Journal of Data Science **10**(2012), 693-710

The Societal Impact of Economic Anxiety

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Abstract: Loss of household income and purchasing power are shown to have broad and negative societal effects. The economic anxiety accompanying this loss has its strongest impact on consumer demand, which is the major factor in a nation's gross domestic product (GDP). Negative effects of economic anxiety are also found on the propensity to vote, political trust, societal satisfaction, and the quality of life. These effects were verified in a cross-national sample from the fifth round of the European Social Survey. Simple regression of the true value of consumer demand, etc. on the true value of economic anxiety is made possible by an estimate of the reliability of our economic-anxiety score (cf. Bechtel, 2010; 2011; 2012). This reliability estimate corrects the regression slope of each societal variable for measurement error in the anxiety score.

Key words: Coefficient alpha, consumer sentiment, interval scales, measurement error, pan-European surveys, simple true-value regression, societal desiderata.

1. Introduction

T. Bechtel (2007) showed that economic distress has strong effects on German and English happiness. This finding begs the questions about 1) the impact of loss of income and purchasing power on life quality at the pan-European level and 2) the impact of economic anxiety on other societal desiderata, also at the pan-European level. Loss of household income and purchasing power are shown here to have negative effects on consumer demand, the propensity to vote, political trust, societal satisfaction, and the quality of life. The economic anxiety accompanying the loss of income and purchasing power has its strongest impact on consumer demand, which is 65% of the gross domestic product (GDP) of most nations. This effect, along with the four others, was obtained in a cross-national sample from the fifth round of the European Social Survey (ESS). These effects at the pan-European level are especially informative nowadays in view of the Euro zone crisis and the impending political reformulation of the European Union.

The estimated reliability of economic-anxiety scores enables a simple regression of the true values of each societal variable on the true values of economic anxiety. This resolves errors in variables as well as imputation errors in survey regression. Section 2 describes the items in our economic-anxiety scale, along with this scale's score, true value, and measurement error. Section 3 exhibits the items that make up the scale for measuring each societal desideratum that is regressed on economic anxiety. Section 4 resolves measurement error in these scale scores with the extension of randomization theory given by Bechtel (2010; 2011; 2012). This resolution provides the true (corrected) regression slope for each societal desideratum on economic anxiety. Section 5 describes the data preparation for each true-value regression carried out in Section 6. These simple regressions calibrate the effects of economic anxiety on consumer demand, voting propensity, political trust, societal satisfaction, and life quality. These results serve as a 2010 baseline for comparing subsequent economic-anxiety effects now occurring during the euro zone financial crisis that is also affecting China and the United States. Section 7 discusses the economic, political, and psychological implications of economic anxiety and suggests that this construct replace the outdated concept of consumer sentiment.

2. Economic Anxiety

The three item responses used to measure economic anxiety are coded in Table 1. Missing responses are filled in as imputations that lie among these coded values. An individual's economic-anxiety score, which contains measurement error, is her (his) average of these three item ratings/imputations.

Referring to Table 1, we write respondent i's three item ratings/imputations as

$$\begin{aligned} X_{i1} &= \tau_i + U_{i1}, \quad \text{(managing on lower income)}, \\ X_{i2} &= \tau_i + U_{i2}, \quad \text{(drawing on savings or going into debt)}, \\ X_{i3} &= \tau_i + U_{i3}, \quad \text{(feeling about household income)}, \end{aligned}$$

where her (his) anxiety τ_i lies on a continuous interval scale. The origin and unit of this scale are set by coding the extreme response labels as zero and ten for each of these items. The departure U_{im} for $m = 1, 2, 3$ is a response or imputation error in measuring τ_i with item m. Thus, if U_{i1} is a response error, it is a departure of the coded value 0, 1.67, 3.33, 5, 6.67, 8.33, or 10 from τ_i on our interval anxiety scale. If U_{i3} is a response error, it is a deviation of 0, 3.33, 6.67, or 10 from τ_i on this same scale. This interval scale tolerates items with differing numbers of response options. It also tolerates the equal spacing of response options that is ubiquitously used in survey work. If this assumed spacing is subjectively incorrect for respondent i, then U_{im} is an increased measurement error due to response coding.

