated, I have deferred further examination of it until the remaining results have been discussed.

DIFFERENCES BETWEEN LIFE-CYCLE CLASSES

It has already been noted that anticipatory initial-data variables are more closely related to purchases in households with younger heads, while objective initial-data variables seemed to have no life-cycle pattern at all vis-à-vis purchases. Table 35 facilitates a more careful examination of this proposition; F ratios from the regression of purchases on anticipatory and objective initial-data variables are shown for each of the nine subgroups, as is the F ratio for durable goods buying intentions. Two sets of these ratios are included: one is the mean of the F ratios calculated from the simple correlation between each independent variable and purchases;

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groups; the O and $\hat{E}_5$ variables just slightly more. A comparison of paired observations in the respective subgroups (A_1 versus C_1, etc.) suggests that the C intentions question exerts a stronger influence on the initial-data variables in almost every case. The reason presumably is that the intentions question in the C groups is a better proxy for purchase probability than the question in A; hence, the initial-data variables are more redundant to buying intentions in the C groups.

the other is the mean of the F ratios estimated from the partial correlations in the complete (fifteen-variable) regression.

The hypothesized life-cycle pattern for both anticipatory initial-data variables and buying intentions is clearly in evidence: households with relatively young heads tend to have the highest F ratios based on either the simple or partial correlation with purchases; those with relatively older heads, the lowest F ratios. But there seems to be no discernible life-cycle pattern to the F ratios for objective initial-data variables. However, these observations are based on the relation between initial-data

TABLE 35

MEAN F RATIOS FOR RELATION BETWEEN GROUPS OF INDEPENDENT VARIABLES AND DURABLE GOODS PURCHASES, BY LIFE-CYCLE CLASS

SUBGROUP	INITIAL-DATA VARIABLES					
	Objective		*Anticipatory*		*Buying Intentions*[a]	
	Simple	Net	Simple	Net	Simple	Net
A_1	10.2	4.1	20.2	6.8	133.3	80.7
B_1	16.8	7.9	6.7	0.8	128.1	71.7
C_1	9.8	1.2	16.0	5.7	154.8	87.0
Mean	12.3	4.4	14.3	4.4	138.7	79.8
A_2	12.9	3.3	6.1	1.6	91.4	61.0
B_2	13.0	6.1	9.9	5.6	115.2	56.2
C_2	12.4	4.8	13.8	4.0	140.2	73.3
Mean	12.8	4.7	9.9	3.7	115.6	63.5
A_3	9.0	3.6	9.8	2.6	48.2	24.2
B_3	11.6	7.2	4.2	1.1	63.5	24.7
C_3	6.6	1.6	9.4	2.6	67.5	38.8
Mean	9.1	4.1	7.8	2.1	59.7	29.2

SOURCE: Tables 42–44.

[a] Standard buying intentions ($\hat{P}$) only; contingent buying intentions ($\hat{P}_c$) and the interaction variable $Z\hat{P}_c$ have a small net effect except in the A groups, although they generally have the predicted signs in other groups as well.

variables and actual purchases. Intervening events may have an important influence on this relation, particularly in view of the relatively short forecast period in the analysis. It can be argued, therefore, that the relation between initial-data variables and *buying intentions* provides a more accurate picture of the relative importance of objective and anticipatory variables in the decision-making process, since intervening events should have little or no influence on this relation.

FACTORS DETERMINING PURCHASE PROBABILITY

The data contain, not one measure of buying intentions, but several; the relation between initial-data variables and buying intentions depends on

which intentions question is used. For example, buying intentions in the A subgroups constitute responses to a question with a relatively high probability cut-off point and a relatively small proportion of yes responses. The intentions question asked of the C subgroups has a much lower cut-off probability than that asked of A, and the C subgroups show a correspondingly much higher proportion of yes responses. Thus, an analysis of the relation between buying intentions and initial-data variables yields different results in the A, B, and C samples because of differences in the intentions variables themselves. An indication of the extent of these differences is provided by Table 36, which shows the proportion of total variance in buying intentions explained by a common set of independent variables in each of the nine subgroups.

TABLE 36

PROPORTION OF VARIANCE IN BUYING INTENTIONS EXPLAINED BY SEVEN INITIAL-DATA VARIABLES

	Life-Cycle Class		
Group	1	2	3
A	.073	.109	.099
B	.100	.110	.148
C	.170	.201	.238

SOURCE: Tables 42–44.

The intentions variable in the C samples is evidently much more closely associated with initial-data factors than that in the A or B samples, and the same is true for the intentions variable in the B sample relative to that in A. The reason is simple enough. The C buying-intentions variable elicited many more yes responses for each of the commodities included in the aggregate, as noted above. A minority of households in the C samples (about 35 per cent) reported no buying intentions at all; the remaining households reported numbers of intentions ranging from one to nine. Thus "aggregate intentions" is a number greater than zero for most C households, and those reporting no intentions at all presumably constitute a relatively homogeneous subsample with relatively low *ex ante* purchase probabilities.

On the other hand, the A intentions variable elicited relatively few yes responses, although many A respondents, other than the small number reporting that they "definitely" would buy, replied that they "probably or possibly" would purchase. A majority of sample A households (about 65 per cent) reported no definite buying intentions; the remainder, numbers of definite intentions varying from one to nine. But the 65

per cent of the A sample who are nonintenders constitute a relatively heterogeneous group, in that their *ex ante* purchase probabilities have a substantial variance. Although aggregate buying intentions—and *ex ante* probability—among those reporting at least one buying intention is as closely (probably more closely) associated with initial-data factors among A households as among those in C, the variance in *ex ante* probability among those reporting no buying intentions is bound to be much greater in the A groups. Since the intentions variable is evidently unable to explain any of the variance in *ex ante* probability among nonintenders, it will necessarily be unrelated to initial-data factors associated with differences in *ex ante* purchase probability for the nonintenders.[17] In sum, the data suggest that the relation between the observed variable "aggregate buying intentions" and the unobserved variable "aggregate *ex ante* purchase probability" is much stronger in the C samples than in A; although the association between aggregate *ex ante* probability and initial-data factors must be the same in both groups, the association between these factors and aggregate buying intentions would be stronger in C than in A if aggregate C intentions were more strongly correlated with aggregate *ex ante* probability; and this appears to be the case.

These considerations suggest that the relation between initial-data variables and purchase probability is most closely approximated by the relation between initial-data variables and buying intentions for the C samples; the next-best intentions variable for this purpose is that in the B samples.[18] Hence, Table 37 summarizes the net regression coefficients and joint F ratios from the regression of aggregate buying intentions on initial-data variables in the B and C samples.

The data indicate that the initial-data variables most closely associated with buying intentions (and, hence, purchase probability) are desired stock adjustment (S'), and opinion about buying conditions for durables (O). Both variables are significant at the 0.01 level net of all seven

[17] The argument is basically empirical, not a priori. There is no logical reason why the association between aggregate intentions and initial-data variables might not be stronger the higher the cut-off probability of the intentions question.

[18] Both standard and contingent buying intentions are proxies for purchase probability, and the A sample appears to have the best contingent-intentions variable among the three groups. But the regressions were run only on the standard buying-intentions variable in each sample, not on contingent intentions. I would guess that the relation between A contingent intentions and initial-data variables is probably as close as that between A standard intentions and these variables; this statement would not be true for the other samples. Further, it is fairly evident that a combination of standard and contingent A intentions—perhaps even so crude a combination as the sum of the two—would yield results that are not very different from those for the C standard-intentions variable.

independent variables, and they account for roughly three-fourths of the total explained variance. Before the anticipatory variables are included in the regression, family income (Y) is also significantly related to intentions at the 0.01 level in all subgroups, and liquid-asset change prior to the intentions survey (ΔL_{-1}) is significant at the 0.05 level in all groups. But the anticipatory variables—mainly O—reduce the influence of both these variables considerably. Income is still significant at the 0.05 level

TABLE 37

NET REGRESSION COEFFICIENT AND JOINT F RATIOS FOR INITIAL-DATA VARIABLES RELATED TO STANDARD BUYING INTENTIONS

	Objective Variables					*Anticipatory Variables*			
Subgroup	Y	ΔL_{-1}	ΔY_{-1}	S'	Joint F Ratio	$\hat{E}$	O	$\hat{E}_5$	Joint F Ratio
	OBJECTIVE VARIABLES ONLY								
B_1	.035[a]	.178[b]	.053	.199[a]	20.0				
B_2	.028[a]	.284[a]	−.075	.208[a]	22.3				
B_3	.035[a]	.275[b]	.095	.282[a]	24.6				
C_1	.063[a]	.232[b]	.221[a]	.316[a]	34.0				
C_2	.038[a]	.241[b]	.095	.375[a]	34.2				
C_3	.050[a]	.288[b]	.264[a]	.444[a]	38.0				
	OBJECTIVE AND ANTICIPATORY VARIABLES								
B_1	.028[b]	.126	.047	.205[a]	17.6	−.193	.326[a]	.076	11.0
B_2	.023[b]	.215[b]	−.103	.212[a]	19.0	.167	.311[a]	.041	9.3
B_3	.031[a]	.239[b]	.039	.288[a]	24.5	.702[b]	.291[a]	.005	8.8
C_1	.047[a]	.141	.167[a]	.322[a]	29.3	.656	.501[a]	.220[b]	20.8
C_2	.028[b]	.113	.078	.369[a]	31.7	.852[b]	.551[a]	.012	20.9
C_3	.036[a]	.149	.184[b]	.439[a]	35.0	−.257	.479[a]	.234	11.0

SOURCE: Tables 42–44, columns 1 and 2.

[a] = Significantly different from zero at 0.01 level.

[b] = Significantly different from zero at 0.05 level.

in all groups; at the 0.01 level, it is significant in only three of the six. In addition, all the income regression coefficients decline markedly. The effect of the anticipatory variables on liquid-asset change is even stronger; only two of the six groups show a significant (0.05 level) relation between (ΔL_{-1}) and buying intentions after the anticipatory variables are included in the regression; and all the coefficients show a noticeable drop. In contrast, the coefficient of S' is completely unaffected when anticipatory variables are included in the regression.

