

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Consumer Expectations, Plans, and Purchases: A Progress Report

Volume Author/Editor: F. Thomas Juster

Volume Publisher: NBER

Volume ISBN: 0-87014-384-0

Volume URL: <http://www.nber.org/books/just59-1>

Publication Date: 1959

Chapter Title: Time Series Data, 1948-1957

Chapter Author: F. Thomas Juster

Chapter URL: <http://www.nber.org/chapters/c1834>

Chapter pages in book: (p. 1 - 11)

1. TIME SERIES DATA

Introduction

The significance of fluctuations in the ratio of consumer spending to disposable income has received increased attention in recent years, particularly by those interested in analyzing the upswings and downswings in business activity. It seems clear, at least for the postwar period, that variations in the ratio are closely associated with variations in the rate at which households choose to accumulate durable goods.¹ If we can obtain reliable information about prospective changes in the consumer purchase rate for durables, our ability to make short-term forward judgments about general business conditions would be considerably enhanced.

Data bearing upon these questions have been gathered and analyzed since 1945 by the Survey Research Center at the University of Michigan.² Results of these surveys of intentions to buy major durables, income experience and prospects, attitudes, debts and assets, and demographic data have been generally suggestive and fruitful to investigators and potentially valuable as an aid to prediction during some periods. The chief emphasis in the research carried out with these data has been developing an index

¹The relationship can be shown by comparing residuals from a savings-income regression equation with residuals from a durable goods purchases-income regression over the period 1948-1957. The two sets of residuals are negatively correlated; that is, when the ratio of durable goods purchases to income is relatively high, the ratio of savings to income is relatively low.

²The results of the annual Survey of Consumer Finances conducted by the Survey Research Center for the Federal Reserve Board (personal interviews, a random sample of about 3,000 households) are published in the *Federal Reserve Bulletin*. The results of interim surveys (for a smaller sample) have been reported in *Consumer Attitudes and Demand, 1950-1952* and *Consumer Expectations, 1953-1956*, both by George Katona and Eva Mueller, and published by the Survey Research Center. See also articles by L. R. Klein, George Katona, J. B. Lansing, and J. N. Morgan in *Contributions of Survey Methods to Economics*, Columbia University Press, L. R. Klein, ed., 1954; J. B. Lansing and S. B. Withey, "Consumer Anticipations: Their Use in Forecasting Consumer Behavior" in *Short-Term Economic Forecasting, Studies in Income and Wealth*, Vol. 17, Princeton University Press for National Bureau of Economic Research, 1955; Eva Mueller, "Effects of Consumer Attitudes on Purchases," *American Economic Review*, December 1956.

of consumer attitudes that is associated with subsequent changes in purchases.³ Comparatively little research on buying plans in relation to changes in purchases has been reported by the Michigan group. Rather, attention has been devoted to analysis of the way attitudes interact with purchases and with each other. Both buying intentions and expectations have been treated as logically equivalent to attitudes with a time dimension. The argument is that usefulness is best served when both are taken to reflect the particular frame of mind of the respondent at the time of the interview, as answers to the question whether the present is a good or bad time to buy reflect it.⁴

On logical and empirical grounds, it seems to the writer not very useful to lump together all these variables under the heading of economic attitudes and analyze them as if they were simply different ways of measuring a current state of mind. It makes a substantial difference how statements in surveys are interpreted: to cite but one illustration, whether the statements "I intend to buy a car this year" and "I expect my income to rise" are interpreted as reflecting an optimistic frame of mind or whether they are interpreted as a forecast of contingent action—"I *will* buy a car this year if my income *does* rise."

