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2. THE CONSUMER PLANNING HORIZON

Introduction

The CU questionnaire of October 1957, which was planned in connection with the National Bureau's research project on consumer purchases, contained several departures that make it of especial interest. A greater number of questions were asked about the financial and demographic characteristics of responding households. The buying plans question was changed radically, by substituting for the usual one about plans for a twelve-month forward period a dual question about buying plans "within the next six months," and "later." It was thought that reducing the time horizon of the buying plans question from one year to six months might serve to improve predictive accuracy. Data on purchases of durable goods over the preceding year were not requested, but data on ownership of them were obtained.

The characteristics of both the six-months and later plans turned out to be quite different from those found previously for the twelve-months plans. Altering the time horizon not only changes the frequency of plans—as it obviously should—but also their structure. In particular, the relationship between income and the frequency of plans is quite sensitive to the time horizon, and the structure of the shorter-horizon plans is closer to that of purchases than the structure of longer-horizon plans is.

Our examination of this set of problems will be facilitated by use of an income-elasticity concept. In its ordinary usage, income elasticity is the ratio of the proportional change in some variable to the proportional change in income. In our usage, the income elasticity of buying plans (purchases) is defined as the proportional change in the *frequency* of buying plans (purchases) compared with the proportional change in *relative* income position. The first variable is simply the percentage of households with any given relative income position that planned to buy (purchased) a commodity; the second is defined as the income for any given household divided by the median income of the entire sample.[1]

[1]The relative income position variable is used in preference to income primarily because it appears to provide a more stable elasticity measure over time. There seem to be sound analytical reasons also for the stability of the measure, e.g., those discussed by J. Duesenberry in *Income, Savings, and the Theory of Consumer Behavior* (Harvard University Press, 1949).

To begin with, it was found useful to classify durable commodities in three categories: (1) automobiles, both new and used; (2) "standard" household durables like refrigerators, ranges, and TV sets; and (3) "prestige" household durables like air conditioners, garbage disposal units, and dishwashers. Categories 2 and 3 are rather arbitrary; they overlap to some extent because goods in the prestige category at any one time are in a continual process of being transferred to the standard category.[2] The distinction between the two is nevertheless meaningful. Standard durables might be defined as those in demand primarily for replacement and secondarily for new acquisition; prestige durables would be those in demand mostly by newly acquiring households. Alternatively, one might define the two in terms of the income elasticity concept. Where the income elasticity of buying plans for this sample is either positive or becomes zero at an income position higher than the median, the commodity would be a prestige durable; where elasticity becomes zero at lower than median income, the item would be classified as standard.

All data presented below are in terms of average relationships. We have computed weighted least squares regression equations for both the buying plans–income and purchases-income relationships. The weights consist of the number of people in each income class. The equations take varying forms,[3] depending upon the type of function that seemed to provide the best fit. Since the number of income positions where frequencies could be specified is quite small (nine at most), no precise test of nonlinearity was made; the appropriate function is usually obvious from the data. Straight line functions were chosen when their use seemed at all reasonable, or where the data gave a bad fit for any simple function. Although correlation coefficients were not computed, the degree to which the fitted function approximates the data is noted in the discussion. All computed functions are plotted on double logarithmic scales to facilitate the discussion of elasticities, since the slope of a function is equal to its elasticity on such scales.