The data in Table 37 exhibit consistent and fairly strong differences among life-cycle classes in the relative influence of objective and antici-

patory variables on buying intentions. . In both the B and C samples the joint F ratio for objective variables is larger the older the head of household. All four objective variables contribute to this pattern, although differences in the partial correlation of S' with $\hat{P}$ are mainly responsible. The anticipatory variables follow the opposite pattern with respect to differences among life-cycle classes; the younger the household head, the more closely are these variables related to buying intentions. This result is almost entirely due to differences in the partial correlation of O with $\hat{P}$; the other two anticipatory variables behave erratically, although in the C samples both $\hat{E}$ and $\hat{E}_5$ appear to be somewhat more strongly related to intentions for households with relatively young heads.

The observed differences among life-cycle classes are consistent with the hypothesis that expenditures on durables are more closely associated with wealth (defined to include the discounted value of future income) than with current income. The correlation between wealth and current income is bound to be relatively weak in households with younger heads because the variance of discounted future earnings, current income held constant, is greater the younger the household head. Hence anticipatory variables, which are correlated more closely with wealth than with current income, will have a relatively stronger net influence on purchase probability in younger households. Conversely, objective variables, which reflect differences among households in their current financial situation, will have a relatively stronger net influence on the decisions of older households because they constitute a better proxy for wealth in such a group.

A DIGRESSION ON TASTE VARIABLES

One of the most interesting results in Table 37 is the powerful influence of the stock adjustment variable, S', on buying intentions.[19] Investigation of the relation between durables stock and purchases (discussed in Appendix A) indicated a weak positive association between the two, instead of the negative relation anticipated a priori. The positive stock-purchases correlation is probably due to the correlation between stock of durables and household tastes, i.e., to what have been called personality correlations. S', however, contains a strong subjective element; a household may have a large and relatively new stock of durables and yet report that many items need replacement precisely because its members have

[19] S' represents the (weighted) number of durables in the household's inventory that were regarded as "in need of replacement." The statement that a particular item needed replacement was interpreted as indicating a difference between the household's actual and desired stock of durables.

a taste for durables, while another household with a smaller and older stock may report that no items are in need of replacement for the converse reason. To some extent, therefore, S' tends to standardize for differences in tastes. The data can thus be interpreted as suggesting that the influence of durables stock on purchases, taste for durables held constant, is really quite powerful; the observed correlation between S' and both purchases and buying intentions is positive and quite strong; and S', while it may standardize tastes, is clearly a very crude measure of the difference between actual and desired stock.

A DIGRESSION ON IDIOSYNCRATIC VARIABLES

The same line of analysis may explain why the opinion variable (O) obtained from responses to the question "Is the present a good or bad time for you to buy durables?" is so strongly related to both purchases and buying intentions in the CU data. Both the form of the question and the intercorrelation between O and other initial-data variables indicate that respondents are essentially saying: "Taking everything into account (our current and prospective income, asset and debt position, etc.), this is a [good, bad, pro-con] time for us to be spending money on durables." Thus, O reflects the household's own judgment about the joint influence of objectively observable factors like income, income change, assets, and debts on its current financial position. Since different households necessarily assign different weights to these factors, the O variable combines them in whatever way is most appropriate for each household. Because it is partly an idiosyncratic variable, it can be argued that O ought to explain more of the variance in purchases or intentions to buy than any simple combination of the underlying factors, and would probably explain more variance than any conceivable combination of these factors.[20]

[20] Several points of interest in connection with this variable should be noted. First, O is not necessarily the same as the apparently identical variable obtained by the Survey Research Center and reported in the annual *Survey of Consumer Finances* or in their own Interim Surveys. The SRC uses a projective question: "Is this a [good, bad, pro-con] time for *people like yourselves* to buy durables?" The responses to this question may thus differ from responses to the similar but personally oriented question asked on the CU surveys. Moreover, the SRC has interpreted responses to the projective question as reflecting judgments about market conditions rather than about the current state of the household's finances. That is to say, the SRC argues that responses to the projective question relate to the household's expectations about current and prospective prices, and this view is supported by responses to a follow-up question, "Why do you say so [that this is a good, etc., time for people like yourselves to buy]?" For further discussion, see Appendix A.

Secondly, the Federal Reserve Board's Consultant Committee on Economic Statistics found that the SRC opinion question was the only attitude variable strongly related to

BUYING INTENTIONS VARIABLES

One of the most important empirical tests in this chapter concerns the structure of the regression coefficients for durable goods buying intentions. The basic thesis of the monograph is that a classification of households into intenders and nonintenders essentially constitutes a classification into groups with relatively high and relatively low mean *ex ante* purchase probability, drawn from a universe characterized by a continuous distribution of *ex ante* purchase probabilities. The mean probability for both intenders and nonintenders depends on the cut-off probability that respondents assign to the question about buying intentions. As pointed out earlier in this chapter, the constant term in a simple linear regression of purchases on intentions is an estimate of mean probability among nonintenders, while the regression coefficient of intentions is an estimate of the difference in mean probability between intenders and nonintenders.[21]

The data in Tables 42–44 contain six different buying intentions variables; the A, B, and C subsamples contain both a standard and a contingent intentions variable, each of which is constructed from responses to questions with different (implicit) cut-off probabilities. A priori, it is clear that the standard intentions variable in each of these (A,B,C) samples has a higher cut-off probability than the contingent intentions variable in the same sample, and that the standard intentions variable in A has a higher probability cut-off than that in C (see Chapters 2 and 3). On the basis of evidence that is partly a priori and partly empirical (the proportion of households responding yes to the alternative questions), the ordering of the cut-off probabilities for the remaining intentions questions can be fixed with a fair degree of confidence.

Given the variation in cut-off probability for the six intentions ques-

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time series changes in expenditures on durables (see *Reports of Federal Reserve Consultant Committees on Economic Statistics*, Joint Committee on the Economic Report, 84th Cong., 1st sess., 1955). Thus these cross-section results are consistent with an analysis of time series changes based on responses (to a roughly similar question) from a random sample of the population.

[21] The fact that the empirical data relate aggregate intentions for each household to aggregate household purchases makes little difference in principle. The linear regression coefficient of aggregate purchases on intentions is still an estimate of the difference in mean probability between intenders and nonintenders, except that it constitutes a weighted average of intender-nonintender probability differences for all commodities included in the aggregate. The constant term, however, becomes the probability that a nonintender will purchase *any* of the commodities in the aggregate. Dividing the constant by the number of commodities aggregated will produce an estimate of the weighted mean probability that nonintenders will purchase the "average" commodity.

tions, it is anticipated that there will be relatively little difference in mean probability among nonintenders, relatively much among intenders (again, see Chapter 3). As a consequence, differences in mean probability between intenders and nonintenders should be positively (though not linearly) correlated with the cut-off probability. Since the regression coefficients of the respective buying-intentions variables are estimates of the respective differences in mean probability between intenders and nonintenders, the test involves a comparison of the respective cut-off probabilities for the six intentions variables—which can be ordered on partly a priori and partly empirical grounds—with the corresponding coefficients estimated in the multivariate regressions.

Table 38 contains two sets of coefficients for the relevant intentions variables. The upper panel contains data from the regressions analyzed in this chapter, while the lower panel contains data from the regressions discussed in Appendix A.[22] The observed regression coefficients follow the predicted pattern closely in all life-cycle classes; the conformity is almost perfect in the youngest age groups, more erratic in the oldest. All coefficients but one are positive, and the size of the differences among coefficients seem generally reasonable. These generalizations apply to the coefficients in either panel, although some of the mean probabilities implied by the Panel B coefficients seem rather large. For example, the mean *ex ante* probability associated with definite buying intentions for households in the 25–34 age group appears to be somewhere around 0.7 or 0.8, judging from the data in the lower panel. The estimated mean difference in observed purchase rates between intenders and nonintenders is calculated as 0.52, and nonintenders must have had purchase rates in excess of zero—say, roughly 0.07; hence, the mean purchase rate for intenders is estimated as roughly 0.6. By implication, mean *ex ante*

[22] The upper and lower panels differ in three important respects. First, the number of cases included in each of the regressions is smaller in the lower panel; the Appendix A regressions excluded all households either intending to buy or purchasing a house. Second, the complete set of independent variables—for the regression equation from which the respective intentions coefficients are taken—is not the same in the upper and lower panels; compare $X_1, \ldots, X_{12}$ listed in the first part of this chapter with $X_{1a}, \ldots, X_{13a}$ listed in Appendix A. Third, interaction between standard and contingent intentions assumes a different form: in the upper panel the interaction variable is $Z\hat{P}_c$, where $Z = 1$ when $\hat{P}$ is zero, $Z = 0$ otherwise; in the lower panel the interaction variable is the cross-product, $\hat{P}\hat{P}_c$.

The most important difference is the third. The cross-product interaction generally tends to increase the coefficients for both standard and contingent intentions to a greater degree than the other ($Z\hat{P}_c$); hence, most of the coefficients in the lower panel are higher than their counterparts in the upper panel. While the ordering is about the same, the differences among intentions variables are somewhat more pronounced in the lower panel.

probability among intenders should have been considerably higher than 0.6 because of regression bias, and I would doubt that this is the case.

The data in Table 38 also indicate that the regression coefficient of buying intentions is a function of life-cycle status, being systematically larger for groups of households with relatively young heads. It is not

TABLE 38

NET REGRESSION COEFFICIENTS FOR ALTERNATIVE MEASURES OF DURABLE GOODS BUYING INTENTIONS

Predicted Order of Cut-off Probability	*Observed Coefficients, Life-Cycle Class:* 1	2	3
REGRESSIONS FROM TABLES 42–44			
1. $\hat{P}$ in A sample	.375*	.292*	.267*
2. $\hat{P}$ in B sample	.359*	.291*	.220*
3. $\hat{P}$ in C sample	.287*	.316*	.253*
4. $\hat{P}_c$ in A sample[a]	.126*	.139*	.052
5. $\hat{P}_c$ in C sample[a]	.082	.067	.036
6. $\hat{P}_c$ in B sample[a]	.049	.021	−.026
REGRESSIONS FROM APPENDIX A			
1. $\hat{P}$ in A sample[b]	.520*	.452*	.179*
2. $\hat{P}$ in B sample[b]	.334*	.416*	.274*
3. $\hat{P}$ in C sample[b]	.406*	.336*	.297*
4. $\hat{P}_c$ in A sample[c]	.147*	.159*	.087*
5. $\hat{P}_c$ in C sample[c]	.136*	.004	.066
6. $\hat{P}_c$ in B sample[c]	.055	.062	−.004

SOURCE: Data in upper panel taken from Tables 42–44, column 7, i.e., from equation that regresses durables goods purchases on all fifteen independent variables. Data in lower panel taken from Appendix A, Tables A-1 through A-9, column 3, i.e., from regressions that do *not* include the interaction variables—ZS', ZY, $\hat{E}\hat{P}$, ZO, and $Z_1\hat{P}_c$.

