The Relationship Between Consumer Sentiment and Stock Prices

by

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I. INTRODUCTON

Testable hypotheses about the relationship between stock prices and consumer confidence seem to appear in the business press whenever new consumer survey data is released. Headlines like "Rise in Consumer Sentiment Sends Share Prices Higher"[1] and "Stocks Tumble, Spurred by Dive in Consumer Confidence"[2] suggest that stock prices respond directly to measures of consumer confidence. Previous research into the matter, however, suggests that the headline writers have it backwards – that the direction of influence runs only one way, from stock prices to consumer confidence, and that any stock price response to new information about consumer confidence is ephemeral.

This paper focuses on the short-run and long-run relationship between stock indices and measures of consumer sentiment, and it presents three key empirical results. First, cointegration test confirm that there is no long-run relationship between different stock indices and the University of Michigan's measure of consumer confidence. Second, regarding the short-run relationship between stock indices and consumer confidence, Granger-causality tests indicate that stock prices affect consumer confidence, but consumer confidence does not affect stock prices. Third, while unexpected changes in consumer confidence have no statistically significant effect on stock prices, expected changes in consumer confidence are directly related to changes in stock prices.

Following this introduction, the second section of the paper presents a brief review of the literature about the relationship between measures of consumer confidence and other economic variables. Unit root tests, cointegration tests, and Granger causality tests are discussed in the

[1] New York Times, December 22, 2001.

[2] New York Times, October 31, 2001.

third section. The fourth section of paper presents a model to predict consumer confidence. These predictions and their errors are used to explain stock prices. The final section of the paper summarizes the results and offers conclusions.

II. LITERATURE REVIEW

As interest in the fortunes of the stock market have increased, so too has interest in the links between stock market indexes and other indicators of economic activity. Recently, researchers have turned their attention to potential links between stock indexes and measures of consumer confidence. Generally, stock indexes and measures of consumer confidence appear to be contemporaneously correlated, with the direction of influence running from stock price movements to consumer confidence, but not the other way (Otoo, 1999; Jansen and Nahuis, 2002). Despite this empirical evidence of causation, there are reasonable theoretical links between stock indexes and consumer confidence. Moreover, it is possible that the direction of causation simultaneously works in both directions, thereby making detection of causal relationships extremely difficult.

The two published measures of consumer confidence in the United States are the Conference Board Consumer Confidence Index and the University of Michigan's Index of Consumer Sentiment (ICS).[3] Of the two indices, the University of Michigan's index has a longer time series, and most academic research has focused on this measure. Because of this longer data series, the ICS is also the focus of this paper. The ICS is based on a sample of 500 people responding to five different questions. Two questions survey respondents about their current financial situation and how they feel it will change over the next twelve months. Two other questions ask participants about their views of future business conditions for the country as a

[3] For a comparison of these two measures of consumer confidence, see the discussion by Bram and Ludvigson (1998).

whole. Finally, the last question asks respondents whether it is good time to purchase a major household appliance. The individual survey questions and the actual calculation of the index are described in the paper's appendix.

There are two channels through which stock movements may influence consumer confidence. The first linkage is the traditional wealth effect, in which movements in stock indexes translate into changes in current wealth, thereby influencing consumer sentiment directly. The second channel is the "leading indicator" linkage, in which consumers interpret current changes in stock indexes as reliable indicators of future income changes (Poterba and Samwick, 1995; Morck, Shleifer and Vishny, 1990). Either scenario -- changes in current wealth or anticipated changes in future income --may reasonably be expected to directly influence consumer sentiment. Using individual observations from the University of Michigan Consumer Sentiment survey and data from the Wilshire 5000 stock index, Otoo (1999) argues that the empirical results are more consistent with the view that households use changes in equity prices as a leading indicator.

Jansen and Nahuis (2002) extend Otoo's analysis to eleven European countries. With few exceptions, they find that stock returns and changes in consumer confidence are positively correlated. Like Otoo, they find that stock prices Granger-cause consumer confidence, but consumer confidence does not Granger-cause stock prices. Their empirical results confirm Otoo's finding that higher stock prices are a leading indicator that increases consumer confidence. Jansen and Nahius characterize this leading indicator link as the "confidence channel," that is independent of the traditional "wealth effect." The empirical results of both Otoo and Jansen and Nahius suggest that the confidence channel is a separate transmission mechanism that is not part of the conventional wealth effect.