The selection of one or the other interpretation as more meaningful leads to use of different procedures for combining data on attitudes, expectations, and intentions and to asking entirely different kinds of questions. If one adopts the first view—that all these variables are different ways of getting at an optimism-pessimism coefficient—then the key to better understanding of consumer behavior is to find better ways of measuring the

³Several authors have examined the relative usefulness of buying plans and attitudes in predicting purchases by individual households or in the aggregate: Arthur Okun ("The Value of Anticipations Data in Forecasting National Income"), Eva Mueller ("Consumer Attitudes—Their Influence and Forecasting Value"), and F. Thomas Juster ("The Predictive Value of Consumers Union Spending Intentions Data") in *The Quality and Economic Significance of Anticipations Data*, Princeton University Press for National Bureau of Economic Research, Special Conference Series No. 10, in press; J. B. Lansing and L. R. Klein, "Decisions to Purchase Consumer Durable Goods," *Journal of Marketing*, October 1955; James Tobin, "On the Predictive Value of Consumer Intentions and Attitudes," *Review of Economics and Statistics*, February 1959.

In general, these studies have shown that plans are more useful than attitudes for predicting purchases, and that attitudes make little additional contribution to an explanation of purchases after buying plans have been taken into account. This finding has been challenged, particularly at the level of aggregative prediction, on the basis of recent research not yet fully reported.

⁴For a discussion of this point of view, see Katona and Mueller, *Consumer Attitudes and Demand*, op. cit., p. 55, and Katona, "Business Expectations in the Framework of Psychological Economics," *Expectations, Uncertainty, and Business Behavior*, M. J. Bowman, ed., 1958, p. 60.

degree of optimism or pessimism that can be attributed to a respondent. By asking about what consumers would like to buy, what their hopes and fears are, and so on, one could hope to construct a better index. If one adopts the second view of the data—contingent action—then it becomes essential to find out the extent to which proposed actions depend upon other events or conditions and what the latter are. We then become interested in experimenting with direct questions about contingent actions (“iffy” questions) and in finding out the degree of association between plans, actions, and the fulfillment of various kinds of expectations. We cannot know a priori which of these two views about behavior is correct and which incorrect; empirical results provide the ultimate criteria. It is probable that both have some effect on the behavior of most households, but that actions would be better explained by one or the other. If so, we should then find out the characteristics of households whose behavior is better explained by one or the other procedure and determine the relative frequency of each in the durable goods buying population.

The present study is concerned mainly with an empirical examination of the contingent action view of household behavior. In particular, relationships of intentions to associated expectations about income, prices, and so on, are in need of intensive investigation. The analytical properties of such a model have not been studied thoroughly although some progress has been made.⁵

For our purposes, it is convenient to separate the factors related to purchase decisions into five categories, which throughout the paper are used as defined here.

1. *Personality traits* can be defined as the results of past experiences that influence the way a person thinks about economic problems. They are mainly a function of education, occupational background, and the broad socioeconomic environment, past and present. They usually reflect deeply rooted economic attitudes toward debt accumulation, savings, risk taking, and so forth. Personality traits, as defined here, would be subject to change over time but usually at a very slow rate.

2. *Recent history* can be defined as a household’s notion of what has actually taken place in the recent past: first, events that impinge directly on its financial situation—income, debts and assets, price movements, purchase of house and durable goods, increase in number of dependents, and others; second, events that have only indirect bearing, such as business conditions or political developments.

⁵See especially Okun, *op. cit.*, who summarizes the thinking on the problem and clarifies the relationship between predictions and buying intentions at the levels of individual and aggregate households.

3. *Expectations* can be defined as judgments about prospective alterations in the pattern of recent history made by a household for a specified future period. Expectations, in this sense, can be compared with actual events at the end of the specified period to determine whether they were fulfilled. In general, expectations take the form of a range of possible outcomes along with a most probable estimate rather than a single valued figure. Fulfillment is thus a somewhat imprecise concept unless it is taken to mean that the outcome lies between the extremes of the prospective range.

4. *Attitudes* are defined as opinions or feelings that can be attributed to households at some specified point in time; for example, opinions or feelings about whether the present is a good or bad time to buy. Attitudes can change over time but cannot be compared with outcomes in the same way that expectations can. Attitudes are a summary measure involving personality traits, recent history, and expectations, these variables being subjectively weighted by the household itself.

5. *Intentions* are prospective actions that the household thinks it will undertake at a more or less clearly defined date in the future. They may or may not be contingent upon future events. Intentions are also a summary measure of some combination of personality traits, recent history, and expectations subjectively weighted by the household.