* = Significantly different from zero at 0.01 level.

[a] Figure shown is the coefficient of contingent buying intentions when standard intentions are zero. The $Z\hat{P}_c$ interaction behaves erratically and also causes erratic movements in $\hat{P}_c$; hence, the combined influence of both variables is a better measure than either taken alone.

[b] Figure shown is the coefficient of standard intentions when contingent intentions are zero.

[c] Figure shown is the coefficient of contingent intentions when standard intentions are zero.

clear why this is so. The simple correlations between intentions and purchases, as well as the corresponding regression coefficients, tend to be slightly smaller in the older age groups, although the differences are not so pronounced as those shown above and are well within the limits of sampling variability. On the other hand, the association between buying intentions and initial-data variables is typically stronger among households in the older age groups; hence, the partial correlation and regression

coefficients for buying intentions are weaker, relative to the zero-order relationships, in the older age groups. By implication, intervening events (not necessarily those observable in the data) must have been relatively more important as an explanation of differences in purchases among older households. It does not necessarily follow that intervening events were more common—indeed, they may have been less so. But unexpected developments—especially adverse ones—may well result in a greater divergence between intentions and purchases among older than among younger households. For example, younger households faced with unexpected financial adversity may be more willing to make use of both accumulated savings and credit than older households faced with a similar situation; if so, the relation between *savings intentions* and *actual savings* would be closer in older households, that between *spending intentions* and *actual spending* closer in younger ones, other things being equal.

A Re-examination of the Housing Variables

The last section of this chapter is concerned with a re-examination of the three variables representing house purchases or house-buying intentions—H_{10}, H_{01}, and H_{11}. As already discussed, the regression coefficients of these (classification) variables, net of durable goods buying intentions, are presumed to measure the relative importance of intervening events. The events themselves are not directly observable but are inferred from the fact that housing purchases in the respective groups were observed to be more (or less) frequent than indicated by the *ex ante* mean probability of housing purchases. Thus, households who purchased houses but did not report house-buying intentions (H_{01}) are presumed to have experienced favorable intervening events to a greater degree, on the average, than those who purchased houses and had also reported house-buying intentions (H_{11}); similarly, households reporting intentions to buy houses but not purchasing (H_{10}) are presumed to have experienced unfavorable intervening events to a greater degree on average than those neither intending to buy nor purchasing houses (H_{00}). The net regression coefficients of H_{01}, H_{10}, and H_{11} measure the respective differences in average purchases, other things being equal, between households in these three groups and those in H_{00}. Consequently, in an equation of the general form

$$P = b_0 + b_1\hat{P} + b_2H_{01} + b_3H_{10} + b_4H_{11} + \cdots + u,$$

where the variables are defined as above, the regression coefficients should be ordered

$$H_{01} > H_{11} > 0 > H_{10}.$$

Instead, the data examined above indicate that, in most subgroups, the net regression coefficients of these variables are ordered

$$H_{11} > H_{01} > 0 > H_{10}.$$

It will be recalled that the regression coefficient of $\hat{P}$, durable goods buying intentions, is an estimate of the difference in mean purchase probability between (durable goods) intenders and nonintenders. Suppose, however, that $\hat{P}$ has not one value but multiple values, depending on the particular circumstances of groups of households. The evidence in Chapters 3 and 4 suggests that the coefficient of $\hat{P}$ probably varies little (if at all) with household characteristics such as income, age, etc. However, the housing variables are so constituted that differences among H_{01}, H_{10}, H_{11}, and H_{00} in mean *ex ante* purchase probability for intenders are not only possible, but likely.

To begin with, durable goods buying intentions are consistently higher in the H_{11} groups than in H_{10} (both reported house-buying intentions, but only those in H_{11} purchased); on a priori grounds, the *ex ante* mean probability of a housing purchase must have been higher in H_{11} than in H_{10}.[23] In the same vein, intentions to buy durables were consistently higher in H_{01} than in H_{00} (neither group "intended" to buy a house, but those in H_{01} bought); a priori, the *ex ante* mean probability of a housing purchase is likely to have been higher in H_{01} than in H_{00}. It is a reasonable supposition that, in these groups, the mean probability associated with buying intentions for durable goods is related to the mean probability of a housing purchase, given the strong complementarity between purchases of housing and purchases of durables. On this line of reasoning the mean probability associated with intentions to buy durables ought to be substantially higher in H_{11} than in H_{10}, somewhat higher in H_{01} than in H_{00}. Moreover, given the nature of these classifications, the mean *ex ante* probability associated with the durables buying intentions of H_{11} households is likely to have been higher than in either H_{01} or H_{00}, while among H_{10} households the *ex ante* mean is likely to have been lower than in either of these groups. That is to say, it can plausibly be argued that mean durable goods purchase probability among intenders ranks in the order

$$H_{11} > H_{01} > H_{00} > H_{10}.$$

There seems to be no a priori reason to suppose that mean *ex ante* purchase

[23] The question on house-buying intentions asked about "the next twelve months." Households that reported intentions to buy houses and purchased within the six-month forecast period surely had higher *ex ante* probabilities of purchasing houses, on the average, than those who reported intentions but did not buy.

probability among nonintenders would necessarily follow the same pattern; even if it did, it is likely that differences among nonintenders would be much less pronounced than among intenders.[24]

If purchase probability varies in this way, the probability model no longer predicts that the coefficient of H_{01} will necessarily exceed that of H_{11} in the regressions summarized in Tables 42–44. If the mean *ex ante* purchase probability associated with durable goods buying intentions varies among the housing groups, the regression coefficients of the housing classification variables will reflect this fact as well as the fact of differences in intervening events. Thus, the coefficient of H_{11} might exceed that of H_{01} even though intervening events were more important in the latter group provided that mean *ex ante* purchase probability were higher among H_{11} than among H_{01} intenders by enough to offset the difference.

This possibility can be explored empirically. For the moment, two assumptions must be made: first, that among households in each of the respective housing categories, the incidence of intervening events is independent of the level (number) of reported buying intentions; second, that in each of the respective groups the *ex ante* probability associated with intentions is independent of the level of intentions. Designating favorable intervening events as F, unfavorable ones as U, and durable goods purchases (buying intentions) for households in the respective housing categories H_{01}, H_{10}, H_{11}, and H_{00} as $P_{01}(\hat{P}_{01})$, . . . ,$P_{00}(\hat{P}_{00})$, we can write

$$\text{within } H_{01},\ P_{01} = c_{01} + a_{01}\hat{P}_{01} + b_{01}(F_{01} + U_{01}) + e_{01},$$
$$\text{within } H_{10},\ P_{10} = c_{10} + a_{10}\hat{P}_{10} + b_{10}(F_{10} + U_{10}) + e_{10},$$
$$\text{within } H_{11},\ P_{11} = c_{11} + a_{11}\hat{P}_{11} + b_{11}(F_{11} + U_{11}) + e_{11},$$
$$\text{within } H_{00},\ P_{00} = c_{00} + a_{00}\hat{P}_{00} + b_{00}(F_{00} + U_{00}) + e_{00}$$

It is clear that favorable intervening events must have outweighed unfavorable ones in subgroups that purchased houses (H_{01} and H_{11}), and that this must have been true to a greater extent in H_{01} than in H_{11}. Unfavorable intervening events must have outweighed favorable ones in H_{10}; and the same should be true in H_{00}, although to a lesser extent. It follows that:

$$(\bar{F}_{01} + \bar{U}_{01}) > (\bar{F}_{11} + \bar{U}_{11}) > 0 > (\bar{F}_{00} + \bar{U}_{00}) > (\bar{F}_{10} + \bar{U}_{10})$$

The *ex ante* purchase probability associated with the durable goods buying intentions of households in these four groups is expected to vary as

[24] *Ex post*, of course, nonintenders who purchase houses will buy considerably more than other nonintenders; but this is in large part attributable to the influence of intervening events, not to differences in the mean *ex ante* probability associated with durable goods buying intentions.

hypothesized above. The probability associated with intentions to buy any given product is presumably highest among those in H_{11}, lowest among those in H_{10}. And the analysis suggests that the probability associated with intentions to buy durable goods might well be higher in H_{01} than in H_{00}. On this basis, it should be observed that:

$$a_{11} > a_{01},\ a_{00} > a_{10} > 0,$$

and it may be that

$$a_{01} > a_{00}$$

Finally, it can be argued that the constant term should be positive, with little if any variation among the groups. Buying intentions, the only available measure of durable goods purchase probability, is basically a dichotomous variable. In an equation of the form

$$P_0 = c_0 + a_0\hat{P}_0 + b_0(F_0 + U_0) + e_0,$$

the a_0 coefficient measures the average difference in the purchase rates of intenders and nonintenders, while the constant is an estimate of the mean purchase rate of nonintenders, other things equal. Since nonintenders have a mean purchase rate greater than zero, c_0 will exceed zero.[25] It follows that

$$c_{01} \sim c_{10} \sim c_{11} \sim c_{00} > 0.$$

The empirical data do not, of course, contain variables that represent favorable or unfavorable intervening events per se, but can be fitted only to equations of the form

$$P = c' + a\hat{P} + e',$$

where $c' = c + b(\bar{F} + \bar{U})$

$e' = e + \text{Var. } (F + U)$.

Thus the constant term in a simple linear regression of purchases on buying intentions is an estimate of the combined influence of intervening events and the mean purchase rate of nonintenders. Since the latter is not expected to show much variation among the groups, other things equal, differences in the constant can be attributed primarily to the differential importance of intervening events.

