I. Introduction

Most of the research concerning ex-ante consumer spending has centered on the consumption of autos. housing, and major household durables. This is largely due to the notion that most of the variance in consumer outlays is attributable to changes in expenditures on durable goods. One suspects that in the future, however, spending on such services and nondurable goods as vacation travel will become increasingly important, both absolutely and cyclically.1/ This paper is pre-dicated on the belief that the need to forecast vacation travel expenditures is becoming increasingly salient. In the past the subject has received limited attention, partly because it has been overshadowed by the greater need to predict the consumption of durables. It is also partly due to the difficulty in measuring spending on travel.2/ The only source for this data is the household itself, and no survey collects travel information on a frequent and regular basis. Thus, there is presently no acceptable series to use as a dependent variable in a vacation expenditures forecast equation.

The study presented here is based upon data collected in the Census-NBER Consumer Anticipations Survey (CAS). Briefly, this research oriented survey was a non-random, convenience sample drawn from Census tracts in the suburban areas of Boston, Minneapolis, and San Jose. Each household was interviewed five times at roughly six-month intervals between May 1968 and September 1970. A general profile of the 4,000 households in the sample would be: family income - \$10,000 to \$25,000; age of head -- 30 to 50 years; and value of property -- \$20,000 to \$40,000. The surveys collected a rather broad range of economic and demographic data from these households.

One of the primary objectives of the CAS research project is to investigate new areas for which consumer anticipations could be worthwhile. From the very beginning, those of us involved in the design of this survey felt that travel expenditures might be an area in which anticipations could be useful. Accordingly, it was decided that household expenditures on travel would be collected in all five interviews. Aggregate expenditures were obtained by summing the amount spent per vacation trip (on up to three trips per household) for each time period. The convention was adopted that a vacation trip counted only if it cost the household \$200 or more. Travel paid for by an employer or someone else outside the household was excluded. Additional data were gathered on the duration, distance, method of travel for each trip. Questions on the subjective probability of someone taking a trip costing \$200 or more in the next twelve months and the likely expenditure per trip were asked in the first and third visits. This study also makes use of the data on type of family, age of head, education of head, and other objective and anticipatory variables.

It should be stressed that the study presented here is a preliminary report. This paper does not utilize all of the information available and the scope is somewhat limited. It should also be noted that since the CAS is in no sense a random sample, no attempt will be made to estimate sampling errors. Results are reported simply as the findings of a biased, although hopefully useful sample.

II. The rational for Consumer Anticipations Data

Consumer anticipations surveys are premised on the failure of traditional, non-survey variables to adequately forecast outlays for durables. There seems, however, to be little evidence that this is also the case for non-durables and services. In fact, econometric models and related research have found, on the whole, that consumption of non-durables and services is highly dependent upon personal disposable income.3/ If this were true for travel expenditures as well, there would be little reason to entertain the notion of collecting travel anticipations data. In short, a survey measure of anticipated spending on travel (PPT*) cannot be tested by simply discerning whether PPT* explains a significant proportion of the variance in travel expenditures. It must also be able to explain variation net of income and other non-anticipatory variables. If anticipations are able to do this, it is possible to make a case for collecting this kind of data on a regular national sample. The Census Bureau's success over the last several years with anticipations to buy cars, houses, and house-hold durables has been modest. It is reasonable to suppose, therefore, that the case for expanding the present Survey of Consumer Buying Expectations to include travel would probably have to be most compelling.

III. Analysis of the CAS Travel Data

Some years ago, Lansing and Blood wrote about the determinants of non-business air travel in the Journal of the American Statistical Association (JASA). 4/ Although the intent of their article was quite different from this one, several of their findings are useful as a point of departure. Among their conclusions were: (1) the probability that an adult will take one or more non-business air trips increases with his income; (2) the stage in the life cycle of a person's family is important in understanding the tendency to travel by air; and (3) attitudes toward, and experience with air travel are useful in explaining air travel behavior. Since the focus here is on cyclical fluctuations in expenditures on travel, we can seemingly ignore conclusion "(3)" above. Certainly attitudes and experience affect travel, but these are much more likely to cause secular rather than cyclical changes.

