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THE CONTRIBUTION OF CONSUMER ANTICIPATIONS IN FORECASTING CONSUMER DEMAND

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BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

A. Summary

BECAUSE THE PLANS, attitudes, and financial capacities of units of economic decision are helpful in the preparation of forecasts, attempts have been made to obtain such information in the Surveys of Consumer Finances sponsored by the Board of Governors of the Federal Reserve System and conducted by the Survey Research Center of the University of Michigan.¹ Although these data are experimental and incomplete, they have been found to be useful. Predictions for time periods up to a year of postwar consumer actions, mainly purchases of durable goods and houses, have generally been correct as to overall direction although erring in some years in details. Estimates based largely on Survey data passed the test of correctly indicating a sustained level of consumer demand for durable goods and housing when aggregate personal income declined in 1949 and of indicating a decline in demand in 1951 when aggregate income rose. Although these estimates have generally been correct as to direction, the indications of amount of change in demand have been very rough. Substantial improvement in this regard may be difficult to attain but would be fostered by larger or more efficiently designed samples, better interviewing techniques, and more efficient estimating procedures.

Experience to date indicates that consumer behavior is neither mechanically determined nor completely erratic. The level of consumer demand as indicated by buying plans and intentions has shown a considerable measure of independence of income, and these plans have been a fairly reliable guide to behavior despite changes in economic circumstances. The interpretation of consumer inten-

¹ Articles presenting and analyzing the results of each survey are published in the *Federal Reserve Bulletin*. Surveys of buying plans for the year have been conducted at the beginning of each year from 1946 to 1951 with samples ranging in size between 2,900 and 3,600 cases. Information is also available on buying plans from surveys conducted in July of 1947, 1948, and 1949 with samples of roughly half this size.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

tions can be difficult at times, however. Consumers' ability and inclination to plan purchases can vary over time as greater or lesser certainty exists regarding availability of goods and credit, prospective incomes, etc. These factors widen the margin of error in interpreting intentions data. The experienced user can make allowance for such factors. This characteristic indicates, however, that intentions data cannot be handled in a mechanical fashion and that judgment is necessary to interpret them.

B. Introduction

Operating in a period of rapid economic, social, and political change may increase the responsibility, but it does not simplify the job of the economic forecaster. Much of his tool kit becomes obsolete rapidly. The environment that provided the basis for his predictive relationships may be quite different from the one to which his predictions will apply. As compared with recent prewar decades, current levels of liquid assets, of incomes and tax rates, home ownership, experience with inflation, and preparation for the eventuality of war contribute to a substantial change in the structure and functioning of our economy. After only a few years data and their relationships and judgments based on past behavior of consumer units may be of little value in forecasting probable developments.

In the postwar period the limited reliance that can be placed on projections of variables according to prewar economic relationships and the considerable uncertainty attached to nonsystematic prediction have stimulated attempts to forecast by other methods. This paper is concerned with an appraisal of one aspect of these new approaches. This newer method seeks to test the predictive value of the advance planning of many important economic acts of governments, businesses, and households. Governments usually prepare budgets for at least a year in advance, as do many businesses. Households also plan, but almost never in as much detail or for as long a period, although certain goals such as the children's college education, a trip to Europe, or the purchase of a house or a new car are frequently planned and budgeted for long in advance of the actual expenditure.

By going to the unit of decision for information about plans for future actions—as well as much supplementary information, in the case of households, on financial capacity, family characteristics, and attitudes—we have advanced beyond a total reliance on past pat-

CONTRIBUTION OF CONSUMER ANTICIPATIONS

terns of action to guide our forecasts. It is true that it is still necessary to interpret buying plans and related data on the basis of past experience with them. But an essential element has been introduced—that of future variability guided by the unit that will take action.

C. The Place of Consumer Anticipations

The expenditures made by individuals range from casual purchases costing a few cents, such as a stick of gum or a Coke, to items of substantial cost, such as a new car or a house, that frequently involve long periods of planning. Where the period of planning is extremely short and purchases are frequent, as with gum or newspapers, it is probable that prediction of such purchases can best be accomplished by aggregate analysis in terms of income, season, etc. Where the period of planning or of consideration of the purchase is relatively long, at least several months, surveys of consumer anticipations become feasible. Also, if a particular item is bought at irregular intervals, as with large durable goods or houses, the value of information on consumer buying plans rises considerably. It is with this kind of prediction that other methods have been least successful. Any improvement of our predictive ability in this area of consumer behavior would be of special significance because of the substantial influence of these items upon economic fluctuations.

In a rapidly changing situation, as in the period immediately following the outbreak of fighting in Korea, the personal survey approach is too slow to keep up with events. At such times other sources, e.g. department store sales data, are better suited to ascertain quickly what and how much consumers are buying, but these data do not tell us how widespread are fears of shortages or how long panic buying may continue. Surveys taken at such times, however, may be very helpful in indicating answers to these latter questions. In the Survey of Consumer Finances taken in early 1951, at a time when consumer durable goods buying was at peak levels following Chinese intervention in the Korean fighting, consumer plans and attitudes indicated that the wave of current buying was about to subside, which it subsequently did.

The lag between the start of field interviewing and the time when information is available to forecasters can possibly be shortened to a month with programming and resources devoted to that objective. This would imply that the minimum period for which data on buy-

CONTRIBUTION OF CONSUMER ANTICIPATIONS

ing plans can be obtained in order to be useful when they become available is greater than one month, or is roughly two months or more. It would also follow from this that only those items whose purchase is planned for at least two months in advance by a substantial proportion of their buyers are eligible for inclusion in surveys of buying intentions. Knowledge as to which items fall in this category is incomplete. Further research concerning the extent of planning of various types of purchases would be highly desirable.

D. Considerations Concerning the Usefulness of Anticipations Data

It is not enough to know that some economic units plan certain expenditures in advance. It is necessary to have some knowledge of the proportion of economic units of various types that anticipate their expenditures with varying degrees of certainty by various periods for each class of item. It is further necessary to know the contingencies surrounding these anticipations and the reactions if these conditions are not met but certain other circumstances develop.

It goes without saying that this array of ideal information is not available at present and probably can never be obtained because of continuous, although possibly not crucial, changes in these variables. But this should not automatically exclude this approach. Few tools are perfect. The important question is really, How much does the information that is available contribute to our ability to forecast?

1. PLANNING AND FORECASTING PERIOD

From one point of view any information in the area of consumer buying plans, of which we are so ignorant, is a contribution. I believe that information on buying anticipations that falls far short of the ideal may yet be of considerable value. All is not lost if we do not know with great precision the proportions of consumers that plan the purchase of a car one month, two months, three months, etc. prior to its purchase, so long as the proportions do not change substantially from one period to the next. The odds are, and this tends to be supported by Survey data, that the proportions do not change without good cause, which can be taken into account in analysis. An example would be the situation in early 1951, when increased uncertainty among consumers concerning the availability and prospective prices of durable goods tended to lessen the frequency and the definiteness of plans to purchase such goods. Rough

CONTRIBUTION OF CONSUMER ANTICIPATIONS

allowance was made for these factors in utilizing the intentions data. The important conclusion was drawn, at a time when fear of inflation was prevalent, that consumer demand was down substantially and was probably no greater than the limited supply of goods available. It is thus possible, from a comparison of the relative frequencies of buying intentions in successive periods, to estimate the direction of change in consumer demand and to measure in a rough way the magnitude of the change.

The period of time to be covered by the forecast is critical, of course. If the time span is so long that only a small percentage of the buyers have plans concerning certain expenditures *and* the timing of them, the margin of error in the anticipations approach is so great as to make it of minor value.

If planning periods vary in length, the period for which forecasts can be made on the basis of anticipations data may be longer for some items than for others. Survey experience tends to confirm this. In general the more expensive the item, the longer the period of planning. For example, house purchases appear to be planned for longer periods than new car purchases, which in turn are better planned than used car purchases. Among the other factors that appear to affect the length of the planning period are the acuteness of the need for the item and the supply situation. Backlog demand appears to have been reflected in considerably longer planning periods for specific items while the backlog lasted. The shorter the forecast period, the more items that can be forecast with a given degree of reliability. Hence the anticipations approach would appear to be of greatest reliability in connection with short-run forecasting.

2. INDIVIDUAL AND GROUP DEVIATIONS FROM PLANS

The longer the forecast period, the greater is the probability that purely random occurrences will cause individuals to change their plans—some deciding to buy and others deciding not to buy. Events resulting in such changes might be sickness or death in the family or possibly the birth or newly anticipated birth of a child, the occurrence of an anticipated but unscheduled promotion, the breakdown of a presently owned good, etc. General economic trends would not, of course, come under the heading of random factors.

The data from reinterview studies, which are discussed by Lansing and Withey, are valuable in indicating the factors that tend to change people's buying plans. These data indicate that only about one-half of the individuals that planned to buy a new car did so in

CONTRIBUTION OF CONSUMER ANTICIPATIONS

the time period specified. The proportion was even lower for other specific durable goods. It is possible that much of the shift in plans of specific individuals occurs as the result of random factors that are largely offsetting and do not alter significantly the level of buying plans for the groups they represent. In other words, the buying plans of individuals may be considered as representative of the socio-economic groups of which they are members. To the extent that these groups have similar standards of living and are subject to similar social pressures, it is reasonable to believe that the operation of random factors leaves the level of buying plans (and of purchases) for each group substantially unchanged, although there is turnover of the particular individuals that plan to buy. This point is important because it bears on the vital question of how well buying plans represent future consumer actions.