Income Relationships to Buying Plans and Purchases

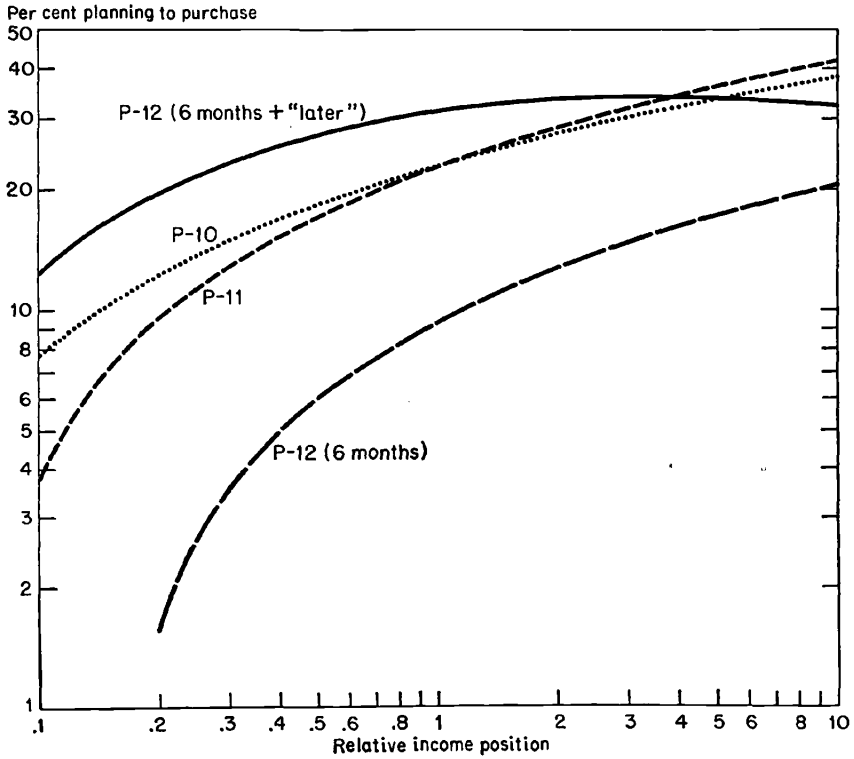
The computed relationships between income and buying plans for different forward periods are shown for new automobiles (Chart 1), new and

[2]This would be especially true during periods when real disposable income per family is rising, as has generally been the case during the period under discussion.

[3]Most of the functions for purchases are straight line semilogarithmic or straight line logarithmic; some are straight lines with natural numbers, and a few are parabolic, usually semilogarithmic or logarithmic. For buying plans the majority of the functions are either straight lines or parabolas on semilogarithmic scales.

CHART 1

Estimated Percentage of Consumers Union Sample Planning to Buy New Automobiles, by Relative Income Position, Selected Time Periods



Source: Appendix Table A-27. Double log scale

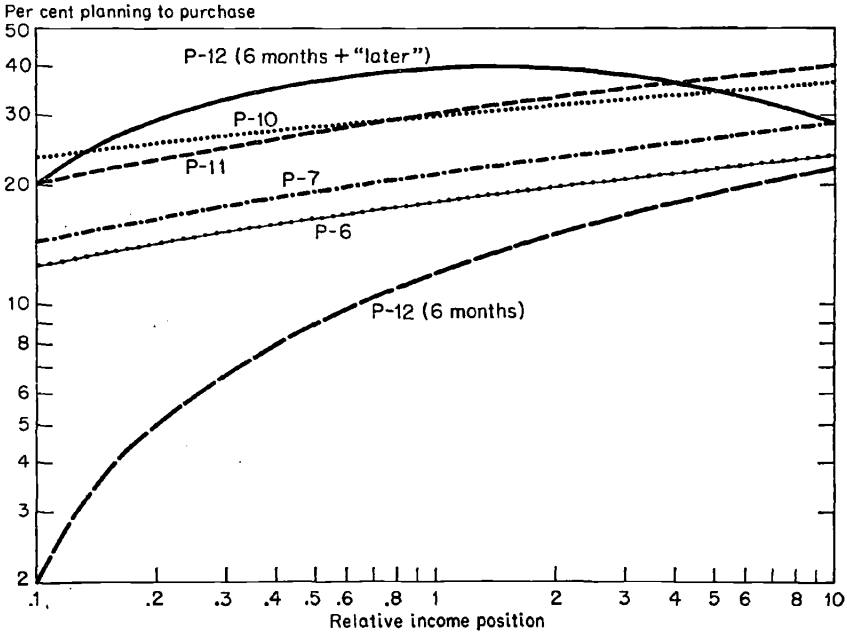
used automobiles (Chart 2), a combined category of ranges, refrigerators, and washing machines (Chart 3), and air conditioners (Chart 4). The latter two illustrate the general character of the relationships for standard and prestige durables, respectively.

The income-elasticity measures for automobiles are remarkably stable through time. For the combined category of new and used automobiles, where more data are available, income elasticities of the twelve-month plans are almost identical at every relative income position for three of the four periods. Elasticity at median income varied from +0.091 to +0.144, being largest for the 1956-1957 period (P-11) and smallest for the 1955-1956 period (P-10).[4]

[4]The time periods covered by the CU data, shown in Appendix Table A-22, are referred to in this section as P-6, P-7, and so on.