Certain kinds of forward looking data obtained from surveys fall on the borderline between expectations and attitudes. For example, a question asked households about the state of the economy five years ahead appears to deal with expectations. After five years, judgment could be made—or requested—about actual business conditions during that time and one could speak of the expectation differing from or coinciding with actual events. However, “business conditions” may be such a vague phrase and “five years” such a long future period to many people that we may really be measuring attitudes rather than expectations. The same might be true of any very broad or vague questions about future events. In the same way, questions about intentions in the equally distant future may really measure attitudes rather than anything else. This is not to say that any question about expectations or intentions does not reflect attitudes or some combination of attitudes. But data that purport to be expectations or intentions may sometimes actually be, rather than reflect, attitudes.

Assuming rationality in the process of household decision making, we can specify some of the relationships that must exist among the five concepts used here. Purchase decisions, for example, must be based on personality traits, recent history, and expectations. We know relatively little about how purchases are related to these factors, particularly to expecta-

tions. Standard demand theory gives us a large number of relationships between recent history and purchases, other things being equal. Unfortunately, it tells us little about magnitudes or about the net effect of several variables moving together.⁶ These are the kinds of relationships that must be pinned down before real understanding of the decision making process can be achieved.

As a substitute for precise knowledge about all these relationships, there are findings that attitudes and intentions, both subjective summary measures, are at least partially successful in predicting what households will do, even though they cannot tell us why particular decisions are made. Some of the relationships between expectations, attitudes, and intentions can be usefully explored to provide a framework in which to interpret the empirical data discussed below.

The relationship between buying intentions and purchases can be shown to be contingent upon whether or not expectations are fulfilled. Given complete knowledge and perfect certainty about the future, we could completely explain purchases during period t_1 from buying intentions at the beginning of the period. The intentions would reflect the net impact of all relevant events, all the events would have been expected, and all would take place on schedule. We might also be able to furnish a complete explanation of purchases even if all expectations are not fulfilled, provided we know how buying intentions depend upon expectations. For this model, purchases during t_1 would be a function of intentions and of the deviation between actual and expected events during the period. We might have to consider the change—if any—in expectations beyond t_1 that take place because expectations were not fulfilled during t_1 , since this kind of change may affect behavior during t_1 .

Many outcomes seem possible, depending on how expectations for future periods are changed. It is possible that all purchase plans would be carried out with readjustment made entirely in financial plans. This could happen if income expectations during t_1 were disappointed but expectations for periods beyond t_1 changed in the opposite direction; for example, temporary deferment of an expected windfall without change in the probability of eventual realization. It seems more likely, however, that the failure of expectations to be realized during one period would result in a revision of expectations for future periods, the revision having the same algebraic sign as the difference between actual and expected in the initial period.

⁶That is, we can be fairly sure, other factors being unchanged, that purchases will increase if prices fall and that purchases will decrease if income falls, but we usually do not know whether purchases will go up or down if both fall simultaneously.

It seems reasonable to suppose that deviations between plans and purchases will be relatively slight if future expectations are changed only slightly or not at all, and relatively drastic otherwise.⁷ Thus, the initial consequence of a difference between expected and actual events would be small if the pattern of longer-term expectations were not affected. However, the impact of such differences is cumulative. If events persistently fail to accord with expectations, longer-term expectations are bound to become affected and, accordingly, actions be modified more extensively.⁸

The difficulties in proper interpretation of plans and associated expectations seem to be mainly problems of obtaining adequate data rather than of the framework for evaluating it. The major problems are to find out the nature of the expectations on which intentions are based and to find out what kinds of change in longer-term expectations take place when events fail to conform to short-run expectations. Our major concern, therefore, is with analysis of intentions data; in particular, with relationships between purchase intentions, expectations held at the time intentions are formulated, and subsequent purchases.⁹ This framework seems—at this point in our long-term investigation—the one most likely to foreshadow changes in purchase rates.

