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PART III

The Predictive Value of Consumers Union Spending-Intentions Data

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Autonomous variations in the rate of consumer expenditures are now widely recognized as an integral part of any analysis of short-term fluctuations in general economic activity. To gain insight into the reasons behind the variations and to predict their direction and extent, researchers have used survey methods extensively and have tried to link data from replies with household income, purchases, liquid assets, and debt. The best known body of data in this area is provided by the Survey of Consumer Finances (SCF), obtained by personal interviews from a widely representative sample of approximately 3,000 households.[1]

The other large and unusually interesting body of data dealing with household intentions and purchases is supplied by Consumers Union of the United States (CU), a product testing and rating organization. Its annual questionnaire (mailed to some 700,000 subscribers, with replies in recent years from over 100,000 or 20 per cent) is designed to obtain information of value to the CU testing program.[2] Replies over the period 1945 to date have included a good deal of intentions data. Respondents

[1] Conducted for the Board of Governors of the Federal Reserve System by the Survey Research Center, University of Michigan, and the results published regularly by the Board.

[2] The usual CU procedure is to tabulate the summary results for a sample of 5,000 of the returned questionnaires and discard the others after a few years. But returns from the questionnaire are available for 1953 and 1954 (incomplete), and for 1955 and 1956 (complete). The punch cards prepared from annual samples are available for 1951, and for 1954 through 1956; summary tabulations of the punch card data are available for all years from 1946 through 1955.

have been asked (every year but 1953) about automobile and household durable goods buying plans for a twelve-month forward period, about income prospects (occasionally), and about house buying plans. Information has been obtained not only about purchases of these major durable goods, but also about income, education, age, and ownership of financial assets. Despite their usefulness, the reader must remember that the CU data have many statistical shortcomings:

1. Most of the analytically interesting questions were not asked every year, some only once. Although the spending-intentions question was asked except in 1953, only about seven major durable goods items were systematically included.

2. The mailing date for the questionnaires and the closing date for returns have varied.

3. The CU subscriber group is quite obviously not a random sample of the population as a whole. The median income is almost double that of the population median; the percentage of college-educated people is several times higher; and CU membership itself suggests that the household is likely to be atypical in its purchasing and planning habits.

The Predictive Value of Spending-Intentions Data

INTENTIONS DATA AND FORECASTING

Before examining the evidence, a discussion of the assumptions (or hypotheses) implicit in tests of the predictive value of intentions data is in order.[3] My purpose is the development of a model useful for making accurate forecasts of aggregate expenditures by economic units—including business and government as well as households. And how data on household intentions to purchase durable consumer goods can contribute to forecasting such totals is by no means obvious, since changes in the purchase of durables may tend to be systematically offset by compensating changes elsewhere in the economy.

Among plausible hypotheses about behavior—unsupported by solid empirical evidence—which would imply net forecasting value for data on purchases of consumer durables, three examples are:

1. The acquisition of durables competes with personal saving for what income remains after customary (habitual) expenditures for rent, food, small clothing items, services, and so forth. The pattern of habitual expenditures is determined by tastes, preferences, and relative prices; the aggregate amount can be predicted fairly easily from income data. The

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[3] Usefulness in prediction is not the only function of these data. Analysis of how people formulate plans, of how the plans emerge from attitudes and expectations, and of how the plans evolve—or fail to evolve—into actions may further our understanding of economic and other social phenomena.

uncommitted income—if any—may then be either saved or spent on durables,[4] with its distribution determined by a complex set of attitudes and expectations, partly by the asset, debt, and demographic characteristics of the household, and partly by the same factors that determine customary expenditures.[5]

2. Purchase intentions for durables are related to aggregate consumer expenditures though not necessarily to expenditures on durables. That is, the consumption–income ratio would tend to be relatively high when intentions to purchase durables are relatively high, and vice versa. Actual purchases of durables would not necessarily be high at the same time, since a household planning to buy a refrigerator might instead take an extra two-week vacation or buy more food. The hypothesis implies that purchase intentions really indicate a general willingness to buy, and that purchase decisions for all categories of goods are arrived at in much the same way regardless of how costly the item or how often bought.

3. A change in the level or composition of durable goods purchases, even though it does not affect consumption expenditures, affects total expenditures via its influence on the level of private investment. This proposition rests on the notion that gross investment tends to be greater when the composition of output is changing than when it is stable, other things being equal. Advancing industries will undertake positive net investment, while declining ones cannot have gross investment of less than zero. On balance, a positive amount of net investment will usually be forthcoming even if the aggregate growth rate of consumption is equal to zero.

Each hypothesis suggests a different kind of empirical test to determine whether or not household intentions data have any predictive value as part of an aggregate model. Even if all were found to be seriously deficient, such data would still have some forecasting value for more modest objectives—for example, for economists analyzing particular industries or groups of industries and for the business community. But I shall now

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[4] An alternative formulation of the hypothesis would be that customary household purchases are differently motivated and more easily predictable than discretionary purchases. The latter comprise such items as vacations and clothes, for example, in addition to major durables—which certainly make up the bulk of the discretionary purchase category.

[5] George Katona and Eva Mueller (*Consumer Attitudes and Demand, 1950-1952,* Survey Research Center, University of Michigan, 1953, p. 4) said that when consumer durable goods outlays are concentrated in one period, the rate of liquid saving declines and total spending by consumers rises, but that when they are made in several periods, the reverse is true. See also "Report of Consultant Committee on Consumer Survey Statistics" (*Hearings on Economic Statistics*, Subcommittee of the Joint Committee on the Economic Report, 84th Cong. 1st sess., July and October, 1955, p. 308) where it is pointed out that consumer expenditures for durable goods as a percentage of disposable income are virtually the inverse of personal liquid saving as a percentage of disposable income. The choice between the two is an important factor determining the inflationary or deflationary impact of the household sector, a choice on which attitudinal data should throw light.

turn to the main purpose of this paper—the analysis of the relationship between purchase intentions and purchases of durables.

INTENTIONS DATA AND PREDICTION

The nature of the empirical tests employed here—comparison of changes in intentions with changes in purchases of durables—implies acceptance of the first hypothesis in order to use the data as an ingredient in an aggregate model.[6] Thus, it is assumed that purchases of major durable goods compete mainly with liquid saving and that the distribution of income between the two is related to the attitudes and expectations of the household, their asset, debt, and demographic position, and to the usual factors of income, tastes and preferences, and relative prices.

In principle, one could construct an empirical model containing expressions for all variables that form the basis for purchase decisions.[7] The task would be formidable, involving perhaps impossible problems of quantification and weighting. Alternatively, the households could be asked, in effect, to do the quantification and weighting by answering whether or not they planned to purchase major durable goods.

The latter approach has the merit of simplicity and concreteness, but it requires sophistication on the part of the responding households.[8] It may be less difficult, however, to use explicit spending plans as indicators of the net interaction of attitudes and expectations than to ask about attitudes and expectations and attempt to deduce future purchases from these. Both kinds of data are subject to the same difficulties. While spending plans do not represent the sum of rationally calculated decisions to purchase particular goods, capricious plans are balanced to some extent by equally capricious and unrealistic attitudes and by unrealized expectations. And explicit spending plan data have the further advantage of reflecting the household's own criteria for the weighting and quantification of the basic variables that influence spending decisions.

[6] The second hypothesis suggests a comparison of changes in intentions to purchase durables with changes in aggregate consumer expenditures.

[7] Up to now, only tentative attempts have been made to use attitude and expectation data as ingredients in a forecasting model, although researchers have used them as permissive, modifying, or intensifying adjuncts to the explicit spending plans. (See Katona and Mueller, *Consumer Attitudes and Demand*; John B. Lansing and Stephen B. Withey, "Consumer Anticipations: Their Use in Forecasting Consumer Behavior," *Short-Term Economic Forecasting*, Studies in Income and Wealth, Vol. 17, Princeton University Press for National Bureau of Economic Research, 1955; and Lawrence R. Klein and John B. Lansing, "Decisions to Purchase Consumer Durable Goods," *Journal of Marketing*, October 1955.) Klein and Lansing investigated the degree to which a large number of attitude and expectation variables, including explicit spending plans, could discriminate between buyers and nonbuyers of durables.

[8] It can be argued that households in general are better able to answer questions about their attitudes and expectations than about what they intend to do. I may know that I am pessimistic about relevant economic events without being able to say concretely what difference this attitude will make in what I will buy.

Whatever the merits of the two procedures, clearly there are knotty analytical problems involved in making *joint* use of attitude and expectation data and spending-intentions data.[9] One can argue that, in principle, the two are redundant. A serious plan to purchase a particular commodity must take into account the probable course of whatever future events influence the household's purchase decisions. Thus knowledge of the buying plan should be equivalent to knowing the end result of the interactions among all factors that shape the plan. However, this does not necessarily imply that attitude and expectation data are redundant to an explanation of actual purchases, though they may be. Information about expectations, in particular, would be necessary in order to know whether plans will be carried out or modified. For example, if the income expectations accompanying buying plans were less favorable than the income actually received, purchases should be high relative to plans and vice versa.[10]

Given the nature of the average household, it is unrealistic to suppose that intentions are always formulated with the degree of care and foresight just described. Thus, we may be able to use the attitude data to discriminate between legitimate and fanciful purchase intentions, or to decide in advance that intentions are likely to prove unreliable for a particular period. And when the spending-plan data are ambiguous, attitude data may show factors that should be included, in principle, in the purchase plan, but often are not.