Averaging over our three item scores gives individual i's anxiety score as

$$\begin{aligned} X_i &= (X_{i1} + X_{i2} + X_{i3})/3 \\ &= \tau_i + (U_{i1} + U_{i2} + U_{i3})/3 \\ &= \tau_i + U_i. \end{aligned} \tag{2.1}$$

The U_i in (2.1) is individual i's error score, which can be a mixture of item response errors and item imputation errors.

Table 1: Items in the economic-anxiety scale (independent variable)

To what extent has each of the following applied to you in the last 3 years?								
I have had to manage on a lower household income.								
I have had to draw on my savings or get into debt to cover ordinary living expenses.								
Not at all	0	1.67	3.33	5	6.67	8.33	10	*A great deal*
How do you feel about your household's income nowadays?								
Living comfortably	0	*Coping*	3.33	*Difficult*	6.67	*Very difficult*	10	

Note: The items in this table are found on the website http://ess.nsd.uib.no.

3. Societal Desiderata

Table 2 exhibits five societal variables that are negatively impacted by economic anxiety. In order to compare regression effects, responses to the items in each of these five scales are calibrated to range between 0 and 10.

3.1 Single-Item Scales

We begin with the two single-item scales by writing respondent i's item ratings/imputations as

$$Y_{i1} = \eta_{i1} + E_{i1}, \quad \text{(consumer demand)}, \tag{3.1}$$

$$Y_{i2} = \eta_{i2} + E_{i2}, \quad \text{(voting propensity)}, \tag{3.2}$$

where i's true values η_{i1} and η_{i2} again lie on our continuous interval scale with origin and unit set by our response coding. The departures E_{i1} and E_{i2} from these true values are response errors or imputation errors.

3.2 Two-Item Scale

Individual i's trust responses/imputations are

$$Y_{i13} = \eta_{i3} + E_{i13}, \quad \text{(trust politicians)},$$
$$Y_{i23} = \eta_{i3} + E_{i23}, \quad \text{(trust political parties)},$$

where the trust value η_{i3} remains on our common interval-scale by coding no trust at all as 0 and complete trust as 10. The item errors E_{i13} and E_{i23} are components of individual i's political trust score

$$\begin{aligned} Y_{i3} &= (Y_{i13} + Y_{i23})/2 \\ &= \eta_{i3} + (E_{i13} + E_{i23})/2 \\ &= \eta_{i3} + E_{i3}. \end{aligned} \tag{3.3}$$

The error score E_{i3} in (3.3) is the average of the two item errors in measuring η_{i3}.

3.3 Three-Item Scales

Still referring to Table 2, respondent i's ratings/imputations making up our fourth dependent variable are

$$Y_{i14} = \eta_{i4} + E_{i14}, \quad \text{(the state of the economy)},$$
$$Y_{i24} = \eta_{i4} + E_{i24}, \quad \text{(the way government is doing its job)},$$
$$Y_{i34} = \eta_{i4} + E_{i34}, \quad \text{(the way democracy works)}.$$

The true value η_{i4} on our interval scale is individual i's societal satisfaction.

Averaging over these three item observations gives individual i's satisfaction score as

$$\begin{aligned} Y_{i4} &= (Y_{i14} + Y_{i24} + Y_{i34})/3 \\ &= \eta_{i4} + (E_{i14} + E_{i24} + E_{i34})/3 \\ &= \eta_{i4} + E_{i4}, \end{aligned} \tag{3.4}$$

where E_{i4} is an error score in measuring i's true satisfaction.

Finally, we write respondent i's ratings/imputations for the fifth dependent variable in Table 2 as

$$Y_{i15} = \eta_{i5} + E_{i15}, \quad \text{(cheerful and in good spirits)},$$
$$Y_{i25} = \eta_{i5} + E_{i25}, \quad \text{(calm and relaxed)},$$
$$Y_{i35} = \eta_{i5} + E_{i35}, \quad \text{(active and vigorous)}.$$

Our interval-scale value η_{i5} is individual i's true life quality which is scored as

$$\begin{aligned} Y_{i5} &= (Y_{i15} + Y_{i25} + Y_{i35})/3 \\ &= \eta_{i5} + (E_{i15} + E_{i25} + E_{i35})/3 \\ &= \eta_{i5} + E_{i5}, \end{aligned} \tag{3.5}$$

where E_{i5} is an error score in measuring η_{i5}.