CHART 2

Estimated Percentage of Consumers Union Sample Planning to Buy Automobiles, by Relative Income Position, Selected Time Periods



Source: Appendix Table A-27. Double log scale

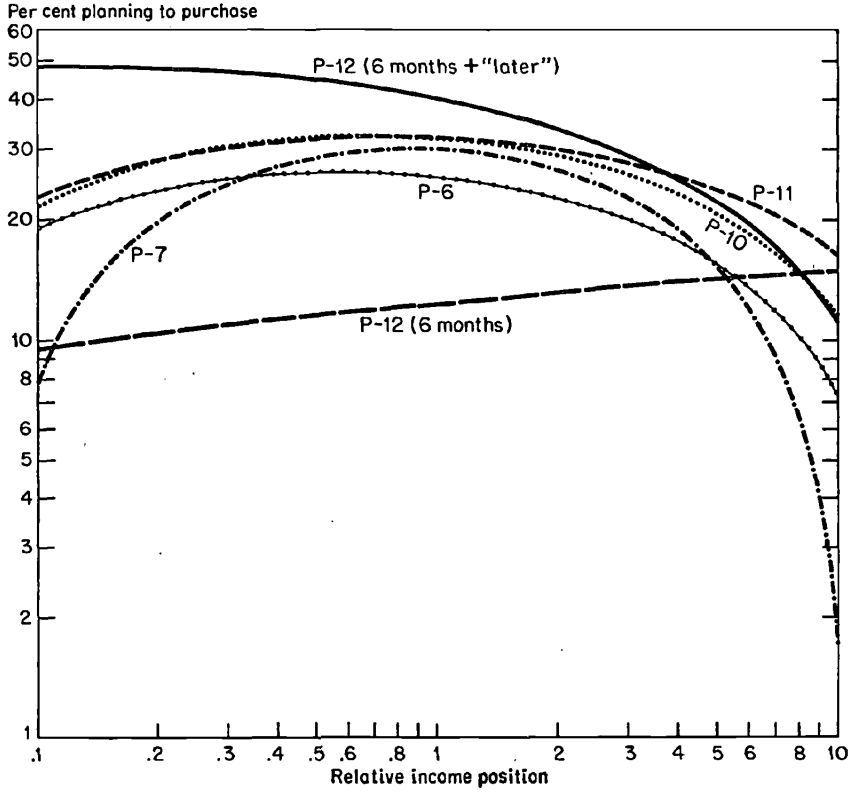
Income elasticities for both new and total automobiles are positive throughout for twelve-months plans, more strongly positive for six-months plans, and positive except at very high incomes for the six-months–plus-later plans.[5] As anticipated, the elasticity becomes negative for the longer-horizon plans at a much earlier point for the combined automobile category than for the new. Used car elasticity (not shown) is negative throughout except for the six-months plans, although more detail in the relatively low-income classes probably would yield parabolic curves.

The regressions for ranges, refrigerators, and washing machines are all unmistakably parabolic for the twelve-months plans and all reach a peak at relative income positions lower than the median. The six-months–plus-later plans reach peak frequency at lower incomes than do regressions

[5]All the regressions for automobiles show a very close fit to the original observations.

CHART 3

Estimated Percentage of Consumers Union Sample Planning to Buy Ranges, Refrigerators, and Washers, by Relative Income Position, Selected Time Periods