In sum, the analysis suggests that, designating the constant term in a simple linear regression of purchases on buying intentions as k, the slope

[25] Data in Chapter 6, Table 23, indicate that mean purchases among nonintenders are typically greater than 1.0 durables.

coefficient as p, and the respective housing groups $H_{01}, \ldots, H_{00}$ by subscripts,[26]

$$k_{01} > k_{11} > k_{00} > k_{10},$$

and

$$p_{11} > p_{01}, p_{00} > p_{10} > 0;$$

perhaps,

$$p_{01} > p_{00}.$$

Differences in the influence of intervening events on purchases in these four groups ought to show up as differences in the constant term, while differences in the mean *ex ante* probability associated with durable goods buying intentions ought to show up as differences in the slope of the regression coefficient for buying intentions.

Differences among these groups in the correlation between purchases and buying intentions should also be observable. A priori, groups in which the variance of intervening events is relatively large ought to show a relatively weak $P,\hat{P}$ correlation, since the error variance will include the within-group variance of $F + U$. The variance of $F + U$ probably tends to be greater for groups in which intervening events are more important—H_{01} and H_{10}. On that count the intentions-purchases correlation ought to be stronger in H_{00} than in the other three groups, and it can be argued that the $P,\hat{P}$ correlation should be stronger in H_{11} than in H_{01} or H_{10}.[27]

[26] It cannot be determined a priori whether all of the k coefficients will be greater than zero. k_{01}, k_{11}, and k_{00} clearly ought to exceed zero; the balance of intervening events is either favorable or very slightly unfavorable, while the mean purchase rate of nonintenders is considerably above zero and should outweigh the (slight) negative influence of intervening events in the H_{00} group. In H_{10}, however, it is not clear that the negative influence of unfavorable intervening events will exceed the mean purchase rate of nonintenders.

[27] The reasoning is as follows. The mean *ex ante* probability of a house purchase among those reporting intentions to buy a house can be roughly estimated as about 0.55; approximately 35 to 40 per cent of all intenders purchased a house, and the regression bias is likely to be fairly strong. The mean *ex ante* probability of a house purchase among those not intending to buy a house is likely to be around 0.05, perhaps less. Mean probability among intenders is the weighted average of the means in H_{10} and H_{11}; since the former group did not purchase and the latter group purchased, mean *ex ante* probability is presumed to be higher in H_{11}. It might be reasonable to assume that the mean *ex ante* probability of a housing purchase was roughly 0.80 in H_{11} and 0.50 in H_{10}. Similarly, the mean probability of 0.05 for nonintenders is the weighted average of the means for H_{01} and H_{00}. A reasonable set of figures here might be 0.30 for H_{01} and 0.04 for H_{00}.

Now the variance of $F + U$ in any of these groups depends largely on the mean *ex ante* probability of a housing purchase. I would judge that an appropriate measure of the variance involves the assumption that an *ex ante* mean of 0.50 in a group where all purchased houses is tantamount to saying that half of the group experienced favora-

The empirical results are summarized in Table 39. Because of the small sample sizes of the groups of households that purchased or intended to buy houses, a regression combining the A, B, and C groups in each life-cycle class is shown in addition to separate regressions for each of the groups.

TABLE 39

BUYING INTENTIONS-PURCHASES CORRELATION WITHIN GROUPS CLASSIFIED BY LIFE-CYCLE AND HOUSING STATUS

	Life-Cycle Group 1				Life-Cycle Group 2				Life-Cycle Group 3			
	H_{01}	H_{10}	H_{11}	H_{00}	H_{01}	H_{10}	H_{11}	H_{00}	H_{01}	H_{10}	H_{11}	H_{00}
A subsamples												
k	2.29	1.27	2.37	0.88	2.40	1.21	2.20	1.29	1.78	2.26	1.17	1.43
p	0.44[a]	0.11	0.37[a]	0.49[a]	−0.16	0.26[a]	0.55[b]	0.41[a]	0.61[b]	0.18	0.88[a]	0.23[a]
r^2	0.12	0.02	0.14	0.13	0.02	0.15	0.12	0.10	0.15	0.01	0.68	0.04
N	85	83	61	852	50	54	32	863	20	31	14	559
B subsamples												
k	1.98	1.62	2.08	1.19	2.18	1.07	2.06	1.17	3.09	1.64	1.80	1.19
p	0.31	0.20[b]	0.44[a]	0.41[a]	0.35	0.11	0.53[a]	0.38[a]	0.11	−0.13	0.57[a]	0.32[a]
r^2	0.05	0.06	0.14	0.10	0.08	0.02	0.32	0.09	0.01	0.03	0.33	0.07
N	60	70	46	866	47	59	32	836	30	20	14	678
C subsamples												
k	2.00	1.23	1.48	0.97	0.82	1.30	0.69	0.82	0.61	0.84	1.46	1.08
p	0.40[a]	0.05	0.45[a]	0.37[a]	1.04[a]	0.09	0.67[a]	0.34[a]	0.73[a]	0.08	0.45[a]	0.29[a]
r^2	0.14	0.00	0.28	0.14	0.41	0.00	0.43	0.14	0.32	0.00	0.62	0.10
N	65	94	47	814	44	65	22	691	19	26	8	570
A, B, C, samples combined												
k	2.13	1.36	1.95	1.14	2.11	1.16	1.92	1.13	2.21	1.81	1.34	1.24
p	0.39[a]	0.09[b]	0.42[a]	0.37[a]	0.29[a]	0.15[a]	0.52[a]	0.34[a]	0.30[b]	−0.07	0.71[a]	0.27[a]
r^2	0.12	0.02	0.19	0.11	0.06	0.04	0.26	0.09	0.06	0.01	0.54	0.06
N	210	247	154	2,533	141	178	86	2,390	69	77	36	1,807

SOURCE: Basic data from Consumer Purchase Study, NBER. See accompanying text for description of procedures.

[a] = Significantly different from zero at 0.01 level, using t test.

[b] = Significantly different from zero at 0.05 level, using t test.

The pattern of the results, though erratic because of small sample sizes, is reasonably consistent with the propositions that mean *ex ante* purchase probability and the influence of intervening events differ along the lines discussed above. The groups that purchased houses (H_{01} and H_{11})

ble intervening events and the other half experienced nothing unforeseen. If "intervening events" are scaled +1, −1, 0, corresponding to favorable, unfavorable, or none, the respective means and variances would be:

Housing Group	*Mean Value of* $F + U$	*Variance of* $F + U$
H_{01}	+.70	.21
H_{10}	−.50	.25
H_{11}	+.20	.16
H_{00}	−.04	.04

generally have larger constants than the nonpurchase groups (H_{10} and H_{00}). But while H_{11} is apt to have a smaller constant than H_{01}, as predicted, there are numerous cases in which the reverse is true; and it is generally not the case that H_{10} has a smaller constant than H_{00}, as the analysis predicts. Further, there are cases in which H_{10} has the largest constant in any of the four groups. The ordering of the slope coefficients is uniformly in accord with predictions, although the size of many of these differences seems unduly large. The regression coefficient of intentions is larger for H_{11} than for H_{00} in eight of the nine subgroups; H_{10} has a smaller slope than H_{00} in all nine subgroups. There is no apparent difference in slope between H_{01} and H_{00}—in five groups, the slope in H_{01} is lower; and in the other four groups it is higher. There are, however, a few cases in which H_{01} has an extremely large slope.

Given these results, it is probable that some of the assumptions do not hold. For example, the slopes in the H_{10} groups are generally very small, and some are negative. It does not seem plausible that these coefficients are estimates of the difference in mean *ex ante* purchase probability between H_{10} intenders and nonintenders. By the same token, some of the slope coefficients in H_{01} and H_{11} seem unreasonably large. If the slope coefficients are seriously biased, it necessarily follows that the constants will be biased in the opposite direction. Thus, an adequate explanation for the observed facts—that H_{10} generally has a larger constant than consistent with the analysis, or that H_{01} and H_{11} frequently have smaller constants than predicted—may simply be that the estimated slope coefficients in these groups are systematically biased.

The analysis underlying Table 39 depends heavily on two critical assumptions: (1) within each of the housing groups the level of durable goods buying intentions is uncorrelated with intervening events; and (2) within each group the *ex ante* probability associated with durable goods buying intentions is also uncorrelated with the level of buying intentions. If favorable intervening events were positively correlated with the level of buying intentions, the regression coefficient of intentions (p) would then be too large as a measure of the mean difference in *ex ante* probability between intenders and nonintenders; the constant term (k) would be too small as a measure of the influence attributable to intervening events. The reverse would be true if U and $\hat{P}$ were positively correlated. Similarly, if the *ex ante* probability associated with intentions were higher for households that reported a relatively large number of buying intentions, the regression coefficient of $\hat{P}$ would be too large in that particular group, the constant term too small.

A comparison of mean purchases and buying intentions in the H_{01} and H_{11} groups, where the mean *ex ante* probability of a housing purchase is likely to be quite different (both purchased houses, but only those in H_{11} reported house-buying intentions), suggests that the higher the *ex ante* probability of buying a house, the larger are both intentions to buy and purchases of durable goods, given that a house is purchased. But if this is true for a comparison between households in H_{01} and H_{11}, it should apply equally well within these groups. If so, households in H_{01} or H_{11} with the highest (lowest) *ex ante* probability of purchasing a house would have reported the most (fewest) durable goods buying intentions and made the most (fewest) purchases, relative to other households in the same groups. To the extent that this is the case, the regression coefficient of buying intentions on purchases will be too large as a measure of the difference between intenders and nonintenders in mean purchase probability, the constant term too small as a measure of the importance of intervening events.

Similarly, mean durable goods buying intentions are generally much smaller in H_{10} than in H_{11} (both groups reported intentions to buy a house, but only those in H_{11} purchased), again indicating that the *ex ante* probability of buying a house is correlated with the number of buying intentions for durable goods. If this is also true within each of these groups, those with the largest number of durable goods buying intentions would have had relatively high *ex ante* probabilities of purchasing the house. Since none of the households in H_{10} purchased, those with relatively large numbers of durable goods buying intentions must therefore have experienced unfavorable intervening events to a greater degree than others in the same group. The consequence here is a *downward* bias in the regression coefficient of durable goods buying intentions in the H_{10} group, an *upward* bias in the constant term.