In the last analysis, the ultimate test is empirical. If spending plans provide an adequate basis for forecasting, they serve the purpose. If they do not, we must develop a model based either on the causal factors that underlie purchase decisions or on some combination of explicit intentions and causal factors.[11]

[9] This is the procedure most frequently followed. For example, the SCF indicates that it employs attitude and expectation data to check the reasonableness of spending plans; and in the actual forecast it makes substantial use of these data to modify or amplify the magnitude of changes suggested by the spending plan data (see, for example, SCF, *Federal Reserve Bulletin*, June 1949.)

[10] It is not entirely clear to me where attitude (as distinguished from expectation) data fit into this picture. Attitudes are either generalized notions about economic status and conditions (better off or worse off than last year, good time or bad time to buy a car, etc.) or they are rather long-run speculations (a major depression likely within the next five years). One cannot speak of attitudes being fulfilled or not fulfilled, but only as being changed or not changed. Whether or not expectations have been fulfilled can hardly be inferred from knowing whether or not attitudes have changed. If this is so, attitudes would still be, in principle, redundant to a knowledge of spending plans, and they or their changes could not be brought to bear on the question of plan fulfillment. Expectations would be redundant to analysis of purchase plans, but not to analysis of purchases.

[11] Much current thinking stresses the desirability of devoting more resources to gathering and interpreting attitude information, since a framework of attitudes and expectations must form the basis for the purchase plans of households. Almost no mention is made of buying-plan data by Katona and Mueller (especially Chapters 3 and

Obviously, there is no simple means of testing the predictive value of spending-intentions data. Nevertheless, if household spending intentions have any real significance there should be some rough correspondence between plans and purchases, or, at least, reasons why plans and purchases diverged for a particular period.

EMPIRICAL TESTS OF DATA

In this section, year-to-year changes in the level of expressed spending intentions are compared with year-to-year changes in the level of purchases. As noted previously, the CU data are employed for the analyses, and SCF data are included for comparison.[12] In both, spending intentions for the respective samples are tested against purchases for the entire population to explore their value as indicators of aggregate purchases. For the CU data, the working hypothesis is that, although the sample is obviously nonrandom for the entire population, it is a fairly good sample of the durable goods-buying population. In addition, the bias toward a better educated and more articulate population in the CU sample may be a net advantage in prediction for the whole population.[13]

Of several possible kinds of empirical tests, comparisons of the direction and extent of year-to-year changes in purchase intentions with actual purchases are useful but somewhat imprecise (see Appendix Tables A-1 and A-2). Although with so few observations, results of correlation tests are subject to a wide margin of error, they give a basis for some tentative conclusions.[14] Table 1 shows squared correlation coefficients (corrected for the number of observations) relating the year-to-year changes in the aggregate value of purchase intentions for the two samples to a similar change in purchases for the population as a whole.

The correlations for the CU data are all significant (at the 5 per cent level), while for the SCF data only total purchases in constant prices show statistical significance. None of the differences between CU and SCF

4) who examine a half-dozen attitude–expectation indicators and their interrelationships. On the other hand, the Consultant Committee on Consumer Survey Statistics (page 64) found that intentions data (buying plans) had considerable predictive value for durable goods purchases, but that the attitude and expectation indicators—with two minor exceptions—made little contribution to an explanation of purchases. Klein and Lansing arrive at much the same conclusion.

[12] The CU and the SCF periods are about the same length, twelve months, but CU data start with the date for the required return of questionnaires and cover roughly fiscal years; the SCF data cover calendar years.

[13] A more complete discussion of the CU sample and an analysis of the biases will be found in the next section.

[14] Data for the full 1946-55 period are incomplete for the following reasons: (1) because in 1945-46 supply restrictions limited purchases, yet wartime price controls prevented price increases, 1946 purchase intentions were not usable, and the year-to-year comparison between 1946 and 1947 was eliminated; and (2) because purchase intentions are lacking in the CU 1953 data when the intentions question was omitted from the questionnaire. We are thus left with only six observations for the CU data and eight for the SCF data.

TABLE 1

Correlation Coefficients and Slopes of Regression Equations Derived from a
Comparison of Changes in CU and SCF Spending Intentions with Changes
in Actual Purchases by the Population as a Whole, 1946-1955

Expenditure Category	r^2 (corrected)		b_{yx}	
	(current prices)	(constant prices)	(current prices)	(constant prices)
Automobiles:				
CU	0.75	0.66	0.64	0.62
SCF	.35	.29	.58	.61
Household furnishings:				
CU	.58	.79	.39	.59
SCF	.00	.00	.19	.16
Total durables:				
CU	.84	.85	.58	.64
SCF	.22	.44	.38	.66

In this and the following tables, figures underlined are significantly different from zero at the 5 per cent level; zeros represent small (positive) correlations that were washed out by the correlation.

a Change in planned purchases is the independent variable; change in actual purchases the dependent variable.

b The SCF data show the effect of the Korean War, unforeseen at the time consumers reported to it their 1950 intentions; the CU questionnaire went out shortly after the war had begun. Recalculating SCF correlations without 1950 data yields r^2's of 0.42 for automobiles, 0.00 for household furnishings, and 0.30 for total durables, in current prices. The r^2's in constant prices become 0.26 for automobiles, 0.00 for household furnishings, and 0.45 for total durables. None of the correlations is significant at the 5 per cent level, since the loss of one observation more than compensates for the gain in degree of relationship for the total durables (constant price) category, and the others do not gain enough from the elimination of 1950 data.

Source: Tables A-4 to A-7. The regression equations are of the form $D_t/D_{t-1} = a + bX_t/X_{t-1}$, where D_t is the value in current (constant) prices of durable goods purchases and X_t is the value in current (constant) prices of spending plans for durable goods.

correlations show statistical significance, even though some—particularly for the household furnishings category, which includes all major durables except automobiles—are quite sizable. The correlation for total durables in the CU data is higher than that for either subcategory in both current and constant price data; a result to be expected if there is any tendency to substitute one kind of durable for another when purchase intentions are translated into decisions. The SCF data are ambiguous in this regard.

As for the slopes of the regression equations, they are all less than unity, which suggests that changes in purchases are generally some fraction of changes in plans.[15] This finding suggests that consumers are apt to show

[15] Since the constant terms are all positive, the statement is true only when the changes in both are relatively large. Thus, if there is no change in plans, purchases tend to be somewhat larger than in the preceding year. This result should not be attributed simply to growth in population or other trend factors, since the index of planned purchases includes an allowance for increase in number of households.

greater changes in attitudes and plans than in actions, in contrast to business planners who show the reverse tendency—changes in actual investment expenditure are generally larger than changes in planned expenditures.[16] It seems plausible that household planning is less systematic than business planning, which often employs last year's results as a first approximation to this year's planning.[17] Such systematized planning might produce a built-in bias toward reporting smaller changes than are really contemplated.

The results obtained with CU data appear to justify their serious consideration as spending-intentions data with considerable forecast value. Despite the severe handicap of so few observations, the CU data can be said to have passed one of the relevant tests with comparatively high marks.

INCOME CHANGES INTEGRATED INTO THE MODEL

Although spending intentions were significantly related to purchases, the existence of a net impact of intentions on purchases, after allowance for other variables, has not been demonstrated. If foreseen, income changes and other events should already be accounted for in the plans; if unforeseen, they will have an independent influence on purchases. In general, we have no way of knowing whether particular economic events were expected by households, although some people apparently were able to make accurate, though crude, forecasts about their own income prospects.[18]

Even if some households anticipate changes correctly, many are certainly pleasantly or unpleasantly surprised, and consequently some net effect of additional variables on purchases should be found. Since income changes are probably one of the most sensitive variables influencing consumer decisions, a relationship first suggested by Duesenberry[19] was employed— the ratio between current real per capita income and the highest level of real per capita income previously achieved. Table 2 summarizes the correlation coefficients for multiple regression equations relating actual purchases to CU and SCF planned purchases and real income changes and

[16] Cf. "Report of Consultant Committee on Consumer Survey Statistics."

[17] Cf. the interesting results obtained by Robert Ferber in "The Railroad Shippers' Forecasts" (*Studies in Business Expectations and Planning*, University of Illinois Press, 1953).

[18] The SCF shows how many people expect their income to rise and how many expect a fall. Aggregate income has tended to move in the direction expected by the majority of those who registered an expectation, thus giving assurance of some correct anticipations of changes. But the inflationary nature of the postwar period over which these surveys have been gathered suggests that the accuracy of such household forecasts may be a pure happenstance.

[19] James Duesenberry, *Income, Saving, and the Theory of Consumer Behavior*, Harvard University Press, 1952.

shows correlations for the two simple regressions. The value of $r^2(R^2)$ was used (corrected for the number of observations).

