

## **The Wealth and Reverse Wealth Effects: Insights from the Survey of Consumer Finances**

**Joann Fredrickson**  
*Bemidji State University*

### **Abstract**

I examine the usefulness of prospect theory and the behavioral life cycle hypothesis to expand upon existing scholarship relating to the wealth and reverse wealth effects. Data from the Survey of Consumer Finances suggest asymmetrical responses in consumer spending to increases and decreases of wealth. The analysis controls for a series of behavioral, demographic, and financial variables.

## **Introduction**

The past decade has seen dramatic changes in stock prices and housing values and, consequently, shifts in household wealth. Between its historic high in October 2007 to its full recovery in March 2013, the U.S. stock market plummeted over 54%. In the U.S. housing market, the average home price has declined 30% from its July 2006 peak (S&P Dow Jones Indices, 2013). As the country struggles through a jobless recovery from the Great Recession and housing values begin to show signs of improvement, an examination of how wealth impacts household spending seems more relevant than ever.

Considerable research has sought to estimate wealth increase on consumption. Recently, Carroll et al. (2010) estimated wealth effect in the U.S. at a three- to five-cent increase in spending in response to a dollar of increased wealth. It is only recently that studies are emerging to confirm the impact of wealth decline on consumption. While Case et al. (2001) found a decline in housing wealth had a smaller impact on decreasing consumption than an increase in housing wealth had on increasing consumption, their latest study (Case et al., 2012) eliminates and maybe even reverses that asymmetry. A similar, but weaker, relationship was found to hold for increases and decreases in stock market wealth.

## **Theoretical Model**

The life cycle model of household spending (Ando and Modigliani, 1963) provides useful conceptual links between consumption and wealth. The life cycle model describes the creation of wealth during years of employment when income exceeds spending, and the drawdown of wealth during years of retirement when spending exceeds income. Based on the premise that people prefer relatively steady consumption over time, the goal of the life cycle model is to estimate future spending needs in retirement and to save for that future consumption.

In response to observed behaviors inconsistent with the rational assumptions upon which the life cycle model is based, a behavioral life cycle hypothesis was developed by Shefrin and Thaler (1988). The behavioral life cycle hypothesis suggests that the source of consumption impacts the amount of consumption, and thus challenges the concept of wealth as fungible (Thaler, 1990). As measures of self-control, the behavioral life cycle hypothesis further identifies saving rules and mental accounts that “frame” wealth as tools to delay consumption.

Prospect theory (Kahneman and Tversky, 1979) is helpful in explaining the differential experience of losses from gains. Prospect theory suggests that people experience, or feel, the pain of a loss more acutely than they experience the joy of a similar-sized gain. Further, losses and gains are experienced in relative terms and, thus, are reference dependent. This combination helps explain why people are more concerned about a loss than happy with an equivalent gain, and the degree of loss aversion is impacted by prior experience.

## **Data and Methodology**

### **Data Collection**

Results from the Survey of Consumer Finances 2009 Panel Study were used for this study. The 2009 Panel study is a follow-up re-interview of those families that responded to the 2007 Survey of Consumer Finance (SCF), and thus, provides a glimpse at the consequences on U.S. households of the severe economic decline which began in late 2007 (Bricker et al., 2011).

According to the life cycle model of household spending, spending behaviors are anticipated to differ between individuals in their working (and wealth creation) years and their

retirement (and wealth drawdown) years. Consequently, only households that did not include a retiree were included for further study, or 3029 of the 3857 households included in the data set.

### **Empirical Model**

From studies on wealth effect we expect that an increase in spending accompanies an increase in perceived wealth. Yet, components of prospect theory lead us to conclude that people are more concerned about a loss than happy with a gain of equivalent magnitude. Combining the tenants of prospect theory to those of wealth effect suggests that reverse wealth effect is not the mirror image of wealth effect; rather, a household's consumption response to a loss in value of things owned is expected to exceed their consumption response to an increase in value of things owned (Camerer and Loewenstein, 2004).

Responses to two questions from the 2009 Panel survey are used to measure the impact on consumption of changes in values of things owned. Wealth Effect (capitalized to represent the variable) is measured with responses to whether respondents are more likely to spend more money when the things they own increase in value. "Agree strongly" and "agree somewhat" are coded as one (1) and the remaining response options ("neither", "disagree somewhat", and "disagree strongly") are coded as zero (0). Reverse Wealth Effect is measured by responses to the question of whether respondents are more likely to spend less money when the things they own decrease in value. Response options and coding are the same as for Wealth Effect. The anticipated relationship between Wealth Effect (WE) and Reverse Wealth Effect (RWE) is set forth in the following hypothesis:

H<sub>1</sub>: The proportion of respondents that decrease spending when asset values decline (RWE) will exceed the proportion of respondents that increase spending when asset values increase (WE).