A test of this particular hypothesis can be devised. The population can be divided into several homogeneous subgroups on the basis of income and of some relatively stable social or economic characteristics. The plans to buy of each subgroup can be measured and then checked against the record of their purchases. If purchases match plans closely for each subgroup in some systematic fashion, it would appear that the two are closely related. If the two are not related, one would expect a random and unsystematic deviation of purchases from plans. The particular illustration, plans to buy and purchases of new cars in 1949, is chosen because this year was relatively free of supply complications and because the anticipatory period for this item is probably closer to the forecast period than for any other commodity covered by Survey data.²

The results of the comparison are shown in table 1. Their pattern indicates a close relationship between plan and performance. The frequency of buying plans of each occupational, educational, and age group at each broad income level is very similar to its frequency of purchase. No difference is larger than those that would be expected 95 per cent of the time from two random samples from the

² The new-car buying plans of nonfarm spending units classified in three groups according to 1948 income, further refined into occupational, age, and educational subgroups, were obtained from the Survey of Consumer Finances conducted in early 1949. Data on the purchases of cars in 1949 by these same groupings were obtained from the Survey conducted in early 1950. Information obtained in 1950 on 1948 income is subject to considerable memory error. Shifts also take place in the composition of units and in their classification according to age and occupation. These deficiencies limit the precision of the comparison, but it is not believed that they alter the basic distributions seriously.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

TABLE 1
Comparison of Frequencies of Plans and Purchases of New Cars for Specified Groups, 1949

Characteristic of Spending Unit	Proportion of Nonfarm 1948 Income Group with Specified Characteristic					
	Under \$2,000		\$2,000 to \$4,999		\$5,000 and over	
	Planned ^a	Purchased ^b	Planned ^a	Purchased ^b	Planned ^a	Purchased ^b
By occupation of head of unit						
Professional and semiprofessional	c	c	17	14	28	26
Managerial and self-employed	c	c	12	17	23	27
Clerical and sales	2	3	8	8	17	21
Skilled and semiskilled	1	5	5	5	23	18
Unskilled	3	2	3	3	c	c
Farm operator ^d	4	4	16	18	25	c
Retired	1	2	c	c	c	c
By age of head of unit						
18 to 24	2	5	9	7	c	c
25 to 34	5	4	8	8	23	29
35 to 44	e	4	5	8	22	20
45 to 54	2	1	7	5	24	23
55 to 64	1	1	6	7	26	3
65 and over	e	2	8	7	c	c
By education of head of unit						
Grammar school	1	1	4	5	20	16
High school	2	4	7	8	21	24
College	4	8	15	11	26	27

^a Proportion of spending units with specified money income in 1948 and other characteristic that reported they would or would probably buy a new car in 1949. Includes a small group that had already purchased new cars in 1949 prior to being interviewed in the January-March 1949 survey period.

^b Proportion of spending units with specified money income in 1948 and other characteristic that reported purchase of a new car in 1949. Information obtained in interviews taken in January-March 1950. The reporting in 1950 of income information for 1948 is subject to considerable memory error.

^c Too few cases (less than sixty-five) to show separately.

^d This is the only line in which data for farm operators are used.

^e No cases reported or less than 0.5 per cent.

Source: Survey of Consumer Finances.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

same universe. In most cases the sampling error of the comparison is about 7 percentage points at the 95 per cent level of probability. There apparently were substantial differences in the frequency with which occupational and educational groups at the same income level planned to buy new cars in 1949, and these differences were apparent in their purchases. There apparently were no differences in either of these respects between age groups at given income levels, although each age group, as well as occupational and educational groups, showed the influence of income by planning and buying more frequently at each higher level of income.

The correlation between the frequency of plans to buy a new car and the frequency of such purchases by each subgroup was calculated under the simplifying assumptions that each value represented one case and that each subgroup was of equal importance.³ The correlation between plans and actions was found to be 0.95 or higher for each of the three sets of data. This is a high correlation, which tends to support the hypothesis of a strong relationship between plans and purchases. It is sometimes argued that plans contribute nothing that is not explained by income, age, and occupation. Since age and occupation among the population change slowly, this is basically a consumption function approach, in which plans and purchases are determined by income. Changes in plans and in purchases of durable goods that were counter to income change in 1949 and 1951 indicate that consumer plans contribute uniquely to ability to forecast.

The correspondence between aggregate plans to buy and aggregate purchases of new cars was very close in 1949, as it was in the other postwar time spans covered by Surveys in which there were no supply problems or war scares (July 1949–June 1950 and the first half of 1950). The correspondence of the aggregates in 1949 does not explain the high correlation for the subgroups. If the agreement of the aggregates was fortuitous, there should have been a random distribution of plans and purchases among the subgroups. This was not found; instead there was a close correlation for each subgroup. It is important also to note that this significantly high correlation was established over a period of a year, and in a year in which there was a minor business recession and a recovery. These circumstances constituted a fairly rigorous test of the reliability of buying plans, a test not of individual firmness—which is a somewhat different mat-

³ There were at least sixty-five cases in each cell for which a value was calculated.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

ter—but of group stability. The record made in this instance suggests that buying plans make a substantial contribution to the forecasting of consumer behavior.

In appraising the buying plans of individuals it is also important to remember that all consumers have a host of goods or services that they wish to acquire and enjoy. Nearly all, however, must make a choice because of limited resources. With some individuals there may be little question as to which purchase comes first. With others a number of prospective purchases may compete for first choice. The particular thing that happens to be bought may depend in large part on chance—on an especially persuasive salesman, a sale on one item in the list, etc. This does not mean that only the buying plans of individuals in the first group have meaning. The plans of the second group are indicative of their disposition to buy, which is the important factor for general economic forecasting. Again, it could be misleading to consider only whether a particular individual carried out his intention to buy a specific commodity. In the early 1949 Survey some consumers said that they had not carried out an intended specific durable goods purchase during 1948. A little more than half of this group was found, however, to have purchased other durable goods. The choice or choices that an individual mentions are representative of the choices of his group. Where only random factors are concerned, these are substantially the purchases that will be made, regardless of which individuals make which purchases.

It is undoubtedly true that the greater the deviation of individual performance from individual plan, the less we can be sure that buying plans will be carried out. Considerable variations of performance from individual plans may be expected, however, due to random factors, with little effect on the levels of total purchases and of purchases of particular commodities.

3. CONTINGENCIES AND PLANS

Our information is also far from complete concerning the contingent expectations consumers have in mind when they make their plans and what the effect will be if these conditions are not met and others must be faced. These contingencies may not, of course, always be clear in the consumer's own mind. We do have some sketchy information along these lines, which is limited both by incompleteness and by the fact that the data refer to a postwar period in which there has been no serious economic recession. With these limitations in mind the following impressions may still be worth noting.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

The evidence for recent years indicates that, in general, individuals are not very sensitive to small prospective changes in prices. In several surveys it has been found that as between consumers who expected prices to rise and those who expected prices to fall, there was virtually no difference in the frequency of intentions to make major durable goods purchases or in the timing of these purchases during the year. This lack of sensitivity in recent years may be due to the fact that most people appear to have expected only small changes in prices. Expectation of a large price change might have a substantial effect. On the other hand, there has been a strong reaction to threats of shortages, as in the waves of panic buying in middle and late 1950 and early 1951, when consumers tried to buy those goods, e.g. automobiles and nylon stockings, which had been in shortest supply during the recent war.

Rapid price changes have at times been taken into account, but in ways that differ from those of businessmen or stock market investors. These different consumer reactions can be important because of their stabilizing effect on the economy and because they are so contrary to what many economists would postulate. In early 1951, for example, a large proportion of the population said that it was not a good time to buy large durables because prices were too high, even though almost all of that proportion expected prices to go even higher. There was little pleading of inability to pay current prices or mention that at some distant date prices might fall. Instead the chief impression was of an emotional reaction to prices which were just too high according to some concept of a "fair" or familiar price. Such a reaction is likely to wear off in time as people become adjusted to the new, higher level of prices. While this mood prevails, however, it is a strong deterrent to consumer purchases, and it was one of the important reasons for the downturn in durable goods buying in the first part of 1951, which tended to relieve inflationary pressures.⁴

The public also appears to be less sensitive to inflation than is commonly believed. The range of choice for many of those concerned is limited by lack of knowledge, and by fear and uncertainty. For instance, it was found by the Survey of Consumer Finances

⁴ Data obtained by the 1953 Survey of Consumer Finances indicate that during 1952 a considerable body of consumers became reconciled to the higher post-Korean level of prices, which had changed little during the year. More than one-third of consumers still felt in early 1953 that times were bad for major durable goods purchases, primarily because prices were too high. Additional details may be found in the June 1953 *Federal Reserve Bulletin*.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

early in 1951 that despite the post-Korean inflation, the wide publicity given to talk of further inflation, and the expectation of rising prices by two-thirds of all consumers, 7 of every 10 consumers with incomes of \$3,000 or more believed that it was wiser to place current savings in assets of fixed dollar value—United States savings bonds and bank deposits—than in assets of fluctuating value—real estate and common stock. The chief reasons for holding savings bonds were safety and high yield, and for bank accounts were safety and convenience. Preference for fluctuating value assets was explained in the majority of cases by the high rate of return on these investments. Only a minority preferring such assets expressed a need to hedge against inflation. The chief reasons given against investing in real estate and common stock were unfamiliarity with these types of assets and their riskiness. Only time can tell which of these investments would have been wisest; the data are presented merely to indicate that the general public appears to be far less sensitive to inflation than is generally thought.

Further, while income changes appear to affect durable goods buying, such purchases appear at times to be fairly insensitive to income declines, as in 1949. It may be that the postwar period is abnormal in respect to a huge backlog of durable goods demand stemming from the curtailment of production during the war, and a rapid increase in real income compared with prewar, plus very high marriage and birth rates during the war and postwar periods. If these factors continue to be of importance and are supplemented by substantial liquid and secondary financial reserves, and by a frequent allowance in plans for foreseen income declines, the carrying out of consumer plans to buy durables may continue to be fairly insensitive to small income declines.