Table 2: Items in the societal scales

Consumer demand								**Dependent variable 1**
In the last 3 years have you had to cut back on holidays or new household equipment?								
A great deal	0	1.67	3.33	5	6.67	8.33	10	*Not at all*
Voting propensity								**Dependent variable 2**
Some people don't vote nowadays for one reason or another. Did you vote in the last [country] national election in [month/year]?								
No	0						10	*Yes*
Political trust								**Dependent variable 3**
How much do you personally trust your country's politicians?								
How much do you personally trust your country's political parties?								
Not trust at all	0	1	2	3	4	5	6	7	8	9	10	*Complete trust*
Societal satisfaction								**Dependent variable 4**
The present state of your country's economy								
The way your country's government is doing its job								
The way democracy works in your country								
Extremely dissatisfied	0	1	2	3	4	5	6	7	8	9	10	*Extremely satisfied*
Life quality								**Dependent variable 5**
I have felt cheerful and in good spirits over the last 2 weeks.								
I have felt calm and relaxed over the last 2 weeks.								
I have felt active and vigorous over the last 2 weeks.								
At no time	0	*Some of the time*	2	*Less than half of the time*	4	*More than half of the time*	6	*Most of the time*	8	*All of the time*	10	

Note: The items in this table are found on the website http://ess.nsd.uib.no. The question on voting refers to the last election of a country's primary legislative assembly.

4. The Effect of Economic Anxiety

4.1 The Population of True Values

Referring to (2.1)-(3.5), we postulate the existence of a pan-European population of true values as $\{\tau_i, \eta_{i1}, \eta_{i2}, \eta_{i3}, \eta_{i4}, \eta_{i5} \mid i = 1, \cdots, N\}$, where N is the population size (cf. Bechtel, 2010; 2011, 2012). The jth simple regression of η_{ij} on τ_i over this population is

$$\eta_{ij} = \kappa_j + \beta_j \tau_i + \varepsilon_{ij}, \quad \text{for} \quad i = 1, \cdots, N; \quad j = 1, \cdots, 5, \tag{4.1}$$

where β_j is the effect of economic anxiety on η_{ij} and ε_{ij} is specification error. Denoting variables that take values over individuals by suppressing the subscript i, our jth dependent variable is η_j and our anxiety variable is τ. With this notation the true slope in (4.1) is identified by the well known form

$$\beta_j = Cov(\tau, \eta_j)/Var(\tau), \tag{4.2}$$

where

$$Cov(\tau, \eta_j) = \big[\sum \tau_i \eta_{ij} - \big(\sum \tau_i\big)\big(\sum \eta_{ij}\big)/N\big]/N,$$
$$Var(\tau) = \big[\sum \tau_i^2 - \big(\sum \tau_i\big)^2/N\big]/N.$$

In (4.2) the numerator is the population covariance of τ and η_j, and the denominator is the population variance of τ. The summations in $Cov(\tau, \eta_j)$ and $Var(\tau)$ run over $i = 1, \cdots, N$.

4.2 An Imputed Census

In order to access the true economic-anxiety effect in (4.2), we now posit a hypothetical (but possible) census in which the 13 items in Tables 1 and 2 have been administered to our pan-European population. Census imputations of missing item responses are computed in the same manner as the sample imputations described in Section 5.4 (cf. Bechtel, 2010; 2011; 2012). Again referring to (2.1)-(3.5), this imputed census of 13 items generates the following censuses of variable scores and error scores:

$$\{X_i, Y_{i1}, Y_{i2}, Y_{i3}, Y_{i4}, Y_{i5} \mid i = 1, \cdots, N\},$$
$$\{U_i, E_{i1}, E_{i2}, E_{i3}, E_{i4}, E_{i5} \mid i = 1, \cdots, N\}.$$

Assume that the error scores U_i and E_{ij} for $j = 1, 2, 3, 4, 5$ sum to zero over $i = 1, \cdots, N$. Assume further that the U_i and E_{ij} are uncorrelated with each other and with the true values τ_i and η_{ij}. Under these classical assumptions about measurement error (Gulliksen, 1950, pp. 4-7; Lord and Novick, 1968, p. 36; Bound, Brown and Mathiowetz, 2001), the numerator in (4.2) may be expressed in terms of our variable scores as

$$Cov(X, Y_j) = \big[\sum X_i Y_{ij} - \big(\sum X_i\big)\big(\sum Y_{ij}\big)/N\big]/N,$$

because $\sum X_i Y_{ij} = \sum \tau_i \eta_{ij}$, $\sum X_i = \sum \tau_i$, and $\sum Y_{ij} = \sum \eta_{ij}$ $(j = 1, 2, 3, 4, 5; i = 1, \cdots, N)$. Moreover, it can be shown that the denominator of (4.2) is equal to