Table 1A provides an indication of the relationship between income and household expenditures on travel in the CAS study.

Table 1A.--DISTRIBUTION OF CAS HOUSEHOLDS BY INCOME AND EXPENDITURES ON VACATION TRAVEL -NOVEMBER 1968 TO JUNE 1969

Characteristics	Percent not	Percent spending	Percent spending	Percent spending
	taking	\$200 to \$299 on	\$300 to \$599 on	\$600 or more on
	a trip	trips	trips	trips
INCOME ^{1/} Under \$10,000 \$10,000 to \$14,999 \$15,000 to \$19,999	72.1 60.8 51.3	14.0 18.8 18.4	11.2 14.4 17.9	2.7 6.0 12.3
\$20,000 to \$24,999	48.1	12.7	19.9	19.3
\$25,000 and over	43.0	1 3. 0	20.0	23.9

1/ Total annual income in 1967.

As in the Lansing and Blood paper, there appears to be a fairly good relationship between income and travel expenditures. Except for trips costing \$600 or more, income above \$20,000 doesn't seem to influence vacation expenditures greatly. This may be partially due to the increased likelihood of families with large incomes owning vacation homes, and thus utilizing these facilities in lieu of taking a vacation trip.

Attempts to relate travel expenditures to the stage in the life cycle were less successful. There are several possible explanations for this difference in findings. The Lansing life cycle variable was almost a dummy variable for having children. It equalled zero if children were present, 1 if married with no children or if over 45 and single, and 2 if under 45 and single. These scaling procedures would be meaningless in the CAS study because such a large proportion of the sample would be assigned a value of zero. Instead, marital status and number of children under six were used as proxies for a life cycle variable. Neither, surprisingly, were found to shed much light on travel expenditures. Age and education of head were found to be more useful. (See Table 1B, and 1C.)

Table 1BDISTRIBUTION	\mathbf{OF}	CAS	HOUSEHOLDS	BY	AGE	OF	HEAD	AND	EXPENDITURES	ON	TRAVEL	-
			NOVEN	IBEF	196 1	8 1	ro JUI	VE 19	969			

Characteristics	Did not	Percent spending	Percent spending	Percent spending
	take	\$200 to \$299 on	• \$3 00 to \$ 599 on	\$600 or more on
	a trip	trips	trips	trips
AGE OF HEAD ^{2/}				
Under 30 years	68.9	14.7	7.9	8.4
	61.5	16.3	14.1	8.1
	52.0	20.7	17.6	9.6
	53.7	17.0	17.8	11.5
	54.2	13.4	18.9	13.6
	53.8	19.6	14.7	11.9

 $\frac{1}{2}$ The convention was adopted that a trip counted only if the household spent \$200 or more. $\frac{2}{2}$ Age as reported in the first CAS interview (May 1968).

Table 1C.--DISTRIBUTION OF CAS HOUSEHOLDS BY EDUCATION OF HEAD AND EXPENDITURES ON TRAVEL -NOVEMBER 1968 TO JUNE 1969

Characteristics	Did not	Percent spending	Percent spending	Percent spending		
	take	\$200 to \$299 on	\$300 to \$599 on	\$600 or more on		
	a trip ¹ /	trips	trips	trips		
EDUCATION OF HEAD ^{2/}						
High school or less	63.4	15.6	14.7	6.3		
1 to 3 years of college	59.0	16.1	13.7	11.2		
4 years of college	56.3	17.5	15.2	11.0		
5 years of college or more	46.6	17.1	20.8	15.5		

1/ The convention was adopted that a trip counted only if the household spent \$200 or more.

2/ Education of head as reported in the first CAS interview (May 1968).