To sum up this discussion of the conditions that consumers impose upon the completion of their buying plans, it appears on the basis of incomplete and possibly atypical data that plans and their execution may not be greatly affected by small actual or prospective changes in prices and incomes. Further, the plans and attitudes of consumers reflect their reactions to economic events, reactions which may be quite different from those of business purchasing agents or economic analysts. Such reactions and the buying decisions that stem from them are considerably more difficult to forecast without anticipatory and attitudinal information.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

E. The Problem of Appraisal

It is obvious that the plans of any one group in the economic world cannot be considered in isolation. Each of the elements—governments, businesses, households, the rest of the world—can initiate a trend. Each will be affected by the actions of the other groups. This lack of complete independence for groups raises serious difficulties in attempting to appraise the contribution to forecasting of the plans of any one group. The anticipations, attitudes, and capacities of each must be analyzed and interpreted and must be integrated with the information available for other groups. The true test of the contribution to forecasting of any source of information is thus an empirical one—the extent to which forecasts that utilize such data turn out to be more accurate than those that do not. Although it would be impossible for practical reasons, such a test would probably require a large-scale experiment in which matched groups of forecasters were equal in every respect except for the availability to only one group of the anticipatory data of the Survey of Consumer Finances. Nothing like this has been attempted either for the anticipatory data of the Survey or for any other forecasting technique, so far as I know. Some experiment continuing over a period of years would appear to be desirable in order to distinguish the contributions of individual forecasters, sources of information, and methods of forecasting. Without such an experiment these factors would be hopelessly confounded.

It is still possible, however, to attempt to measure the accuracy of the more important predictions or judgments that have been based largely on consumer finances data. This too is not simple, because the experimental nature of the data and the official status of the Federal Reserve System have discouraged the preparation or publication of forecasts based upon the data. Because of these factors, the forecasts that have been based largely on Survey data have tended to be vague and to lack precision, and in a number of cases they have been restricted to unpublished memoranda. A further complication arises from the fact that as the number of people and of interests involved in drawing a conclusion tends to increase, so do the vagueness of and the qualifications accompanying the conclusion. Reliance will be placed, therefore, not only on published statements concerning the significance of Survey findings, but also on earlier unpublished analyses prepared at the Federal Reserve offices. The

CONTRIBUTION OF CONSUMER ANTICIPATIONS

forecasts will be tested by evidence concerning actual purchases obtained in later Surveys and from other sources.

A few words may be in order describing how the Survey data on anticipations have been incorporated into the economic judgments listed in the following pages. The procedure is not mechanical and is, therefore, difficult to describe. In general terms the most basic indication of consumer demand is considered to be the data on buying plans. These furnish information of any apparent changes in the level of consumer demand and provide a rough measure of the magnitude of any apparent change. This first approximation is then considered very carefully for internal Survey consistency. Checks are made upon the degree of certainty of these buying plans, the prices expected to be paid, the financial and other characteristics of the people planning to purchase, financing plans, the expected timing of the purchase, related attitudes such as price and income expectations and whether it is a good or bad time to make purchases, as well as other Survey data. Another type of check tries to compare the environment at the time of the most recent Survey with those of immediately preceding Surveys to ascertain if there has been some change that would affect either the ability or the inclination of consumers to make plans for a period as long as a year. All of the above factors permit some refinement of the first approximation provided by the buying plans themselves. Together they provide a picture of prospective consumer demand at the time of the Survey from the consumer's point of view. These data must then be fitted into the framework of the entire economy to determine prospective income and price levels, availability of goods and financing, etc., and possible reactions upon consumer buying plans.

It is a testimonial to the validity of the buying plans that in most years these data taken by themselves have provided an accurate picture of changes in the level of consumer demand (see table 2). Such changes are of the first order of importance for the forecaster. Additional analysis is necessary to define the magnitude of shifts in demand, and also to determine if the apparent shift in demand may be relied on.

F. The Accuracy of the Forecasts

A detailed listing of the more important predictions or judgments made on the basis of each Survey, with the evidence that bears on their accuracy, is given in the Appendix.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

TABLE 2
Comparison of Prediction of Change in Consumer Demand with Actual Change in Purchases, 1948-1951

	1948		July 1948 to June 1949		1949		July 1949 to June 1950		January-June 1950 ^b		1951	
	Fore-cast	Actual	Fore-cast	Actual	Fore-cast	Actual	Fore-cast	Actual	Fore-cast	Actual	Fore-cast	Actual
Houses												
New	+	+			+	- ^a			+	+	-	+
Existing	-	=							= or -	+	+	-
Automobiles												
New	+	+			+	+		+	+	+	-	-
Existing			= or +	+	+	+	= or +	+				
Furniture and major household appliances, total	+	+	= or -	-	+	+	+	+	+	+	-	=
Television sets												
Furniture												
All other												

Plus (+) indicates an increase over the preceding year; minus (-) a decrease; and equality (=) little change.

^a New house completions and purchases were slightly lower in 1949 than in 1948 according to production and mortgage data, although housing starts were slightly higher in 1949 and were rising throughout the year in recognition of existing demand.

^b In this table the comparison for 1950 has been restricted to the first half of the year to cover the period prior to the outbreak of hostilities in Korea.

Source: Survey of Consumer Finances.

For more detailed comparison see the Appendix. It is difficult to put predictions for certain periods into simple plus and minus categories—for example, when level of demand is falling but is still greater than limited, but rising, supply. (In such cases it has seemed appropriate to indicate a plus in anticipated consumer purchases.) The table has been restricted to the 1948-1951 period both because this has been the most difficult period to forecast and because the predictions for the earlier periods were couched in terms that are especially difficult to handle with simple pluses and minuses.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

The judgments made largely on the basis of consumer anticipations but supplemented by other Survey data and by freely available independent information appear to have correctly indicated the overall direction of consumer demand for major durable goods and for housing in each year from 1946 to 1951. Details of some estimates were in error, but the major conclusions were generally correct as to the direction of the overall level of expenditure. The estimates met the test of correctly predicting a sustained level of consumer demand when aggregate income declined in 1949, and a lowered level of demand when income rose in the first half of 1951. A high degree of sensitivity has also been shown in a number of years to changes in demand for specific commodities, as in 1949 when correct judgments were made about increases in demand for new cars, television sets, and houses and about somewhat less demand than in 1948 for other major durables taken as a group.

Trends in the use of installment credit, in the use of liquid assets, and in nonliquid investment have also been correctly predicted.

The errors that have been made illustrate the problems of using these data.⁵ They have been mainly of three types. The first has been a failure to recognize the extent to which buying plans may reflect factors such as a change in prospective supply or a working off of urgent, and therefore better planned, needs. This type of error occurred chiefly in the early Surveys, before experience was obtained of the phenomenon. An example is the interpretation of the drop from 28.0 per cent in 1946 to 21.1 per cent in 1947 in the proportion of the population planning to buy furniture and major household appliances. This was thought to indicate a tempering of the very strong, even excessive, demand for such goods, although the correct general conclusion was drawn that purchases of such goods would continue at high levels. The proportion that bought such goods rose from 28.3 per cent in 1946 to 35.1 per cent in 1947. The easing of the supply situation and the working off of backlog demands are thought to have led to a decline in the extent of advance planning for such goods. It is also possible, of course, that the discrepancy was due to a weakness in the anticipations approach.

A second type of error arises from not drawing a positive inference when a change is found that is too small to provide a specified

⁵ A detailed discussion of the problems involved in analyzing consumer buying plans is presented by John B. Lansing and Stephen B. Withey in "Consumer Anticipations: Their Use in Forecasting Consumer Behavior," in this volume.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

level of statistical reliability. The 95 per cent level of probability has been most frequently used in working with these data. It may be that this is too high a level of probability, that many important economic trends will be missed because of it. This is a point on which I would appreciate comment. An example is the conclusion, which was certainly correct in itself, that there was no indication of a weakening in the underlying demand for new automobiles as of July 1949, when plans to buy were slightly more extensive than at the beginning of the year but by an amount that could not be considered statistically significant relative to sampling error. The proportion planning to buy in the July 1949–June 1950 period was 9.4 per cent, the highest percentage found in any postwar Survey to that point. In early 1949 it had been 8.2 per cent. The sampling error of this difference of 1.2 percentage points is about 1.8 to 1.9 percentage points. The midyear figure indicated that output in the automobile industry was not going to level off but would support the recovery from the minor 1949 recession by continuing to rise for at least another year. The number of purchases indicated by it was 4.8 million. New car registrations in this period were 5.5 million, of which an estimated 0.3 to 0.4 million represented purchases of groups excluded from the Survey universe, e.g. businesses. Thus the Survey findings did indicate very accurately the direction and amount of change in car demand in the July 1949–June 1950 period—it had also done this for the full year of 1949—although the most accurate and most useful conclusion was not drawn because the level of statistical confidence in the finding was as low as 81 per cent.

A converse type of error can arise in drawing an inference from data with too low a level of statistical probability.

To the present time these judgments have indicated primarily the direction of the expected change in consumer expenditures. This is usually of first importance in forecasting. Precise forecasting, however, also requires estimates of the amount of change in expenditures. Rough adjectival estimates of amount of change have been made, but it is probable that more precise estimates must await further progress.

G. Conclusions.

The following tentative conclusions would seem to be justified by the record to date. Consumer anticipations appear to have con-

CONTRIBUTION OF CONSUMER ANTICIPATIONS

tributed to the correct forecasting of overall consumer demand for major consumer durables and houses, key items which are probably the most difficult to forecast by other forecasting methods. This approach has been tested under a variety of postwar conditions, including a minor recession, and has passed the tests with fairly high marks for sensitivity to shifts in demand for particular commodities and to shifts in demand that run counter to changes in income. Adherence to plans to buy new cars for an extended period has been indicated for various social and economic groups. This demonstration suggests that accurate forecasting for other items may be possible, although in some cases the forecast period may have to be less than a year in order to attain a given level of predictive reliability. It is probable that the shorter the forecast period, the greater is the number of items that can be reliably forecast on the basis of anticipations data. Frequent surveys, say three or four per year, could keep the forecaster and policy-maker in tune with the very important consumer sector at a relatively low cost. It should be recognized, however, that this method is too slow to keep up with rapidly changing conditions, although it may be most helpful in estimating future developments, as in early 1951.

