

AN EMPIRICAL INVESTIGATION OF THE RELATIVE
EFFECTS OF WINDFALL INCOME AND PERMANENT
INCOME ON CONSUMPTION: A PARTIAL TEST
OF FRIEDMAN'S PERMANENT INCOME HYPOTHESIS

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INTRODUCTION

The permanent income hypothesis has served several purposes in consumption spending theory and policy. It has contributed to the reconciliation of short run and long run estimates of the consumption function and identified lags in the reactions of consumers to changes in income. Knowledge of the lags permits a better understanding of the timing of government policy effects. In addition, it has introduced a framework for explaining consumer reactions to transitory and permanent income changes. The 1968 tax surcharge episode and other temporary government actions¹ such as current reversals in tax policies have established the importance of the policy implications.

The hypothesis is open to empirical testing as well as requiring estimation of the parameter values. Many tests have been performed with little consensus on the validity of the hypothesis or parameter values. The 1972-73 Consumer Expenditure Surveys provide an opportunity to improve the tests by a well defined windfall and inclusion of extensive information on socioeconomic characteristics of consumers. These variables also permit the use of an instrumental variable for permanent income, and reduce the measurement error inherent in current income. An improved specification and estimation technique are necessary to obtain an accurate test of the hypothesis and estimate of parameter values.

The objective of this paper is twofold: first, to test the validity of the permanent income hypothesis using the most recent Consumer Expenditure Survey. Specifically, the study examines (a) the magnitude of the marginal propensity to consume out of windfall income as compared with permanent income; (b) the relationship between measured consumption and permanent and windfall income; and (c) the degree of correlation between windfall and permanent income. The second objective is to compare the results of testing the hypothesis through the use of the traditional least square regression analysis versus the instrumental variables approach.

REVIEW OF PREVIOUS STUDIES

An important assumption of Friedman's [5] Permanent Income Hypothesis is that transitory income and consumption are uncorrelated. The marginal propensity to consume out of transitory income is zero in the current period due to the structure by which transitory income affects wealth and permanent income.

Bodkin [2] was the first researcher to empirically test the validity of that assumption. The test was a looser version than Friedman suggested, requiring that the marginal propensity to consume out of transitory income, through possible greater than zero, be considerably smaller than the marginal propensity to consume out of permanent income. By examining the effect on consumption of a windfall receipt reported by 1,414 veteran recipients of the National Service Life Insurance, he reported a marginal propensity to consume out of windfall income of .966 when purchases of durable goods were included as consumption expenditures, and .723 when durables were excluded. Based on these estimates, Bodkin concluded that there is a strong tendency to spend windfall income, contrary to Friedman's assumption.

Kreinin [10] measured consumption expenditures of eighty Israeli recipients of sizeable restitution payments made by Germany. The results indicated that the marginal propensity to consume out of the restitution payments was .167 when durables were included as consumption expenditures, and .156 when durables were excluded. Kreinin concluded that his results strongly favor the permanent income hypothesis.

Laumas [12] argued that the restitution payments had been the subject of prior negotiations and anticipated by the recipients, therefore, cannot be properly classified as transitory income.

Reid [16] using observations from the 1950 Survey of Consumer Expenditures arrived at the conclusion that transitory income caused an increase in net assets, including consumer durables. The marginal propensity to consume out of transitory income was less than the marginal propensity to consume out of disposable income, consistent with Freidman's hypothesis. By using 32 residential-place averages, instead of individual observations, to increase the likelihood of zero mean transitory income, she found a correlation between money income and consumption expenditures, excluding autos, furnishings, and equipment of .926. When windfall income was substituted for money income the correlation fell to .043.

Bird and Bodkin [1] re-examined the data used by Bodkin [2] by adding a number of additional proxies for permanent income in their regression equations with the intended purpose of minimizing the impact on results if the windfall was serving as a proxy for permanent income, as suggested by Jones [9]. The results supported Bodkin's previous conclusions.