These considerations also bear on the within-group correlations between intentions and purchases. The data show that the correlation between purchases and intentions is generally weaker in H_{01} and H_{10} than in H_{11}, and generally stronger in H_{00} than in H_{10}, as predicted. That is,

$$r_{11} > r_{01}, r_{10}$$
$$r_{00} > r_{10},$$

where the subscripts denote the housing groups and r is the simple correlation between purchases and durable goods buying intentions. However, it is also true that r_{11} is always greater than r_{00}, and that r_{01} is frequently greater than r_{00} and almost always greater than r_{10}. Both r_{11} and r_{01} thus

tend to be higher than anticipated and r_{10} tends to be lower than anticipated, observations consistent with the presence of within-group intercorrelations between the *ex ante* probability associated with buying intentions and the level of intentions.

One experiment that shows rather interesting results is to substitute a set of partially a priori regression coefficients for those shown in Table 39 and then to recompute the constant. The data provide empirical evidence that

$$p_{11} > p_{01},\ p_{00} > p_{10},$$

but the quantative differences seem unduly large. Suppose it is assumed that p_{00} is an unbiased estimate of p^*_{00}—the "true" regression coefficient in H_{00}. Since the sample size in H_{00} is extremely large and the importance of intervening events is presumably less than in any of the other groups, any bias ought not to be serious. The data indicate that p_{10} is smaller than p_{00}, but the differences seem too large on a priori grounds. So p^*_{10} is arbitrarily set equal to $p^*_{00} - 0.05$. There is no empirical evidence that p_{01} differs from p_{00}; hence, p^*_{01} is set equal to p^*_{00}. Finally, the empirical evidence indicates that p_{11} is greater than p_{00}, but again the difference seems too large in many of the groups. In addition, it appears that the difference between p_{11} and p_{00} varies with life-cycle status; a careful scrutiny of Table 39 suggests that $p_{11} - p_{00}$ is quite small in the youngest age group, quite large in the oldest age group, and of moderate size in the central age group. Accordingly, it is assumed that in A_1, B_1, and C_1: $p^*_{11} = p^*_{00} + 0.05$; in A_2, B_2, and C_2: $p^*_{11} = p^*_{00} + 0.15$; and in A_3, B_3, and C_3: $p^*_{11} = p^*_{00} + 0.25$.[28] Given these assumptions a new set of constants—k^*—can be estimated.[29] These are shown in Table 40, with the original k values included for comparison.

[28] It is not quite accurate to designate all of the p^* estimates as "assumptions." The p coefficients are of course empirically obtained. Since p^*_{00} is assumed equal to p_{00}, it is basically an empirical estimate. Similarly, p^*_{01} is assumed equal to p^*_{00}, but p_{01} shows no systematic tendency to differ from p_{00}. The estimate of p^*_{10} is essentially arbitrary, since the data suggest only that p^*_{10} is lower than p^*_{00}. Finally, the p^*_{11} estimates are reasonably close to the (observed) average p_{11} for the A, B, and C samples in the respective life-cycle classes, as can be seen from the following tabulation.

Life-cycle Class	*Computed Mean* p_{11}	*Mean Estimate of* p^*_{11}
1	.42	.47
2	.58	.53
3	.63	.57

[29] In the A_3 group shown in Table 39, the estimate of p_{00} seemed unduly low. The estimates of k^* are based on the assumption that all the p_{00} regression coefficients are unbiased except for this one, which was raised from 0.23 to 0.35. This adjustment has some effect on the differentials in p^* but serves mainly to reduce all the k^* values in the A_3 group.

The k^* estimates are almost wholly consistent with the hypotheses advanced earlier, except in the A sample. The rank ordering of the k^* estimates is perfectly consistent with the predicted ordering for all three life-cycle classes in the combined (A + B + C) sample, for the mean of the k^* estimates in the separate samples, and for the C sample.

TABLE 40

ESTIMATED AND COMPUTED VALUES OF THE CONSTANT TERM IN A LINEAR REGRESSION OF PURCHASES ON BUYING INTENTIONS WITHIN SPECIFIED LIFE-CYCLE AND HOUSING STATUS GROUPS

	*Estimated k**					*Computed k*				
	A	B	C	A + B + C	Mean of A, B, C	A	B	C	A + B + C	Mean of A, B, C
Life-cycle group 1										
H_{01}	2.23	1.85	2.06	2.16	2.04	2.29	1.98	2.00	2.13	2.09
H_{10}	0.94	1.30	0.31	0.85	0.85	1.27	1.62	1.23	1.36	1.37
H_{11}	2.01	2.03	1.59	1.95	1.87	2.37	2.08	1.48	1.95	1.97
H_{00}	0.88	1.19	0.97	1.14	1.01	0.88	1.19	0.97	1.14	1.01
Life-cycle group 2										
H_{01}	1.68	2.15	2.15	2.03	1.99	2.40	2.18	0.82	2.11	1.80
H_{10}	1.03	0.60	0.64	0.80	0.75	1.21	1.07	1.30	1.16	1.19
H_{11}	2.19	2.06	1.39	2.00	1.88	2.20	2.06	0.69	1.92	1.65
H_{00}	1.29	1.17	0.82	1.13	1.09	1.29	1.17	0.82	1.13	1.09
Life-cycle group 3										
H_{01}	2.00	2.74	1.45	2.24	2.06	1.78	3.09	0.61	2.21	1.82
H_{10}	2.17	0.62	0.31	1.21	1.03	2.26	1.64	0.84	1.81	1.58
H_{11}	2.05	1.79	1.27	1.95	1.70	1.17	1.80	1.46	1.34	1.48
H_{00}	1.35	1.19	1.08	1.24	1.20	1.43	1.19	1.08	1.24	1.23
Rank[a] r^2	0.16	0.75	1.00	1.00	1.00	0.16	0.64	0.00	0.44	0.44

SOURCE: Computed values of k from Table 39; see accompanying text for discussion of the k^* estimate.

[a] Predicted versus observed rank.

These results suggest a basis for recomputation of the net regression coefficients for H_{01}, H_{10}, and H_{11} in the multivariate analysis. If the mean probability associated with buying intentions is such that

$$p^*_{11} > p^*_{01}, p^*_{00} > p^*_{10}$$

and if the numerical relations are those estimated above, the equation used to estimate the coefficients of H_{01}, H_{10} and H_{11} was not properly specified. Instead of one buying intentions variable there ought to have been several, reflecting the fact that the mean probability associated with durable goods buying intentions differs among the housing groups. A rough estimate of the coefficients that would have been observed for H_{01}, H_{10}, and H_{11} if

separate intentions variables had been included in the analysis can be obtained from the p^* values.

The coefficients of the housing variables in Tables 42–44 are estimates of the difference in mean purchases of durables between households in H_{00} and those in the other three groups, other things equal. The coefficient of buying intentions is an estimate of the difference between intenders and nonintenders in mean purchase probability. The above analysis suggests that mean probability among intenders is a function of whether the household is in H_{01}, H_{10}, H_{11}, or H_{00}; that mean probability among nonintenders is about the same for households in all four groups; and that the difference among these four groups in the mean probability associated with buying intentions is adequately measured by the p^* estimates. Granting these propositions, the appropriate coefficients for H_{01}, H_{10}, and H_{11} can be approximated by the following procedure.

1. Start with the coefficients of the housing dummy variables in the regression that does not include buying intentions (column 6 in Tables 42–44). These coefficients are estimates of mean differences in purchases of durables between H_{00} and the other groups, other things equal but ignoring intentions to buy durables.
2. Assume that p^*_{00}—the true regression coefficient of buying intentions in H_{00}—is equal to the net regression coefficient of buying intentions for the sample as a whole, as estimated in column 7 of Tables 42–44. The "true" coefficients of buying intentions in H_{01}, H_{10}, or H_{11} are then estimated from the assumed differences between p^*_{00} and p^*_{01}, p^*_{10}, or p^*_{11}.
3. Multiply the p^* coefficients in step 2 by the mean difference between H_{00} and the other three groups in the level of buying intentions. This calculation indicates the degree to which purchases in H_{01}, H_{10}, or H_{11} are expected to be higher or lower than purchases in H_{00} because of differences among these groups either in the level of buying intentions or in the mean probability associated with intentions.
4. Adjust the housing coefficients estimated in step 1 by adding (subtracting) the differences calculated in step 3. The resulting figure is an estimate of what H_{01}, H_{10}, and H_{11} would have been if the "true" coefficient of buying intentions for each group, rather than one coefficient reflecting a weighted average for all groups, had been used in the regressions. The calculation rests on the assumption that interrelations among purchases, buying intentions, housing status, and all other variables included in Tables 42–44 regressions

would not be affected if separate intentions variables, reflecting the mean probability associated with buying intentions in each of the groups, had been used in place of the single intentions variable actually employed. Since all these interrelations appear to be quite weak, this assumption is unlikely to cause serious difficulty.

Table 41 summarizes alternative estimates of the regression coefficients for H_{01}, H_{10}, and H_{11}. The first estimate is taken from step 1 above; it consists of the mean differences in durable goods purchases between H_{00} and the other groups, as estimated by the multiple regression before account is taken of buying intentions but after standardizing for the influence of seven initial-data and two intervening variables. The second estimate is also taken directly from the multiple regressions; it measures differences among housing groups in mean purchases net of buying intentions, initial-data, and intervening variables on the implicit

TABLE 41

ALTERNATIVE ESTIMATES OF REGRESSION COEFFICIENTS FOR HOUSING CLASSIFICATION VARIABLES

Estimate Number	H_{01}	H_{10}	H_{11}	H_{01}	H_{10}	H_{11}	H_{01}	H_{10}	H_{11}
	A_1 SUBGROUP			A_2 SUBGROUP			A_3 SUBGROUP		
1.	1.20	−0.09	1.52	0.66	−0.13	1.25	0.68	0.54	2.04
2.	1.05	−0.23	1.05	0.49	−0.31	1.03	0.66	0.54	1.39
3.	0.99	−0.19	1.00	0.51	−0.44	1.08	0.64	0.53	1.38
4.	0.99	−0.18	0.93	0.51	−0.39	1.00	0.64	0.53	0.77
5.	1.35	0.06	1.13	0.39	−0.26	0.90	0.65	0.83	0.70
	B_1 SUBGROUP			B_2 SUBGROUP			B_3 SUBGROUP		
1.	0.77	0.30	1.53	1.14	−0.33	2.08	1.69	−0.27	2.26
2.	0.71	−0.03	1.06	1.05	−0.63	1.48	1.54	−0.53	1.78
3.	0.68	−0.10	0.95	1.04	−0.68	1.41	1.53	−0.61	1.59
4.	0.68	−0.04	0.87	1.04	−0.62	1.07	1.53	−0.54	0.82
5.	0.66	0.11	0.84	0.98	−0.57	0.89	1.55	−0.57	0.60
	C_1 SUBGROUP			C_2 SUBGROUP			C_3 SUBGROUP		
1.	1.39	−0.40	1.38	1.27	−0.06	1.94	0.45	−0.46	0.62
2.	1.10	−0.89	0.78	1.32	−0.40	1.33	0.40	−0.86	0.51
3.	1.09	−0.88	0.83	1.21	−0.58	1.26	0.43	−0.83	0.56
4.	1.09	−0.80	0.74	1.21	−0.49	0.94	0.43	−0.76	0.49
5.	1.09	−0.66	0.62	1.33	−0.18	0.57	0.37	−0.77	0.19
	$A_1 + B_1 + C_1$ SUBGROUP			$A_2 + B_2 + C_2$ SUBGROUP			$A_3 + B_3 + C_3$ SUBGROUP		
5.[a]	1.02	−0.29	0.81	0.90	−0.33	0.87	1.00	−0.03	0.71

SOURCE: See accompanying text for explanation of estimates.