Greater precision, however, would be desirable in forecasts based on anticipations. It may be difficult to achieve, chiefly because of variation over time in the extent of consumer planning. Some gain would be realized, however, from larger or more efficiently designed samples and possibly from more efficient estimating techniques, as with double sampling or reinterviewing of identical consumers. Experimentation concerning the length of planning periods for each item and the weight to be attached to various degrees of certainty would also be highly desirable.

The results to date would therefore indicate that consumer anticipations should be given serious consideration as a tool of forecasting. These findings cannot, of course, be used in isolation but must be interpreted and pooled with information concerning other economic sectors. Although the record of this approach has been generally good in the postwar period to date, the range of economic fluctuations in this time has been limited. Backlogs of demand have also tended to make for a close adherence to buying plans. Further experience with and testing of consumer anticipations are necessary before any conclusive judgment can be made. However, the record is sufficiently good and the potentialities appear so promising that I believe that, given adequate resources, this approach could well

CONTRIBUTION OF CONSUMER ANTICIPATIONS

become one of the most powerful tools at the command of the short-range forecaster.

Appendix

Appraisal of Predictive Value of Consumer Surveys for 1946-1951

PREDICTIONS FOR 1946

Quoted from the Federal Reserve Bulletin, August 1946, page 854:

"Strong inflationary pressures will continue in the consumer goods markets. The present demand for consumer goods, largely made possible by current income plus the additional purchasing power created by the availability of borrowing and by spending of liquid assets, will continue to exceed production, particularly in those industries not yet able to operate at top capacity [i.e. automobiles, other durables, houses].

"The demand for consumer durable goods, in addition to the increase in prices of cost-of-living articles, will result in savings far below 1945 levels and in a large reduction in the rate of liquid asset accumulation. A greatly increased proportion of consumer income is currently being allocated to consumer expenditures at the expense of saving. . . .

"The use of instalment credit, an indirect way of buying from current income, will be substantial during the year. Borrowings to finance the purchase of consumer durable goods and houses will greatly exceed the amounts of liquid assets people plan to use for these purchases. . . . However, the use of liquid assets by consumers who plan to use them to purchase durable goods or housing, together with the use of liquid assets by consumers to meet other consumption outlays, could amount to a sizeable fund relative to the available supplies of such goods.

". . . . Relatively small amounts of liquid assets are held by most individuals and, according to intentions expressed at the beginning of 1946, these people do not intend to use their Government bonds or bank deposits for consumption expenditures. . . ." [However, see point above.]

"The sum of \$10 to 15 billion, the estimated volume of liquid assets that might be used for various purposes in 1946, is a significant inflationary magnitude. Some allowance must be made, however, for the noninflationary character of consumer savings that will be invested during 1946 in liquid assets."

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PURCHASES IN 1946

Prices continued to rise sharply during 1946, especially after the lifting of price controls. Shortages of automobiles, major durables, and houses were particularly noticeable.

Personal holdings of liquid assets rose by only \$7 billion in 1946 compared with \$24 billion in 1945, according to Federal Reserve estimates. Personal saving declined sharply, according to Commerce Department and Survey data.

Of the total 1946 expenditures for durable goods, less than one-fifth were borrowed and about one-third were drawn from previously accumulated liquid assets. In buying houses about half the total was obtained from mortgages, with the balance derived largely from the sale of real estate and from withdrawals of liquid assets. Approximately 2 in every 5 spending units reduced their liquid asset holdings during the year. The total amount of these reductions was \$10 billion, of which about 40 per cent was used for non-durable goods and services; about 20 per cent for consumer durable goods; over 20 per cent for housing; and nearly 20 per cent for investment purposes, including investment in securities and unincorporated businesses, according to Survey data.

PREDICTIONS FOR 1947

Quoted from the Federal Reserve Bulletin, June 1947, page 649:

"Consumer intentions to buy consumer durable goods and houses point to a possible tempering during 1947 of the very strong demand for durable goods, other than automobiles, that characterized 1946. That is, some lessening of inflationary pressures is indicated but buying will apparently continue at high levels. Any marked increase or decrease in prices or in incomes during the year might be expected to modify actual performance as compared with earlier intentions. . . .

"Demand for new automobiles . . . was as strong at the beginning of 1947 as a year earlier. The number of spending units intending to buy new cars in 1947 appears to be considerably larger than the number of cars likely to be produced for domestic sale to consumers.

"Used car demand tends to exceed substantially that indicated by consumer plans to purchase because of the many unforeseen factors influencing buying decisions in the used car market. In 1946, about three times as many consumers bought used cars as had indicated plans to buy. . . .

CONTRIBUTION OF CONSUMER ANTICIPATIONS

"Because of price considerations many consumer units, and more particularly those in lower-income brackets, have disappeared from the list of prospective purchasers of houses. . . .

"Fewer people plan to buy houses in 1947 than either planned to buy or bought them in 1946. These plans cover both newly constructed houses and those built in previous years. . . . More spending units are uncertain and undecided about entering the housing market now than a year ago. It is estimated that at the beginning of 1947 at least 1 million spending units planned to buy newly built houses in 1947. . . .

"Use of the large volume of accumulated liquid assets, together with consumer borrowing, will continue during 1947 to add significantly to purchasing power available from current income. Use of consumer credit, however, in purchasing durable goods during 1947 will probably continue to remain below prewar use relative to the volume of current purchases.

". . . consumers planned to transfer during 1947 a few billion dollars of their liquid assets to other forms of investment. The amounts to be placed in real estate (not for personal occupancy), securities, or unincorporated businesses show no significant shift from 1946 intentions. . . ."

PURCHASES IN 1947

Sales of durable goods continued to be limited only by supplies. Prices continued to rise, but at a lesser rate than in 1946.

Production of new cars increased, but was still considerably less than the 4 million that consumers had indicated they planned to buy.

The frequency of house purchases by consumers with incomes of less than \$3,000 fell off relative to that of such purchases by other income groups.

Purchases of houses—newly built and existing houses—declined from approximately 2.5 million in 1946 to 2 million in 1947. New house purchases increased but were still less than the number consumers had planned to buy. Purchase of existing houses fell off sharply on the basis of production and mortgage data.

Approximately 16 million spending units reduced their holdings of liquid assets during 1947, according to Survey data. The aggregate amount involved was \$15 billion, approximately one-third of which was used for the purchase of consumer nondurable goods and services, and the remainder for the purchase of automobiles and other durable goods and for investment purposes.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

PREDICTIONS FOR JULY 1947-JUNE 1948

Quoted from the Federal Reserve Bulletin, October 1947, page 1215:

"In general, the interim survey does not indicate that consumer plans to purchase durable goods or houses in the twelve months following July 1947 have been discouraged sufficiently by the prevailing [high] level of prices to cause an early decline in expenditures for these items[;] . . . it appears that at lower price levels a considerably larger group of consumers would purchase durable goods and houses in the near future.

"Information obtained with respect to the timing of consumers' intended purchases suggests that consumer plans to buy certain types of durable goods during the twelve months following July 1947 may not indicate the full volume of their actual purchases. In some cases, the rate of planned expenditure was considerably less for the first half of 1948 than for the last half of 1947. Plans to buy houses, on the other hand, were more evenly timed for the full twelve-month period. In the case of new automobiles considerable uncertainty was of course expressed by consumers [because of supply conditions] as to the exact timing of their purchases within the twelve-month period."

PURCHASES FROM JULY 1947 TO JUNE 1948

Consumers continued to snap up all new cars produced. Expenditures for furniture and major appliances were about 10 per cent higher in this twelve-month period than the annual rate of purchases in the first half of 1947, according to Department of Commerce data. Purchases of new houses rose slightly, according to production and mortgage data.

PREDICTIONS FOR 1948

Quoted from unpublished Federal Reserve staff analysis, May 14, 1948, pages 2-3:

"The outlook is that consumer expenditure for durables will continue in expanding volume. Some tempering appeared in the demand for new cars, but buying intentions still exceed expected production. As a result of recently proposed armament expenditures, it is probable that there has been a substantial increase in immediate demand for certain types of durable goods since the survey was taken. . . .

CONTRIBUTION OF CONSUMER ANTICIPATIONS

"There was some indication of a drop in the demand for new cars on the part of spending units with incomes below \$3,000 but this was largely offset by an increase in the number of spending units at higher income levels that planned to buy new cars. There was a slight increase in the number of spending units that were prospective buyers of durable goods other than cars. . . .

"Continuing tendencies noted in early 1947, there was a further softening in the prospective *total* demand for houses. Approximately 20 per cent less spending units in early 1948 as compared to 1947 indicated some plans for buying houses. Again this slackening in buying intentions was most noteworthy on the part of spending units with incomes below \$2,000. Buying plans were particularly strong, however, for new houses. Somewhat more than one million spending units indicated intentions to buy such houses in 1948. This total is greater than estimated completions of new houses for owner-occupancy for the year 1948. The prices that prospective buyers indicated they would pay for these houses were closely in line with prices paid in 1947. . . .

"There was no significant difference noted in purchasing plans for consumer durable goods among interviews taken before and after the commodity price break. . . .

"In order for spending units to satisfy their demand for houses, particularly new houses, in 1948, there will need be a further substantial increase in the volume of mortgage credit. Since veterans account for approximately half of the total housing demand, no slackening in requests for GI mortgage loans can be anticipated. . . .

"In general, consumer plans to buy both durable goods and houses would indicate a continuation of heavy demand in those areas which are strongly dependent upon availability of credit and liquid assets for effective buying power. . . .