Explanations of possible causal relationships between consumer confidence and equity prices that work in the other direction are theoretically reasonable, but empirically unsupported. Again, there are two channels of potential influence. The first channel is the link between consumer spending and corporate profits. Several studies show that measures of lagged consumer sentiment are statistically significant explanatory variables in explaining the behavior of current household spending.[4] If this is so, then there should be an indirect link between consumer sentiment and expected corporate profits, thus providing a link (albeit tenuous) between consumer sentiment and stock prices. However, the relationship between consumer sentiment and measures of output differs considerably across countries and across the different measures of consumer confidence. In terms of predicting future output, measures of consumer confidence have less explanatory power than measures of business confidence.[5] The second potential channel of influence is the so-called "publication effect" (Jansen and Nahuis, 2002), whereby publication of consumer survey data exerts a psychological effect on the market. Such an effect, if it were to occur, is most likely highly transitory.[6]

III. UNIT ROOT, COINTEGRATION, AND GRANGER CAUSALITY TESTS

The data

Three different stock indices were used to explore the relationship between stock prices and measures of consumer sentiment. While Otoo's study only used the Wilshire 5000 index, this study uses three stock indices that are regularly reported in the news: the Dow Jones Industrials, the S&P 500, and the NASDAQ.

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[4] See Carroll, Fuhrer, and Wilcox (1994), Bram and Ludvigson (1998), and Souleles (2001).

[5] See Santero and Westerland (1996).

[6] On October 30, 2002, the Financial Times, in a story on consumer confidence reaching a 9-year low, reported that the Dow Jones Industrial Average initially fell about 1% after the survey data was released, but "made up the lost ground by the close."

The index of consumer confidence is generated by the Survey Research Center of the University of Michigan. The unemployment rate is used as an explanatory variable to describe the behavior of consumer sentiment. The regression model explaining the behavior of stock prices includes the yield on 10-year U.S. government bond rate as an explanatory variable.

All of the data consist of monthly time series. With the exception of the NASDAQ stock index, the data sample is 1978:01 – 2003:01. However, the NASDAQ stock index is only available for the 1984:10 – 2003:01 sample.[7]

Unit root tests

To avoid regressions with spurious results, each time series is tested for a unit root. First, all the variables are expressed in their natural logs. Table 1 reports the augmented Dickey-Fuller tests (Dickey and Fuller, 1979) for both levels data and first-differenced data. Data plots indicate that the underlying regressions used to generate the Dickey-Fuller test statistics for level data should include both an intercept and a trend variable. On the other hand, data plots of the first differences indicate that neither an intercept nor a trend variable is necessary in the regressions that generate the Dickey-Fuller test for the first-differenced data. Each test statistic is derived by including the number of lagged dependent variables that minimizes the Akaike Information Criteria (Akaike, 1973) for each specification.

Referring to Table 1, the augmented Dickey-Fuller tests indicate that the null hypothesis of a zero root cannot be rejected for measures of consumer confidence, the three stock indices, and the unemployment rate. The null hypothesis of zero roots is rejected at the five percent level for the interest rate on the ten-year U.S. government bond. Using the first-differenced data, the

[7] Consumer sentiment and the yield on U.S. ten-year government bonds were downloaded from the Federal Reserve Bank of St. Louis' FRED at http://research.stlouisfed.org/fred/. Monthly Dow Jones, S&P 500, and NASDAQ data were downloaded from http://finance.yahoo.com/. The Bureau of Labor Statistics web page, http://www.bls.gov, was the source of the monthly unemployment rate.

null hypothesis of a zero root is rejected at the one-percent level for every variable. In their study of the relationship between consumer confidence and stock indices in Europe, Jansen and Nahuis found that their time series also exhibited zero roots.

Cointegration test

Given that the consumer confidence and stock indices have zero roots, cointegration tests (Johansen and Juselius, 1990) are preformed to determine whether a long-run relationship exists between consumer confidence and each of the stock indices. If consumer confidence and a stock index are cointegrated, that implies a long-run relationship between the two variables exists. Three independent statistical tests were performed to determine whether consumer confidence and the Dow Jones Industrial, consumer confidence and the S&P 500, and consumer confidence and the NASDAQ were pair wise cointegrated. The results of the cointegration tests are reported in Table 2. The natural log of the consumer sentiment and stock index variables were used in deriving the statistics in Table 2.