[a] Multiple regression not computed; hence, estimates 1 through 4 could not be calculated.

assumption used in the first part of this chapter—that the mean probability associated with intentions does *not* vary systematically among the housing groups. The third estimate is similar in derivation to that described in step 4 above, but the coefficients of H_{01}, H_{10}, and H_{11} are based on the same assumption as in estimate 2—that the mean purchase probability associated with buying intentions is the same in all housing groups and is equal to the net coefficient of intentions in the basic multiple regressions. The fourth estimate is the one described in step 4; it measures differences in purchases net of buying intentions on the assumption that the probability associated with intentions is such that

$$\text{in life-cycle class 1: } p^*_{11} - 0.05 = p^*_{01} = p^*_{00} = p^*_{10} + 0.05;$$
$$\text{in life-cycle class 2: } p^*_{11} - 0.15 = p^*_{01} = p^*_{00} = p^*_{10} + 0.05;$$
$$\text{in life-cycle class 3: } p^*_{11} - 0.25 = p^*_{01} = p^*_{00} = p^*_{10} + 0.05;$$

and that in all three cases $p^*_{00} = X_{13}$, the net coefficient of intentions in Tables 42–44. The last estimate is derived from k^*; the mean differences in purchases between H_{00} and H_{01}, H_{10} or H_{11} are calculated as the respective differences between k^*_{00} and k^*_{01}, k^*_{10}, or k^*_{11}.

A comparison of the second and third estimates indicates the extent to which the rough-cut procedure described above is able to reproduce the results of a formal regression. The third and fourth estimates differ only with respect to assumptions about the mean purchase probability associated with buying intentions for durable goods; both estimates are derived from the first estimate in exactly the same way. A comparison of the third with the fourth estimate is therefore a fair measure of the change in the H_{01}, H_{10}, and H_{11} regression coefficients that would take place if the assumptions about differential mean probability among the housing groups were correct.

Averaging the data for all nine subgroups, the results indicate that those in H_{11} purchase 0.60 more durables than those in H_{01} when the influence of buying intentions is ignored, standardizing for the effect of initial-data and intervening variables (estimate 1). Taking account of intentions but assuming that the mean *ex ante* probability associated with intentions is the same for all housing groups, those in H_{11} still purchase more than those in H_{01}; but the average difference is considerably smaller—0.23 durables instead of 0.60 (estimate 2). A conceptually comparable figure based on a rough approximation (estimate 3) yields an average difference of 0.22. If it is assumed that mean *ex ante* probability varies according to the p^* values, the differential is reversed on average, although the mean difference is small—0.05 durables (estimate 4). Finally, the k^* estimate

(5) indicates that those in H_{01} purchase more net of intentions than those in H_{11}, the average differential for all nine groups being 0.21 durables. These results support the proposition that the H_{01} coefficient would in fact be greater than H_{11} if the *ex ante* probability differences associated with intentions were held constant, or if a good measure of purchase probability itself, rather than intentions to buy, were available.

In sum, the model predicts that the coefficient of H_{01} must exceed that for H_{11}, holding purchase probability constant, because favorable intervening events must have been more common in H_{01}. The regression data in Tables 42–44 indicate that the reverse is true, a finding that I would regard as strong contradictory evidence vis-à-vis the probability model. But the simple regressions of purchases on intentions within the housing groups clearly suggest that mean *ex ante* probability is likely to be different for intenders in these groups, and reasonable assumptions about the size of the differences are sufficient to reverse the original result.

Summary

The results in this chapter lend additional support to the hypothesis that consumer responses to questions about intentions to buy durable goods are basically a reflection of purchase probability. To a considerable degree, information about income, assets, durables stock, expectations, and attitudes is not needed to explain differences among households in reported durable goods purchases; it may be that these variables are not completely redundant to intentions because the latter constitutes a less than adequate proxy for purchase probability. On the other hand, variables that reflect wholly or partly unforseen events are strongly associated with durable goods purchases net of all other explanatory factors, as predicted. The summary tabulation below shows the mean of the F ratios (i.e., the means of the squared t ratios for each variable in the respective groups, taken from column 7 in Tables 42–44) for the groups of independent variables discussed at the beginning of the chapter—objective initial-data variables, of which the model contains four, anticipatory initial-data variables (three), intervening variables (five), and buying intentions variables (three).

Class of Variables	*Number of Variables*	*Subsample*								
		A_1	A_2	A_3	B_1	B_2	B_3	C_1	C_2	C_3
Initial-Data										
Objective	4	4.1	3.3	3.6	7.9	6.1	7.2	1.2	4.8	1.6
Anticipatory	3	6.8	1.6	2.6	0.8	5.6	1.1	5.7	4.0	2.6
Intervening	5	11.5	5.3	2.4	5.2	8.4	7.3	10.1	7.8	1.4
Buying Intentions	3	46.0	45.0	13.4	36.0	28.0	13.0	45.3	36.7	19.5

In all nine groups, intentions to buy durable goods have by far the strongest net relation to durable goods purchases; in six of the nine groups, intervening variables are more strongly related to purchases, on average, than either category of initial-data variables.[30] More importantly, the net influence of initial-data variables is reduced in all eighteen cases (nine subgroups, both objective and anticipatory categories) when buying intentions are held constant; in contrast, the net influence of intervening variables is increased in nine of eighteen comparable cases (nine subgroups, both income-change and housing categories). Finally, in the only instance where the empirical results generally stand in apparent contradiction to the model—the regression coefficient of anticipated housing purchases generally exceeds that of unanticipated housing purchases—it can be shown that the contradiction is only apparent: A simplifying assumption that holds in most cases clearly does not hold for the housing variables, and relaxation of the assumption makes enough difference to reverse the original results.

[30] It is true that the intervening income-change variables (ΔY and ΔY_t) are less strongly related to purchases than some of the initial-data variables, net of intentions to buy. However, the intervening income-change variables happen to be less strongly related to purchases throughout, and the model predicts that the net influence of initial-data variables will be *reduced* to a greater degree than that of intervening variables when intentions are held constant, not that the net influence of initial-data variables will be less. A glance at Tables 42–44 indicates clearly that intentions have less influence on the intervening income-change variables than on the initial-data variables, and that the former are generally less closely related to purchases than the latter.

TABLE 42

SUMMARY OF CORRELATION DATA FOR TWELVE-MONTH DEFINITE AND PROBABLE-POSSIBLE INTENDERS CLASSIFIED BY LIFE-CYCLE STATUS

	REGRESSION COEFFICIENTS FOR CORRELATION BETWEEN *Buying Intentions* ($\hat{P}$) *and*			*Durable Goods Purchases* (P) *and*				*F* RATIOS FOR ZERO-ORDER CORRELATION WITH	
	$x_1 \ldots x_4$	$x_1 \ldots x_7$	$x_1 \ldots x_{12}$	$x_1 \ldots x_4$	$x_1 \ldots x_7$	$x_1 \ldots x_{12}$	$x_1 \ldots x_{15}$	$\hat{P}$	P
INDEPENDENT VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	A1—HUSBAND-WIFE HOUSEHOLDS, HEAD BETWEEN 25 AND 34 YEARS OLD								
Initial-Data									
Objective	(9.0)	(7.7)	(8.8)	(10.2)	(7.4)	(6.8)	(4.1)		
Y	.019	.010	.007	.064**	.052**	.048**	.039**	4.3	28.8
ΔL_{-1}	.088	.024	.004	.093	.004	.000	−.000	3.2	3.2
ΔY_{-1}	.065	.024	.037	.025	−.010	−.024	−.039	4.3	1.1
S'	.135**	.140**	.147**	.100*	.108*	.106**	.020	24.3	7.6
Anticipatory		(15.9)	(12.7)		(14.8)	(10.9)	(6.8)		
$\hat{E}$		.361	.260		.286	−.019	−.100	6.5	4.3
O		.305**	.283**		.436**	.383**	.291**	35.7	53.2
$\hat{E}_5$		.186**	.157*		.086	.043	−.010	15.3	3.2
Intervening									
Income Changes			(0.9)			(3.7)	(4.3)		
ΔY			−.034			.126*	.125*	0.0	13.1
ΔY_t			−.106			.252	.289	0.0	4.3
Housing									
Unanticipated P			(5.2)			(33.6)	(28.1)		
H_{01}			.422*			1.196**	1.055**	6.5	34.5
Unfulfilled $\hat{P}$			(1.9)			(0.2)	(1.4)		
H_{10}			.242			−.094	−.234	0.0	2.2
Anticipated P			(40.0)			(39.7)	(19.4)		
H_{11}			1.275**			1.519**	1.053**	42.6	38.0
Buying Intentions[a]							(46.0)		
$\hat{P}$							.375**		133.3
$\hat{P}_c$							.045		16.4
$Z\hat{P}_c$							.081		
Constant	.478**	−.132	.015	.946**	.428	.264	.132		
R^2	.032	.073	.113	.036	.075	.139	.210		