Nature of the Sample

The data presented in this paper have all been obtained from a rather special group of households belonging to Consumers Union of the United States (CU), a nonprofit product testing and rating organization. Its

⁷We are implicitly assuming that household expectations are of such a nature that one can make sensible statements about whether actual events followed or departed from them, and about how intentions that were contingent upon expectations might be altered. This rather tidy framework may not be applicable to cases where the range of possible outcomes for some event is very wide and shows little central tendency, and where intentions are contingent on the outcome of that particular event.

⁸There is some evidence from survey data to bolster this proposition. For example, the widespread expectation of retail price declines after the inflationary burst at the end of the Korean War became noticeably weaker as time passed, and prices remained at their post-Korean War level. Willingness to buy increased as consumers changed their views about prices. See Katona and Mueller, *Consumer Attitudes and Demand, 1950-52*, *op. cit.*

⁹This view is by no means generally held. There are sharp differences of opinion about the relative merits of data oriented toward reality (do you expect to buy a car next year?) and those reflecting dreams, hopes, and fears (which of the following would you like to buy?). Researchers favoring the latter kind of data argue—negatively—that intentions and expectations data (construed as judgments about specific events) are too confining to catch changes in the public's buying mood, and—positively—that important variations in purchase rates are based on changes in the rate of impulse buying, better measured by asking about hopes, dreams, and fears than by asking about intent.

annual questionnaire (mailed to over 500,000, with replies in recent years from more than 120,000) is designed to obtain information of value to the CU testing program. The questions deal mainly with subscriber reactions to the content of *Consumer Reports*, CU's monthly publication. In addition, questions about buying intentions have been included every year since 1946 (except 1953). Questions about past purchases have been asked in most years and questions about income, age, income expectations, budgeting habits, and so forth, have been included sporadically. The usual practice of CU has been to tabulate the results for a sample of about 5,000 returns.

The aggregate buying plans for the CU sample have been analyzed and found to be closely related to aggregate durable goods purchases by the United States population as a whole.¹⁰ The plans are even more closely related to purchases by the sample, as would be expected. These results were obtained despite the use of a demanding test of predictive value. In addition, the CU sample is in many ways not representative of the United States population, as in income (the median sample income is close to double that of the population), in education (percentage of college educated people is about three times that of the population), in age (the average is lower), and so forth.¹¹

At the moment, the good prediction record can be explained only by reasonable guesses. One guess is that the CU sample contains relatively more people who can and do use considerable discretion in their rate of expenditure on durables. The sample thus may contain a good share of the durable goods buying population that accounts for most of the flexibility in spending. Further, members of CU are younger and more apt to be in the early stages of household formation than are members of a random population sample.¹² The usual procedure for choosing a random probability sample may tend to underrepresent newly formed households, depending upon the proportion of new housing developments that show up on area maps. In effect, the CU sample overrepresents the population in two groups—higher income and lower age—where durable goods buyers are concentrated.

¹⁰See F. Thomas Juster, "Expectational Data and Short-Term Forecasting," unpublished Ph.D. thesis, Columbia University, 1956, and *idem.*, "The Predictive Value of Consumers Union Spending Intentions Data," *The Quality and Economic Significance of Anticipations Data*, *op. cit.*

¹¹The relationship between these characteristics of the CU sample and the problem of predictive accuracy is discussed more fully in Juster, "The Predictive Value of Consumers Union Spending Intentions Data," *op. cit.*

¹²The extreme importance of taking account of the family life cycle in analysis of durable goods purchases has been shown in numerous studies. For example, see the two articles by Morgan in *Contributions of Survey Methods to Economics*, *op. cit.*

Lastly, responses to forward looking questions from an articulate and educated group such as the CU subscriber sample may correspond more accurately to what the respondents will actually do than would responses from a random population sample. If the differences between what people in the two samples do are sufficiently stable, better predictions for the population as a whole would be expected from replies of the CU sample.¹³ It is hoped that further research now underway will clarify the matter.