Consistent with previous findings, the degree of loss aversion is expected to be impacted by prior experience. Specifically, after a prior loss, the decision maker is expected to become even more loss averse, while after a prior gain, the decision maker is expected to become less loss averse (Barberis et al., 2001). A dummy variable is created to indicate if the market value of the respondent's principal residence declined between the 2007 and 2009 surveys. It is anticipated that those who have experienced a loss in housing wealth will report a higher Reverse Wealth Effect and a lower Wealth Effect than those who have not.

H<sub>2</sub>: The proportion of respondents that increase spending when asset values increase (WE) will be lower for respondents that have experienced a decline in home value than for respondents who have not.

H<sub>3</sub>: The proportion of respondents that decrease spending when asset values decline (RWE) will be higher for respondents that have experienced a decline in home value than for respondents who have not.

The impact of changes in financial wealth on consumption has also received considerable study (Davis and Palumbo, 2001; Dynan and Maki, 2001; Maki and Palumbo, 2001; Salotti, 2012). A dummy variable is created to indicate if the respondent's financial wealth declined between the 2007 and 2009 surveys. It is anticipated that those who have experienced a loss in financial wealth will report a higher Reverse Wealth Effect and a lower Wealth Effect than those who have not.

H<sub>4</sub>: The proportion of respondents that increase spending when asset values increase (WE) will be lower for respondents that have experienced a decline in financial asset value than for respondents who have not.

H<sub>5</sub>: The proportion of respondents that decrease spending when asset values decline (RWE) will be higher for respondents that have experienced a decline in financial value than for respondents who have not.

Some sources of wealth are considered more “fungible” than others. Specifically, housing wealth has been measured as more fungible than financial wealth (Benjamin et al., 2004; Case et al., 2012). Consequently, it is anticipated that the impact of housing wealth decline on Reverse Wealth Effect and Wealth Effect will exceed the impact of financial wealth decline on Reverse Wealth Effect and Wealth Effect.

As described earlier, the behavioral life cycle hypothesis incorporates psychological variables such as self-control heuristics in its explanation of spending and saving. Saving rules can help savers assert self-control over spending (Schooley and Worden, 2008; Strotz, 1956). A dummy variable is used to code whether the respondent uses any one of three regular saving habits, including saving regularly each month, spending regular income and saving extra income, or saving the income of one family member and spending the income of the other. Respondents who use a saving rule are anticipated to exert more self-control in their spending behaviors, and to be less likely to exhibit a Wealth Effect and more likely to exhibit a Reverse Wealth Effect.

Several additional financial and demographic control variables are included in this study. To measure current income levels as compared to normal, respondents are asked to indicate whether this year’s income is unusually high or low compared to what would be expected in a “normal” year, with “normal” being set as the reference category (Fisher and Montalto, 2011). To measure expected income levels, respondents are asked whether they expect their income over the next year to go up more than, less than, or the same as inflation, with “same as inflation” being set as the reference category. Dummy variables are created for respondent’s marital status (not married or living with partner set to zero) and race/ethnicity (white non-Hispanic as reference). Continuous variables are used to control for income, net worth, age of the respondent, number of children in the household, and number of years of education completed by the head of household. A dummy variable for risk tolerance is established, ranging from no risk (set as the reference category), to average risks, above-average risks, and substantial risks. Another dummy variable is established for planning horizon, with categories of long term (over 10 years, and set as reference category), medium term (a year to next five to 10 years), and short term (up to a year). Finally, a dummy variable is created to measure income uncertainty. In response to the question of whether the respondent has a good idea of what their income would be next year, “no” is coded as “1.” Separate models of prospect, behavioral, and life cycle variables on measures of Wealth Effect and Reverse Wealth Effect, respectively, are tested using logistic regression.

H<sub>6</sub>: Prospect, behavioral, and life cycle theory measures will provide a significant contribution to predicting the likelihood of WE and RWE behaviors.

## **Analysis**

The SCF adjusted sampling weights are used to calculate point estimates and descriptive statistics of the independent variables, and the resulting descriptive statistics are generalizable to the U.S. population. The unweighted responses are used for the multivariate logistical regression analysis due to disadvantages in using weights in multivariate analyses with a dichotomous dependent variable (Rha et al., 2006). The SCF contains five implicates for each record, and all five implicates were used for the current study. To estimate and adjust for the variability introduced by imputing the missing data, repeated-imputation inference (RII) techniques

(Montalto and Sung, 1996; Rubin, 1987) are used to estimate both coefficients and estimates of variability in the univariate and multivariate analyses.