Landsberger [11] stratified 297 Israeli windfall recipients into five groups according to the size of the windfall. The average nonwindfall income was approximately similar among the groups. His analysis showed a

consistently declining marginal propensity to consume nonwindfall income, consistent with the permanent income hypothesis and lending support to Kreinin's results.

Doenges [4] studied the consumption and savings uses of 598 households in Boulder, Colorado, who received windfall income. He found that larger receipts tended to be saved and smaller ones had a greater tendency to be spent. This conclusion is similar to Landsberger's.

Laumas in two studies [12; 13] found that while the marginal propensity to consume transitory income was less than the marginal propensity to consume permanent income, the marginal propensity to consume transitory income was quite high, much as in Bodkin's studies [2; 1].

Holbrook [8], investigating the time horizon of income that affects consumer behavior, concluded that the empirical data supported a fairly short time horizon and that the distinction between permanent income and current income might be quite small.

Darby [3] found that the marginal propensity to consume transitory income was often small but consistently significant and was occasionally relatively high though smaller than the marginal propensity to consume permanent income.

The empirical tests reviewed above indicate inconsistent findings with respect to the permanent income hypothesis. Four studies [4, 10, 11, 16] show support for the contention that the marginal propensity to consume windfall income is quite small compared to the marginal propensity to consume permanent income which is consistent with Friedman's [6] later thoughts on the permanent income hypothesis. However four studies [1, 2, 12, 13] found the marginal propensity to consume windfall income to be quite large which is inconsistent with the permanent income hypothesis. Another study [3] provided results that both supported and rejected the permanent income hypothesis. The inconsistency

suggests that at the very least there may be conditions under which the permanent income hypothesis does not describe consumption behavior. Given the policy implications of changes in permanent and windfall income, it is important to test the permanent income hypothesis and probe for an explanation of the inconsistent empirical results.

DATA AND VARIABLES

The interview component of the 1972-73 Consumer Expenditure Surveys was the data base for this research. The specific data analyzed were from the 1973 survey year.

Three groups of consumer expenditures were used as the dependent variables in this study. The first representing consumer expenditures on durable commodities included house furnishings and equipment, household textiles, furniture, major appliances, small appliances, housewares, and clothing. The second category representing semi and nondurable commodities included: food, alcoholic beverages, tobacco, fuel and utilities, health insurance, shelter, transportation, health care not paid by insurance, personal care, and recreation. The third group was total consumer expenditures, the sum of the first two.

The explanatory variable of windfall income termed "other money receipts" by the Bureau of Labor Statistics, and is defined as "inheritances and occasional large gifts of money from persons outside the family...and net receipts from the settlement of fire and accident policies" [18]. Two concerns with any measure of windfall income are that it is unanticipated, so that recipients have not already adjusted permanent consumption, and that it be uncorrelated with current income. If the windfalls are anticipated, wealth is increased and the flow of permanent income therefore is also increased in

the period in which the windfall is announced and in all subsequent periods, but since measured income does not increase immediately, the windfalls result in negative transitory income from the time it is announced until the actual windfall is received. Therefore, only if the announcement and receipt of the windfall occur in the same period are transitory and permanent income uncorrelated [6]. We maintain that the above definition of "other money receipts" would represent unanticipated income. The simple correlation coefficient between this measure of windfall income and current income is .041 for the data used in the present study and the partial correlation, given all other variables in the regression is -.07. Windfall income also has a low correlation with each of the other socioeconomic variables. Money income as an independent variable was used as a proxy for permanent income and did not include "other money receipts."

The importance of socioeconomic variables in affecting consumer behavior is well documented and is readily apparent from the amount of treatment devoted to the topic in consumer behavior texts [e.g. 14]. Indeed, Friedman [5] explicitly recognizes the impact of socioeconomic variables on consumption. In spite of their importance, very few studies of windfall income have controlled for their impact.