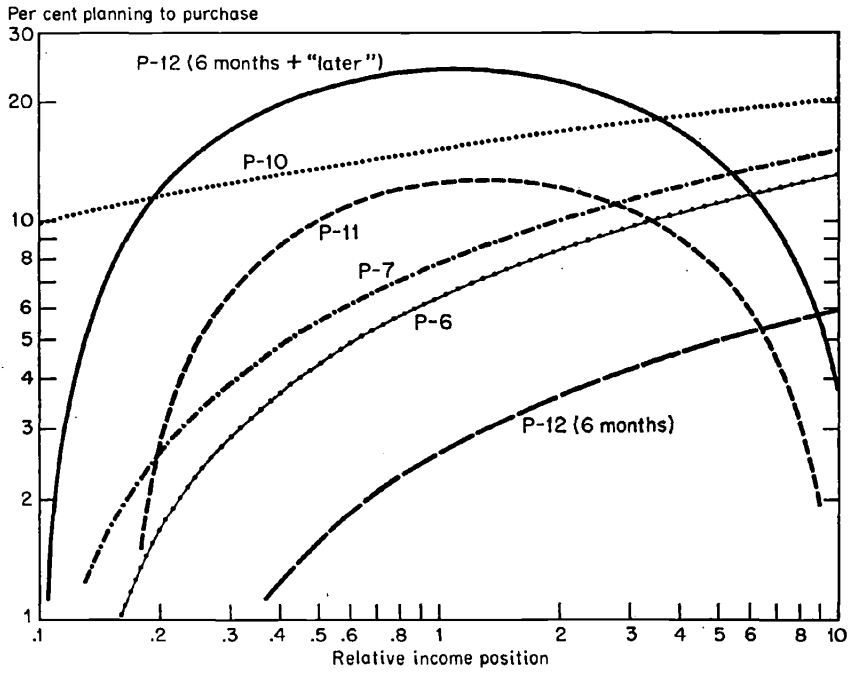
Source: Appendix Table A-28. Double log scale

for twelve-months data. However, the curve shown for the former probably overstates the tendency. The six-months plans have positive elasticity throughout, in sharp contrast to the longer-time horizons.

Data for air conditioners are strikingly different from those for the other categories in several ways. There is an obvious tendency for the elasticity of twelve-months plans to decline over the period. The earliest observation (P-6) shows a relatively high elasticity; later years show a continual reduction, and the latest year (P-11) shows negative elasticity at incomes above the median. The six-months plans show elasticities of about the same magnitude as those for the earliest twelve-months plan period, hence distinctly higher than elasticities for the later (and more

CHART 4

Estimated Percentage of Consumers Union Sample Planning to Buy Air Conditioners, by Relative Income Position, Selected Time Periods



Source: Appendix Table A-28.

Double log scale

comparable) twelve-months data. Six-months–plus-later plans become negative at about median income.[6]

In general, the differences between elasticity patterns for the standard and prestige durables examined are reproduced for other items in the two broad classes. Standard durables always show negative elasticity at income positions lower than the median (except TV sets, where there is almost no pattern at all); prestige durables either show positive elasticity throughout, or they do not become negative until relatively high incomes are reached.

[6]Regressions for both household equipment categories analyzed fit the original data less well than automobile regressions do. The parabolic nature of the range, refrigerator, and washing machine category is evident, although the location of peak frequencies is not always clear from the original observations. The air conditioner regressions also provide mediocre fits, although the downward drift in elasticity is unmistakable.

For both kinds of household durables and also automobiles, the longer the time horizon, the smaller the income elasticity—given relative income position (Table 4). This generalization fails to apply at very low relative incomes when the parabolic regressions frequently yield very high positive elasticities.

TABLE 4

INCOME ELASTICITY FOR BUYING PLANS, CONSUMERS UNION SAMPLE, SELECTED PERIODS AND COMMODITIES

	INCOME ELASTICITY AT MEDIAN INCOME FOR HORIZONS OF:					
	12 Months or so				*6 Months*	*6 Months plus later*
	P-6	*P-7*	*P-10*	*P-11*	*P-12*	*P-12*
Product	*1951-52*	*1952-53*	*1955-56*	*1956-57*	*1957-58*	*1957-58*
New automobiles	n.a.	n.a.	+0.290	+0.363	+0.517	+0.137
Used automobiles	n.a.	n.a.	−0.563	−0.541	−0.115	−0.303
Total automobiles	+0.135	+0.143	+0.091	+0.144	+0.362	+0.046
TV sets	−0.070	−0.138	+0.050	+0.092	+0.127	−0.082
Air conditioners	+0.459	+0.457	+0.148	+0.119	+0.568	+0.033
Ranges, refrigerators, washing machines	−0.098	−0.045	−0.069	−0.043	+0.095	−0.200
Vacuum cleaners	−0.270	−0.138	−0.264	−0.038	−0.036	−0.254

Source: Basic data from Appendix Tables A-27 to A-30.