In general, the probability of a family taking a vacation trip and their chances of spending large sums on trips increase with age and education. These tables, however, do not separate the tangled influence of income, education, and age. Nevertheless, it is interesting to observe the nearly monotonic relationship between education and travel in Table 1C.

Attention is now focused on the subjective travel anticipations variables. In the past we have mainly concerned ourselves with relating the consumer's expected behavior in the period with his actual behavior in a subsequent period. Increasingly, however, we are inclined to think that the first differences in reported anticipations are an important consideration. In the CAS survey we asked respondents, "What are the chances that you will take a vacation trip costing \$200 or more during the next 12 months?" Respondents answered by giving one of the numbers on an eleven point scale card (0, 10, 20, ... 100). The first difference is simply the remainder of the reported anticipation in the first period minus the reported anticipation in the second period. Table 1D shows the average change in travel expenditures by income and the first difference in reported subjective probability of taking a trip costing \$200 or more. The relationship is not perfect, but the numbers do move in the right direction for the most part.

Table 1D .-- AVERAGE CHANGE IN EXPENDITURES ON TRAVEL BY INCOME AND CHANGE IN PROBABILITY OF TAKING A TRIP

	Change in reported probability of taking a trip										
Characteristic	-100 to -80	-70 to -50	-40 to -20	-10 to +10	+20 to +40	+50 to +70	+80 to +100				
INCOME ^{1/}											
All households.	-\$ 68	-\$ 73	\$12	\$ 39	\$ 153	\$3 8	\$ 152				
	(3, 527)	(3, 527)	(3,527)	(3,527)	(3, 527)	(3,527)	(3, 527)				
Under \$5,000	-\$3 05	\$ 375	\$118	\$ 28	\$20	\$\$250	\$203				
	(27)	(4)	(8)	(46)	(5)	(4)	(16)				
\$5,000 to \$9,999	-\$ 94	-\$ 69	-\$103	\$22	\$ 110	\$41	\$ 85				
	(84)	(31)	(38)	(280)	(14)	(12)	(44)				
\$10,000 to \$14,999	-\$ 37	\$51	\$25	\$ 57	\$ 23	-\$ 77	\$ 159				
	(369)	(83)	(108)	(529)	(67)	(38)	(100)				
\$15,000 to \$19,999	\$ 70	\$ 35	\$ 102	-\$ 3	\$256	\$ 96	\$105				
	(295)	(35)	(79)	(293)	(36)	(27)	(81)				
\$20,000 to \$29,999	-\$38	-\$ 60	\$14	\$110	\$267	\$ 88	\$251				
	(190)	(29)	(46)	(166)	(20)	(18)	(49)				
\$30,000 and over	-\$ 1 33	-\$ 303	-\$33 6	-\$ 6	\$513	\$250	\$169				
	(112)	(15)	(15)	(85)	(11)	(5)	(13)				

(Total number of households in each cell shown in parentheses)

1/ Total annual income in 1967.

Table 3 displays the R-squares, regression coefficients, & 's, and Sy.x for nine regression equations. (See Table 2 for the definition and scaling of individual variables.) In all of the equations, the dependent variable is the actual expenditures on vacation travel from June 1968 to November 1968 (EXPV₂). Expected expenditures on travel (EEV,*) completely dominates all the equations in which it is included. Only total income (I1967) is also clearly significant in all of the equations in which it appears. In fact as long as EEV_1 * and I_{1967} are included, no other variables improve the regression equation. In most of the equations, however, education of head (EH₁) explains a significant portion of the variance. Other objective variables such as marital status, number of children, and number of children under six years are seldom significant. A priori, it would have seemed likely that the number of children under six would have proved more useful. Liquid assets (LA_1) is significant both times it appears in the equation. But LA_1 does not reduce Sy.x or improve R^2 .