The test statistics reported in Table 2 are based on the null hypothesis that a cointegrating vector between consumer confidence and a given stock index does not exist. In other words, the null hypothesis is there is no long-run relationship between a measure of consumer sentiment and a given index of equity prices. The trace test indicates that such a long-run relationship does not exist. In each of the three cases, the test statistic was less than the critical value associated with a five-percent level of significance. Hence, the null hypothesis of no long-run relationship cannot be rejected. Likewise, in all three cases, the max-eigenvalue test statistic was less than the five-percent critical value. This adds additional evidence that the null hypothesis of no long-run relationship cannot be rejected. The outcomes of these cointegration tests are similar to the results that Jansen and Nahuis found with their European data.

Granger-causality tests

Given that there is no long-run statistical relationship between consumer confidence and the stock indices, the nature of the short-run relationship was explored. Granger-causality tests (Granger, 1969) were performed by estimating a two-equation, vector autoregressive system. Let the natural log of the index of consumer confidence in month t be denoted by c_t, while the natural log of a given stock index in month t is denoted by s_t. There are two equations in the VAR. The first equation in the two-equation system of seemingly unrelated equations is

$$\Delta c_t = \delta_0 + \sum_{i=1}^{N} \delta_i \Delta c_{t-1} + \sum_{i=1}^{N} \gamma_i \Delta s_{t-1} + u_t \ , \qquad (1)$$

and the second equation of the VAR is

$$\Delta s_t = \theta_0 + \sum_{i=1}^{N} \theta_i \Delta c_{t-1} + \sum_{i=1}^{N} \varphi_i \Delta s_{t-1} + e_t \ . \qquad (2)$$

Notice that both equations (1) and (2) have the same lag structure, that is, there are N lagged explanatory variables for both the stock index in question and the consumer sentiment. Referring to equation (1), if $\gamma_i = 0$ for every i, then one could conclude that the stock index does not Granger cause consumer confidence. Likewise, if $\theta_i = 0$ for every i, then consumer confidence does not Granger cause the stock index.

The results of the Granger causality tests are reported in Table 3. The regressions are preformed on first-differences of the natural logs of the variables to avoid the problems of spurious correlations caused when regressing time series with unit roots on each other. The length of the lag was chosen by picking that value of N that minimized the Akaike Information Criterion for each VAR. Regardless the stock index used, the Dow Jones, the S&P 500, or the NASDAQ, the results were the same. In all three cases, the null hypothesis that a given stock index did not Granger cause consumer sentiment was rejected at the one-percent level of

significance. Likewise, in each of the three cases, the null hypothesis that measures of consumer confidence do not Granger cause measures of the stock index could not be rejected.

The finding that stock indices affect consumer confidence, but not the reverse, is consistent with the findings of Otoo and Jansen and Nahius. However, neither of these studies investigate whether the impact of expected changes in consumer confidence and unexpected changes in consumer confidence differ. If the stock market is efficient, then stock prices should reflect only expected changes in consumer confidence

IV. EFFECT OF EXPECTED AND UNEXPECTED CONSUMER CONFIDENCE

The typical approach to estimating the relationship between movements in stock prices and movements in measures of consumer confidence is to regress changes in the logs of stock indexes on changes in the logs of consumer confidence indexes. A formal model is

$$\Delta s_t = a_0 + a_1 \Delta c_t + a_2 \Delta c_{t-1} + \varepsilon_t \qquad (3)$$

where, as before, s_t is the natural log of a stock index for the current period, and c_t and c_{t-1} are the natural logs of the contemporaneous and previous period's consumer confidence index. Such regressions usually yield little predictive value, with R^2s of less than 0.10, and statistical significance for only the contemporaneous consumer confidence variable. Our own estimations of such regressions yielded statistically significant results for the coefficient on the contemporaneous consumer confidence variable, and R^2s ranging between 0.04 and 0.08.

Our alternative approach is to distinguish between *expected* changes in the consumer confidence index and *unexpected* changes. In an efficient market, movements in stock prices should only reflect expected changes in consumer confidence.

To investigate the proposition that only expected changes in the consumer confidence are related to stock indexes, it is necessary to first settle upon a forecasting model for consumer

confidence. A naive approach would be to assume that the current period index is a function of its most recent value. The third column of Table 4 presents the results of estimating

$$c_t = \alpha_0 + \alpha_1 c_{t-1} + \upsilon_t . \quad (4)$$

As a baseline forecast, such a model performs well, as indicated by the high R^2 and low Root Mean Square Error (RMSE).