**Results**

Descriptive statistics are displayed in Table I for the overall sample (N=3029). In addition, descriptive statistics are provided for the group of households that expressed a Wealth Effect behavior, or not, as well as for the group of households that expressed a Reverse Wealth Effect behavior, or not. Significant differences between the groups are noted and were determined with t-test for continuous variables and chi-square test for categorical variables.

In describing the 2009 survey respondents, 70.5% were white non-Hispanic and averaged 45.5 years of age. Just over half (54.7%) of the respondents were married or living with a partner, and an average of one child lived at home. Other averages included 13.5 years of educational attainment, \$83,682 in household income, and \$410,544 in household net worth. Just over half (51.1%) had seen a decline in their house value since 2007 while 49.9% had seen a decline in the value of their financial assets over the same time period. With regard to income, 65.4% of respondents indicated their current income levels were about normal, 43.2% indicated they expected income to go up about the same as inflation, and 40% indicated they did not have a good idea of what their income would be next year. With regard to financial preferences, most (54.4%) preferred a medium planning horizon, 83.2% preferred to take “no” or “average” risk, and 44.8% employed a saving rule.

Just over 25% of respondents reported they are more likely to spend more money when the things they own increase in value (thus reporting a Wealth Effect). Respondents who indicated agreement with the Wealth Effect statement differed from those who did not agree with Wealth Effect statement. The respondents that indicated a Wealth Effect were younger, less likely to be white, less likely to have experienced a decline in their home value, more willing to take on risk, more uncertain about next year’s income, less likely to employ a saving heuristic, and had higher expectations with regard to future income.

Table I. Descriptive Statistics of Nonretired Sample including Subsamples Based on Wealth Effect

	Total	Wealth Effect		Reverse Wealth Effect		
		Yes	No	Yes	No	
<i>Unweighted N</i>	3029	894	2135	1987	1042	
Race/Ethnicity						***
White	70.5%	65.1%	72.4%	69.8%	71.9%	
Black	14.2%	18.7%	12.7%	14.9%	13.0%	
Hispanic	10.3%	10.8%	10.1%	9.9%	11.0%	
Other	5.0%	5.4%	4.8%	5.5%	4.0%	
Married	54.7%	55.1%	54.6%	57.9%	49.3%	***
Number of children	1.04/.02	1.05/.04	1.03/.03	1.05/.03	1.01/.04	
Age of respondent	45.5/.23	43.4/.40	46.2/.28	45.4/.29	45.7/.04	***
Education of respondent	13.5/.05	13.5/.10	13.5/.06	13.6/.14	13.4/.08	
Income (in \$100,000)	.837/.04	.922/.08	.808/.05	.868/.05	.784/.08	

Net Worth (in \$million)	.411/.05	.535/.13	.369/.05		.441/.05	.359/.08
House Value Down	51.1%	47.9%	52.1%	*	52.3%	49.0%
Financial Assets Down	49.9%	52.0%	49.1%		50.2%	49.4%
Planning horizon:						*
Short: Up to a year	33.6%	31.8%	34.3%		31.8%	36.7%
Medium: Next 5-10 yrs	54.4%	55.1%	54.2%		56.0%	51.9%
Long: Over 10 years	11.9%	13.1%	11.5%		12.2%	11.4%
Willingness to take risk:				***		**
Substantial	3.8%	5.2%	3.3%		3.8%	3.8%
Above average	13.0%	16.1%	12.0%		13.1%	12.9%
Average	40.8%	43.5%	39.9%		43.1%	36.8%
No risk	42.4%	35.3%	44.8%		40.0%	46.5%
Current income:						
High	10.2%	9.3%	10.5%		10.4%	9.8%
Low	24.4%	26.8%	23.6%		25.5%	22.7%
Norm	65.4%	64.0%	65.9%		64.2%	67.5%
Expected Income:				***		
Up more than inflation	18.5%	22.4%	17.2%		18.8%	17.9%
Up less than inflation	38.4%	31.9%	40.5%		37.4%	40.0%
About the same as infl	43.2%	45.7%	42.3%		43.8%	42.1%
Income Uncertain	40.0%	44.9%	38.3%	***	42.1%	36.5%
Saving Heuristic	44.8%	41.4%	46.0%	*	46.8%	41.5%

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Means for continuous variables are weighted. Standard errors employ the RII technique. T-test was used for continuous variable tests of differences and chi-square for categorical variables.