"Prospects in 1948 are for further heavy dissaving on the part of at least one-fourth of all spending units and no substantial change in the aggregate amounts saved by other spending units. In this connection, while no change in motives for saving is indicated by the general results of the survey, it is evident that considerable efforts will be necessary to make the security savings bond drive an outstanding success. Total saving out of current income will not be sufficient during the year to permit substantial increases in consumer holdings of these bonds. Purchase of savings bonds by use of other liquid assets, particularly checking accounts, should be

CONTRIBUTION OF CONSUMER ANTICIPATIONS

further encouraged to supplement purchases through the pay roll deduction plan.”

PURCHASES IN 1948

Purchases of cars and other major durables were substantially higher in 1948 than in 1947. New car buying plans (3.7 million units) did exceed the 3.5 million cars produced for domestic sale to households, businesses, etc. Data on the number of new cars purchased by the various income groups are not available for 1947.

The number of consumer units that bought furniture and major appliances rose from 17.2 million in 1947 to 19.8 million.

Total house purchases did not decline from 1947 to 1948 but increased slightly, according to production and mortgage data. The increase was concentrated in the new house segment, although production and purchases remained below indicated demand for new houses. There was no slackening in the frequency of house purchases by the under \$2,000 group. Prices paid for houses in 1948 were somewhat higher than had been planned.

Mortgage debt outstanding on one- to four-family houses rose by \$5.3 billion in 1948, according to the Home Loan Bank Board. GI mortgage loans outstanding increased by \$1.5 billion in this period, on the basis of Veterans' Administration data.

Total installment credit rose by \$2.2 billion in 1948, according to Federal Reserve data.

The volume of dissaving increased from \$7 billion in 1947 to \$10.5 billion in 1948, and the proportion of the population that dissaved rose slightly, from 27 to 28 per cent. The amount of positive saving rose only half as much as did negative saving, so that net saving declined by nearly \$2 billion, according to Survey data.

The proportion of the population holding liquid assets declined, primarily because of a reduction in holdings of savings bonds, according to Survey data. Net redemption of low-denomination savings bonds (\$100 or less), which are presumably held by middle and lower income groups, continued during the year.

PREDICTIONS FOR JULY 1948-JUNE 1949

Quoted from the Federal Reserve Bulletin, November 1948, pages 1356, 1358:

“The demand for consumer durable goods showed little sign of abatement. Between the beginning of 1948 and July, there were no significant changes in the proportion of spending units which con-

CONTRIBUTION OF CONSUMER ANTICIPATIONS

templated buying furniture, refrigerators, and other household appliances. In the case of automobiles, there was a slight increase in the number who said they would, or would probably, buy during the coming year. . . . The increase occurred in the planned purchases of both used and new cars; its size is so small, however, relative to the size of the sample and the sampling errors involved, that it cannot be considered significant. The major conclusion to be drawn from the findings is that demand for automobiles did not decline during the first half of 1948. . . .

“For other selected durable goods, the plans expressed in July were similar to those expressed early this year. . . . According to both surveys about the same proportion of spending units intended to purchase specific commodities. It appears that demand for refrigerators, washing machines and furniture remained unchanged while the demand for radio sets declined somewhat during the first half of the year.”

PURCHASES FROM JULY 1948 TO JUNE 1949

Sales of furniture and major household appliances were unchanged at an annual rate from the first half of 1948 to the second half, and there was a slight decline, about 5 per cent, in the first half of 1949, according to Commerce Department data.

The number of units (3.7 million) that planned to buy a new car in early 1948 was greater than prospective 1948 production as noted at that time. The midyear Survey confirmed the level of demand. Registrations of new cars between July 1948 and June 1949 were 4.0 million, of which 0.2 to 0.3 million are estimated to have been purchased by groups excluded from the Survey universe.

PREDICTIONS FOR 1949

Quoted from unpublished Federal Reserve staff analysis, May 18, 1949, pages 5-6:

“More consumers planned to buy automobiles during 1949 than had planned to buy during 1948. This was true for both new and used cars. For those who were not fairly certain that they would buy during 1949, the level of car prices appeared to be the factor of greatest importance. . . .

“At the beginning of 1949, consumer demand for selected durable goods other than television sets appeared to be somewhat lower than at the beginning of 1948. However, the decline in reported demand for these goods (furniture, refrigerators, and other large ap-

CONTRIBUTION OF CONSUMER ANTICIPATIONS

pliances) was small. The indications were that consumers were planning to maintain such purchases at a high level but one that was somewhat below that of the record year of 1948. . . .

"More than twice as many consumers intended buying television sets during 1949 as had actually bought sets during 1948. . . .

"Data on consumer intentions to buy houses are still incomplete but the preliminary evidence points to a very strong housing market, particularly for houses priced below \$12,500. More than 1 million spending units indicated that they would buy new houses in 1949. This total is greater than estimated completions of new units for owner-occupancy during 1949. More low and middle income consumers are in the market for moderate-priced houses of 'good' quality than are likely to be produced."

Quoted from the Federal Reserve Bulletin, June 1949, page 653:

"Since early March, when the survey was completed, small declines in personal income have become more widespread, especially for persons employed in manufacturing industries. A moderate rise in the number of unemployed has received much attention and substantial price cuts for most major durable goods have been given wide publicity. It is not known what effect these developments may have had upon the buying plans reported. At the time of the survey . . . , many consumers expressed some uncertainty about economic prospects for the year and others who anticipated 'good times' for the year hedged their answers. Unless downward readjustment in economic activity and prices should go beyond the extent to which it was discounted by consumers early in the year, it is possible that consumer buying plans may not be greatly affected."

PURCHASES IN 1949

There was an increase in purchases of cars and television sets and a decrease in other durables as a group. See below for housing.

New car registrations were 3.5 million in 1948 and 4.8 million in 1949. Used car purchases rose from 5.6 to 6.9 million, according to Survey data.

Furniture sales declined from \$2.9 to \$2.8 billion, according to Department of Commerce data. Refrigerator sales declined from 4.8 to 4.5 million units, while television sales rose from 1 to 3 million sets, according to *Electrical Merchandising*.

New house completions and purchases were slightly lower in 1949 than in 1948, according to production and mortgage data, al-

CONTRIBUTION OF CONSUMER ANTICIPATIONS

though housing starts were slightly higher and were rising throughout the year in recognition of existing demand.

PREDICTIONS FOR JULY 1949-JUNE 1950

Quoted from unpublished Federal Reserve staff analysis, September 8, 1949, page 2:

"Consumer optimism was reflected in their stated intentions to buy durable consumer goods. There has been no apparent downward revision of consumer plans to buy such goods. The stated intentions of the public to buy automobiles, houses, and other durable goods in the period from July 1949 to June 1950 indicate probable maintenance of sales of these goods, as a whole, at a rate comparable to the high level of the preceding twelve months. . . .

"In July of 1949 at least as many consumers planned to buy new and used automobiles within the coming year as had planned to do so at the beginning of 1949. There was no indication of a weakening in the underlying demand for new automobiles. The majority of prospective automobile purchasers reported they would postpone their purchases until the first half of 1950. This was partly due to the anticipation of price declines but also presumably, to the imminence of new models and to seasonal factors.

"Approximately as many consumers reported intentions to buy other durable goods [than automobiles] during the next twelve months as had indicated such intentions early in 1949. Potential demand for certain types of goods such as television sets and furniture appeared to be somewhat stronger while for other types of goods the number of intended purchases was unchanged or somewhat lower than at the beginning of 1949.

"Over 1 million spending units are estimated to have plans to acquire newly built homes within the coming 12 months. The number of units with such plans in mid-1949 was at least as large as at the beginning of the year."

PURCHASES FROM JULY 1949 TO JUNE 1950

There was no decline in purchases of these goods in this period; their overall total rose.

Registrations of new cars in this period were greater than for calendar 1949, with sales in the first half of 1950 being slightly higher than in the last half of 1949.

Television sales rose sharply in this period. Furniture sales were slightly higher in the July 1949-June 1950 period than in 1949,

CONTRIBUTION OF CONSUMER ANTICIPATIONS

according to the Department of Commerce, and other major durables showed little change.

New house purchases appear to have risen during this period, on the basis of production and mortgage data.

PREDICTIONS FOR 1950

Quoted from unpublished Federal Reserve staff analysis, April 5, 1950, pages 1-3:

"Consumer plans to purchase houses, automobiles, and other selected durable goods in 1950 appear, on the whole, to be at least equal to those expressed at the beginning of 1949 and again in midsummer. These findings support the view that consumer spending on these items will be well sustained during the entire 12-month period. . . .

"Consumer plans to buy houses in the coming year—newly built and existing houses combined—were slightly larger in early 1950 than in early 1949. Plans to purchase newly constructed homes were somewhat greater than in 1949 while there was no change or a slight decline in reported intentions to purchase existing homes.

"Preliminary survey data justify an estimate of over 1 million consumers having 'definite' plans to buy new houses in 1950. Compared with a year ago, a somewhat stronger demand was evident for units priced below \$10,000 while little change in purchasing intentions was noted for homes priced above this level.

"About as many consumers indicated intentions to buy new homes in 1951 as reported such intentions for 1950. Purchase plans for 1951 were more commonly uncertain than those pertaining to 1950, reflecting in part at least the remoteness of the time period.

"These findings point to the general conclusion that consumer demand for owner-occupied housing, as measured by plans to purchase, is not yet tapering off and, for lower-priced units, appears still to be increasing.

"Considerably more than twice as many consumers intended buying television sets during 1950 as reported similar intentions for 1949. Buying plans for other selected durable goods (furniture, refrigerators, and other large appliances) were not very different from those expressed in early 1949, with some showing small increases and others showing no change or small decreases.