Some of the previous tests of the permanent income hypothesis may be grouped into three categories according to their consideration of socioeconomic variables. Several tests have considered no socioeconomic variables, and estimated either consumption or savings as a simple function of income. Some tests chose only data which had similar characteristics in family size, age of head of household, employment status and income. These studies usually estimated the function for all observation and then for subsamples according to a few socioeconomic characteristics. A third type of

test included some, but usually only a few, socioeconomic variables. The most extensive was Bird and Bodkin's [1] estimate which considered whether the family was a homeowner, had purchased a house that year, housing cost and interaction with the homeowner variable, age and education of the head of household and extensive dummy variables for geographic location. Table 1 classifies studies on the basis of these three categories.

Insert TABLE 1 about here

Neglect of the socioeconomic influences implies there is some specification error due to omitted variables, and those which chose samples according to values of socioeconomic characteristics will produce less efficient estimates than if the full sample can be used. In this study we controlled for the impact of certain socioeconomic variables thought to have an impact on consumption. Region of the country was expressed by three dummy variables for those living in the South, Central, and West with those living in the East being coded as zero on all three dummy variables. Size of the household was measured as the number of resident family members. Marital status of head of household was a dummy variable (1 = not married). Race was a dummy variable (1 = nonwhite), as was sex of the head of household (1 = female.) The occupation of the head of household was expressed by four dummy variables for those in white collar occupations, blue collar occupations, self-employed and retired, with all other occupations being coded as zero on all four dummy variables. Educational level of the head of household was treated as a dummy variable (1 = attended or graduated from college). Employment status of the head of household was expressed as two dummy variables, part-time indicating that the head of the household usually worked less than 35 hours per week and full-time indicating that the head of the

household usually worked more than 35 hours per week while the unemployed were coded as zero on both dummy variables. Age of the head of household was measured in years and wealth as the sum of the dollar value of the market values of an owned home and financial assets held.

The full sample had 19975 observations of which 2835 reported windfall income greater than zero. Since income below \$2000 was reported as \$2000 and those above \$36,000 were reported as \$36,000, these two terminal values were deleted resulting in 2327 observations. These 2327 observations were subdivided into recipients for whom windfall income was less than ten percent of their reported income and those whose windfall income was ten percent or more of their reported income to test the hypothesis that relatively small windfalls are spent differently than relatively large windfalls as suggested by Landsberger [11] and Doenges [4].

Method of Analysis

Two methods of estimation have been used to provide comparison. Previous studies have relied on OLS to estimate the consumption function, and that method was applied to be consistent with earlier studies. Then, the Instrumental Variables approach was used as it is a superior technique for this type of problem. Results may be compared to illustrate the gain of the better specification.

The use of OLS carries the assumption that the independent variables are uncorrelated with the error term, which is necessary for the estimates to be consistent. If variables are measured with error, even if it is uncorrelated with the independent variables, the assumption should not be made and OLS will be biased and inconsistent. This problem appears in testing the permanent

income hypothesis. The hypothesis is that permanent consumption is a function of permanent income:

$$C_p = f(Y_p)$$

Permanent consumption and permanent income are both unobservable variables since their values depend on expected consumption and income. Consumption and income as measured may be defined as being composed of two unobservable parts, permanent and transitory.

$$C_{\text{measured}} = C_{\text{permanent}} + C_{\text{transitory}}$$

$$Y_M = Y_p + Y_T$$

An attempted OLS estimate of measured consumption on measured income, if the permanent income hypothesis is true, would involve measurement error in both variables, the error being the transitory parts of each. Measurement error in the dependent variable appears as part of the residual, but the error of transitory income would result in biased and inconsistent estimates. While OLS results are presented, they and the OLS results of previous studies contain that statistical defect.