TABLE 2

Correlations Relating Changes in Purchases to Changes in Spending Plans and Real Income, CU and SCF Data, 1946-1955

	Square of Correlation Coefficients for Regression Equations[a]					
	(current prices)			*(constant prices)*		
	Independent Variables			*Independent Variables*		
Expenditure Category	X, Y[b]	X	Y	X, Y[b]	X	Y
Automobiles:						
CU	0.73	0.75	0.68	0.67	0.66	0.63
SCF	.48	.35	.15	.38	.29	.16
Household furnishings:						
CU	.65	.58	.70	.73	.79	.63
SCF	.63	.00	.67	.36	.00	.43
Total durables:						
CU	.83	.84	.74	.80	.85	.65
SCF	.58	.22	.50	.58	.44	.35

[a] The regression equations have the following form: X, Y: $D_t/D_{t-1} = a + b(X_t/X_{t-1})$ $+ c[(Y/NP)/(Y/NP)_0]$, $X: D_t/D_{t-1} = a + b(X_t/X_{t-1})$, and Y: $D_t/D_{t-1} = a + b[(Y/NP)/(Y/NP)_0]$, where D = purchases of major durable goods, X = spending plans for major durable goods, and Y/NP = real disposable per capita income.

[b] Multiple correlation coefficients among plans, income, and purchases are sometimes lower than simple correlation coefficients because the improvement in relationship does not compensate for the loss of an additional degree of freedom.

Source: Tables A-4 to A-9.

Clearly real income changes were closely related to purchases, especially of household furnishings, but, surprisingly, in different degrees for the CU and SCF data. Recalculation of the material (in both cases relating purchases of the population as a whole to changes in per capita real income) for SCF calendar years indicated that much of the discrepancy arose from a difference in time periods rather than in coverage.[20]

Addition of the income variable did not much improve the correlations for the CU data. This finding cannot be due to a lack of relationship between purchases and real income, which was generally stronger for the CU data, but rather to the close relationship for that data between the *independent* variables—spending intentions and income changes where the impact of the same variable appears to be measured twice. The same problem did not arise with the SCF data, where the correlations between

[20] The coverage of purchases is somewhat different because CU time periods do not run over either a calendar or a fiscal year. I had to aggregate quarterly CU data, and the available breakdowns are less finely detailed (e.g. automobile parts are included in purchases of automobiles).

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independent variables—spending intentions and real income changes—are quite low:

Expenditure Category	r^2 (corrected)			
	Current Price Data		Constant Price Data	
	CU	SCF	CU	SCF
Automobiles	0.61	0.00	0.35	0.00
Household furnishings	.73	.18	.70	.28
Total durables	.66	.00	.70	.01

The existence of the relationship for the CU data makes it impossible to determine the net influence of either spending plans or income changes on purchases. In the following tabulation, $r^2_{12.3}$ gives the relationship between actual purchases (dependent) and planned purchases (independent), real income changes being held constant, and $r^2_{13.2}$, that between actual purchases (dependent) and real income changes (independent), planned purchases being held constant:

Expenditure Category	r^2 (not corrected)			
	Current Price Data		Constant Price Data	
	$r^2_{12.3}$	$r^2_{13.2}$	$r^2_{12.3}$	$r^2_{13.2}$
Automobiles				
CU	0.40	0.23	0.35	0.27
SCF	.49	.32	.38	.27
Household furnishings				
CU	.12	.37	.45	.01
SCF	.07	.70	.06	.52
Total durables				
CU	.52	.23	.58	.03
SCF	.31	.56	.46	.37

The net correlations for the CU data are erratic, since whichever of the two independent variables has the higher correlation with purchases tends to dominate. (Compare the current and constant price net correlations for household furnishings.) The net correlations for automobiles are the most significant since the relationship between independent variables is least powerful. Net correlations for the SCF data are considerably more significant and conform generally to what would be expected on a priori grounds. Automobile purchases are more dependent on spending plans than on real income changes, and purchases of household furnishings show the reverse tendency. Actually, income changes dominate the household furnishings category in the SCF data because of lack of relationship between plans and purchases.

In general, the attempt to integrate real income changes into the analysis of CU data proved unsuccessful. The changes are closely related to purchases though not so closely as spending intentions are. However, a close relationship also exists between spending intentions and income changes, vitiating any endeavor to isolate the net effects of the two factors.

The most striking aspect of the data is the disparity between the CU and SCF spending intentions–real income change relationships. If we postulate that (1) household spending intentions are an indicator of household purchases, (2) spending intentions are formulated within a framework of anticipated income change, with intentions being high when income is expected to rise and vice versa, and (3) household anticipations of income changes are generally correct, then intentions and income changes should be highly correlated. If (1) and (2) are correct, but (3) is wrong, then we would expect little or no correlation. The CU sample may show a high correlation between the independent variables because its members successfully predicted changes in their own income. But these conclusions are based on few observations, and alternative (and less complimentary) explanations are not precluded by the data.

SUMMARY

The empirical test demonstrates that the CU data are a most promising body of information. All correlations between the purchase intentions of the sample and actual purchases of the whole population show statistical significance at the 5 per cent level. This result is especially noteworthy for the household furnishings category of durables, where purchase intentions data from other surveys have proved unreliable. The net forecasting value of the CU intentions data after allowance for the effect of real income changes on purchases could not be accurately measured since the independent variables were highly correlated. Nevertheless, the improvement of all but one of the simple correlations between real income changes and purchases when the intentions variable was added indicates that such value exists.[21] Indeed the high correlation between the independent variables is suggestive in itself, since purchase intentions and income changes should be highly correlated under certain conditions.

Certain reservations bear repeating. All the generalizations are based on exceedingly few observations within a prosperous period conducive to reasonably accurate forecasting. The nature of the CU sample gives added pause for thought. Why should a sample of this kind, with its obvious biases and peculiarities, yield as good results as it did during this period, and is it likely to continue to perform well?

[21] See Table 2. In contrast, the simple correlation between intentions and purchases is generally not improved, after correction, by adding the income-change variable.

Characteristics of the Consumers Union Sample

SOME CONSIDERATIONS ON SAMPLING

If intentions data are to be used to forecast consumer expenditures, a random probability sample of the total population may not be the best one. If the sample is random, then the average rate of purchase intentions in the sample is an estimate of the average rate for the population as a whole. Changes in the rate from one year to the next are taken to signify more purchase plans and hence more purchasing than in the preceding year.

Suppose, however, that the sample deviates from the average in income and age distribution but deviates in the same way and about equally during consecutive years. Any change in the level of purchase intentions for a wholly random sample, provided it was systematic (i.e. proportional) for all groups, would be reflected by the biased sample. The *level* of intentions would be different, being higher or lower depending on the nature of the biases.[22]

Since our concern is with intentions to purchase durables, a sample with income and age distribution biases might actually provide *better* estimates of change in the level of purchase intentions for the population than a random sample of the same size could. The objective is really a random sample of the durable goods buying population rather than of the entire population. The younger, higher-income groups purchase durable goods more often, relative to disposable income, than the older, lower-income groups do. Thus, a consistently biased sample of the first group might be a better sample of the relevant population, and therefore have a smaller sampling error.[23]

[22] If a change in the frequency of intentions occurred in one class of people and not in others, the biased sample would not necessarily show movements exactly comparable from year to year with those shown by a random sample, although the movements would be generally similar. The two samples might even show movements in different directions. For example, if high income people planned to purchase many more durables and lower income people many less, a sample biased toward high incomes could show a higher average rate of purchase intentions at the same time that a random sample of the population showed a lower average rate.

The level of the intentions would usually differ. For example, in a sample with high income and younger age for the household head relative to the population average, the level of purchases would be considerably higher than for a random sample. However, in a sample with relatively high income but relatively *older* age for the household head, the level of purchases might not differ from the population average, despite the biases. In any event, changes in the population would be reflected in the sample, provided the biases were consistent and all subgroups showed proportionate changes.

[23] What matters is not only the sampling error for intentions but also (1) the relationship between intentions and fulfillment for the sample, and (2) the relationship between sample purchases and population purchases. If the members of a biased sample, such as the CU subscriber group, show a closer relationship between their own purchase plans and purchases than does the population, and in addition there is a stable relationship between the purchases of the sample and population purchases, then the biased sample might predict population purchases better than any conceivable random probability sample could. I am indebted to Mary Jean Bowman for this point.

Another facet of the sampling problem is the possible advantage of concentrating on series that are thought to move in advance of the rest of the economy or whose reactions are more volatile than the average, in the hope of predicting changes in general conditions by observing changes in supposedly critical areas. Are there households whose patterns of behavior are likely to precede (and perhaps influence) the behavior of other households? Economists frequently assert that the consumption patterns of higher-income groups—certainly patterns of what goods are purchased and perhaps also of what is saved or spent—"trickle down" to the rest of the economy.[24] By the same logic, the more perceptive and articulate members of the population may exert an influence on behavior out of proportion to their numbers; and changes in their attitudes, expectations, and plans may foreshadow similar changes for the population as a whole.

Such an argument cannot be tested since there is little empirical evidence that can be brought to bear on it, and so must be used with caution. However, the results obtained with the CU data suggest its validity.

DESCRIPTION OF THE SAMPLE

Table 3 shows that median income for the CU sample was markedly higher than that for the whole population. There was some tendency for

TABLE 3

Comparison of Income Distributions for the CU and SCF Samples, 1948, 1951, and 1953

| | PERCENTAGE OF SPENDING UNITS DURING | | | | | |
| | 1948 | | 1951 | | 1953 | |
MONEY INCOME BEFORE TAXES	*CU*	*SCF*	*CU*	*SCF*	*CU*	*SCF*
	(per cent)					
Less than $2,000	4	30	1	28	1	23
2,000–2,999	16	23	3	18	2	14
3,000–3,999	24	20	13	18	7	16
4,000–4,999	19	12	18	15	14	16
5,000–7,499	22	10	35	14	35	21
7,500–10,000	8	2	14	4	19	5
10,000–over	8	3	15	3	21	5
	(dollars)					
MEDIAN INCOME	4,337	2,840	5,992	3,200	6,818	3,780

The time periods are not equivalent because the CU data do not cover calendar years, and they are not reported in every year. Accordingly, the time difference in the CU data between the columns marked 1948 and 1951 in the table, is really 49 instead of 36 months. The correspondence between 1951 and 1953 is better, with a 26-month gap for the CU data. See Table A-3 for the time periods actually covered.