Although some observations in the table do not fit the general pattern the similarity in results is obvious. Unfortunately, we have no good data for any prestige durables for the six-months–plus-later horizon. The only prestige item included in the October 1957 questionnaire happened to be air conditioners, with no other items for which we have previous data listed. The six-months and six-months–plus-later plans for air conditioners are suspect because of the strong seasonal pattern, apparently following the seasonal in purchases.[7]

[7]The six-months question included the period from October 1957 to March 1958. The six-months–plus-later plans for air conditioners are about eight times as frequent as the six-months plans, the highest ratio found for any listed durable goods. The seasonal factor does not necessarily throw off the six-months–plus-later plans, but it makes the six-months plans for air conditioners impossible to interpret relative to other items with no seasonal problem. We find that the income elasticity for the six-months plans is higher than anything calculated previously, and about three times as high as the elasticity in the two previous years.

The most consistent feature of these data is the behavior of the six-months plans relative to the twelve-months ones. There is no commodity for which the income elasticity for any twelve-months horizon is as high as its elasticity for the six-months horizon, although the difference is trivial in one case. The consistency is not quite so striking when we compare the twelve-months horizon with the longer (six-months–plus-later) horizon. Here we find 5 observations (out of 24) where the elasticity for the longer horizon is larger than the elasticity for one of the twelve-months horizons—two for used automobiles, and two for vacuum cleaners.

For the over-all results, the following interpretation is suggested. The six-months buying plans consist of rather definite commitments, thought about in enough detail to make their accomplishment fairly certain, unless some completely unforeseen (and economically important) events take place. This notion is buttressed by a comparison of elasticities for the six-months plans with actual purchases. The magnitudes of the two elasticities are frequently quite close to each other, and both are different from elasticities for either the twelve-months or the longer horizon plans (Table 5).

TABLE 5

INCOME ELASTICITIES FOR PURCHASES AND BUYING PLANS, CONSUMERS UNION SAMPLE, SELECTED PERIODS AND COMMODITIES

	INCOME ELASTICITY AT MEDIAN INCOME FOR:						
	Purchases			*Buying Plans*			
	Past 12 months			*Within*	*12 months or so*		
	A-6	*A-7*	*A-10*	*6*	*P-6*	*P-7*	*P-10*
Product	*1951-52*	*1952-53*	*1955-56*	*months*	*1951-52*	*1952-53*	*1955-56*
New automobiles	n.a.	+0.441	+0.604	+0.517	n.a.	n.a.	+0.290
Used automobiles	n.a.	−0.235	−0.197	−0.115	n.a.	n.a.	−0.563
Total automobiles	+0.309	+0.230	+0.332	+0.362	+0.135	+0.143	+0.091
TV sets	+0.204	+0.156	+0.107	+0.127	−0.070	−0.138	+0.050
Air conditioners	+0.809	+1.209	+0.762	+0.568	+0.459	+0.457	+0.148
Ranges, refrigerators, washing machines	+0.152	+0.017	+0.022	+0.095	−0.098	−0.045	−0.069
Vacuum cleaners	+0.010	n.a.	+0.014	−0.036	−0.270	−0.138	−0.264

Source: Basic data from Appendix Tables A-27 to A-31.

For every commodity in the table—with the possible exception of air conditioners—the similarity of elasticities for the six-months plans and purchases is evident.[8] It is almost certainly true—although not directly

[8] See the reasons noted above why air conditioners present special problems.

verifiable—that the six-months plans would also show a higher fulfillment ratio than the longer horizon plans.[9] The dissimilarity in income elasticities between twelve-months plans and purchases almost certainly means a relatively low plan-fulfillment ratio, although the proposition cannot be proved conclusively from the data. By the same token, the similarity we find in elasticities for six-months plans and purchases augurs for a relatively high fulfillment ratio.[10]

Given our findings for the shorter-horizon plans, what can be said about what "Twelve-months-or-so" plans actually represent? Clearly, they are something of a mixed bag. The twelve-months-or-so plans necessarily have included the six-months plans, although we do not know what fraction of the total would normally consist of the short-range, more definite, plans. But they also include rather more uncertain, indefinite, or longer-range plans that may not really be buying plans at all in any narrow sense. It is possible that these longer-range plans really measure and reflect buying mood or some kind of optimism coefficient. It seems evident that they do not represent merely varying proportions of whim, wish, and hope, partly because the internal structure is reasonably consistent through time, and partly because the plan frequencies are usually lower than the actual purchase frequencies of the CU population.