"Preliminary data on consumer intentions to buy new automobiles in 1950 indicate no substantial change in number of units from 1949, a year of record sales. Somewhat more spending units had

CONTRIBUTION OF CONSUMER ANTICIPATIONS

'definite' or 'fairly definite' plans to buy new cars in the first half of 1950 than in the second half. Prospective buyers in the second half of the year were less certain of their intended purchases. Preliminary evidence seems to indicate that middle and low income consumers comprise a larger part of the prospective demand in 1950. Such a pattern will mean, in all likelihood, a continued rapid expansion of instalment credit to finance automobile purchases. It will also act as an influence in shifting car production from higher-priced to lower-priced lines."

PURCHASES IN 1950

Purchases of these items were substantially higher than in 1949 for the year as a whole, but more appropriately, prior to Korea, the annual rate of purchases was in the direction indicated by the Survey.

Total house purchases appear to have been higher in the first half of 1950 as the result of increases in both new *and existing* house purchases, on the basis of production and mortgage information. Data on prices paid for houses before Korea are too incomplete to mark a trend.

Sales of television sets appear to have risen sharply during the first half of 1950, on the basis of production and inventory figures. Sales of furniture and major appliances, other than television sets, showed little change as a group, according to Department of Commerce data.

Survey data indicate planned purchases of about 2.5 million new cars in the first half of 1950. Total new car registrations in this period were 2.8 million, of which an estimated 0.1 to 0.3 million were purchases of groups not covered in the Survey, e.g. businesses, governments, and nonprofit institutions.

Data are not available on the income levels of first-half new-car purchasers. The proportion of credit purchases appears to have increased in the first half.

The share of the market obtained by the three lowest-priced cars increased slightly in this period.

PREDICTIONS FOR 1951

Quoted from unpublished Federal Reserve staff analysis, April 3, 1951, pages 1-2:

"Consumer plans to buy houses during the coming year—newly constructed and existing houses combined—were nearly as high as

CONTRIBUTION OF CONSUMER ANTICIPATIONS

last year's record level of plans and actual purchases. However, two major differences were evident. This year, more consumers were uncertain in their plans and the proportion intending to buy new houses was substantially lower than last year. Regulation 'X' was indicated to be a significant factor in this change in consumer buying plans. Uncertainty as to the availability of materials and prices may also have been factors.

"At the beginning of 1951, consumer plans to buy automobiles were substantially lower than a year ago. While no firm conclusion can be drawn at this time because of complex factors which were not adequately explored in the survey, the most probable conclusion is that plans to purchase new cars are not greater than prospective production. It is also possible that there may be some softening of the automobile markets.

"The number of consumers with fairly definite plans to buy major durable goods (refrigerators, television, furniture, etc.) was substantially lower than a year ago but there was an increase in the number of uncertain or undecided buyers. The largest declines were found with respect to plans to buy television sets and washing machines while there was no decline in plans to buy radios."

PURCHASES IN 1951

As of early September, production and mortgage data indicated that total house purchases were continuing at about the same rate as in the full year of 1950. The rate of new house purchases was falling, chiefly because of credit controls and material shortages, according to market data.

Production of new cars was large, but was falling, primarily because of material restrictions but also, in the case of some producers, because of a slackening of demand. Consumers had absorbed practically all of current production, but demand did not appear to be greater than the restricted supply of recent months, according to market data.

Purchases of television sets had fallen off sharply from 1950 levels, according to market data. Since March, sales of major durables as a group were below 1950 levels, according to Department of Commerce data.

C O M M E N T

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We may postulate two extreme views of the role of surveys in economic theory. According to one view, surveys, particularly of subjective data, would be a useless and inexcusable infringement upon the a priori and deductive domain of theorists; economic theorists so envisaging matters would reject all survey findings as irrelevant and unworthy of consideration. I shall not endeavor to express my objections to this view; most of us have implicitly rejected its assumptions by participating in this Conference. But the survey vantage point for research should not, on the other hand, produce an equally categorical rejection of economic theory.

I shall refer to Schweiger's paper for illustrations of unwarranted rejection of the basic assumption of much of economic theory, to wit, that economic activity is generally consistent with rational rules of behavior. For Schweiger indicates that consumers tend to be "emotional." Their response to inflation is contrary to reason (because of liquidity preference induced by uncertainty!), and prediction of their behavior has greater need of "attitudinal information" than has prediction of the behavior of "business purchasing agents or economic analysts." These latter categories apparently symbolize to Schweiger the rational "economic man," from whose ranks he would largely exclude the consumer. Schweiger is led to conclude that consumer actions "may not be greatly affected by small actual or prospective changes in prices and incomes."

Thus Schweiger may be seen to question directly conventional economic theory relating to price and income elasticities of demand as well as the effect on demand of expectations of changing price. I submit that a careful juxtaposition of relevant economic theory and available survey data will fail to shatter economic theory and will in many instances confirm its appropriateness.

Let us, therefore, first state carefully certain relevant elements of price theory: (1) The quantity of a commodity demanded decreases, *ceteris paribus*, with an increase in its price. (2) The demand for a commodity decreases, *ceteris paribus* (except in the case of an "inferior good"), with a drop in demanders' real incomes. (3) The current demand for a commodity will be greater, *ceteris paribus*, the higher the future prices anticipated by demanders.

Then let us note that a comparison and contrast of economic theory and survey findings require rejection at the outset of certain

straw men traditionally used in the attack on the postulate of rationality. The rational "economic man" need not be aware of the full range of economic choice open to him. He need only choose in a manner consistent with his own preference scale among the alternatives or variety of possibilities of which he is directly aware. A customer does not have to articulate his entire personal demand curve in order to react rationally to an increase in price.

Further, the finding that individuals do not usually report a direct reaction to economic changes affecting them only indirectly should certainly not be used to belittle the significance of such economic changes. One is reminded of methodologically unfortunate attempts to minimize the significance of interest rate changes in the economy by asking businessmen if they would curtail investment as a result of a rise in the rate of interest. A rise in the interest rate might be expected to manifest itself in such developments as rises in supply prices and drops in effective demand because of the increased cost of borrowing (to buy houses or goods on installment credit, etc.). However, these developments are not likely to be taken into account by a businessman answering a survey question about his reaction to a rise in the rate of interest. Indeed, he might reasonably be expected to eliminate such effects by an implicit *ceteris paribus* assumption. Whether these effects, which the businessmen feel directly, actually stem indirectly from a rise in the rate of interest is a matter to be determined by economic analysis and not a public vote via an attitude survey.

It should be clear that small price increases or any other change in an economic variable may have a substantial effect on consumer demand without consumers' being aware of the basic cause-and-effect relationship. It is quite conceivable, for example, that many of the reinterviewed respondents whom Lansing and Withey report¹ as denying the car-buying intentions expressed on their first interviews had actually been driven out of the market by price increases. However, the data offered by Lansing and Withey do, in this case, offer direct evidence of the subjectively viewed influence of price increases. Before considering these data we might well reflect upon the theoretical mold into which the data may be expected to fit. In particular, we might stress the intertwined aggregative and marginalistic elements in this mold. To complicate further our metaphor, these elements constitute round holes into which the

¹ See paper by Lansing and Withey in this volume, table 34.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

surveyor should not attempt to fit loosely the square pegs of data from individual consumers.

Schweiger states that consumers of durable goods such as automobiles do not "react" to small increases in price. I suggest that Schweiger must have set an unreasonable test for reaction. This may be illustrated by consideration of the following hypothetical example:

1. There is a 1 per cent increase in the price of automobiles.
2. A panel of respondents who have, before the price increase, declared their intentions to purchase automobiles are asked again whether they intend to do so.
3. Respondents are now divided as follows:
 - a. Ninety-six per cent still plan to buy.
 - b. Two per cent say that they will not buy and give the price increase as the cause of their change in plans.
 - c. Two per cent say that they will not buy but ascribe their change in plans to factors other than the price increase.

Would data such as those of this hypothetical example indicate that since the overwhelming majority—96 per cent—of prospective purchasers report no effect of a small price change, consumers "may not be greatly affected by small . . . changes in prices"? In the case of such a substantially discontinuous variable as car purchases, consumers generally buy one car or none. For 2 per cent of the potential purchasers to abandon their purchase plans implies, therefore, a 2 per cent drop in the quantity of cars demanded. The price elasticity of demand is then in the order of -2 , without reading unexpressed price considerations into the response of the additional 2 per cent who dropped out of the market while ascribing nonprice factors as a cause of their actions. A price elasticity of demand of -2 indicates a substantial price effect and in no way offends conventional economic theory as to downward-sloping demand curves and rational reactions to price changes. As to the 96 per cent of prospective purchasers who have not yet been affected by the price change, they are well provided for by economic theory; they occupy the upper reaches of the market demand curve. It is only the marginal purchasers whom our survey may be expected to find responding to small price changes. The mere 2 per cent located by the survey in category 3b, above, thus confirm rather than disturb economic theory.

Let us turn from our hypothetical example to the Survey data.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

From tables 23 and 24 in the Lansing and Withey paper we can calculate that roughly 50 per cent of those who had declared that they would buy new cars did not actually do so in the period under consideration. Of this 50 per cent who did not carry out their car purchase plans 31 per cent (table 34) gave "prices too high" as the reason for failure to purchase. One might presume that prices must have been, in fact, higher than when original car purchase intentions had been expressed.² For otherwise, one might argue, the original prices would have been high enough to inhibit car-buying plans at their inception.

We thus find that some 16 per cent (31 per cent of 50 per cent) of those planning to buy cars were dissuaded by considerations of price. While only about half of actual new car purchasers came from the group that had expressed buying intentions, there is no reason to presume that others in the car market were less sensitive to price than those in the plan-to-buy group we have been considering. We may infer a high price elasticity of demand by reasoning that the 16 per cent who failed to execute purchase plans were led to abandon these plans by the small price increases that took place in 1949.³

The available Survey data can be adduced to question just as sharply the income reference in Schweiger's suggestion "that plans and their execution may not be greatly affected by small actual or prospective changes in prices or incomes." Table 42 in the Lansing and Withey paper reveals distinctly that income changes are correlated with fulfillment of car purchase plans: 63 per cent of "plan-fulfillers" had an increase in income, while only 43 per cent of "non-fulfillers" had an increase in income: 37 per cent of nonfulfillers had a decrease in income, as against only 23 per cent of those who carried out their new car purchase plans.