$\alpha\, Var(X)$, where α is the census reliability coefficient given by Bechtel (2010, (3.3)). Hence, our target parameter in (4.2) can be expressed in terms of census scores as

$$\beta_j = Cov(X, Y_j)/\alpha Var(X), \tag{4.3}$$

where $Var(X)$ is

$$Var(X) = \big[\sum X_i^2 - \big(\sum X_i\big)^2/N\big]/N.$$

The true anxiety effect in (4.3) is the well known regression slope divided by coefficient alpha, which corrects for attenuation due to measurement error. This corrected slope is a function of census totals which may now be estimated from a design-based sample (Neyman, 1934; Horvitz and Thompson, 1952; Thompson, 1997; Chaudhuri and Stenger, 2005; Lohr, 2010).

4.3 A Horvitz-Thompson Type Estimator of β_j

Round five of the ESS has drawn (without replacement) a stratified cross-national sample in which each country is a stratum. Here we assume that the responses/imputations to the 13 ESS items in Tables 1 and 2 have been sampled from the census posited in Section 4.2. This census sample of size n generates a net sample of scores $\{X_i, Y_{i1}, Y_{i2}, Y_{i3}, Y_{i4}, Y_{i5} \mid i = 1, \cdots, r\}$, where $r < n$ due to unit non-response in the ESS round 5. This net sample provides our estimate of the true slope β_j in (4.2) and (4.3) as

$$B_j = Cov(X, Y_j)/AVar(X), \tag{4.4}$$

where

$$Cov(X, Y_j) = \big[\sum w_i X_i Y_{ij} - \big(\sum w_i X_i\big)\big(\sum w_i Y_{ij}\big)/\sum w_i\big]/\sum w_i,$$
$$Var(X) = \big[\sum w_i X_i^2 - \big(\sum w_i X_i\big)^2/\sum w_i\big]/\sum w_i.$$

The five weighted sample sums over $i = 1, \cdots, r$ in $Cov(X, Y_j)$ and $Var(X)$ are Horvitz-Thompson type estimates of the corresponding census totals over $i = 1, \cdots, N$ in $Cov(X, Y_j)$ and $Var(X)$. Thus Cov and Var in (4.4) are estimates of Cov and Var in (4.3). The euroweights w_i in (4.4) are defined in formula (5.1) and adjust our pan-European data for each country's population size. These euroweights also adjust the ESS sampling weights for each country's unit non-response, which has reduced our net sample size from n to r. In (4.4) A is the estimate, given by Bechtel (2010, (4.1)), of reliability coefficient α in (4.3).

The standard error of B_j in (4.4) is derived in the Appendix of Bechtel (2010). This estimate $(Var(B_j))^{1/2}$, which is inflated by measurement error in our economic-anxiety scores, is exhibited in Table 3 for regression $j = 1, \cdots, 5$.

5. Pan-European Regressions

5.1 The European Social Survey

The data for our analysis was supplied by the ESS (Fitzgerald and the Central Co-ordinating Team, 2012) which is

> among the first social science projects to receive funding to support its infrastructure and in 2005 was awarded Europe's top annual science award, the Descartes prize.
>
> The ESS is an academically-driven social survey designed to chart and explain the interaction between Europe's changing institutions and the attitudes, beliefs and behaviour patterns of its diverse populations. ⋯ the survey covers over 30 nations and employs the most rigorous methodologies. The survey has been funded through the European Commission's fifth and sixth Framework Programme, the European Science Foundation and national funding bodies in each country ⋯.
>
> Data collection takes place every two years, by means of face to face interviews of around an hour in duration ⋯. The questionnaire consists of a 'core' module lasting about half an hour which remains relatively constant from round to round ⋯ the core module aims ⋯ to monitor change and continuity in a wide range of socio-economic, socio-political, socio-psychological and socio-demographic variables (cf. http://www.europeansocialsurvey.org).