Further, it is by no means evident that the six-months plans would turn out to be better predictors of changes in aggregate purchases. Even assuming—as seems almost certain—that shorter-range plans have a significantly higher fulfillment ratio than longer-range ones, their aggregate prediction record might be less good than the longer-range record. The aggregate predictive value of buying plans depends on (1) the percentage of households that report plans and their fulfillment ratio (the fraction of the planners who actually purchase), and (2) the percentage of households that do not report plans and their nonfulfillment ratio (the fraction of nonplanners who actually purchase). It has been shown that buying plans have predictive value in the aggregate if the fulfillment ratio of the planners is higher than the nonfulfillment ratio of the nonplanners, i.e., if relatively more planners actually buy than nonplanners, assuming that the fulfillment (nonfulfillment) ratios are independent of the percentage of planners (nonplanners).[11]

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9 This result was found by R. Ferber, "Decisions to Purchase Durable Goods," (*American Economic Review,* 1954), p. 854.

10 Plan fulfillment for the CU sample will be checked directly in the near future.

11 Arthur Okun, "The Value of Anticipations Data for Forecasting National Product," *The Quality and Economic Significance of Anticipations Data,* Princeton University Press for National Bureau of Economic Research, in press. The above is a verbal translation of Okun's formal analysis.

It follows, from the above argument, that the larger the difference between the planners' fulfillment ratio and the nonplanners' nonfulfillment ratio, the greater the aggregate predictive value, other things being equal. It thus seems to follow that the six-months plans should have more aggregate predictive value. However, suppose we have a situation where: (1) the percentage of short-horizon planners, A, remains relatively stable through time—because the plans are closely related to, for example, demographic variables; (2) the percentage of long-horizon planners, B, fluctuates considerably through time because B really measures some kind of buying mood complex; and (3) the percentage of A nonplanners who buy (the nonplanner nonfulfillment ratio) is positively related to the percentage of B planners. In this case, it might easily follow that, even though the A sample has both a higher fulfillment ratio and a larger difference between the fulfillment ratio of the planners and nonfulfillment ratio of the non-planners than the B sample has, B would furnish better aggregate predictions.[12]

Given the lack of experience with the shorter-horizon buying plans, it will not be possible for some time to test any of the notions discussed above. But we have one piece of indirect evidence that bears on the problem. Over the period 1949-1957, it has been shown that the aggregative predictive record of buying plans for the Consumers Union sample is somewhat better than that of the Survey of Consumer Finances sample.[13] It is possible that one explanation for this is the vagueness of the CU buying plans question. The Survey asks about plans for a twelve-month forward period (but in fact a bit less, because the question is for a calendar-year period, and the interviewing extends into March) and about the degree of certainty accompanying such plans. The series of questions asked by the Survey is probably more confining than the CU buying-plans question, which simply asks about "buying plans" over the "next twelve months or so"; if so, the greater degree of precision in the Survey question might be a reason for less good aggregate results.

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[12]Okun (*ibid.*) does not take up this problem directly, although he does specify conditions under which predictive value at the individual level would fail to result in predictive value at the aggregate level. The conditions have some similarity to our case above, where plans with high individual fulfillment may have low aggregative predictive value.

[13]See F. Thomas Juster, "The Predictive Value of Consumers Union Spending Intentions Data," *The Quality and Economic Significance of Anticipations Data,* Princeton for National Bureau of Economic Research, Special Conference Series No. 10, in press.

Predictions from the October 1957 Survey

Because of the differences in the buying-intentions question used in the October 1957 survey, it was not possible to make direct comparisons with previous years to determine whether or not plans had shown any change. The six-months plans were from one-half to one-third as frequent as twelve-months plans for previous years. Plans to buy later were about as frequent as twelve-months plans in previous years. The sum of the two was therefore higher than the earlier twelve-months plans, as Table 6 shows. An attempt was made to adjust the October 1957 data to get a