The proportion of the respondents stating they are more likely to spend less money when the things they own decrease in value (thus reporting a Reverse Wealth Effect) was 62.7%. Respondents who indicated agreement with the Reverse Wealth Effect statement differed from those who did not agree with the Reverse Wealth Effect statement. The respondents that indicated a Reverse Wealth Effect were more likely to be married, more likely to take more risk, more uncertain to about next year's income, more likely to employ a saving heuristic, and had a longer planning horizon.

With regard to the test of prospect theory, the difference in proportions between respondents indicating Reverse Wealth Effect and Wealth Effect was examined. The proportion of the respondents that reported a RWE was 62.7% while the proportion reporting a WE was 25.1%. Thus, a decline in asset value had a bigger impact on behavior than an increase in asset value. The difference of 37.7%, which might be considered a "prospect effect," is statistically significant ( $Z=29.6$ ,  $p < .001$ ). These results support  $H_1$ .

Table II contains results that compare measures of Wealth Effect and Reverse Wealth Effect for those respondents whose home values have declined, or not declined, over the two years from 2007 to 2009. Of the respondents whose housing value declined, 23.5% indicated

they are likely to spend more money when the value of the things they own increase. In comparison, 26.7% of the respondents whose housing value did not decline indicated the same Wealth Effect. The difference of -3.2% is significant ( $Z=-2.00$ ,  $p<.05$ ), and these results support  $H_2$ . Along those same lines, 64.3% of the respondents whose housing value declined indicated they are likely to spend less money when the value of the things they own decline in value. In comparison, only 61.0% of the respondents whose housing value did not decline indicated the same Reverse Wealth Effect. The difference of 3.1% is moderately significant ( $Z=1.77$ ,  $p<.10$ ) and provides moderate support for  $H_3$ .

Table II. Asset Value Changes and Reported WE and RWE

	Housing Value Down			
	<u>Yes</u>	<u>No</u>	<u>Yes-No</u>	
Wealth Effect	23.5%	26.7%	-3.2%	*
Reverse Wealth Effect	64.3%	61.0%	3.1%	<sup>a</sup>

  

	Financial Value Down			
	<u>Yes</u>	<u>No</u>	<u>Yes-No</u>	
Wealth Effect	26.1%	24.0%	2.2%	
Reverse Wealth Effect	63.1%	62.4%	0.7%	

Note:  $q<.10$ ,  $*p<.05$ ,  $**p<.01$ ,  $***p<.001$ .

Table II also contains results that compare the Wealth Effect and Reverse Wealth Effect based on changes in financial wealth between 2007 and 2009. Surprisingly, the proportion of respondents that indicated a Wealth Effect (26.1%) was higher for those whose financial wealth had declined than the proportion that indicated a Wealth Effect (24.0%) whose financial wealth had not declined. The difference of 2.2% is not significant ( $Z=1.38$ ). These results do not support  $H_4$ . And, the proportion of respondents that indicated a Reverse Wealth Effect (63.1%) was higher for those whose financial wealth had declined than the proportion that indicated a Reverse Wealth Effect (62.4%) whose financial wealth had not declined. The difference of .7 is not significant ( $Z=.42$ ), and  $H_5$  is not supported.

We can look again at the results in Table II to evaluate how the source of wealth decline might have a differential impact on Wealth Effect and Reverse Wealth Effect. Beginning with the difference between a decline in housing wealth and a decline in financial wealth on Wealth Effect, the -3.2% difference in Wealth Effect due to housing wealth decline exceeds the 2.2% difference in Wealth Effect due to financial wealth decline. Similarly, comparing the difference between a decline in housing wealth and a decline in financial wealth on Reverse Wealth Effect, the 3.1% difference in Reverse Wealth Effect due to housing wealth decline exceeds the .7% difference in Wealth Effect due to financial wealth decline. Combined, these findings support the assumption that housing wealth has a bigger impact than financial wealth on Wealth Effect and Reverse Wealth Effect.

The logistical regressions of Wealth Effect and Reverse Wealth Effect are displayed in Table III. Both regression equations have chi-square statistics that are statistically significant. The pseudo- $R^2$  are low at .053 for regressing Wealth Effect and .033 for Reverse Wealth Effect. The prediction accuracy is 70.7% for Wealth Effect values and 66.1% for Reverse Wealth Effect

values indicating an acceptable model fit. Statistical significance of equation parameters are provided, and parameter estimates can be used to compute odds ratios predicted by the model. Looking first at predictors of Wealth Effect, several variables emerged as increasing the likelihood of reporting a Wealth Effect. Willingness to take on average, above average, and substantial risk, as compared to no risk, increased the odds of Wealth Effect by 55.7%, 103%, and 135%, respectively. Reporting a Black race/ethnicity increased the odds of Wealth Effect by 39.1% while each additional year of education increased the odds by 3.2%. Finally, each additional \$1 million in net worth increased the odds of reporting a Wealth Effect by .2%. Several variables also emerged as decreasing the likelihood of reporting a Wealth Effect. Using a saving heuristic decreased the likelihood of Wealth Effect by 22%. Expecting future income to be up less than inflation decreased the likelihood of Wealth Effect by 16.5%. Having a short planning horizon decreased the odds of Wealth Effect by 30.7%. And, each additional year of age decreased the likelihood of a Wealth Effect by .7%.