Aggregate Results, 1948-1957

A notion of the over-all record for the past years can be obtained from data shown below. Tables 1 and 2 present aggregate year-to-year changes

TABLE 1

YEAR-TO-YEAR PERCENTAGE CHANGE IN VALUE OF PLANNED PURCHASES FOR CONSUMERS UNION SAMPLE COMPARED WITH SIMILAR CHANGE IN ACTUAL PURCHASES FOR U.S. POPULATION, 1948-1957

Year ^a	PERCENTAGE CHANGE IN PURCHASE OF AUTOMOBILES		PERCENTAGE CHANGE IN PURCHASE OF HOUSEHOLD EQUIPMENT		PERCENTAGE CHANGE IN PURCHASE OF TOTAL DURABLES	
	<i>Planned (CU)</i>	<i>Actual (population)</i>	<i>Planned (CU)</i>	<i>Actual (population)</i>	<i>Planned (CU)</i>	<i>Actual (population)</i>
	1948-49	-1.6	+20.0	+12.6	-7.0	+3.5
1949-50	+19.6	+41.7	+55.4	+21.7	+33.7	+29.8
1950-51	-3.5	-3.4	-11.6	-3.9	-7.2	-4.4
1951-52	-39.8	-13.9	-27.5	-9.7	-34.3	-11.0
1952-53	+29.1	+20.2	+6.6	+6.3	+18.1	+12.8
1953-54	n.a.	^b	n.a.	^b	n.a.	^b
1954-55 ^c	+52.9	+37.8	+21.6	+16.8	+39.1	+27.3
1955-56	+11.1	-9.1	-2.2	+5.8	+6.0	-2.3
1956-57	+4.3	+5.4	-4.0	+1.4	+1.4	+3.4
r^2	0.57 ^d		0.70 ^d		0.89 ^d	

In this and other tables, n.a. =not available.

^aThe beginning and end dates of the period covered by the data vary somewhat, since these depend upon when the questionnaires were mailed. A list of the precise coverage of each year is included in the appendix (Table A-24). The actual change data cover the same period as the plans.

^bThe question on buying plans was not included in the 1953 questionnaire, so we have no data on planned changes; actual changes are consequently omitted.

^cBased on 1952-53 data, since the preceding year is not available.

^dSignificant at the 5 per cent level. The correlation coefficients were actually estimated from link relatives rather than from percentage derivations. Thus, the 1948-49 observations for automobiles would be 98.4, 120.0 rather than -1.6, +20.0 as shown above. Source: Appendix Table A-24.

¹³The existence of such differences does not in itself mean worse prediction; changes in the extent of the difference would, however.

in buying plans for the CU sample, and in population purchases for two major categories (and the total) of durable goods. The figures in Table 1 show changes in aggregate value built up from data on the percentage of the sample planning to buy, estimates of the average prices they expected to pay, and estimates of the number of spending units in the population as a whole. Thus, the columns giving changes in planned purchases indicate the percentage change in planned current dollar expenditures the population would have made if their planned expenditures changed with a frequency proportional to that of the CU sample. Table 2 shows the same kind of comparison except that the number of planned expenditures, rather than their current value, is used.

Several characteristics of these data should be noted. The relationship for total durables is much closer than for either automobiles or household equipment separately. In view of the competition for priority among these purchases, the results suggest that the plans reflect some kind of buying

TABLE 2

YEAR-TO-YEAR PERCENTAGE CHANGE IN NUMBER OF PLANNED PURCHASES FOR CONSUMERS' UNION SAMPLE COMPARED WITH SIMILAR CHANGES IN ACTUAL PURCHASES FOR U.S. POPULATION, 1948-1957

Year ^a	PERCENTAGE CHANGE IN PURCHASE OF AUTOMOBILES		PERCENTAGE CHANGE IN PURCHASE OF HOUSEHOLD EQUIPMENT	
	Planned (CU)	Actual (population)	Planned (CU)	Actual (population)
1948-49	-14.6	+20.6	+2.3	-7.9
1949-50	+17.7	+55.0	+34.4	+22.9
1950-51	-5.0	-8.9	-15.1	-11.6
1951-52	-46.9	-24.9	-28.7	-10.5
1952-53	+18.4	+16.0	+1.5	+7.8
1953-54	n.a.	^b	n.a.	^b
1954-55 ^c	+35.0	+41.7	+27.7	+20.9
1955-56	+8.3	-8.8	+1.1	+6.8
1956-57	+1.8	-6.1	-4.0	+0.7
<i>r</i> ²		0.49 ^d		0.82 ^d

^aSee footnote a, Table 1.