Finally, we may question, as well, Schweiger's judgment that consumer reactions in periods of rapidly changing prices "are so contrary to what many economists would postulate." Schweiger ascribes consumer resistance to high prices to "emotional reaction" that will wear off in time as people become adjusted to the "new

² The only partly appropriate data readily available to me, Department of Commerce wholesale price indexes, indicate that passenger car prices rose 2 per cent from January to October 1949, the period under consideration.

³ I should be guilty of rather tenuous reasoning and an unwarranted acceptance of subjective explanations as causes were I to offer specific calculations of elasticity on the basis of these data. My point is merely the negative one that these data should prevent any facile rejection of rational price theory.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

higher level of prices," and infers irrationality from consumers' failure to "*mention*" (italics added), as the cause of their sales resistance, "that at some distant date prices might fall." But individuals can certainly act in a manner consistent with standards of reasonable behavior without understanding, and without "mentioning," the reasonable basis of their behavior. And economic theory that depends on a postulate of rational action need not rule out emotional concomitants of rationally sound consumer behavior. Consumers may get "mad" at high prices and refuse to buy; yet the refusal to buy may be quite rational action in terms of consumer income and preference scales. One may recognize this emotional reaction and still assert that the subsequent emotional development—to "become adjusted to the new higher level of prices"—is likewise implicitly rational. For it implies the development of a conviction that high prices will continue; here again, the appropriate economic theory—in this case the economic theory associated with price expectations—proves quite satisfactory in explaining consumer actions, whether or not consumer verbalizations in response to our survey question convey theoretical explanations in themselves.

Survey data should prove of increasing value in giving empirical content to economic theory. Properly supplementing economic and statistical theory, they should prove of increasing value in predicting economic phenomena. It would be most unfortunate for them to be improperly enlisted in the old and all too persistent attack upon economic theory.

DOROTHY S. BRADY, *Bureau of Labor Statistics*

The interpretation of consumer anticipations in Schweiger's analysis depends on logical assumptions that are basic to empirical inference in all of the social sciences. The frequency for a particular occurrence is estimated from a series of observations in each of which the causal factors are held relatively constant and no new cause of variation is introduced. The pooled estimate of such a frequency provides a basis for predicting the results of a new set of observations. When all conditions remain relatively unchanged, experience has shown that a great many frequencies exhibit statistical stability from year to year—demographic rates, per capita expenditures, and even indexes of social and political actions. It has long been known that the standard of living and the financial resources of particular socio-economic groups in the population determine

CONTRIBUTION OF CONSUMER ANTICIPATIONS

their spending patterns. Schweiger's assumption that the frequencies of planned purchases and of actual purchases should approach equality is entirely reasonable, and his statistical test of this hypothesis of group stability is convincing. Consumer buying plans appear to provide an accurate index of the level of actual purchases.

According to the same logic, the rates of purchase in 1948 serve as estimates of the 1949 rates among relatively homogeneous sub-groups of the population. When the proportions of families buying new cars in 1948 in each income group are multiplied by the 1949 income distribution, the result, 8.0 per cent, agrees as well with the actual rate of purchases in 1949, 8.6 per cent, as most comparisons of consumer intentions to buy new automobiles and the actual purchases.¹ For this particular year, 1949, the rate of anticipated buying and that of actual purchases happened to be almost identical. During 1949 there was an increase over 1948 in the proportions of spending units of each income group that bought new automobiles, and the anticipation data appear to have reflected this change. For earlier years there was a tendency for the anticipated purchases of new automobiles to exceed the actual purchases, so that the correspondence in 1949 may have been entirely fortuitous.

The anticipated rate of purchases of used automobiles runs consistently below the actual rate of purchases, and the same is true of the rates of purchase of automobiles both new and used. It therefore appears that anticipated purchases will correspond with actual purchases, as rates, only when the changes between two successive years are small. When the changes are small, the previous year's rates are as good a forecast as the rates of purchases planned. The following comparison for the purchases of automobiles suggests that the estimate based on the previous year's rates still offers a more accurate forecast than the anticipated rate of purchases:

	<i>Percentage of Spending Units</i>		
	<i>Planning Purchases</i>	<i>Making Purchases</i>	<i>Estimated on the Previous Year's Rates</i>
1946	11	11	
1947	12	15	11
1948	11	17	16
1949	13	22	18
1950	12	24	23
1951	7	22	25

¹ *Federal Reserve Bulletin*, July 1950, p. 781, table 1. For 1946 the figures are 8.3 and 3.3; for 1941, 8.5 and 5.8; for 1948, 7.6 and 6.1.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

This estimated rate was based on the actual income distribution in the particular year, a statistic that is not a datum for forecasting purposes. Income distribution can, however, be estimated from forecasts of the general level of income, which usually appear early in the year.

If anticipation data are to contribute to short-run forecasts when circumstances change substantially, they must prove to be more accurate than simple estimates based on previous years' rates. The expected rates of purchase of automobiles have been peculiarly stable—the range of variation in the lowest income class was from 2 to 4 per cent as contrasted with actual purchase rates from 2 to 8 per cent, and in the income class \$5,000 or more the anticipated purchase rate ranged from 20 to 27 per cent as contrasted with purchase rates between 20 and 38 per cent in the years 1946 to 1951. Apparently the planned purchases measure the more stable component of actual purchases among the population groups that do not experience significant changes in their economic position from one year to the next. Actual purchase rates are evidently strongly affected by segments of the population whose classification changes substantially. To serve adequately as forecasting data, anticipations should be related to the changes in economic circumstances that are associated with the purchase of durable goods.

Purchase rates are a composite of replacement rates and acquisition rates. Within a population at all times there are groups whose purchases represent primarily an addition to the inventory of durable goods—the young spending units, the newly established families, and households that have changed location. There are basic changes in income, family status, and location associated with each level of the national income. The expected rates of purchase of durable goods, when these changes in family situations occur with "normal" frequencies, should exhibit a fairly systematic relation to the actual rates. The years in the postwar period cannot be described as having "normal" rates of increase in households, families, or spending units.

Between 1946 and 1951 some 6 million spending units were added to the population, an increase of about 13 per cent. This group with the highest acquisition rate for durable goods probably accounts for a large proportion of the "extra" automobiles bought in 1949 and 1950. In each of these years the rate of automobile purchases was 6 or 7 per cent above the rates characteristic of the level of income achieved. Half of the extra purchases were made by the

CONTRIBUTION OF CONSUMER ANTICIPATIONS

spending units with incomes under \$4,000, in which the greater number of new units must be concentrated. The greatest increase in purchase rates in 1949 and 1950 compared with 1947 and 1948 appeared in the income classes under \$3,000. The impact of the addition of a relatively large number of units to the population in a short time would probably affect the relation of purchase rates to income and other factors, and consequently the aggregate rates, in just this way.

The usefulness of anticipation data for forecasting cannot really be tested until the effects of significant group changes are included in the determination of the forecast. The contribution of anticipation data cannot be appraised until the type of analysis undertaken by Schweiger is carried much further, so that the year to year changes in the aggregate can be traced to the population groups responsible through alterations in their spending pattern or simply through shifts in their relative importance.

GROVER W. ENSLEY, *Joint Committee on the Economic Report, United States Congress*

The papers presented at this Conference and the accompanying discussion explain the methodology currently used in amassing separately the plans of major segments of the national economy. The factors important in the determination of the original intentions on the part of businessmen and consumers have also been discussed, as well as some of the reasons why consumers and businessmen change their plans during the course of the period covered by the projection.

I hesitate to refer to these intentions as "forecasts," as have a number of speakers during the last two days, with the notable exception of Firestone. Rather, I like to think of them as simple totals of the budget plans of those making up the particular economic category. They are the result, largely, of limited or primitive analysis, although more and more overall economic evaluation enters into their preparation. We know, however, that events necessitate adjustment in these *ex ante* plans.

I should like to suggest that the Conference program might well have included a session on methodology for synthesizing the plans of all categories of the economy—consumer, business, and government. As one primarily concerned with advising those charged with formulating national economic policy, I find need for a technique

CONTRIBUTION OF CONSUMER ANTICIPATIONS

(1) to express these combined plans in *ex ante* form, (2) to measure the gaps that result from synthesis, (3) to evaluate quantitatively the likely economic impact of alternative programs for closing the gaps and for maintaining economic stability and growth, and (4) to express the plans of the several categories as adjusted by such actions.

The Joint Economic Committee is experimenting with the economic aspects of the nation's budget technique and is finding it a useful tool in overall economic analysis and in formulating economic policy.¹ I might add that the question is not, as some imply,² whether responsible policy agencies, public or private, should build models and analyze economic gaps. Every person on the firing line knows that such procedures are necessary, whether they are primitive or scientific, implicit or explicit. The problem today is one of improving our methods, our information, and our judgments.

GEORGE GARVY, *Federal Reserve Bank of New York*

The real test of the success of any technique of short-time forecasting is its ability to forecast cyclical turning points. Schweiger's review of the Federal Reserve Board's published and internal analyses based on the successive Surveys of Consumer Finances, while very encouraging, leaves me with the feeling that the crucial test is still ahead. The period in which these Surveys were conducted was one of nearly sustained expansion and nearly full employment. Neither the inventory adjustment of 1949, nor the lull of the summer of 1951, nor the one or two short early spring periods of hesitation reflected by slightly declining consumer spending were of sufficient amplitude to cause a brisk change in consumer attitudes. The longer the period of sustained levels of high employment, the more consumers come to assume this state of affairs to be "normal."