Instrumental variables provide an approach to the problem of measurement error which in this context, is also quite appropriate to testing the permanent income hypothesis. It must be assumed also that permanent income depends on certain other variables so that an instrument can be created for permanent income. In doing so, transitory income may be isolated. Permanent income is assumed to be a function of socioeconomic variables such as geographic region, age, sex, race and occupation.²

Then a regression of measured income on the set of socioeconomic variables serves two purposes. The fitted values of the regression produce an instrumental variable for permanent income. The measurement error of income becomes merged with the residual to isolate transitory income, which will also be uncorrelated with the instrument.³ The residual of this regression is

interpreted as predominantly transitory income and is added to our previous variable for "other money receipts", yielding a more comprehensive measure of transitory income. The new variable takes on both positive and negative values, whereas previous studies and our own OLS estimates allowed only positive transitory income.

RESULTS

Tables 2, 3, and 4 present the OLS analysis for the total sample, the portion of the sample with windfall less than ten percent of total income and the portion of the sample with windfalls greater than ten percent of their total income.⁴

Insert TABLES 2, 3, and 4 about here

The consumption functions for each sample were established for total consumption, durable goods consumption, and consumption that was clearly not for durable goods. Socioeconomic variables that were consistently significant included: size of household, marital status of the head of the household, education, wealth, age of head of household, occupation, race and sex.

Table 5 presents the results of the instrumental variables analyses for the total sample and the two subsamples.

Insert TABLE 5 about here

In general, all of the independent variables were significant in the instrumental variables analyses. As in the OLS analyses, wealth was consistently significant. Table 6 presents a summary of the windfall and permanent income coefficients from the OLS and instrumental variables analyses.

Insert TABLE 6 about here

The marginal propensity to consume out of windfall income has been found to be positive in this and most other studies, whereas the strict interpretation of Friedman's proposition would imply a value of zero. A test was performed to determine whether the marginal propensities to consume out of windfall and permanent income were significantly different. This was done by redefining the income variable to include the windfall, so that the coefficient on windfall income alone represents its difference from the marginal propensity to consume out of permanent income [15]. A negative coefficient is expected for the marginal propensity to consume out of windfall to be less. For the total sample and both subsamples, OLS and instrumental variables estimates, the coefficients of windfall income were significant. It was negative for the total sample estimates and for the subsample for large windfalls, but positive for the subsample of small windfalls. Thus, the marginal propensity to consume out of windfall income is significantly lower than the marginal propensity to consume out of permanent income except that it is significantly larger for the small windfall sample.

CONCLUSIONS AND IMPLICATIONS

The OLS and instrumental variables analyses provide clear support for Friedman's permanent income hypothesis when the windfall is large relative to regular income. However, when windfall income is small relative to regular income, the marginal propensity to consume windfall income is greater than the marginal propensity to consume regular income thus rejecting Friedman's permanent income hypothesis. This finding suggests that a fruitful area for further research would be an investigation to determine the level of windfall

income relative to regular income where Friedman's permanent income hypothesis begins to be violated.

OLS and instrumental variables techniques provided similar results in most cases. In a setting of clear and important measurement error it is interesting to note that parameter estimates were often quite close. In most cases, OLS provided lower estimates of marginal propensities to consume than did instrumental variables, indicating that the bias of OLS has been in favor of supporting the permanent income hypothesis. However, both estimates would result in the same implications regarding relative effects of changes in windfall and permanent incomes.

The results reported in this paper also have clear implications for economic policy. In the short run, the results indicate that a relatively small windfall income would be more effective, dollar for dollar, than changes in permanent income in generating consumption. In recessionary times, a small windfall income increase would do more to stimulate consumption immediately than comparable size long term changes in the tax rates. Conversely, changes in permanent income and large relative windfalls would be more likely to be effective in encouraging savings and purchase of consumer durables than relatively small windfall incomes, but there would likely be a longer lag for the effect. This paper not only provides a partial test of the permanent income hypothesis, but also has strong implications for economic policy drawn from the insights generated concerning the relative impacts of windfall and regular incomes on consumption. Furthermore, the moderating influence of socioeconomic variables on consumption and on estimating the relative impacts of windfall regular income on consumption has been amply demonstrated.