A more sophisticated approach would be to assume that an index of consumer confidence is influenced by economic indicators that consumers use to formulate their personal views regarding the health of the economy. The last three columns of Table 4 present the results of such a regression using different stock indexes:

$$c_t = \alpha_0 + \alpha_2 s_t + \alpha_3 s_{t-1} + \alpha_4 u_{t-1} + \mu_t \quad (5)$$

where u_{t-1} is the natural log of the previous period's unemployment rate. As indicated by the high R^2s and low RMSEs, these forecasting models also perform well.

The predicted values from regressions such as equation (4) or equation (5) are used to forecast expected changes in consumer confidence, while the residuals of these regressions serve as proxy for unexpected changes in consumer confidence. The intuition behind this approach is that markets should fully anticipate expected changes in consumer sentiment.

Table 5 presents the estimation results of two different specifications. The first specification, the basic model, assumes the change in stock prices is a function lagged changes in interest rates and the actual change in consumer confidence, with no attempt to distinguish between expected and unexpected changes in consumer confidence. This specification is

$$\Delta s_t = a_0 + a_1 \Delta i_{t-1} + a_2 \Delta c_t + \omega_t \quad (6)$$

where i_t is the natural log of the yield on the ten-year U.S. government bond. The second specification, the revised model, disaggregates the change in consumer confidence into two

components: the expected change in consumer confidence, Δc_t^e, and the unexpected change in consumer sentiment, Δc_t^u. This specification becomes

$$\Delta s_t = a_0 + a_1 \Delta i_{t-1} + a_3 \Delta c_t^e + a_4 \Delta c_t^u + \eta_t . \quad (7)$$

In each case, the basic model yields results that are similar to those found in previous research: the coefficient on the change in consumer confidence is statistically significant, but the overall model yields little explanatory value as exhibited by very low R^2s. The revised model has considerably more explanatory power, and the importance of the expected change in consumer confidence is ten times greater than that for the actual change in consumer confidence in the basic model. Forecasted changes in consumer confidence are priced into the market. Surprise changes in consumer confidence are not. This is precisely what one would expect from an efficient market.

V. CONCLUSIONS

Similar to the results of Jansen and Nahuis, this paper finds that measures of consumer confidence and stock indices exhibit unit roots. The finding that no long-run relationship between U.S. measures of consumer confidence and stock indices exists also agrees with findings of Jansen and Nahius. In terms of the short-run relationship between these variables, Granger-causality test indicate that measures of the Dow Jones, S&P 500, and the NADAQ affect consumer confidence, but the opposite does not hold. Jansen and Nahuis found the same result using European data, while Otoo found a similar relationship in the U.S. using the Wilshire 5000 stock index. This paper extends Otoo's findings to the more commonly used indices of the Dow Jones, the S&P 500, and the NASDAQ.

However, in a departure from the studies of Jansen and Nahius and Otoo, this paper finds that stock prices reflect expected changes in consumer confidence. There is no statistically

significant correlation between unexpected changes in consumer confidence and stock prices. This finding complements the theoretical conclusions of the efficient markets literature. Forecasts of expected changes in consumer confidence are based on commonly available data that are also incorporated in the determination of stock prices. Expected increases in consumer confidence lead to increases in the demand for stock and higher equity prices. Our empirical results are consistent with the notion that unexpected changes in consumer confidence exhibit no sustained correlation with stock prices.

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Table 1
Augmented Dickey-Fuller Tests for Unit Roots

Levels Data: Regressions Include Intercept and Trend

Variable (in natural log)	Test Statistic	Lags	Sample
Consumer Confidence	-3.12	0	1978:02 – 2003:01
Dow Jones Industrial	-2.16	0	1978:02 – 2003:01
S&P 500	-1.36	0	1978:02 – 2003:01
NASDAQ	-1.32	1	1984:12 – 2003:01
Unemployment Rate	-2.91	6	1978:08 – 2003:01
10-Year Government Bond	-3.66**	3	1978:05 – 2003:01

First-Differenced Data: Regressions Don't Include Intercept or Trend

Variable (in natural log)	Test Statistic	Lags	Sample
Consumer Confidence	-9.06***	5	1978:08 – 2003:01
Dow Jones Industrial	-16.91***	0	1978:03 – 2203:01
S&P 500	-6.67***	4	1978:07 – 2003:01
NASDAQ	-13.12***	0	1984:12 – 2003:01
Unemployment Rate	-4.35***	5	1978:08 – 2003:01
10-Year Government Bond	-8.83***	2	1978:05 – 2003:01

*** indicates the null hypothesis that the time series has a unit root is rejected at the 1% level, while ** indicates the same null hypothesis is rejected at the 5% level.