Source: For CU data, Table A-10. For SCF data, as a random sample of the population, "Survey of Consumer Finances," *Federal Reserve Bulletin*, September 1952, Table 1; and July 1954, Table 2. Details may not add to totals due to rounding.

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[24] Cf. Duesenberry.

the spread *between* the median incomes to increase slightly, since median CU income increased by about 6 per cent per year from 1946 to 1955, the population median by a little under 5 per cent. The CU sample has particularly small representation of income groups below $2,000, and for recent years poor representation of the $2,000-2,999 group relative to its estimated size in the population. The higher income groups are, of course, strongly overrepresented.[25]

The geographical distribution of the CU sample for two periods, indicates that major underrepresentation occurs only in sparsely populated areas:[26]

| | | PERCENTAGE RESIDING IN REGION | | | |
| | | 1947 | | 1950 | |
CU REGION	CENSUS REGION	CU Sample	Total Population	CU Sample	Total Population
1	New England and Middle Atlantic	36	27	33	26
2	South Atlantic and East South Central	10	21	11	22
3	East North Central and West North Central	31	30	30	30
4	West South Central and Mountain	7	13	8	13
5	Pacific	18	10	17	10
6	Outside Continental United States	0	—	2	—

Two census regions have half the share of CU subscribers required for full representation of their populations, but the representation is not really poor. The geographic overconcentration of CU subscribers seems to be primarily in the New England and Middle Atlantic area and on the Pacific Coast.

Geographical underrepresentation in the CU sample is apparently related to the size of the communities in which subscribers reside. The following tabulation shows the distribution of CU subscribers and of the

[25] An average of over 96 per cent of all CU respondents answered the income question on the questionnaire every year.

[26] The CU data are from Table A-11. Data on the United States population are from *Statistical Abstract of the United States, 1949*, p. 31; and *1953*, p. 18. CU period 6—roughly fiscal 1952—was used for comparison with the 1950 population figures, because geographical information was not requested in the previous year. Census regions were grouped to conform with CU classification in regions.

population as a whole by size of community and size of urban community, for selected years:[27]

	PERCENTAGE OF TOTAL POPULATION				PERCENTAGE OF URBAN POPULATION		
	CU Sample			U.S. Population	CU Sample		U.S. Population
	1949	1953	1954	1950	1953	1954	1950
Over 1 million	27	18	21	12	19	22	18
1 million to 100,000	28	29	29	18	31	30	28
100,000 to 25,000	15	18	18	12	19	19	18
25,000 to 2,500	20	22	19	18	23	20	28
Less than 2,500	11	12	12	41			
Farm		5	5	36			
Nonfarm		7	7	5	8	8	8

The major gap is in towns of less than 2,500 population in which only about 11 per cent of the CU sample reside, compared with about 41 per cent of the whole population, and in rural areas. The distribution of urban CU subscribers is close to that of the U.S. urban population. Surprisingly enough, there is little overconcentration in large cities.[28]

The education of CU subscribers may give some indication of how "planning minded" they are. In replies of 1948-49 and 1954-55, over 70 per cent of the sample indicated some college education, and 17 per cent high school or an equivalent. The corresponding percentages for the United States adult population in 1950 are 13 and 37.[29] The two sets of figures are not strictly comparable. The CU data may refer to only one adult in each family, while the census data indicate the percentage of all adults having a particular degree of education. If the CU percentages for the "some college" group are halved, the percentage of CU college educated persons is still close to three times that of the population, a disparity that cannot be dismissed on grounds of a possible tendency to exaggerate on the part of CU respondents.[30]

[27] The CU data are from Table A-12. Data for the United States population are from *Statistical Abstract, 1949*, p. 12; and *1954*, p. 27. Details may not add to totals because of rounding.

[28] The data may be misleading because communities classified as under 25,000 frequently turn out to be suburbs of nearby larger cities.

[29] *Statistical Abstract of the United States, 1953*, Bureau of the Census, p. 121.

[30] The occupational status of CU respondents is similar. While roughly 55 per cent of the CU sample from the 1954-55 questionnaire are either professional or self employed, about 10 per cent of the whole population are classed as professional and another 15 to 20 per cent as managerial or self employed ("Survey of Consumer Finances," *Federal Reserve Bulletin*, July 1954, Supplementary Table 2). Thus the percentage of CU respondents classed in the two categories is about double the percentage for the whole population.

PURCHASING HABITS OF THE CU SAMPLE

Of perhaps greater significance than the characteristics of the sample are its purchasing habits. In the last section, it was argued that the under-representation of low income groups in the sample is not necessarily a disadvantage for its use in forecasting durable goods purchases. As Table 4 shows, an average of more than 80 per cent of all major durables are purchased by household spending units with incomes higher than $3,000 per year.[31] This confirms the belief that the CU sample was a better sample of the major durable goods buying population over most of the period than a random sample of the population as a whole was.[32] This conclusion may not be valid for recent years, however.

TABLE 4

Cumulative Income Distributions of the CU and SCF Samples,
and Purchasers of Major Consumer Durable Goods,
by Income Groups, 1952, 1953, 1954

| YEAR | PERCENTAGE OF UNITS WITH INCOMES GREATER THAN:[a] | | | | |
	$2,000	*$3,000*	*$4,000*	*$5,000*	*$7,500*
1952:					
CU	99	96	85	67	31
SCF	75	59	41	26	9
Purchasers of major durables	92	83	67	52	23
1953:					
CU	99	97	90	75	41
SCF	77	63	47	31	10
Purchasers of major durables	93	83	69	54	25
1954:					
CU	99	97	91	77	42
SCF	77	63	46	32	11
Purchasers of major durables	89	80	68	53	22

[a] The percentage for greater than zero is 100, and for infinity it is zero.

Source: Tables A-13 to A-15. The figures for purchasers of major durables are averages for the two categories, new automobiles, and furniture and major household appliances, in Table A-15.

A limited amount of data can be used to test differences between the purchase habits of the CU sample and the population as a whole in

[31] The percentage is even higher for the crucial "purchases of new automobiles" category.

[32] That is, the match between the share of major durable goods purchases made by households with incomes greater than x dollars per year and the share of CU subscribers with incomes greater than x dollars is closer than the match between the shares of purchases by households with incomes greater than x and the share of the total population with incomes greater than x dollars per year. Also the CU sample contains many more households that make purchase plans, relative to households of the population in keeping with their higher income composition (see Robert Ferber, "Planning in Consumer Purchases—Durable Goods," *American Economic Review*, December 1954).

comparable income groups. A detailed breakdown of the population income distribution of durable goods purchasers is available only for automobiles and television sets.[33] From Table 5 it is evident that far more automobiles, particularly new ones, were purchased by the CU sample than by comparable income groups in the population. The disparity is clearly marked for income groups below $5,000 per year, becoming less clear above that level. For the highest income group shown ($7,500 and up) the percentages are quite close. Prospective purchasers are also much more numerous in the CU sample than in comparable population groups.

Since the CU publication, *Consumer Reports*, stresses its analyses of automobile performance and characteristics, people purchasing automobiles (or planning to purchase them) naturally tend to subscribe to it at an average above that of the population in general. Since the greater frequency of actual (and prospective) automobile purchasers among CU subscribers is a recurring phenomenon, it should cause no bias in the use of CU automobile spending plans to forecast purchases of the population. Instead, the high concentration of new car buyers may enhance the accuracy of forecasting changes in the level of purchases.

Similar comparisons for television sets (Table 5) show only actual purchasers by income class, since prospective purchasers are not obtainable from published SCF data. In contrast to the automobile data, there appears to be little or no systematic tendency in the data for the frequency of purchases in the CU sample to exceed that of the SCF sample, except in the lowest income groups.[34] The differences are not statistically significant at the 5 per cent level of probability in most cases, and none are at the 1 per cent level.

Estimates were made of purchases of other durable goods items by the population by assuming their purchasing habits to be comparable to those of the CU subscriber sample if the percentage of purchasers among CU subscribers at each income level was multiplied by the number of spending units at that income level in the population. The results indicate that the average CU subscriber purchases more of most durables (especially freezers) relative to income, than the average for the population.[35]

Work Planned on CU Project for 1957-1958

At present the National Bureau of Economic Research is analyzing tabulations from a pilot study of about 5,000 CU questionnaires for 1955. The study is designed to test the usefulness of certain cross relationships

[33] The data are published in the *Survey of Consumer Finances*. In addition, the SCF publishes the income distribution for purchasers of furniture and major household appliances, but a comparable category cannot be extracted from the CU data.

[34] The percentages for the lowest income groups are unreliable because their representation in the CU sample is extremely small.

[35] For details of the computation, see Appendix C of Juster, in source note to Table 5.