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FOOTNOTES

¹Several articles have discussed the 1968 tax surcharge in terms of the permanent income hypothesis, such as [17].

²The estimate had an R^2 of .40, $F = 24.90$ and t-values were significant for the following variables: Size of the family, Not Married, College, Age, Sex, Full-time work.

³Hayashi also identifies the error as transitory, but uses an instrumental variables approach as a solution to a different error problem and not to isolate the transitory component.

⁴Chow tests were performed on OLS and instrumental variable estimates which indicate a difference in structures between the subsamples of windfalls greater than ten percent of income and windfalls less than 10 percent of income for total consumption and for nondurable consumption. The tests indicated no difference for durables.

Table 1

Socioeconomic Variables in Previous Studies

No Socioeconomic Variables	Sample Chosen by Socioeconomic Characteristics	Some Socio-Economic Variables
Darby (1974)	Bodkin (1959)	Bird and Bodkin (1965)
Doenges (1966)	Jones (1960)	Bodkin (1959)
Holbrook (1967)	Kreinin (1961)	Jones (1960)
Laumas (1969)		Landsberg (1966)
Laumas and Mohabbat (1972)		Reid (1962)

TABLE 2

Ordinary Least Squares Regression: Sample in Which Windfall/Income is > 0 (n=2327)

Independent Variables	Total Consumption	Semi and Nondurables	Durables
Regular Income	.36a	.28a	.08a
Windfall Income	.08a	.05a	.03a
Central	-245.25	-87.66	-157.59
South	24.19	61.97	-37.78
West	86.70	226.99	-140.28
Family Size	461.89a	452.53a	9.35
Not Married	-548.15c	52.52	600.67a
Race	-234.85	-774.08b	539.23a
College	374.82c	350.83b	23.99
Blue Collar	-946.16b	-783.03b	-163.12
White Collar	-750.62c	-711.78c	-38.84
Self-employed	-91.73	-214.92	123.18
Retired	-330.23	-344.44	14.21
Wealth	-.01a	.01c	.01a
Age	-18.92a	-7.44	-11.48a
Sex	133.98	-314.39	448.37a
Part-time work	598.90	665.10	-66.20
Full-time work	711.08	648.76	62.32
Constant	3469.14	2472.55	996.59
Adjusted R ²	.57	.52	.26
F	172.18	138.78	46.82
Standard Error	3024.25	2644.98	1324.83
Mean Value of Dependent Variable	8842.36	7310.73	1531.63

a Significant at the .001 level
 b Significant at the .01 level.
 c Significant at the .05 level.

TABLE 3

Ordinary Least Squares Regression: Sample in Which Windfall/Income is < .10 (n=1753)

Independent Variables	Total Consumption	Semi and Nondurables	Durables
Regular Income	.38a	.29a	.09a
Windfall Income	1.24a	.94a	.30a
Central	-43.13	55.56	-98.70
South	132.02	83.88	48.14
West	69.78	155.42	-85.64
Family Size	465.96a	458.13a	7.38
Not Married	-43.17	555.35c	-598.51a
Race	-205.00	-732.06c	527.06a
College	325.24c	287.24c	47.99
Blue Collar	-900.48c	-712.05c	-188.43
White Collar	-751.43c	-638.48c	-112.94
Self-employed	-227.31	-137.33	-89.98
Retired	-321.73	-378.38	56.65
Wealth	.006	.01	.005b
Age	-16.01b	-3.88	-12.13a
Sex	-142.29	-664.11c	521.82a
Part-time work	723.50	668.34	55.16
Full-time work	740.59	698.92	41.66
Constant	2669.97	1829.53	840.44
Adjusted R ²	.60	.54	.29
F	145.65	114.70	40.66
Standard Error	2867.98	2544.84	1230.80
Mean Value of Dependent Variable	8936.35	7418.73	1527.62

a Significant at the .001 level
 b Significant at the .01 level.
 c Significant at the .05 level.