5.2 Items and Sample

The present study uses the 13 items in Tables 1 and 2. These items were administered in round 5 of the ESS during the aftermath of the global financial crisis of 2008 and the lead-up to the Euro Zone crisis of 2011. Our pan-European sample includes the following 18 countries: Great Britain, The Netherlands, Belgium, France, Spain, Portugal, Germany, Switzerland, Denmark, Norway, Sweden, Finland, Estonia, The Czech Republic, Poland, Hungary, Slovenia and Bulgaria. In each country a representative probability sample was drawn from the residential population aged 15 and older (cf. http://www.europeansocialsurvey.org). Thus, our cross-national sample is a stratified probability sample in which each country is a stratum.

5.3 Unit Non-Response: A Weighting-Class Adjustment

The ESS provides design weights and population size weights that give euro-

weights representative of the populations in our sample. The design weight for individual i is the rescaled inverse of her (his) sample inclusion probability. These design weights are normed to sum to each country's net sample size. A country's population size weight is

(country's population size aged ≥ 15)/(country's net sample size $*$ 10000).

Then

$$w_i \equiv \text{euroweight}_i = (\text{design weight}_i) * (\text{country's population size weight}) \quad (5.1)$$

insures that each of our weighted regressions represents a country in proportion to its population size. Bechtel (2011) shows that this euroweight is a normed ESS sampling weight that has undergone a weighting class adjustment for unit non-response (cf. Lohr, 2010, pp. 340-342). The weighting classes for this adjustment are the 18 countries in our pan-European survey.

5.4 Item Non-Response: Regression Imputation

To fill in missing census and sample data for the 13 items in Tables 1 and 2, we assume imputed census ratings that mimic imputed sample ratings (cf. Bechtel, 2010; 2011; 2012). In our sample one regression imputation was run for each single-item scale in Table 2, with each item regressed on age, gender, income, education, life satisfaction, happiness, and closeness to one political party. Two regression imputations were carried out for political trust, with each item regressed on the other, along with the seven variables just listed for our two single-item scales. Finally, three regression imputations were conducted for each of the three-item scales in Tables 1 and 2. Each item was regressed on the other two items making up its scale, as well as on the same seven variables used in the other imputations (cf. StataCorp., 2001, Volume 2, pp. 69-71). These regression imputations prevented sample loss by preserving 100% of the $r = 34085$ cases in our net cross-national sample.

5.5 Results[1]

Our dataset for each simple regression in Table 3 is the net sample of scores $\{X_i, Y_{i1}, Y_{i2}, Y_{i3}, Y_{i4}, Y_{i5} \mid i = 1, \cdots, r\}$. The items composing these six scores underwent the 13 regression imputations described in Section 5.4. The net sample of anxiety scores X_i have an estimated coefficient alpha of 0.762. This reliability coefficient was computed from Bechtel (2010, (4.1)) using the pan-European weights in (5.1).

[1]The Stata .do file and documentation for running true-value regression may be obtained by email from the author.

The imputed net sample size for each regression in Table 3 is 34085. Each simple regression coefficient was computed from formula (4.4), also with the euroweights w_i in (5.1). These five coefficients exhibit the true societal effects of economic anxiety. Moreover, these true effects are comparable because our six scores $X_i, Y_{i1}, Y_{i2}, Y_{i3}, Y_{i4}, Y_{i5}$ are standardized to the common interval scale described in Sections 2 and 3. This allows each regression slope to be interpreted as a drop in desideratum j on the scale [0,10] due to a one-unit gain in anxiety on this same scale. The five slopes in Table 3 show that loss of household income and purchasing power have broad and negative societal effects. The anxiety accompanying this loss does its strongest damage to consumer demand, which is the major factor in a nation's gross domestic product (GDP).

The results in Table 3 serve as a 2010 baseline for comparing subsequent anxiety impacts now occurring during the European financial crisis that also threatens China and the United States. Upcoming ESS data collected in 2011-12 will provide our first comparative time point for assessing the direction being taken by these effects.

Table 3: Societal effects of economic anxiety

Consumer demand	Voting propensity	Political trust	Societal satisfaction	Life quality
−1.248 (0.0110)	−0.252 (0.0160)	−0.204 (0.0085)	−0.260 (0.0077)	−0.266 (0.0087)

Note: Each coefficient is the slope of it's societal variable on economic anxiety. These slopes were estimated from five simple true-value regressions. The standard error of each slope is in parentheses. The number of cases in each of these five regressions is 34085.