TABLE 5

Prospective and Actual Purchasers of Automobiles, and Actual Purchasers of
Television Sets, CU and SCF Samples, by Income Group, 1952 and 1953
(*percentage of spending units*)

PURCHASER	MONEY INCOME BEFORE TAXES					
	Under $3,000	*$3,000– 3,999*	*$4,000– 4,999*	*$5,000– 7,499*	*$7,500 and over*	*All Spending Units*
New and Used Automobiles						
Prospective, 1952:						
CU	13	18	19	18	20	18
SCF	a	8	9	13	15	8
Prospective, 1953:						
CU	17	20	22	20	24	21
SCF	a	10	10	15	20	10
Actual, 1952:						
CU	22	25	28	32	37	31
SCF	a	28	27	27	33	22
Actual, 1953:						
CU	20	32	36	34	39	35
SCF	a	23	26	29	39	24
New Automobiles						
Prospective, 1953:b						
SCF	a	4	5	10	7	4
Actual, 1953:						
CU	10	17	22	23	30	25
SCF	a	7	6	14	29	9
Television Sets						
Actual, 1951:						
CU	13	19	19	23	29	23
SCF	a	14	14	24	26	12
Actual, 1952:						
CU	10	15	17	17	19	16
SCF	a	13	17	16	16	11
Actual, 1953:						
CU	11	17	16	18	18	17
SCF	a	18	19	19	21	14

See Table A-3 for details on the CU time periods, which do not correspond exactly
to the calendar years shown.

a Less than 0.5 per cent.

b CU not available.

Source: *Purchasers of automobiles*—CU percentages, F. Thomas Juster, "Expecta-
tional Data and Short-term Forecasting" (unpublished doctoral dissertation, Columbia
University, 1956), Appendix C; SCF data, "Survey of Consumer Finances," *Federal
Reserve Bulletin*, July 1953, Supplementary Table 3; June 1954, Supplementary Tables
7 and 22. *Purchasers of television sets*—CU data, basic data sheets prepared by Con-
sumers Union; SCF data, "Survey of Consumer Finances," *Federal Reserve Bulletin*,
June 1954, Supplementary Table 11.

for the analysis of purchase decisions. For example, exhaustive cross tabulations of questions dealing with income expectations and with budgeting habits may yield previously unavailable information bearing on purchase decisions and plans. Questions were included on where subscribers live, their education, and their living arrangements to test whether the data are systematically related to purchases or plans. The pilot study should also yield more information on how many questionnaires must be tabulated to provide statistically significant relationships among the variables.

In addition to the pilot study, between 16,000 and 25,000 of the 1955 questionnaires are now being coded, punched, and tabulated to give information both more detailed and of higher quality. For example, it will be possible to analyze and cross classify aggregate purchases and purchase plans for some thirty major consumer durables by household and by commodity, which should extend our knowledge about the net impact of many variables on the structure and magnitude of durable goods purchases, on the formation of purchase intentions and decisions, and on the use of mail surveys of this kind to gather information about consumer intentions and actions.

In the near future, tabulation will begin on the 1957 questionnaire designed, partly for the analytical needs of the project, to elicit more information about purchases, plans, and characteristics of the households than previous CU questionnaires. Comprehensive demographic information and comprehensive data on ownership of durable goods are being gathered for the first time. A distinction being made between plans to purchase within six months and plans to purchase later than that should help to separate concrete plans with good prospects of fulfillment from rather vague hopes or wishes and thereby improve the predictive value of the spending-intentions data.

Important data will still be lacking, particularly on a household's debt and liquid asset structure, but the 1957 questionnaire provides an opening for future gathering of this kind of information. Subscribers are asked to indicate willingness to answer future questionnaires for the sole purpose of contributing information for research purposes. A preliminary review shows an impressive number of positive replies, possibly promising a sample of 30,000. Provided the sample proves reasonably unbiased in other characteristics—which can easily be determined—rather complete information should be obtained on debt and liquid asset structure, expectations and attitudes, income changes, buying plans for different forward time periods, and so forth. Further, it may be possible to use this sample as the basis for a re-interview study, which would require matching returns from the same respondent in successive surveys.

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Appendix

TABLE A-1

Predictive Value of CU Spending Plan Data, Seven Observations, 1947-1953 and 1955

| | CATEGORY OF SPENDING PLANS | | | | | |
| | Automobiles | | Household Furnishings | | Total | |
	(value)	*(volume)*	*(value)*	*(volume)*	*(value)*	*(volume)*
Criterion: Direction of Change						
Successful prediction	6	5	3	5	6	5
Unsuccessful prediction	1	2	4	2	1	2
Criterion: Difference between Planned and Actual Changes						
Less than 10%	3	3	2	3	4	4
10%–20%	2	1	3	3	1	1
More than 20%	2	3	2	1	2	2

Source: Tables A-4 and A-5.

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TABLE A-2

Predictive Record of SCF Spending Plan Data, Nine Observations, 1947-1955

| | CATEGORY OF SPENDING PLANS | | | | | |
| | Automobiles | | Household Furnishings | | Total | |
	(value)	*(volume)*	*(value)*	*(volume)*	*(value)*	*(volume)*
Criterion: Direction of Change						
Successful prediction	8	7	5	5	8	6
Unsuccessful prediction	1	2	4	4	1	3
Criterion: Difference between Planned and Actual Link Relatives						
Less than 10%	4	2	3	3	1	3
10%–20%	0	3	3	4	5	5
More than 20%	5	4	3	2	3	1

Source: Tables A-6 and A-7.

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TABLE A-3

Time Period Equivalent for CU Data, 1946-1955

Calendar Time Span	Planning Period	Purchasing Period
July 1, 1946–June 30, 1947	P-1	A-1
July 1, 1947–June 30, 1948	P-2	A-2
July 1, 1948–June 30, 1949	P-3	
Nov. 15, 1948–Nov. 14, 1949		A-3
Nov. 15, 1949–Nov. 14, 1950	P-4	
Oct. 1, 1949–Sept. 30, 1950		A-4
Oct. 1, 1950–Sept. 30, 1951	P-5	
Aug. 15, 1950–Aug. 14, 1951		A-5
Aug. 15, 1951–Aug. 14, 1952	P-6	
July 1, 1951–June 30, 1952		A-6
July 1, 1952–June 30, 1953	P-7	
Oct. 1, 1952–Sept. 30, 1953		A-7
Oct. 1, 1953–Sept. 30, 1954	P-8	A-8
Oct. 1, 1954–Sept. 30, 1955	P-9	

Planning period (P) is the time span of data on quantity of consumer durables CU subscribers planned to buy.

Purchasing period (A) is the time span of data on quantity of consumer durables CU subscribers actually purchased.

Source: Memorandum from Consumers Union.

TABLE A-4

Year-to-Year Changes in the Value of Planned Purchases, CU Sample, and in Total Purchases of Durable Goods, Department of Commerce Data, Current Dollars, 1947-1955

(previous period= 100)

	CONSUMER PURCHASES IN CURRENT DOLLARS					
	Automobiles		*Household Furnishings*		*Total*	
PERIOD	*Plan*	*Actual*	*Plan*	*Actual*	*Plan*	*Actual*
P-2	88	117	76	115	84	116
P-3	100	120	121	94	107	104
P-4	126	142	139	119	131	130
P-5	94	97	102	96	99	96
P-6	58	86	73	90	63	89
P-7	128	120	98	106	114	113
P-8	n.a.	104	n.a.	104	n.a.	104
P-9	140[a]	130[b]	131[a]	112[c]	137[a]	121[d]

n.a. = not available.

See Table A-3 for analysis of the time span of each CU time period in this and the following tables.

[a] P-7 = 100, since P-8 data are not available.

[b] 135, if P-7 = 100.

[c] 117, if P-7 = 100.

[d] 126, if P-7 = 100.

Source: *Planned purchases*—Juster, Tables B-13 through B-18. *Actual purchases*—Table A-26.

TABLE A-5

Year-to-Year Changes in Volume of Planned Purchases, CU Sample, and
in Volume of Durable Goods Purchases, Department of
Commerce Data, Constant Prices, 1947-1955
(previous period= 100)

| | CONSUMER PURCHASES IN CONSTANT PRICES | | | | | |
| | Automobiles | | Household Furnishings | | Total | |
PERIOD	Plan	Actual	Plan	Actual	Plan	Actual
P-2	80	n.a.	69	n.a.	75	n.a.
P-3	85	110	103	93	92	102
P-4	116	134	134	121	125	128
P-5	99	92	87	88	93	90
P-6	53	82	71	89	60	86
P-7	117	115	102	108	110	112
P-8	n.a.	104	n.a.	105	n.a.	105
P-9	138[a]	131[b]	127[a]	114[c]	132[a]	123[d]

n.a. = not available.
The total for the actual purchases data is the average of the year-to-year changes in the two components shown.
[a] P-7 = 100, since P-8 data are not available.
[b] 135, if P-7 = 100.
[c] 120, if P-7 = 100.
[d] 127, if P-7 = 100.
Source: *Planned purchases*—Juster, Tables B-13 through B-18. *Actual purchases*—Table A-29.

TABLE A-6

Year-to-Year Changes in Total Value of Planned Purchases of Durables,
SCF Sample, and in Purchases, Department of Commerce Data,
Current Dollars, 1947-1955
(previous year= 100)

| | CONSUMER PURCHASES IN CURRENT DOLLARS | | | | | |
| | Automobiles | | Household Furnishings | | Total | |
YEAR	Plan	Actual	Plan	Actual	Plan	Actual
1947	127	175	73	136	104	148
1948	116	120	123	105	118	111
1949	130	134	108	93	123	110
1950	104	129	125	127	110	127
1951	62	86	82	91	69	89
1952	124	92	93	97	111	95
1953	138	133	139	102	138	117
1954	87	94	89	102	87	98
1955	114	137[a]	85	114[a]	104	126[a]

[a] Based on only three quarters.
Source: *Planned purchases*—Juster, Tables B-13 through B-18. *Actual purchases*—Table A-23.