Table 2
The Long-Run relationship between Consumer Confidence and a Stock Index : Johansen Cointegration Test Results

Null Hypothesis: A cointegrating equation for the following two variables does not exist.

	Pair-Wise Combination of Consumer Confidence and Stock Index		
	(1) Consumer Confidence And Dow Jones	(2) Consumer Confidence And S&P 500	(3) Consumer Confidence And NASDAQ
Sample	1978:04 - 2003:01	1978:04 - 2003:01	1985:02 - 2003:01
Eigenvalue	0.03	0.04	0.06
Number of lags	2	2	3
Akaike Information Criteria	-6.71	-6.74	-6.04
Trace Test			
Test Statistic	11.40	13.13	15.74
5% Critical Value	15.41	15.41	25.32
1% Critical Value	20.04	20.04	30.45
Max-Eigenvalue Test			
Test Statistic	10.60	11.28	13.71
5% Critical Value	14.07	14.07	18.96
1% Critical Value	18.63	18.63	23.65

Table 3
Pair-wise Granger Causality Tests

$$\text{Model A: } \Delta c_t = \delta_0 + \sum_{i=1}^{N} \delta_i \Delta c_{t-1} + \sum_{i=1}^{N} \gamma_i \Delta s_{t-1} + u_t$$

$$\text{Model B: } \Delta s_t = \theta_0 + \sum_{i=1}^{N} \theta_i \Delta c_{t-1} + \sum_{i=1}^{N} \varphi_i \Delta s_{t-1} + e_t$$

All dependent and explanatory variables are first differences of natural logs.

Pair of Variables: Consumer Confidence (Δc_t) *and Dow Jones Industrial* (Δs_t)

Null Hypothesis	Test Statistic	Lags	Sample
Dow Jones Does Not Granger Cause Consumer Confidence	15.39***	2	1978:04 – 2003:01
Consumer Confidence Does Not Granger Cause Dow Jones	0.29		

Pair of Variables: Consumer Confidence (Δc_t) *and S&P 500* (Δs_t)

Null Hypothesis	Test Statistic	Lags	Sample
S&P 500 Does Not Granger Cause Consumer Confidence	15.38***	2	1978:04 – 2003:01
Consumer Confidence Does Not Granger Cause S&P 500	0.17		

Pair of Variables: Consumer Confidence (Δc_t) *and NASDAQ* (Δs_t)

Null Hypothesis	Test Statistic	Lags	Sample
NASDAQ does not Granger Cause Consumer Confidence	14.32***	2	1985:01 – 2003:01
Consumer Confidence Does Not Granger Cause NASDAQ	0.18		

*** indicates the null hypothesis can be rejected at the 1% level.

Table 4
Forecasting models for consumer confidence

Regression Parameter	Associated Intercept Or Explanatory Variable	Naïve Forecast (1) 1978:02 – 2003:01	Complex Forecast (2) 1978:03 – 2003:01	Complex Forecast (3) 1978:03 – 2003:01	Complex Forecast (4) 1984:12 – 2003:01
α_0	Intercept	0.198**	0.977	2.082***	3.452***
		(0.762)	(0.890)	(0.639)	(0.387)
α_1	Lagged dependent variable, c_t	0.956***			
		(0.017)			
α_2	Contemporaneous Dow Jones Index, s_t		0.181**		
			(0.056)		
α_3	Lagged Dow Jones Index, s_{t-1}		0.253***		
			(0.056)		
α_2	Contemporaneous S&P 500 Index, s_t			0.188***	
				(0.057)	
α_3	Lagged S&P 500 Index, s_{t-1}			0.232***	
				(0.057)	
α_2	Contemporaneous NASDAQ Index, s_t				0.074**
					(0.035)
α_3	Lagged NASDAQ Index, s_{t-1}				0.132***
					(0.035)
α_4	Lagged Unemployment Rate, u_{t-1}		-0.191*	-0.191**	-0.224**
			(0.094)	(0.094)	(0.098)
ρ	Autoregressive parameter		0.991***	0.987***	0.964***
			(0.008)	(0.009)	(0.017)
R^2		0.913	0.921	0.921	0.884
DW		1.967	2.139	2.140	2.183
F-test		3,136.56†	861.99†	857.13†	404.59†
Forecast RMSE		0.046	0.044	0.044	0.038