6. Societal Implications of Economic Anxiety

6.1 Economic Impact

6.1.1 Aggregate Consumer Demand

Consumer demand accounts for two-thirds of a modern nation's gross domestic product (GDP). Since 1952 The University of Michigan's Survey Research Center has attempted to forecast consumer demand in the United States with George Katona's Index of Consumer Sentiment (ICS). This index, which launched behavioral economics (cf. Mandell, Katona, Morgan and Schmiedeskamp, 1973), remains a closely watched indicator today. It is computed as the sum of five differences between proportions of favorable and unfavorable responses to the items in Table 4 (Curtin, 1973, p. 254). These questions are answered monthly by an American sample of 500 telephone respondents. Almost identical questions are now asked monthly of 1000 Chinese telephone respondents in a stratified ran-

dom sample drawn from 30 representative cities in eastern, middle, and western China. This eziData China Consumer Confidence Survey is conducted under the guidance of The University of Michigan's Survey Research Center. Katona, who founded Michigan's Economic Behavior Program, gave a history of behavioral economics and the Survey Research Center's approach to measuring consumer sentiment and predicting consumer demand (Katona, 1975, Chapter 5).

Table 4: Questions in the Index of Consumer Sentiment

We are interested in how people are getting along financially these days. Would you say that you and your family are better off or worse off financially than you were a year ago?
Now looking ahead, do you think that a year from now you people will be better off financially, or worse off, or just about the same as now?
Now turning to business conditions in the country as a whole, do you think that during the next 12 months we'll have good times financially, or bad times, or what?
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?
Now about the big things people buy for their homes, such as furniture, refrigerator, stove, television, and things like that. Generally speaking, do you think now is a good or a bad time for people to buy major household items?

Note: Curtin (1973, Table 15-1)

Apart from its very small sample sizes in the United States and China, doubts have lingered over the years about the effectiveness of the ICS in predicting consumer spending. In an early econometric critique Shapiro (1972) questioned the need for the ICS in forecasting equations that predict consumer demand. Bram and Ludvigson (1998) reported that Michigan's expectation index (a subset of three items in Table 4) provided no incremental power in forecasting the next period's total consumption growth over and above economic predictors that are available without surveying consumers. They attribute this failure to the lack of specificity of the questions in Table 4. In a 2002 New York Times article Uchitelle also expressed skepticism about the ICS, versus an array of specific survey questions, in predicting consumption (cf. http:// www.nytimes.com). Dominitz and Manski (2004) echo this concern with the ICS and argue for more personal, less ambiguous questions when measuring consumer confidence.

Stimulus and response specificity of survey questions was advocated decades earlier by Turner and Krauss (1978):

> ⋯ there appears to be emerging some evidence that the most unstable indicators are those involving questions that are the most amorphous in their

> meaning ⋯, the most imprecise in their referents ⋯, and that involve the most arbitrariness in the selection of a response category ⋯.

All three of these linguistic burdens beset the questions in Table 4 and appear to contribute to the ICS's weakness in predicting aggregate consumer demand.

6.1.2 Individual Consumer Demand

Consumer sentiment. Preoccupation with the aggregate characteristics of the ICS in time-series data (e.g., Curtin, 1973) has obscured the psychometric properties of the items in Table 4. In a rare psychometric look at the ICS, Adams (1965) coded pessimistic, intermediate, and optimistic individual responses to the items in Table 4 as 0, 1, and 2. He found very low cross-sectional correlations among these five items that ranged between 0.032 and 0.278. This multi-dimensionality was also expressed by Adams' principle components analysis in which three factors accounted for only 60% of the cross-sectional variance among the ICS items (see Table 5). These results were an early warning that the items in Table 4 do not measure any strong dimension at the individual level. It is not surprising, therefore, that a consumer-sentiment score, i.e. the sum of the five coded responses, "has not been found to be a significant predictor of expenditures in cross-sectional research" (Didow, Perreault and Williamson, 1983, p. 340). These authors conclude (p. 346):

> It seems clear that satisfactory psychometric qualities (validity, reliability) at the individual level are a necessary starting point for a well constructed measure of group sentiment.