TABLE A-7

Year-to-Year Changes in Number of SCF Spending Units Planning to Buy
Selected Durable Goods, Survey of Consumer Finances Data, and
in Volume of Durable Goods Purchased, Department of
Commerce Data, Constant Prices, 1947-1955
(*previous year = 100*)

	NUMBER OF SPENDING UNITS PLANNING TO BUY AND TOTAL PURCHASES					
	Automobiles		*Household Furnishings*		*Total*	
YEAR	*Plan*	*Actual*	*Plan*	*Actual*	*Plan*[a]	*Actual*[a]
1947	109	n.a.	77	n.a.	94	n.a.
1948	95	107	107	99	101	103
1949	126	126	111	96	119	111
1950	116	126	109	127	113	127
1951	57	80	89	83	73	82
1952	121	86	91	99	106	93
1953	119	130	137	101	128	116
1954	94	96	87	105	91	101
1955	110	138[b]	103	114[b]	107	126[b]

[a] Simple average of automobile and household furnishings index.
[b] Based on first three quarters only.
Source: *Spending units planning to buy*—Juster, *op. cit.*, Table A-20. *Actual purchases*—Table A-28.

TABLE A-8

Derivation of Income Change Variables Covering CU Time Periods

	1935-39 DOLLARS PER CAPITA			CURRENT DOLLARS PER CAPITA		
PERIOD	Y/NP	$(Y/NP)_0$	$\dfrac{Y/NP}{(Y/NP)_0}$	Y/N	$(Y/N)_0$	$\dfrac{Y/N}{(Y/N)_0}$
P-2	740	738.5[a]	100.3	1,223	1,148	106.5
P-3	750	740	101.4	1,288	1,223	105.3
P-4	782	750	104.3	1.333	1,288	103.5
P-5	788	775	101.7	1,440	1,333	108.0
P-6	789	790	99.9	1,489	1,440	103.4
P-7	811	790	102.7	1,546	1,489	103.8
P-8	813	816.5	99.6	1,563	1,546	101.1
P-9	838	818	102.4	1,606	1,563	102.8

The Y/NP and Y/N are averages for the period covered, with quarterly data being divided in half where necessary to insure accuracy. The $(Y/NP)_0$ and $(Y/N)_0$ data are the highest level of real per capita disposable income and per capita disposable income, respectively, for any four consecutive quarters prior to the spending period under consideration (except as noted). It can be seen that the highest previous income level is not necessarily the income level during the immediately preceding period, even during periods when income is steadily rising. The reason is that the CU time periods do not

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TABLE A-9

Derivation of Income Change Variables Covering Calendar Year
Time Periods, 1948-1955

	1935-39 DOLLARS PER CAPITA			CURRENT DOLLARS PER CAPITA		
PERIOD	Y/NP	$(Y/NP)_0$	$\dfrac{Y/NP}{(Y/NP)_0}$	Y/N	$(Y/N)_0$	$\dfrac{Y/N}{(Y/N)_0}$
1948	748	737	101.5	1,281	1,174	109.1
1949	746	748	99.7	1,261	1,281	98.4
1950	787	748	105.2	1,359	1,281	106.1
1951	791	787	100.8	1,464	1,359	107.7
1952	797	791	100.5	1,508	1,464	103.0
1953	819	797	102.8	1,568	1,508	104.0
1954	815	819	99.5	1,569	1,568	100.1
1955	839[a]	819	102.4	1,615[a]	1,569	102.9

$(Y/NP)_0$ and $(Y/N)_0$ are the highest levels of real disposable per capita income and disposable per capita income, respectively, for any year previous to the one under consideration. The 1941-46 period is not included in the calculations for the highest level of per capita disposable income achieved previous to the given year, since the apparent real income level during this period was badly overstated because of shortages of goods and the existence of price controls.

[a] First three quarters.

Source: Y/NP and Y/N data, Juster, Table A-35.

always start and stop at the same date. Thus, the highest level of income prior to period 5 is $775 per capita, while period 4 showed a higher average income level—$782 per capita. Period 5 begins on October 1, 1950, while period 4 ends on November 15, 1950; thus, the high income level during October and November, 1950, is not part of the highest level of income previous to period 5. Several other periods show similar results for the real income computation, though none does for the per capita money income data.

[a] Taken as the average for the first two quarters of calendar 1947, the period just prior to the P-2 spending period. This period is used rather than the preceding four quarters because the latter include the last part of 1946, where the real income level is badly overstated due to disequilibrium on the supply side of the market. Prices had risen sufficiently during the first part of 1947 to make the real income figures for that period reasonably accurate (cf. Robert Ferber, *A Study of Aggregate Consumption Functions*, National Bureau of Economic Research, Technical Paper 8, 1953).

Source: Juster, Table A-36; time periods as shown in Table A-24.

TABLE A-10

Income Distribution of Households, CU Sample

CU TIME PERIODS[a]	MONEY INCOME BEFORE TAXES								Don't Know or No Answer	Median Income
	0–$1,999	$2,000–2,999	$3,000–3,999	$4,000–4,999	$5,000–7,499	$7,500–9,999	$10,000–24,999	$25,000 and over		(dollars)
	(number)									
P-1	130	437	615	432	469	132	161	17	107	4,034
P-2	208	738	1,129	928	1,037	364	333	38	225	4,336.7
P-4	116	373	907	1,001	1,348	494	497	60	204	5,002
P-6	66	167	636	880	1,709	676	624	96	146	5,992
P-7	57	140	533	858	1,793	749	653	97	120	6,188
P-8	36	119	363	687	1,700	947	889	142	117	6,818
P-9	38	103	293	638	1,676	905	958	130	259	6,937
	(per cent)									
P-1	5	18	25	17	19	5	6	1	4	
P-2	4	15	23	19	21	7	7	1	4	
P-4	2	8	18	20	27	10	10	1	4	
P-6	1	3	13	18	34	14	12	2	3	
P-7	1	3	11	17	36	15	13	2	2	
P-8	1	2	7	14	34	19	18	3	2	
P-9	1	2	6	13	34	18	19	3	5	

In this and the following tables, details may not add to totals because of rounding.

[a] In Tables A-10–A-14, the omission of a period means that the appropriate data were not requested in that period.

Source: in Tables A-10–A-12, the basic data were obtained from CU questionnaires. The sample was 2,500 in P-1, and 5,000 in the other periods. The dates of the periods are given in Table A-3.

TABLE A-11

Geographical Distribution of Households, CU Sample
(*per cent*)

CU TIME PERIODS	CU REGION[a]					
	1	2	3	4	5	6
P-2	36	10	31	7	18	b
P-3	34	10	32	6	18	1
P-4	38	10	32	7	13	1
P-6	32	11	30	8	17	2
P-7	31	12	29	7	18	1
P-8	33	11	30	8	16	2

[a] The CU regions correspond to census regions, as follows: 1, New England and Middle Atlantic; 2, South Atlantic and East South Central; 3, East North Central and West North Central; 4, West South Central and Mountain; 5, Pacific; 6, Outside Continental U.S.
[b] Less than 0.5 per cent.

TABLE A-12

Distribution of Households by Size of the Community, CU Sample, 1946-1955
(*per cent*)

CU TIME PERIODS	PERCENTAGE OF TOTAL IN CU SAMPLE LIVING IN COMMUNITIES WITH POPULATION OF				
	Over 1 million	100,000 to 1 million	25,000 to 100,000	2,500 to 25,000	Less than 2,500
P-1	27	24	16	21	12
P-2	26	24	17	22	11
P-4	27	28	15	21	10
P-8	18	29	18	22	12a
P-9	21	29	18	19	12a

[a] Farm, 5 per cent; nonfarm, 7 per cent.

TABLE A-13

Income Distribution of Households, CU Sample 1946-1955
(*cumulative percentages*)

CU TIME PERIODS[a]	INCOME BEFORE TAXES GREATER THAN[a]						
	$2,000	$3,000	$4,000	$5,000	$7,500	$10,000	$25,000
P-1	95	76	51	33	13	7	1
P-2	96	80	57	37	15	8	1
P-4	98	90	71	50	22	12	1
P-6	99	95	82	64	29	15	2
P-7	99	96	85	67	31	15	2
P-8	99	97	90	75	41	21	3
P-9	99	97	91	77	42	23	3

[a] The percentage for greater than zero is 100, and for infinity it is zero.
Source: from Table A-10.

TABLE A-14

Income Distribution of United States Population, 1948-1954
(*cumulative percentages*)

	INCOME BEFORE TAXES GREATER THAN[a]						
YEAR	*$1,000*	*$2,000*	*$3,000*	*$4,000*	*$5,000*	*$7,500*	*$10,000*
1948	88	70	47	27	15	5	3
1949	86	67	46	27	16	5	3
1950	87	70	51	32	20	6	3
1951	87	72	54	36	21	7	3
1952	89	75	59	41	26	9	4
1953	90	77	63	47	31	10	n.a.
1954	90	77	63	46	32	11	n.a.