TABLE 6
PURCHASE INTENTIONS OF CONSUMERS UNION SAMPLE, OCTOBER 1957 SURVEY AND TWO PREVIOUS YEARS

	PER CENT OF SAMPLE PLANNING TO BUY DURING:				
			1957-58		
Product	*1955-56*	*1956-57*	*Within 6 months*	*Later*	*Sum of both*
Air conditioner, room	15.0	11.6	2.6	19.6	22.2
Automobile					
New	23.2	23.2	9.6	21.2	30.8
Used	6.6	7.0	2.7	4.7	7.4
Total	29.8	30.2	12.3	25.9	38.2
Food freezer	9.4	8.2	2.2	12.5	14.7
Hi-Fi					
Separate			5.1	9.9	15.0
Packaged			2.5	5.5	8.0
Total	12.5[a]	13.9[a]	7.6	15.4	23.0
Power mower	10.3	10.3	3.4	8.7	12.1
Outboard motor	5.0	5.1	1.3	7.0	8.3
Range					
Electric	5.7	6.6	2.3	6.3	8.6
Gas	3.0	3.4	1.4	3.5	4.9
Refrigerator	10.2	10.5	4.0	9.0	13.0
Washing machine	12.7	10.7	4.6	7.7	12.3
TV set	16.8	14.7	6.4	12.9	19.3
Vacuum cleaner	8.6	8.9	4.3	6.3	10.6

[a]Components only.
Source: Appendix Tables A-15, A-17, and A-19.

measure of comparability with earlier data. By employing several procedures that hinged on the income elasticity characteristics described above, it was estimated that automobile buying plans had declined—perhaps substantially—relative to previous years, and that buying plans

for household equipment had also declined somewhat. The estimates made in December 1957 are shown in Table 7. These should be considered a "best guess" figure with an unknown but probably sizable margin of error.

TABLE 7

ESTIMATED PERCENTAGE OF CONSUMERS UNION SAMPLE PLANNING TO BUY MAJOR DURABLE GOODS, OCTOBER 1956 AND 1957

	PER CENT OF SAMPLE PLANNING TO BUY DURING NEXT 12 MONTHS			
	October	*Estimated October 1957 by Procedure:*		
Product	*1956*	*A*	*B*	*C*
New automobile	23.2	16.7	15.9	Decrease from 1956
All automobiles	30.2	25.4	20.5	Decrease from 1956
TV sets	14.7	15.0	13.3	Decrease from 1956
Ranges, refrigerators, and washing machines	31.2	21.2	26.4	Ambiguous
Vacuum cleaners	8.9	8.5	9.7	Decrease from 1956

October 1956 data were obtained from Consumers Union questionnaires. For October 1957, the estimates were obtained as follows.

Procedure A was based on the assumption that the time horizon for "later" plans was proportionally longer for all income classes than the 12-months horizon would have been. The horizon was reduced to an estimated 12-months length by taking whatever fraction of the later plans which, when added to the six-months plans, yielded an income elasticity that approached the elasticities obtained in years when the 12-months question was asked. Since the elasticity for the 6-months horizon was always higher than any previous years' 12-months horizon, while the elasticity for the later horizon (6-months–plus-later plans) was usually lower, the combination of 6-months plans plus successively larger fractions of later plans would necessarily tend to approach the lowest elasticity found for previous years' 12-months plans. The numbers above were computed by adding to 6-months plans whatever fraction of later plans pulled this hypothetical 12-months elasticity above the range found in other years.

Procedure B estimates were built up from 6-months plans. We found that the ratio of 12-months plans for past years to six-months plans for October 1957 tended to decrease systematically as income increased. These ratios were calculated and averaged. Then an arbitrary ratio for one income class was selected, and the pattern of ratios for other classes estimated by means of these averages. We adapted the convention that the estimated ratio for the lowest income class could not be above 3:1. The arbitrary ratio was chosen as the highest reasonably rounded ratio that would fit this limitation.

Procedure C estimates were based on an examination of data for the highest income class ($25 000 and over). Since the sum of 6-months–plus-later plans clearly has a longer horizon than the 12-months plans, it would be evident that plans had declined if the sum of these two were lower than the 12-months plans in the preceding year. As pointed out above, this was generally not true, but the extent of the difference tended to fall as income increased. If the difference was actually negative for any income class, we inferred that comparable 12-months plans would have been lower for all income classes. It should be noted that this procedure is only capable of showing whether or not a decrease has occurred. If 6-months–plus-later plans were higher for every income class, we would not be able to infer anything at all.

Source: Appendix Tables A-17 and A-19.