The performance of the attitudinal variables is also somewhat disappointing. Neither expected business conditions (EBC₁*) nor good or bad time

to buy durable goods (TB₁*) explain a significant

portion of the variance in household vacation expenditures. Attitudinal variables, of course, have never performed particularly well in cross-section studies. Consequently, this does not necessarily mean that attitudinal variables would also perform poorly in a time series study of vacation travel expenditures.5/ The five regression equations in Table 4 relate changes in the objective and subjective variables with the change in expenditures on vacation trips. The results in general are quite similar to those reported above. The major exception is that the only significant first difference is expected vacation expenditures (Δ EEV₁*). None of the

other first differences make any contribution to the regression equation. It is also interesting to note that actual expenditures on vacations in the previous period (EXPV_2) is highly significant.

In a sense, EXPV₂ is a stock variable.

Summary

A number of variables which are worthy of study do not appear in these equations, but will be examined in the future. Among these are spending on durable goods, changes in assets and debts, permanent income, and ownership of vacation homes. The analysis presented above, however, indicates that anticipated expenditures on travel is a powerful variable in a cross-section study of household expenditures on travel. Income, although much weaker, also appears to be fairly important. Other objective variables such as the number of children under six, age of head, education, and liquid assets seem to be rather weak determinants of household spending on vacation travel.

Table 2.--CAS VARIABLES INCLUDED IN REGRESSION ANALYSIS

- AH_1 = Age of head (as reported in the first CAS interview)
 1 = Under 25 years
 2 = 25 to 29 years
 3 = 30 to 34 years
 4 = 35 to 39 years
 - 5 = 40 to 44 years 6 = 45 to 54 years 7 = 55 to 64 years 8 = 65 years or older
- $AW_1 = Age of wife$

Scaling is same as for AH₁

- $EH_{1} = Education of head$
 - 1 = no education 2 = 1 to 8 years of elementary school 3 = 1 to 3 years of high school 4 = 4 years of high school 5 = 1 to 3 years of college 6 = 4 years of college 7 = 5 or more years of college
- EW_1 = Education of wife

Scaling is same as for EH1

 $NC_1 = Number of children$

1 = no children
2 = 1 child
3 = married, 1 child, and head under 45

4 = married, 1 child, and head over 45 5 = married, no children 6 = single, no children

NC6, = Number of children under six years

Same as NC,

LA₊ = Amount in liquid assets

Actual dollar amounts (5 digits)

 Δ LA = Amount in liquid assets in period t minus amount in liquid assets in period t -1

 EBC_{+} = Expected business conditions

- 1 = much better
- 2 = better
- 3 = about the same, don't know
- 4 = worse

5 =much worse

EXPV₂ = Actual expenditures on vacation travel expenditures in the second interview

Actual dollar amounts (5 digits)

- Δ EBC_1= Expected business conditions in period t minus expected business conditions in period t -1
- TB_t = Good or bad time to buy large durable goods
 - 1 = very good
 2 = good
 3 = partly good, partly bad; don't know
 4 = bad
 - 5 = very bad
- Δ TB₁ = Good or bad time to buy in period t minus good or bad time to buy in period t -1
- VX_t = Vacation expenditures by household since last visit

Actual dollar amounts (5 digits)

- $\Delta VX_1 = Vacation expenditures in period t minus vacation expenditures in period t -1$
- EEV * = Expected expenditures on vacations (the product of a household's probability of taking a trip and their likely expenditures if they do take a trip)

Actual dollar amount (5 digits)

∆ EEV*= Expected expenditures on vacations in period t minus expected expenditures in period t -1

I = Total annual income from all sources

Actual dollar amount (5 digits)