Dependent variable: c_t = natural log of the University of Michigan Consumer Sentiment Index. The "naive" model is a simple autoregressive function: $c_t = \alpha_0 + \alpha_1 c_{t-1} + \upsilon_t$. The "complex" models incorporate stock indexes and the unemployment rate: $c_t = \alpha_0 + \alpha_2 s_t + \alpha_3 s_{t-1} + \alpha_4 u_{t-1} + \mu_t$. All variables are expressed in natural logs. Standard errors are in parentheses. *, **, and *** indicate that the null hypothesis that the slope coefficient is equal to zero may be rejected at the 10%, 5%, and 1% level of significance, respectively. These *t*-tests are two-tail tests. † indicates that the null hypothesis that all the slope coefficients are simultaneously equal zero is rejected at the 1% level.

Table 5

Relationship Between Expected and Unexpected Changes in Consumer Confidence

	Δs_t = change in the natural log of the Dow Jones Industrial Index		Δs_t = change in the natural log of the S&P 500 Index		Δs_t = change in the natural log of the NASDAQ Composite Index	
Regression Parameter	Basic model using actual Δc_t	Revised model: Δc_t^e and Δc_t^u generated from forecast (2) in Table 4	Basic model using actual Δc_t	Revised model Δc_t^e and Δc_t^u generated from forecast (3) in Table 4	Basic model using actual Δc_t	Revised model Δc_t^e and Δc_t^u generated from forecast (4) in Table 4
a_0	0.007**	0.008***	0.007**	0.008***	0.001	0.008**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.005)	(0.004)
a_1	-0.221***	-0.123***	-0.186***	-0.090**	-0.148	-0.150
	(0.062)	(0.043)	(0.062)	(0.043)	(0.131)	(0.105)
a_2	0.190***		0.195***		0.316**	
	(0.057)		(0.056)		(0.127)	
a_3		1.820***		1.910***		2.936***
		(0.125)		(0.131)		(0.336)
a_4		-0.017		-0.012		0.034
		(0.045)		(0.045)		(0.117)
ρ	-0.076	-0.414***	-0.072	-0.373***	0.045	-0.259***
	(0.060)	(0.059)	(0.060)	(0.060)	(0.071)	(0.077)
R^2	0.076	0.417	0.067	0.422	0.042	0.252
DW	2.002	2.158	2.012	2.130	1.992	2.054
F-test	8.04†	52.29†	7.02†	53.37†	3.09	17.79†
Sample	1978:04 – 2003:01	1978:04 – 2003:01	1978:04 – 2003:01	1978:04 – 2003:01	1894:12 – 2003:01	1894:12 – 2003:01

The basic regression model is $\Delta s_t = a_0 + a_1 \Delta i_{t-1} + a_2 \Delta c_t + \omega_t$. The revised regression model is $\Delta s_t = a_0 + a_1 \Delta i_{t-1} + a_3 \Delta c_t^e + a_4 \Delta c_t^u + \eta_t$. *, **, and *** indicate that the null hypothesis that the slope coefficient is equal to zero may be rejected at the 10%, 5%, and 1% level of significance, respectively. These *t*-tests are two-tail tests. † indicates that the null hypothesis that all the slope coefficients are simultaneously equal zero is rejected at the 1% level.

Appendix

The Index of Consumer Sentiment (ICS)
Calculated by the Survey Research Center, University of Michigan

The ICS is derived from the responses to the following five questions.	
x_1	"We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago?"
x_2	"Now looking ahead - - do you think that a year from now you (and your family living there) will be better off financially, or worse off, or just about the same as now?"
x_3	"Now turning to business conditions in the country as a whole - - do you think that during the next twelve months we'll have good times financially, or bad times, or what?"
x_4	"Looking ahead, which would you say is more likely - - that in the country as a whole we'll have continuous good times during the next five years or so, or that we will have periods of widespread unemployment or depression, or what?"
x_5	"About the big things people buy for their homes - - such as furniture, a refrigerator, stove, television, and things like that. Generally speaking, do you think now is a good or bad time for people to buy major household items?"

x_i is equal to the percent of favorable replies minus percent of unfavorable replies plus 100, rounded to nearest whole number.

$$\text{ICS} = \frac{x_1 + x_2 + x_3 + x_4 + x_5}{6.7558} + 2.0$$

The denominator, 6.7558, is the 1966 base period total, and the addition of 2.0 corrects for survey design changes that occurred in the 1950s.

Source: Survey Research Center, University of Michigan, http://www.sca.isr.umich.edu .