TABLE 4

Ordinary Least Squares Regression: Sample in Which Windfall/Income is $\geq .10$ ($n=574$)

Independent Variables	Total Consumption	Semi and Nondurables	Durables
Regular Income	.32a	.26a	.06a
Windfall Income	.04c	.02	.02c
Central	-702.11	-458.97	-243.14
South	-137.72	53.03	-190.76
West	115.08	382.92	-267.84
Family Size	550.20a	517.58a	32.63
Not Married	-1498.83b	-883.54	615.29c
Race	-264.71	-852.73	588.02
College	273.50c	328.04	-54.54
Blue Collar	-1216.80	-1076.18	-140.63
White Collar	-1010.85	-1120.41	109.55
Self-employed	-515.64	-946.11	430.47
Retired	90.17	76.87	13.30
Wealth	.03a	.02a	.01b
Age	-34.58a	-22.62b	-11.95c
Sex	939.71	569.72	370.00
Part-time work	889.90	1100.66	-213.76
Full-time work	1294.16	1069.55	224.61
Constant	4782.09	3532.13	1249.96
Adjusted R ²	.53	.48	.21
F	37.13	30.94	9.54
Standard Error	3329.91	2837.82	1571.36
Mean Value of Dependent Variable	8555.31	7011.42	1543.88

aSignificant at the .001 level
 bSignificant at the .01 level.
 cSignificant at the .05 level.

TABLE 5

Instrumental Variables Regression: Sample in Which Windfall/Income is > 0 (n=2327)

Independent Variables	Total Consumption	Semi and Nondurables	Durables
<u>Windfall/Income Is > 0 (n=2327)</u>			
Regular Income	.47a	.42a	.09a
Windfall Income	.06a	.18a	.02a
Wealth	.05a	.01c	.01a
Constant	1892.85	1638.99	92.05
Adjusted R ²	.38	.45	.16
F	479.31	623.36	145.63
Standard Error	3626.28	2831.73	1415.55
<u>Windfall/Income Is < .10 (n=1753)</u>			
Regular Income	.44a	.43a	.08a
Windfall Income	1.93a	.30a	.46a
Wealth	.05a	-.00	.01a
Constant	1875.86	1723.41	131.72
Adjusted R ²	.40	.52	.17
F	390.17	623.68	117.05
Standard Error	3503.09	2606.85	1333.68
<u>Windfall/Income Is > .10 (n=574)</u>			
Regular Income	.39a	.39a	.11a
Windfall Income	.09a	.09a	.03b
Wealth	.01c	.01c	.01b
Constant	1777.85	1777.85	-22.81
Adjusted R ²	.38	.38	.16
F	119.88	119.88	37.40
Standard Error	3103.48	3103.48	1621.88

TABLE 6

Marginal Propensities to Consume Windfall (MPC-W)
Income and Regular Income (MPC-I)

Consumption Group	Least Square Regression		Instrumental Variables Approach	
	MPC-I	MPC-W	MCP-I	MPC-W
	<u>Total Sample (n=2327)</u>			
Durables	.08	.03	.09	.02
Semi and nondurables	.28	.05	.42	.18
Total	.36	.08	.47	.06
	<u>Sample with W/I \geq 10% (n=574)</u>			
Durables	.06	.02	.11	.03
Semi and nondurables	.26	.02	.39	.09
Total	.32	.04	.49	.07
	<u>Sample with W/I < 10% (n=1753)</u>			
Durables	.09	.30	.08	.46
Semi and nondurables	.29	.94	.43	.30
Total	.38	1.24	.44	1.93