[a] The percentage for greater than zero is 100, and for infinity it is zero.
Source: "Survey of Consumer Finances," *Federal Reserve Bulletin*, September 1952, Table 1; July 1954, Table 2; and May 1955, Supplementary Table 2.

TABLE A-15

Cumulative Purchases of Major Consumer Durable Goods by Incomes
of Purchasers, 1952-1954

	PERCENTAGE OF TOTAL PURCHASES BY SPENDING UNITS WITH INCOME BEFORE TAXES GREATER THAN[a]					
COMMODITY	*$1,000*	*$2,000*	*$3,000*	*$4,000*	*$5,000*	*$7,500*
Automobiles:						
1952	98	91	78	55	36	14
1953	97	90	77	61	44	18
1954	98	89	77	59	44	15
Furniture and major household furnishings:						
1952	96	87	72	53	35	12
1953	95	86	75	59	39	14
1954	94	84	73	56	41	14
Television sets:						
1952	98	94	78	58	36	12
1953	99	94	85	64	43	16
1954	98	91	78	57	31	13
New automobiles:						
1952	100	97	93	81	68	33
1953	100	99	91	79	68	36
1954	98	94	88	79	64	29

[a] The percentage for greater than zero is 100, and for infinity it is zero.
Source: "Survey of Consumer Finances," *Federal Reserve Bulletin*, May 1955, Supplementary Table 2.

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C O M M E N T

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Thomas Juster's analysis of the forecasting value of the Consumers Union data on intentions to purchase durable goods is extremely interesting, and his presentation is both cautious and well organized. But his findings are perhaps even more valuable for raising questions that affect other kinds of social and economic analysis than they are for forecasting.

JUSTER'S HYPOTHESES

Juster suggests three "hypotheses about behavior . . . which would imply net forecasting value for data concerned with purchases of consumer durables." He specifies that hypothesis 1, the comparison of changes in intentions with actual changes in purchases of consumer durables, is the only one suited to his particular test. I think the part of hypothesis 3 that is on the same analytical plane with 1 is equally suitable. The confusion arises because he shifts when he comes to 3, and considers the adjustments of the whole economic system to a change in consumer durables outlays. This aspect of 3 cannot, of course, be tested by his study, but 1 and 2 might also have been elaborated similarly. Evidently 3 was selected for special treatment so that consumer durables spending intentions could be used as an indicator of total consumer spending and gross national product and not merely of consumer durables expenditures. But this broader goal is given no further explicit attention in Juster's study.

At the simplest and most limited level one might set up all three of Juster's hypotheses with an initial assumption of no change in income. Hypothesis 1 involves a shift from savings to consumer durables with no change in expenditures on other consumer goods. Hypothesis 2 involves a change in what might be called spending mood, leading to a shift from saving to consumption, with part of the expressed intentions to buy durables diverted to consumer nondurables. Finally, the first part of hypothesis 3 involves an increase in purchases of consumer durables matched by a corresponding decrease in expenditures on nondurables. This is supplemented by the proposition that gross investment would thereby be increased because of the change in the composition of consumer goods output. If one ignores this supplementary aspect of 3, the hypothesis fits just as well as 1 into his empirical study. With appropriate modifications, all three hypotheses can be set up to conform to a situation in which income is in fact changed, partly because of changes in consumer durable goods purchases or intentions. Such a model could distinguish between expected and unexpected income changes in deriving the components of total spending (and saving) as functions of consumer durables buying intentions. Elaborating still further, one could introduce stochastic

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variables into equations for each component of spending (both consumer and investment expenditures) and savings.

ATTITUDE DATA AND FORECASTING

Juster next discusses the use of attitude and associated expectations data in conjunction with intentions data. With a number of qualifications, he takes a position essentially contrary to that of the Survey Research Center, discarding attitude data as inefficient for forecasting and largely redundant when combined with intentions data. He appears to justify this position partly by a limited but clear deductive logic (enlarged in the revision of his paper), partly on the basis of the crude empirical evidence suggested by the superiority of CU over Survey of Consumer Finances predictions even when the latter are modified by attitude data. However, testing the forecasting value of attitude materials was not a principal objective of Juster's study.

Even if we assume that results to date are negative, it is curious that Juster stopped here, for his findings on the superior predictive value of the CU data suggest fresh approaches to the content and uses of attitude surveys—including value attitudes that have no particular time dimension and no orientation to the future per se. I believe that Juster's concept of attitudes is too narrow when he says, "Attitude data may show factors that should be included, in principle, in the purchases plan, but often are not." Two examples of possibilities that Juster appears to ignore are (1) attitudes and expectations in conjunction with conditional intentions data; and (2) the use of attitude data in sample evaluation.

The first possibility implies a prior or simultaneous refinement in the intentions data by the introduction of explicit "if" conditions. Questions on durable goods buying intentions might, for example, include some on income expectations and their firmness, on anticipated shifts in purchase plans in the event of specified shifts in income, prices, commodity models, and so forth, together with questions concerning attitudes and expectations about such changes.[1] While care must be taken in formulating "if" questions and in interpreting the answers, intentions data are implicitly "if" data. Experiments to make the "if" questions and the judgments of answers to them more explicit are worth considering.

While my suggestions are consistent with Juster's basic analytical framework, they point to a somewhat different set of research problems and lead to a different conclusion about the potentialities of attitude and expectations data for forecasting consumer purchases. The kinds of attitude–expectations data I have in mind are in the main fairly conventional. But the methods of using them differ. This approach seems a logical step

[1] The experiences of the Survey Research Center with income expectations data do not, in my judgment, justify discontinuing this line of questioning. They do indicate that the approach should be revised.

following upon the work of Katona and Mueller with consumption surveys, and that of Okun with survey data on assumptions about external variables that underlie reported intentions.

One specific use of expectations data could be to determine whether an event such as a general increase or decrease in income was foreseen. Juster recognizes this in passing, but with no attention to its relevance in connection with degrees of uncertainty and their role in behavior. With a proper project design, income (and some other) expectations data would provide a possibility of testing the effects on consumer behavior of increased sureness or the "spread of sureness" and the effects of the realization of expectations versus surprise. These problems have been noted in connection with business behavior by a number of economists.[2]

The second possibility—the use of attitude data for sample evaluation —would require fresh concepts of the kinds of attitude material to be investigated. Here the emphasis is on attitudes with no clear time dimension or future orientation, as distinct from expectations. Attitude data, some of them with an "ought" character, would be used with information about past spending patterns, shopping practices, household budgeting and economic planning, and other household attributes (e.g. demographic traits and income). Its potential value for improving forecasting would justify only a small part of the expense and technical difficulties involved in gathering such information; the main justification would probably lie in its contribution to the study of human behavior and decision-making processes. Can we measure degrees of planning? When and to what extent do impulsive and residual spending displace weighing of alternatives, and vice versa? What are the time lags between thinking about a major purchase and acting? Do different groups of people have distinctive patterns? How close are the associations between attitudes and behavior in the decision-making process? Can certain attitude and behavior patterns be identified objectively in different sectors of the population? These and other questions could have ultimate, even if incidental, value for the interpretation of intentions data and the improvement of predictions based upon them.

FORECASTING VALUE OF THE CU SAMPLE

Juster's defense of the CU sample for forecasting purchases of consumer durables must stand on four pegs, the first three of which he considers at some length:

1. Better representation of the population that buys consumer durables than a random sample of the same size

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[2] Among them Ruth P. Mack and Robert Eisner in their papers for the 1955 Social Science Research Council conference proceedings, *Expectations, Uncertainty, and Business Behavior*, ed. M. J. Bowman, SSRC, 1958.

2. More accurate prediction of both spending by CU members and associated variables (such as changes in income)

3. Stability in the bias of the sample in representation of the actual population buying durable goods, i.e. stability of bias in representation of actual purchases

4. Stability in the bias of predictions versus actual buying at least as great as in the population as a whole.

Juster finds support for the first two of these points in his empirical material, though he is commendably cautious in his discussion of it. But the most problematic and vital of the pegs are the third and fourth—stability in the sample biases with respect to actual purchases and to discrepancies between predicted and actual purchases.

A likely advantage of the CU sample (point 1) that Juster passes by is that it may represent new households better than the SCF does. The Survey Research Center is fully aware of the problem of forecasting expenditures on household furnishings because the newest families and those about to be formed are missed or seriously underrepresented. Is the SCF less successful in dealing with new households than the self-selected CU sample? Perhaps the 1957 CU questionnaire will enable Juster to answer this question more directly.

Attempts to assess any possible changes in the bias of the CU sample vis-à-vis the total consumer durables buying population (point 3)—not mentioned by Juster in discussing his plans for future research—might include an analysis of turnover and change in composition in CU membership. How do intentions of new members compare with those of old ones? Such information, together with data on occupation, income, age, household composition, date of marriage, and so forth, could throw light on a number of important questions; and it is good news that the 1957 questionnaire will provide some of the basic demographic information hitherto unavailable.