^bSee footnote b, Table 1.

^cSee footnote c, Table 1.

^dSignificant at the 5 per cent level. The correlation coefficients were actually estimated from link relatives rather than from percentage deviations. Thus, the 1948-49 observation for automobiles would be 85.4, 120.6 instead of -14.6, +20.6 as shown above. Source: Appendix Table A-25.

mood more than firm intentions to fill some particular need. Examination of plans and purchases for individual items within the household equipment category strengthens this rather common sense notion.

The relationship between plans of the CU sample and purchases of the population is somewhat closer than the relationship between buying plans obtained in the Survey of Consumer Finances (SCF) and the same population purchases. This is especially true for household equipment items, where the Survey buying plans show practically no relationship to subsequent purchases. The relationship in the automobile category is somewhat closer and the total durables relationship is substantially closer for the CU data. Table 3 summarizes these comparisons.

TABLE 3

COMPARISON OF CORRELATION COEFFICIENTS RELATING BUYING PLANS OF CONSUMERS UNION SAMPLE AND OF SURVEY OF CONSUMER FINANCES SAMPLE TO SUBSEQUENT PURCHASES BY U.S. POPULATION, 1948-1957

Category	SQUARE OF CORRELATION COEFFICIENT (r^2) RELATING CHANGE IN BUYING PLANS TO SUBSEQUENT CHANGE IN PURCHASES	
	CU sample (eight years) r^2	SCF sample (ten years) r^2
Automobiles		
Current value	0.57	0.38
Number of units	0.49	0.36
Household equipment		
Current value	0.70	0.08
Number of units	0.82	0.08
Total durables		
Current value	0.89	0.33

Source: Appendix Tables A-24, A-25, and A-26.

The buying plans of the CU sample have, in addition to the gross relationship to purchases, considerable net forecasting value. A large part of the variation in purchases of durable goods can be attributed to variations in disposable income. The effects of income can be eliminated (statistically) by regression analysis, leaving only unexplained deviations in purchases (residuals). It turns out that these unexplained residuals are in turn closely related to CU buying plans. The plans furnish explanations for most of the residuals: some 51 per cent from an automobile purchase-income regression, 71 per cent for household equipment, and 82 per cent

for total durables.¹⁴ In the past, therefore, it has been true that the combination of disposable income and the CU buying plans accounted (statistically) for about 90 per cent of the variation in purchases of all major durables.¹⁵

The data constitute impressive evidence of the aggregate predictive value of the CU buying plans. They can hardly be conclusive, however, given the small number of observations and the resulting possibility of happenstance. Correlations of this kind are heavily influenced by large changes that are accurately caught, which has been done so far with the CU data. In addition, small changes have been caught rather accurately (except in the 1955-1956 period). At the moment one must enter the Scottish verdict of "not proven"—adding that more observations would enable us to make a firmer judgment.

¹⁴We are actually explaining residuals from an actual purchases—disposable income regression with residuals from a planned purchases—disposable income regression. The hypothesis under test is that the durables-income ratio can be predicted from the frequency of plans. But the frequency also contains an implicit income variable that should be corrected for. In principle, one should use residuals from a planned purchases—*expected* income relationship, but expected income cannot be obtained for the CU sample. The results would probably be about the same since the difference between expected income and actual income in the aggregate could not have been large during any year in the period.

¹⁵Similar calculations for the SCF buying plans indicate that about one-third of the purchases-income residuals are explained for automobiles and for total durables, while the household equipment residuals are substantially unrelated to buying plans for these items. About 85 per cent of the total variation in purchases is explained by the combination of disposable income and SCF buying plans for all three categories—automobiles, household equipment, and the total. See Appendix Tables A-22 and A-26 for basic data and regression equations.