Table III. Logistic Regression of the Likelihood of Wealth Effect and of Reverse Wealth Effect (n=3029)

Variables	Wealth Effect		Reverse Wealth Effect	
	B	Odds Ratio	B	Odds Ratio
Race/Ethnicity (ref category = white)				
Black	.330 *	1.391	.254 q	1.289
Hispanic	.222	1.248	.001	1.001
Others	.044	1.045	.324	1.383
Married	-.072	.931	-.212 *	.809
Number of children	.022	1.022	.024	1.024
Age of respondent	-.007 *	.993	-.004	.996
Education of Respondent	.032 Q	1.032	.009	1.009
Current Income (ref categ. = normal)				
High	-.062	.940	.164	1.179
Low	.150	1.162	.270 **	1.309
Future Income (ref categ = same as inflation)				
Up more than	.072	1.074	-.101	.904
Up less than	-.181 q	.835	-.085	.919
Home Value Declined	.011	1.011	.145 q	1.157
Financial Assets Declined	.081	1.084	.041	1.042
Saving Heuristic	-.249 **	.780	.162 q	1.176
Planning horizon (ref = >10 years)				
Few months up to next year	-.367 **	.693	-.162	.850
Next few years up to 5-10	-.149	.862	.022	1.022
Willingness to take risks (ref = no risks)				
Substantial risks	.856 ***	2.353	.354 q	1.425



Above average risks	.707	***	2.028	.238	q	1.269
Average risks	.443	***	1.557	.290	**	1.336
Income (in \$100,000)	-.001		.999	.000		1.000
Net Worth (in \$1,000,000)	.002	q	1.002	.000		1.000
Uncertain income	.140		1.151	.229	**	1.257
Constant	-1.149	**	.317	.492		1.635
-2 log likelihood	3560.3			3826.1		
Percent concordance	70.7%			66.1%		
Pseudo-Rsquare	.053			.033		

Note: q=<.10,\*p=<.05, \*\*p=<.01, \*\*\*p=<.001. Source: 2009 SCFP (unweighted analysis of data pooled from all five implicates).

Looking at the predictors of Reverse Wealth Effect, willingness to take on average, above average, and substantial risk, as compared to no risk, increased the odds of reporting Reverse Wealth Effect by 33.6%, 26.9%, and 42.5%, respectively. Having current income lower than normal increased the odds of Reverse Wealth Effect by 30.9%, while being uncertain about the level of next year’s income resulted in a 25.7% increased likelihood of Reverse Wealth Effect. Experiencing a decline in home value, using a saving heuristic, and reporting a Black race/ethnicity increased the likelihood of Reverse Wealth Effect by 15.7%, 17.6%, and 28.9%, respectively. With regard to decreasing the likelihood of reporting Reverse Wealth Effect, only being married decreased the likelihood of reporting Reverse Wealth Effect, and by 19.1%.

### Discussion and Implications

The results of this study confirm the existence of a reverse wealth effect and support prospect theory’s usefulness in explaining changes in consumption patterns of households. An asymmetrical response in spending to changes in wealth was established, as was an increased loss aversion after a decline in housing wealth. The results further suggest saving heuristics provide a measure of self-control on wealth effect and “frames” on wealth sources impact the amount of consumption, with financial wealth being less fungible than housing wealth.

Several limitations of the current study are offered. First, measures of actual household spending, rather than statements of intended spending, may reveal better explanation of the mechanisms through which consumption is affected by wealth. Second, a continuous change in wealth variable might reveal important effects that the current dichotomous change in wealth variable may mask. And, third, future research on consumption elasticity would benefit from a longitudinal research design for determining causal relationships.

Given the current U.S. economy, two implications of this study are offered as significant. First, this study suggests a negative shock to the housing market may have a larger impact to the economy through consumer spending than a shock to the financial markets. And, second, due to the asymmetry between wealth effect and reverse wealth effect, a recovery to former spending would not automatically accompany a recovery of housing values to pre-recession levels.

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