Unfortunately there are no simple relations between economic or demographic attributes and consumer durable purchases. For example, a change in the income bias of the CU sample would not necessarily imply a change in the bias for representation of actual purchases; it might even be a necessary condition of stability in the purchases bias. This could be the case if CU members are younger, if younger people make up most of the durable goods buying population, and if incomes of younger people have risen more than those of the rest of the population.[3] Relations among

[3] Because of the time periods covered in the CU data in Juster's Table 3, the increase in upward income bias of the CU sample between 1948 and 1951 is exaggerated. As he notes in his Appendix Table A-3, the "1951" CU data are in fact for the period August 15, 1951 to August 14, 1952 and his "1948" CU data are for July 1, 1947 to June 30, 1948. A rough test of the hypothesis of stability in income bias over this period is only possible by comparing the change in the CU membership income distribution with the 1947 to 1951 and the 1948 to 1952 changes in the SCF sample. This was done, plotting

household size and composition, income, and consumer goods purchases, and changes in these relations, introduce even more awkward problems. Nevertheless, if we are to have better insight into possible changes in the actual purchases bias of the CU sample it is necessary to have a better understanding of these relationships.

In evaluating the hypothesis of a stable bias, the big question is what would happen in a severe downturn. It cannot be denied that the scientific validity of evaluations of forecasting data inevitably suffers from lack of sufficiently severe economic experience since the beginning of forecasting efforts. Until, as scientists, we are granted the dubious good fortune of a dismal dish of economic experience, we can only speculate on its taste and appearance to the would-be forecaster. Like Shackle, I see ghosts at the table.

Juster raised the question about economic climate in connection with the sampling problem in use of CU data for forecasts: Has the relatively continuous prosperity since World War II brought accidentally good predictions from CU versus other data? But he goes no further. It is plausible to speculate that a downturn of any real severity would increase planning and care in spending for the large items, and that a larger proportion of prospective purchasers would then take the precaution of joining CU.[4] A less likely result could be a selective dropping out of old members who definitely intended no important purchases and were saving pennies. In any case, the CU sample vis-à-vis the durable goods buying population as a whole could be seriously distorted. This and other possible hypotheses point once again to the importance of regularly analyzing both buying intentions and demographic and income attributes of the CU sample by membership categories—new and old members, and if possible

[4] It should be noted that a cyclical pattern of this sort might be associated with a rising income bias of the CU sample in a period of prosperity and a decreasing income bias of the sample in a major downturn. However, other aspects of selectivity in the CU sample would probably be more important in their effects on cyclical income bias.

the curves on log-probability paper and interpolating for the quartile and median incomes. The resulting income ratios were estimated to be as follows:

	SCF		CU	SCF	CU
	1951	*1952*	*8/15/51–8/14/52*	*1953*	*10/1/53–9/30/54*
	1947	*1948*	*7/1/47–6/30/38*	*1951*	*8/15/51–8/14/52*
Bottom quartile	1.27	1.14	1.34	1.17	1.14
Median	1.24	1.20	1.33	1.19	1.15
Top quartile	1.19	1.22	1.31	1.18	1.14

Some increase in the upward income bias of the CU sample between 1947 and 1952 is indicated. Why Juster used the 1953 SCF figures for comparison with the CU data for the period 10/1/53–9/30/54 is not clear, but the difference in dates is certainly sufficient to explain any small reversal of the apparent bias that might be suggested by the figures shown here; in fact, the upward bias in the CU sample could even have continued to increase from 1951 to 1954.

drop-outs. Changes in any or all of these relationships among subgroups or between the CU membership and the population as a whole, or both, would signal warnings about the interpretation of CU data for predictions in a changing general economic climate.

While the likelihood of a highly variable bias in the prediction sample (nonrealization of point 4, above), as distinct from that in the actual purchase sample bias, appears to me to be low, the possibility remains. Two questions are pertinent:

1. How accurate are predictions by individual CU members, and what clues do they give us about what might be expected in a changing economic climate?

2. Is there a distinctive cyclical pattern in the prediction accuracy of CU members, reflecting the nature of their household economic planning?

The second question merges in part with the question of sample bias in actual purchases. For example, there is obviously a motivation to join CU when major durable goods outlays are contemplated. If CU membership is selective for those with firmer plans, and if, when economic conditions worsen, the ratio of total actual outlays to firmly planned outlays changes versus its ratio to vaguer intentions, then there would be a cyclical factor in CU sample prediction bias. This factor would be over and above changes in the bias as an actual-purchase sample. There can be no adequate test of this distinctly plausible hypothesis in advance, but some hints may be found by considering the first question.

Instead of attempting a systematic estimate of what can be learned from analysis of prediction accuracy of individuals within the CU sample, and of comparable panel studies by the Survey Research Center, I shall again rely on an illustration. What can such material contribute to the problem raised in discussing question 2? Maximum insights would be obtained (depending on the scope of the information) by including expectations–attitude materials, and data on conditional intentions and "firmness of intentions or plans." Actual behavior, in the face of pleasant and unpleasant surprise, observed subsequently in the same spending units, would then be analyzed. Such a study could serve as a partial proxy—inadequate but extremely illuminating—for aggregative observations in a changing general economic climate. This would of course be an ambitious program, but it would be amply justified for nonforecasting as well as forecasting use.

Juster mentions study of individual prediction accuracy as a possibility in analyzing future CU questionnaires. Perhaps some method can be derived for identifying individual respondents by number in subsequent CU questionnaires to facilitate a panel study approach. For such a purpose the CU sample has unusual advantages because of membership accruals and drop-outs, which almost automatically solve many of the

usual sampling problems in survey panel technique, at far less cost, and permit introduction of limited revolving features. Also comparison of buying intentions and their realization rates for relatively new versus old members might increase understanding of the meaning of the intentions data. For example, are plans of new members firmer because of the relative prosperity of recent years, and is this a major factor in the comparative success of the CU forecasts to date? If so, would this advantage persist in the future, or would it, with a significant worsening of the general economic situation, introduce a distortion? Full-scale analysis to include expectations, and so forth, would be a special study, requiring interviews with a subsample of the CU membership.

WARNING SIGNALS IN ANTICIPATIONS DATA

At this point, perhaps a brief digression from the problem of forecasting consumer expenditures to a more general question of anticipations data may be justified. Several authors have mentioned the effects of the no-change responses on forecasting from intentions data. Hartle set up a three-part classification of reasons for such a reply: (1) it may be the easiest way of getting rid of the interviewer or the questionnaire; (2) people may really mean it; and (3) people may be uncertain about the future and think that there is nothing better to say. The first category should be fairly stable, lending a conservative bias to predictions. But the relative weights of the other two could be highly significant for forecasting purposes. A sizeable increase in the proportion reflecting uncertainty should be at least a warning signal to the forecaster concerning the viability of the situation. It is worth a try to develop techniques for sorting out these types of no-change responses, even by interviewing a sample if necessary.

Often the analysis of no-change responses would fail to reveal the nature or extent of the "spread of uncertainty," but other techniques for "building in" measures of this phenomenon are possible and should be explored. Recent experience with the McGraw–Hill survey, as reported by Keezer, showing that more follow-ups were required, and that the firms failing to reply as usual to the questionnaires explained that their predictions this time would be less reliable than formerly, should surely be taken into account in interpretation of the McGraw–Hill forecasts of capital expenditures. It would be interesting to know whether any significant differences between the forecasts for these firms and others (both analyzed relative to their previous behavior) shows up in the data. Also, this recent experience suggests the introduction of questions to evaluate the degree of firmness of plans or intentions this year versus last year.

SAMPLE SELECTION AND LEAD SERIES

Whether or not the biases of the CU sample remain stable, Juster's findings are fertile with suggestions for improving and supplementing

research on the SCF and related studies. As for the forecasting use of these studies, their contribution is not only toward improving predictions based on responses from any given sample of the population but also toward sample selection. The CU sample, as a self-selected group, has performed remarkably well. Can this performance be matched, or even bettered, by development of criteria for selective sampling, or the selective weighting of returns from a random sample?

I should like to conclude with a few suggestions for research other than or complementary to work with CU data. As a first step in determining criteria of sample selections and weighting, some of the questions to be proposed here should be asked of panels so that attributes of the household can be directly related to its prediction accuracy record. Other questions might aim at trying to develop a lead series sample in consumer durable goods buying, by identifying the kinds of households that change actual purchases or purchase plans, or both, ahead of the rest of the population.

Among attributes that might be investigated on both counts are the obvious demographic ones—income, occupation, and education. Also, as a check on both the accuracy selection and lead series elements, a distinction, as in the 1957 CU questionnaire, might be made between plans or intentions for the immediate future, for the second half of the year, and possibly intentions with no definite time specifications.

On the prediction accuracy side, there is a strong case for looking into shopping habits and household account keeping—if any—along with attitudes toward planning. Incidentally, it might be interesting to know how many and who of a random sample have ever heard of Consumers Union.

In attempts to identify a lead series subsample, rough indexes of social mobility and social participation might prove illuminating. But a word of warning is needed. Statistical evidence of diffusion requires a sophisticated interpretation that must take into account distinctive economic and psychosocial constraints and precipitating conditions. Also, a shift in the composition of durable goods purchases can alter the apparent diffusion pattern and the identity of the lead households, as Juster's figures on home freezers versus television clearly attest.[5] Moreover, either stability in the statistical diffusion rate or some kind of predictability of it is necessary for the effective use of a lead series. Here, again, there is wide scope for research that would incorporate but go far beyond the type of analysis reported in this volume by Katona, and its contributions to basic problems in human behavioral sciences might far exceed those to economic forecasting, as such.

[5] I am highly skeptical of his suggestion that the CU sample may be a lead sample for actual purchases. Examination of characteristics of a consumer lead sample might incidentally contribute insights into changes in the CU sample vis-à-vis the durable goods buying population as a whole.