(continued)

TABLE 42 (continued)

	REGRESSION COEFFICIENTS FOR CORRELATION BETWEEN *Buying Intentions* ($\hat{P}$) *and*			*Durable Goods Purchases* (P) *and*				F RATIOS FOR ZERO-ORDER CORRELATION WITH	
INDEPENDENT VARIABLES	$x_1 \ldots x_4$ (1)	$x_1 \ldots x_7$ (2)	$x_1 \ldots x_{12}$ (3)	$x_1 \ldots x_4$ (4)	$x_1 \ldots x_7$ (5)	$x_1 \ldots x_{12}$ (6)	$x_1 \ldots x_{15}$ (7)	$\hat{P}$ (8)	P (9)
A$_2$—HUSBAND-WIFE HOUSEHOLDS, HEAD BETWEEN 35 AND 44 YEARS OLD									
Initial-Data									
Objective	(16.8)	(14.7)	(15.6)	(12.0)	(10.2)	(10.7)	(3.3)		
Y	.044**	.036**	.034**	.039**	.034**	.035**	.021*	33.0	20.3
ΔL_{-1}	.003	−.092	−.109	.132	.080	.058	.055	0.1	6.0
ΔY_{-1}	.081	.011	.006	.073	.038	−.011	−.030	4.0	3.0
S'	.153**	.164**	.167**	.156**	.162**	.168**	.078*	29.8	22.4
Anticipatory		(16.4)	(15.3)		(4.2)	(4.5)	(1.6)		
$\hat{E}$		−.038	−.101		−.250	−.355	−.372	0.0	0.0
O		.398**	.382**		.247**	.247**	.131	53.6	18.3
$\hat{E}_5$		.120	.110		.039	.030	−.022	5.0	0.1
Intervening									
Income Changes			(0.0)			(5.8)	(5.8)		
ΔY			.017			.152*	.148*	0.0	6.0
ΔY_4			.001			.494*	.488*	0.0	8.0
Housing									
Unanticipated P			(4.8)			(6.2)	(3.6)		
H_{01}			.548*			.664*	.488	3.0	4.0
Unfulfilled $\hat{P}$			(20.4)			(0.0)	(1.4)		
H_{10}			.966**			−.013	−.312	22.4	0.0
Anticipated P			(1.7)			(14.4)	(10.2)		
H_{11}			.451			1.253**	1.027**	3.0	15.0
Buying Intentions[a]							(45.0)		
$\hat{P}$							.292**		91.4
$\hat{P}_c$							.148**		35.1
$Z\hat{P}_c$							−.009		
Constant	.127	−.096	−.141	.958**	1.056**	.608	.527		
R^2	.064	.109	.132	.046	.058	.089	.158		

(continued)

TABLE 42 (concluded)

A3—HUSBAND-WIFE HOUSEHOLDS, HEAD BETWEEN 45 AND 64 YEARS OLD

Initial-Data									
Objective	(9.1)	(9.8)	(11.1)	(8.2)	(4.9)	(5.9)	(3.6)		
Y	.012	.005	.004	.043**	.035**	.035**	.033**	3.2	22.5
ΔL_{-1}	.100	.042	.046	.106	.046	.065	.047	0.6	2.5
ΔY_{-1}	−.052	−.109	−.086	.160	.102	.100	.126	0.0	5.6
S'	.196**	.204**	.215**	.100*	.107*	.114*	.042	32.0	5.6
Anticipatory		(10.0)	(7.6)		(5.8)	(4.7)	(2.6)		
$\hat{E}$		.227	.135		−.113	−.300	−.351	3.2	0.0
O		.269**	.250**		.309**	.281*	.214*	14.6	19.9
$\hat{E}_5$		.379**	.336**		.325*	.262*	.166	13.8	9.5
Intervening									
Income Changes			(1.5)			(0.6)	(0.4)		
ΔY			.066			.100	.077	1.2	1.9
ΔY_t			−.233			−.005	.051	2.5	0.0
Housing									
Unanticipated P			(0.0)			(2.2)	(2.2)		
H_{01}			.073			.679	.657	0.0	1.9
Unfullfilled $\hat{P}$			(0.4)			(2.2)	(2.2)		
H_{10}			−.246			.541	.540	0.0	3.8
Anticipated P			(33.2)			(14.4)	(6.8)		
H_{11}			2.326**			2.038**	1.388*	34.0	18.5
Buying Intentions[a]							(13.4)		
$\hat{P}$							.267**		48.2
$\hat{P}_c$							.054		3.8
$Z\hat{P}_c$							−.002		
Constant	.348*	−.123	−.265	.982**	.826	.859	.898		
R^2	.055	.099	.151	.050	.076	.111	.148		

SOURCE: Basic data from Consumer Purchase Study, NBER.

NOTE: Figures in parentheses in first seven columns are either F ratios or joint F ratios.

* = t ratio >2.

** = t ratio >3.

[a] $\hat{P}$ signifies definite intentions to buy within a year; $\hat{P}_c$, probable-possible intentions to buy within a year.

TABLE 43

SUMMARY OF CORRELATION DATA FOR SIX-MONTH AND "LATER" INTENDERS CLASSIFIED BY LIFE-CYCLE STATUS

	REGRESSION COEFFICIENTS FOR CORRELATION BETWEEN *Buying Intentions* ($\hat{P}$) *and*			REGRESSION COEFFICIENTS FOR CORRELATION BETWEEN *Durable Goods Purchases* (P) *and*				F RATIOS FOR ZERO-ORDER CORRELATION WITH	
INDEPENDENT VARIABLES	$x_1 \ldots x_4$ (1)	$x_1 \ldots x_7$ (2)	$x_1 \ldots x_{12}$ (3)	$x_1 \ldots x_4$ (4)	$x_1 \ldots x_7$ (5)	$x_1 \ldots x_{12}$ (6)	$x_1 \ldots x_{15}$ (7)	$\hat{P}$ (8)	P (9)
				B1—HUSBAND-WIFE HOUSEHOLDS, HEAD BETWEEN 25 AND 34 YEARS OLD					
Initial-Data									
Objective	(20.0)	(17.6)	(16.9)	(15.6)	(13.0)	(13.5)	(7.9)		
Y	.035**	.028*	.033**	.064**	.059**	.066**	.056**	13.7	30.0
ΔL_{-1}	.178*	.126	.102	.138	.101	.077	.047	10.5	7.4
ΔY_{-1}	.053	.047	.020	.104*	.100*	.077	.073	4.2	8.4
S'	.199**	.205**	.197**	.147**	.151**	.144**	.079*	53.6	21.2
Anticipatory		(11.0)	(8.3)		(3.8)	(2.1)	(0.8)		
$\hat{E}$		−.193	−.247		.098	−.018	.056	0.0	2.1
O		.326**	.257**		.225**	.160*	.085	34.4	16.9
$\hat{E}_5$		.076	.091		.033	.036	.006	2.1	1.0
Intervening									
Income Changes			(1.4)			(2.3)	(1.3)		
ΔY			−.058			−.058	−.036	0.0	0.0
ΔY_t			.220			.307	.234	3.1	4.2
Housing									
Unanticipated P			(0.4)			(10.2)	(9.0)		
H_{01}			.205			.773**	.710**	0.0	6.3
Unfulfilled $\hat{P}$			(24.3)			(1.7)	(0.0)		
H_{10}			.936**			.300	−.032	25.6	2.1
Anticipated P			(34.5)			(30.2)	(14.4)		
H_{11}			1.443**			1.530**	1.062**	38.8	31.1
Buying Intentions[a]							(36.0)		
$\hat{P}$							.359**		128.1
$\hat{P}_c$							−.019		1.0
$Z\hat{P}_c$							.068*		
Constant	.476**	.457	.588*	.882**	.664*	.842*	.550		
R^2	.071	.100	.152	.057	.067	.104	.165		

(continued)

TABLE 43 (continued)

B_2—HUSBAND-WIFE HOUSEHOLDS, HEAD BETWEEN 35 AND 44 YEARS OLD

Initial-Data									
Objective	(22.3)	(19.0)	(22.1)	(13.0)	(12.1)	(11.9)	(6.1)		
Y	.028**	.023*	.025**	.038**	.032**	.033**	.026**	16.8	18.8
ΔL_{-1}	.284**	.215*	.194*	.112	.032	.048	−.004	14.8	2.0
ΔY_{-1}	−.075	−.103	−.068	−.098	−.138*	−.119	−.103	0.0	2.0
S'	.208**	.212**	.210**	.170**	.177**	.172**	.109**	57.6	29.0
Anticipatory		(9.3)	(8.3)		(9.2)	(8.3)	(5.6)		
$\hat{E}$		.167	−.050		.655*	.463	.480	0.0	3.9
O		.311**	.284**		.332**	.333**	.256**	33.2	25.9
$\hat{E}_5$		.041	.004		.038	−.013	−.019	0.0	0.0
Intervening									
Income Changes			(0.0)			(0.0)	(0.3)		
ΔY			−.036			.049	.055	0.0	0.0
ΔY_t			.026			−.023	−.018	0.0	0.0
Housing									
Unanticipated P			(2.0)			(16.8)	(15.2)		
H_{01}			.409			1.136**	1.046**	0.0	12.8
Unfulfilled $\hat{P}$			(27.2)			(1.7)	(6.8)		
H_{10}			1.119**			−.331	−.634*	22.9	2.0
Anticipated P			(57.9)			(38.4)	(19.4)		
H_{11}			2.234**			2.079**	1.475**	54.4	40.5
Buying Intentions[a]							(28.0)		
$\hat{P}$							.291**		115.2
$\hat{P}_c$							.003		0.0
$Z\hat{P}_c$							.018		
Constant	.412**	.068*	.259	.972**	.148	.141	−.032		
R^2	.085	.110	.185	.050	.076	.130	.179		

(continued)

TABLE 43 (concluded)