 ΔI_1 = Total annual income for year y minus total annual income for year y-1

Faultion	2	REGRESSION COEFFICIENTS											
number	R [≁]	I ₁₉₆₇	AH	EHl	NC6 ₁	·NC	LAl	™s _l	eev _l *	EBC ₁ *	TB ₁ *	Ø	Sy.x
I	.24	0.003 (3.03)	15.81 (2.72)	19.1 (2.68)					0.35 (18.55)			-120.71	355.22
II	•24	0.004 (3.96)			-11.94 (-1.05)				0.35 (18.52)		·	50.28	356.16
III	.24	0.004 (4.06)							0 .3 5 (18.67)	15.74 (1.42)		0.553	356.07
IV	.14	0.008 (7.94)	17.43 (2.26)	2.51 (0.64)								-96.97	400.72
۷	.25	0.004 (3.67)	17.37 (2.93)	18.73 (2.62)			-0.002 (-2.28)		0 .36 (18 . 67)	11 .33 (1.02)		-149.38	3 54.79
VI	•25	0.004 (3.54)	7.56 (0.63)	19.08 (2.64)	-0.002 (-2.27)			29 .3 1 (0.64)	0.36 (18.58)	11.92 (1.07)	-6.12 (-0.59)	-163.91	3 54•94
VII	•24	0.004 (4.07)							0 .3 5 (18.67)	15.66 (1.42)		0.94	356.14
VIII	.24	0.004 (4.05)							0 .3 5 (18.63)			42.6	356.17
IX	.25	0.004 (3.41)	7.06 (0.59)	19.91 (2.42)	-2.31 (-0.17)	3.40 (0.58)	-0.002 (02.20)	30.39 (0.67)	0.36 (18.49)	12.04 (1.08)	-6.11 (-0.59)	159.77	355.20

Table 3.--REGRESSION EQUATIONS WITH OBJECTIVE AND ANTICIPATORY VARIABLES, DEPENDENT VARIABLE IS HOUSEHOLD VACATION EXPENDITURES

(t values are shown in parentheses)

NOTE: In order to test several hypotheses the CAS sample was split into A and B segments. The regression equation shown above are based on the 1747 households included in the A segment. The numbers shown above are coefficients for the variables included in each equation.

Table 4.--REGRESSION EQUATIONS WITH SELECTED OBJECTIVE AND ANTICIPATORY VARIABLES, DEPENDENT VARIABLE IS CHANGES IN VACATION EXPENDITURES

number	₽ ²	$\triangle \texttt{Eev}_1*$	$\Delta \mathbf{I}_1$	$\Delta \operatorname{Ebc}_1*$	∆ тв_т*			EXPV ₂	8	S y. x
I	0.14	0.35 (16.56)	0.003 (1.68)						2.79	520.21
II	0.14	0.35 (16.56)	0.003 (1.69)	-5.20 (-0.43)					2.41	520 .33
III	0.14	0 .3 5 (16.54)	0.003 (1.65)	-5.80 (-0.48)	6.00 (0.52)				2.95	520.44
IV	0.14	0 .3 5 (16.50)	0.003 (1.60)	5.83 (-0.48)	5.9 3 (0.51)	0.0002 (0.15)			2.53	520.59
۷	0.45	0.35 (18.38)		-5.88 (-0.61)			0.30 (12.52)	-0.88 (-31.6)	100.56	414.98

(Numbers in parentheses are t-values)

NOTE: In order to test several hypotheses the CAS sample was split into A and B segments. The regression equations shown above are based on the 1747 households included in the A segment. The numbers shown above are coefficients for the variables included in each equation.

FOOTNOTES

1/ Detailed household travel expenditures will be collected in the 1972 Consumer Expenditures Survey sponsored by the Bureau of Labor Statistics. It will then be possible to compare them with 1961 expenditure data.

2/ Part of the difficulty lies in the fact that travel expenditures are spread out over a rather large number of non-durables and services. 3/ See Michael K. Evans and Lawrence R. Klein, <u>The Wharton Econometric Forecasting Model</u> (2nd edition, University of Pennsylvania, Economics Research Unit, 1968).

4/ John B. Lansing and Dwight M. Blood, "A Cross-Section Analysis of Non-business Air Travel," Journal of American Statistical Association, December 1958.

5/ See F. Gerard Adams, "Prediction With Consumer Attitudes: The Time Series-Cross Section Paradox," <u>Review of Economics and Statistics</u>, November 1965.