In a nutshell, the Consumer Surveys have taught us that a considerably larger proportion of consumers than of businessmen or economists have adjusted their thinking to the deep changes in our economy that have occurred during the last two decades. This, I

¹ See *Inflation Still a Danger*, Senate Report No. 644, 82d Cong., 1st Sess., August 15, 1951. The use of this concept and procedure was originally presented in my article "A Budget for the Nation," *Social Research*, September 1943.

² For example, see Albert G. Hart and E. Cary Brown, *Financing Defense* (Twentieth Century Fund, 1951), p. 15.

CONTRIBUTION OF CONSUMER ANTICIPATIONS

believe, is a valuable piece of information. But does not this very relative stability of consumer expectations as to their own income and the general business outlook limit their predictive value?

The forecaster of short-run changes looks mainly for indications of changes in the socio-economic fabric that are likely to lead to cumulative developments in production and employment. If it were possible to conduct surveys of consumer finances frequently enough, and if the questions asked could be modified and new questions introduced to focus on attitudes and intentions likely to be particularly relevant in the given situation, there would be less reason for skepticism with respect to the survey method as a tool of *short-run forecasting*. No doubt such a development of the survey techniques is more a financial than a technical problem. Yet, as long as we must base our appraisal on actual results of a new method rather than on its potentialities, we must conclude that the crucial test is still ahead.

Some of the discussants have expressed the view that much of the usefulness of the survey method for forecasting demand for specific goods depends on the planning period. Obviously, useful results can be obtained only for goods for which the planning period is long enough so that consumer action occurs only after analysis of the survey material is completed and the forecaster has done his job.

More generally, the attempt to forecast demand for specific goods on the basis of consumer anticipations implies that for a sufficiently large number of durable goods there is such a thing as a planning period of a rather fixed duration. I am afraid that this assumption will hold true only in times when nothing more than minor ripples occurs on the surface of the body economic. Sudden revisions in expectations under the shock of unexpected events (or the failure of anticipated events to materialize) are likely to result in actions quite different from those inferred on the basis of expectations expressed at a time when no great change from current conditions was anticipated. The structure of expectations as of the time of the most recent survey and the historical record of the relationship of consumer actions to stated intentions (which grows with the number of surveys made) will help the short-run forecaster to judge how consumer intentions are likely to be revised under the impact of events that either were not generally anticipated or developed in a direction (or with a force) at variance with expectations expressed in the survey.

I am, therefore, inclined to consider the Surveys of Consumer

CONTRIBUTION OF CONSUMER ANTICIPATIONS

Finances less valuable as a source of specific, quantitative estimates of the size and composition of demand for individual durable goods than as a basis for a more general evaluation of the probable behavior of consumers in a situation which was *not* generally anticipated at the time of the most recent Survey—because it is precisely in such a situation that the need for drawing on the largest and most diversified body of information is most pressing.

Indeed, surveys of consumer behavior supply us with two types of data. They reveal certain patterns of socio-economic relationships, such as the relationship between age and automobile ownership, or marital status and amount of life insurance carried. They also indicate anticipations, attitudes, and plans of consumers with respect to certain future events on which the survey is focused.

The predictive value of the second type of pattern is subject to important limitations, as pointed out by several discussants. For instance, anticipations may be based on subjective misjudgment of the general economic outlook due to limited knowledge or understanding. Thus the "nonrealization of anticipations" that is revealed by *ex post* surveys of consumer actions may be due partly to the nonrealization of anticipated events (such as general improvement in business situations, or a promotion of the respondent), and partly to the influence of factors not covered by the survey.

Subjective anticipations are, as Lansing, Withey, and Schweiger recognize, only one of the elements that are relevant in appraising the future course of the economic behavior of consumers. Other elements are no less important, but they are partly or entirely beyond the horizon of the individual consumer—for example, unexpected turns in international tension with their immediate repercussion on world prices and the level of domestic defense expenditures.

Thus we can take it for granted that whatever the correlation might be between anticipations of consumers and their realization when no significant and unexpected changes on the economic-political scene occur, it is more likely than not that, at least in the few years to come, enough significant external events will take place to provide sufficient explanation why many consumer anticipations were not, and could not have been, fulfilled. In such a situation a systematic scrutiny of past surveys (either an examination of those conducted under conditions more closely approximating the new situation than in the case of the most recent survey, or a comparative analysis of the entire body of accumulated knowledge of patterns and motivations of consumer behavior emerging from past

CONTRIBUTION OF CONSUMER ANTICIPATIONS

surveys) might be no less illuminating than the study of the most recent inquiry.

Such an approach relies not alone on the chain of consumer attitude-expressed intention-action, but also on the broad knowledge of the distribution of income, assets, and commitments (such as institutional saving) and of *typical* reactions of various socio-economic groups to different categories of recurrent as well as unique events.

In order to make short-run forecasts based on what Bassie calls statistical analysis, we need to know a good deal about structural relationships. Surveys of consumer finances are an excellent source of such knowledge. It seems to me that in appraising the contribution of surveys of consumer finances we are somewhat too much inclined to stress that part of the interview which is focused on specific attitudes toward selected elements of the current economic scene, rather than the contribution the rest of the interview makes to our knowledge of monetary relationships in our society. A good knowledge of these structural relationships is likely to place our short-run forecasts on a firmer basis.

In spite of the uncertainty inherent in the current situation, and perhaps because of it, we shall have to make short-run projections and to construct models involving judgment on the probable course of consumer behavior with respect to such significant variables as spending, saving, or liquid asset holdings. The only question is that of the respective values of the two types of information—structural relationships and specific anticipations—derived from consumer surveys.

A. G. HART, *Columbia University*

CROSS-CHECK ON PREDICTIVE VALUE OF "OBJECTIVE" MACRO-EXPLANATIONS

One of the main uses of data on consumer anticipations and intentions is to give clues to the relative weights of the factors we put into the equations of our mechanical dynamics. If we rely merely on time-series, as is well known, intercorrelation of the time-series for our independent variables may keep us from sorting out their influence, while a cross-section analysis can permit us to stratify relative to the variables in the background and get a clearer picture of the influences we are studying at the moment.

Reinterview data are particularly valuable for making macro-

CONTRIBUTION OF CONSUMER ANTICIPATIONS

analysis more sure-footed. In a methodological experiment carried out by Mrs. Vivian Carlip, under my direction, we obtained data on purchases of butter and margarine by a group of identical consumers in January of two successive years. Aggregative data for these consumers (which showed much the same shape as national data) registered a roughly constant income level (corrected for the price level), a substantial rise in the price of butter and some decline in that of margarine, a roughly constant consumption of butter-plus-margarine, and a sharp rise in the margarine share of this consumption. On the surface this looked like a good case of price-induced substitution. But going inside the data we found fairly clear evidence of a change in tastes. Those consumers of both fats for whom the price shift was most in favor of margarine showed no greater shift in consumption than those for whom the price shift was least in favor. Shifts toward margarine were almost as common among income-gainers as among income-losers. The plausibility of hypotheses on the interaction of influences on consumers can often be checked along these lines.

Incidentally, reinterview is the most promising way to check the influence of the items that (as Tobin remarked in his discussion) are predictable actuarially but not for single households. Whether (to use his illustration) funerals lead to dissaving is a question that survey methods can never answer from single interviews, but can answer from reinterviews.

CHECK ON DIRECT PREDICTIVE VALUE OF INTENTIONS

The contribution of consumer intentions to forecasting lends itself to an internal check from reinterview data. Here we start with a fact that Lansing and Withey evidently regard as too obvious to require emphasis (though they go into it briefly in relation to table 23): those planning to buy durables show a much higher frequency of purchase than those not planning to do so. This is one point at which I differ sharply from Schweiger (if he really meant a remark in his oral presentation). For however high the correlation between the number in a group that plan to buy and the number that do buy, I would have no faith in intentions data if few of those planning to buy did so. An influence that affects the group must be visible among those most susceptible to it.

Obviously, the group intending to buy might show a high percentage of buyers solely because its members select themselves as having the permissive factors of high and rising income, high liquid-

CONTRIBUTION OF CONSUMER ANTICIPATIONS

ity, unreliable old car, and the like. In this case the marginal predictive value of intentions would be nil; a survey of these permissive factors would give as good an estimate. As I mentioned above, the reality of the marginal contribution of intentions lends itself to check from reinterview data. The method is plainly to stratify cases by the permissive factors. As may be seen from the Lansing and Withey paper, this is far from easy if any substantial number of permissive factors is recognized. Their tables 39 to 46, as they remark, show clearly that "No one factor alone . . . appears to explain fully the failure to buy of persons expecting to buy a new car or the unexpected purchase of a new car by persons stating no expectancy." They show also that stratification by any one of these factors does not remove the apparent greater propensity to buy of those who intend to buy. But the analysis of combinations of factors is inconclusive. A wide difference between *buyers and nonbuyers* appears in table 47 and those following it; but the comparison between *intenders and nonintenders* is not set up so as to be revealing.

One rather elementary suggestion for handling such tabulations is to set them up so that meaningful additions can be made both horizontally and vertically. For example, table 39 might well appear as follows:

Number of Cases per Thousand Consumer Units in Population in Various Expectancy, Purchase, and Income Groups

1947 Income (dollars)	<i>Expected to Buy New Car</i>		<i>Expected to Buy No Car</i>	
	<i>Bought New Car</i>	<i>Bought No Car</i>	<i>Bought New Car</i>	<i>Bought No Car</i>
Under 3,000	0	4	5	429
3,000 to 4,999	14	4	10	230
5,000 or over	11	11	18	99
Not ascertained	1	0	1	7

Figures fail to add to 1,000 because of omission of consumer units expecting to buy or buying a used car.

The relations actually appearing in this version of table 39 stand out just as well as when each figure is a percentage of its column total; the fact that this stratification does not eliminate the greater propensity of intenders to buy stands out also. When two permissive variables must be analyzed, a three-dimensional cross-tabulation is needed; for more dimensions, more powerful tools.