INDEPENDENT VARIABLES	REGRESSION COEFFICIENTS FOR CORRELATION BETWEEN *Buying Intentions* ($\hat{P}$) *and* $x_1 \ldots x_4$ (1)	$x_1 \ldots x_7$ (2)	$x_1 \ldots x_{12}$ (3)	*Durable Goods Purchases* (P) *and* $x_1 \ldots x_4$ (4)	$x_1 \ldots x_7$ (5)	$x_1 \ldots x_{12}$ (6)	$x_1 \ldots x_{15}$ (7)	F RATIOS FOR ZERO-ORDER CORRELATION WITH $\hat{P}$ (8)	P (9)
				B_3—HUSBAND-WIFE HOUSEHOLDS, HEAD BETWEEN 45 AND 64 YEARS OLD					
Initial-Data									
Objective	(24.6)	(24.5)	(24.4)	(12.4)	(11.6)	(11.2)	(7.2)		
Y	.035**	.031**	.031**	.052**	.049**	.050**	.044**	16.6	30.8
ΔL_{-1}	.275*	.239*	.202*	.100	.065	.046	.006	10.5	2.2
ΔY_{-1}	.095	.039	.004	.143	.123	.052	.053	2.2	3.7
S'	.282**	.288**	.269**	.150**	.153**	.142**	.093*	59.1	9.7
Anticipatory		(8.8)	(7.5)		(2.6)	(2.3)	(1.1)		
$\hat{E}$		.702*	.601*		−.048	−.076	−.218	6.7	0.0
O		.291**	.287**		.235*	.219*	.142	23.7	12.0
$\hat{E}_5$		.005	.001		.024	.000	.004	0.7	0.7
Intervening									
Income Changes			(1.1)			(3.8)	(3.2)		
ΔY			.067			.054	.052	0.7	1.3
ΔY_t			.216			.562*	.524*	0.7	4.5
Housing									
Unanticipated P			(3.0)			(22.1)	(17.6)		
H_{01}			.582			1.687**	1.535**	3.7	21.3
Unfulfilled $\hat{P}$			(14.8)			(0.4)	(1.4)		
H_{10}			1.448**			−.274	−.532	13.6	0.7
Anticipated P			(33.1)			(18.5)	(10.9)		
H_{11}			2.585**			2.257**	1.776**	40.6	21.3
Buying Intentions[a]							(13.0)		
$\hat{P}$							.220**		63.5
$\hat{P}_c$							−.056		2.2
$Z\hat{P}_c$							.030		
Constant	.205	−.666*	−.836*	.740**	.622	.523	.702		
R^2	.117	.148	.207	.063	.073	.130	.162		

SOURCE: Basic data from Consumer Purchase Study, NBER.

NOTE: Figures in parentheses in first seven columns are either F ratios or joint F ratios.

* = t ratio >2.

** = t ratio >3.

[a] $\hat{P}$ signifies intentions to buy within six months; $\hat{P}_c$, intentions to buy later.

TABLE 44

SUMMARY OF CORRELATION DATA FOR TWELVE-MONTH AND INCOME-CONTINGENT INTENDERS CLASSIFIED BY LIFE-CYCLE STATUS

	REGRESSION COEFFICIENTS FOR CORRELATION BETWEEN *Buying Intentions* ($\hat{P}$) *and*			*Durable Goods Purchases* (P) *and*				*F* RATIOS FOR ZERO-ORDER CORRELATION WITH	
INDEPENDENT VARIABLES	$x_1 \ldots x_4$ (1)	$x_1 \ldots x_7$ (2)	$x_1 \ldots x_{12}$ (3)	$x_1 \ldots x_4$ (4)	$x_1 \ldots x_7$ (5)	$x_1 \ldots x_{12}$ (6)	$x_1 \ldots x_{16}$ (7)	$\hat{P}$ (8)	P (9)
	C_1—HUSBAND-WIFE HOUSEHOLDS, HEAD BETWEEN 25 AND 34 YEARS OLD								
Initial-Data									
Objective	(34.0)	(29.3)	(36.0)	(9.7)	(7.2)	(8.0)	(1.2)		
Y	.063**	.047**	.053**	.046	.034*	.038**	.022	21.8	13.4
ΔL_{-1}	.232*	.141	.072	.138	.076	.034	.010	13.4	5.1
ΔY_{-1}	.221**	.167**	.162**	.083	.043	.039	−.006	20.8	4.1
S'	.316**	.322**	.321**	.144**	.148**	.151**	.043	73.1	16.6
Anticipatory		(20.8)	(16.6)		(11.7)	(11.0)	(5.7)		
$\hat{E}$		.656	.299		.318	.283	.199	6.1	3.1
O		.501**	.449**		.343**	.308**	.192*	64.6	32.6
$\hat{E}_5$		.220*	.199*		.228*	.273**	.208*	13.4	12.3
Intervening									
Income Changes			(0.9)			(2.3)	(1.6)		
ΔY			−.063			−.082	−.066	0.0	0.0
ΔY_t			.231			.262	.208	1.0	1.0
Housing									
Unanticipated P			(6.7)			(33.6)	(22.1)		
H_{01}			.790*			1.387**	1.100**	8.2	36.9
Unfulfilled $\hat{P}$			(49.4)			(4.0)	(17.6)		
H_{10}			1.474**			−.397	−.893**	44.6	4.1
Anticipated P			(34.0)			(24.0)	(7.8)		
H_{11}			1.863**			1.384**	.785*	28.2	22.9
Buying Intentions[a]							(45.3)		
$\hat{P}$							.287**		154.8
$\hat{P}_e$							.048		20.8
$Z\hat{P}_e$							.034		
Constant	.872**	−.153	.174	1.056**	.424	.638	.423		
R^2	.118	.170	.241	.037	.069	.130	.203		

(continued)

TABLE 44 (continued)

INDEPENDENT VARIABLES	REGRESSION COEFFICIENTS FOR CORRELATION BETWEEN *Buying Intentions* ($\hat{P}$) *and* $x_1 \ldots x_4$ (1)	$x_1 \ldots x_7$ (2)	$x_1 \ldots x_{12}$ (3)	*Durable Goods Purchases* (P) *and* $x_1 \ldots x_4$ (4)	$x_1 \ldots x_7$ (5)	$x_1 \ldots x_{12}$ (6)	$x_1 \ldots x_{15}$ (7)	F RATIOS FOR ZERO-ORDER CORRELATION WITH $\hat{P}$ (8)	P (9)
				C_2—HUSBAND-WIFE HOUSEHOLDS, HEAD BETWEEN 35 AND 44 YEARS OLD					
Initial-Data									
Objective	(34.2)	(31.7)	(34.8)	(13.4)	(12.0)	(12.2)	(4.8)		
Y	.038**	.028*	.028*	.051**	.043**	.041**	.032**	10.8	21.9
ΔL_{-1}	.241*	.113	.127	.075	−.014	.040	.006	9.1	1.6
ΔY_{-1}	.095	.078	.062	−.008	−.032	−.056	−.070	3.3	0.0
S'	.375**	.369**	.372**	.189**	.186**	.186**	.072*	105.5	26.2
Anticipatory		(20.9)	(16.7)		(10.2)	(8.7)	(4.0)		
$\hat{E}$		.852*	.696*		.467	.472	.289	10.8	4.1
O		.551**	.492**		.358**	.334**	.190*	61.7	30.6
$\hat{E}_6$		.012	−.045		.175	.172	.176*	1.6	6.6
Intervening									
Income Changes			(2.5)			(1.5)	(0.8)		
ΔY			.163*			.108	.060	4.9	4.1
ΔY_t			.062			.201	.184	0.0	0.8
Housing									
Unanticipated P			(0.0)			(20.2)	(23.0)		
H_{01}			.012			1.274**	1.320**	0.0	21.0
Unfulfilled $\hat{P}$			(27.0)			(0.1)	(2.6)		
H_{10}			1.245**			−.060	−.402	34.2	0.0
Anticipated P			(27.5)			(24.0)	(11.6)		
H_{11}			2.131**			1.940**	1.328**	20.2	19.3
Buying Intentions[a]							(36.7)		
$\hat{P}$							.316**		140.2
$\hat{P}_c$							−.011		6.6
$Z\hat{P}_c$							.078		
Constant	.834**	−.253	−.710	.648**	−.053	−.536	−.446		
R^2	.141	.201	.257	.061	.095	.145	.219		

(continued)

TABLE 44 (concluded)

C_3—HUSBAND-WIFE HOUSEHOLDS, HEAD BETWEEN 45 AND 64 YEARS OLD

Initial-Data									
Objective	(38.0)	(35.0)	(35.3)	(7.6)	(6.6)	(6.4)	(1.6)		
Y	.050**	.036**	.038**	.037**	.029*	.030*	.020*	14.0	11.4
ΔL_{-1}	.288*	.149	.130	−.012	−.118	−.101	−.132	7.5	0.0
ΔY_{-1}	.264**	.184*	.181*	.150	.089	.070	.026	10.7	3.1
S'	.444**	.439**	.441**	.158**	.160**	.158**	.045	96.9	12.0
Anticipatory		(11.0)	(10.9)		(6.0)	(5.3)	(2.6)		
$\hat{E}$		−.257	−.335		.449	.394	.461	0.0	1.9
O		.479**	.486**		.328**	.324**	.212*	42.4	21.8
$\hat{E}_5$		.234	.187		.141	.134	.086	8.2	4.4
Intervening									
Income Changes			(0.7)			(0.3)	(0.4)		
ΔY			.085			.032	.013	2.5	1.2
ΔY_t			−.147			.163	.198	0.0	1.9
Housing									
Unanticipated P			(0.0)			(1.0)	(0.8)		
H_{01}			.089			.448	.396	12.7	1.2
Unfulfilled $\hat{P}$			(15.9)			(1.4)	(4.8)		
H_{10}			1.482**			−.456	−.859*	0.0	1.9
Anticipated P			(0.5)			(0.8)	(0.6)		
H_{11}			.311			.616	.514	0.0	1.2
Buying Intentions[a]							(19.5)		
$\hat{P}$							.253**		67.5
$\hat{P}_c$							.011		0.0
$Z\hat{P}_c$							.025		
Constant	.582**	.529	.262	.899**	.259	.134	.043		
R^2	.196	.238	.259	.047	.075	.082	.137		

SOURCE: Basic data from Consumer Purchase Study, NBER.

NOTE: Figures in parentheses in first seven columns are either F ratios or joint F ratios.

* = t ratio >2.

** = t ratio >3.

[a] $\hat{P}$ signifies intentions to buy within twelve months; $\hat{P}_c$, intentions to buy within twelve months if income is higher than expected.