Economic anxiety. The results in Table 5 for our economic-anxiety scores present a very different picture than those for consumer sentiment. The cross-sectional correlations among the three items in Table 1 range between 0.45 and 0.63, suggesting that they measure a much stronger dimension at the individual level. This is confirmed by our first principle component which accounts for 71% of the cross-sectional variance among the three items in Table 1. Moreover, the factor scores for this first component correlate 0.996 with the economic-anxiety scores X_i in (2.1).

This psychometric performance of economic anxiety scores would appear to be facilitated by the specific and personal nature of the items in Table 1 (cf. Dominitz and Manski, 2004). The prominent first principal component in these items is prerequisite to our finding in Table 3 that these scores strongly predict consumer spending in cross-sectional pan-European data. This cross-sectional prediction, in turn, will be prerequisite to the prediction of aggregate demand when our scores can be averaged up to national and cross-national levels in time-series analyses. If our aggregated anxiety index proves to predict macro consumption in forecasting equations, then survey questions such as those in Table 1 can replace the anachronistic items in Table 4. This departure from the status

quo was called for long ago by Didow, Perreault and Williamson (1983, p. 347):

> The time has come to develop alternative measures of consumer sentiment and to collect data with them for future forecasting and related uses.

Table 5: Principal components of the consumer sentiment and economic anxiety items

Principal component	1	2	3	Range of item correlations
Consumer sentiment	27%	18%	15%	0.03 - 0.28
Economic anxiety	71%	16%	13%	0.45 - 0.63

Note: The statistics in the first line of this table have been drawn from Adams (1965, Tables 3 and 4). Each percent is the portion of consumer-sentiment (or economic-anxiety) score variance accounted for by a principal component.

6.2 Political Impact

6.2.1 Societal Satisfaction as a Driver of Political Trust

American opinion polling suggests that:

> Feelings of trust in government are grounded in one's assessment of how well government is satisfying normative expectations for government performance ⋯. Numerous studies report that citizens' level of trust in government is linked to various indicators of government performance. (Rudolph, 2005, pp. 851-853)

A widely watched indicator of government performance is presidential approval, which is surveyed by The Gallup Organization, Zogby International, CBS News/ New York Times, ABC/Washington Post, NBC News/Wall Street Journal, and the American National Election Studies (Clarke, Stewart and Rodgers, 2005). Another important indicator of government performance is congressional approval.

> Congressional approval is the extent to which the American public approves of the job that congress, as a whole, is doing at any given point in time. These public evaluations are generally based both on what Congress is doing, in terms of representing the public and keeping the country running smoothly, and on how it is doing it. Congressional approval is an important concept in political science as it is believed to influence the public's trust in our system of government in general. (McDermott, 2005, p.115)

Government approval in the present study is measured by the societal satisfaction scale in Table 2. This scale taps the perceived performance of a country's economy, national government, and democratic institutions. In an unpublished analysis of rounds 2, 3, 4, and 5 of the ESS, Bechtel has found that this societal

satisfaction scale is a consistent and strong predictor of the political trust scale in Table 2. This finding supports the American link between perceived government performance and trust in government.

6.2.2 Political Trust as a Driver of Voter Turnout

Casting an election ballot is the ultimate citizen action in a participatory democracy. The importance of this action to the citizens of new democracies has been demonstrated recently in Iraq, Egypt, and the Democratic Republic of Congo. In the United States voter turnout and political trust have been surveyed since 1977 by the National Election Studies at The University of Michigan (Burns and Kinder, 2005). However, "Scholars exploring the link between declining political trust and declining political participation have consistently arrived at null findings" (Hetherington, 1999, p. 311). In summarizing the literature on political trust in Polling America: An Encyclopedia of Public Opinion, Rudolph (2005) treats political trust as a societal goal per se without any mention of voter turnout.

In contrast, recent studies show that political trust does predict voter turnout in Europe at both the macro and micro levels. In Round 1 of the ESS Grönlund and Setälä (2007) report a correlation of 0.57 between average trust in politicians and percent turnout across 19 countries. They also report that trust in politicians has a highly significant effect on voting in their pan-European regression across 34,111 cases from 20 countries. These macro and micro results are confirmed by Birch (2010) with data from the Comparative Study of Electoral Systems (CSES). She found a highly significant difference between voters and non-voters on a trust-in-electoral-fairness scale averaged across 31 country elections from 1996 to 2002. She also found this trust scale to be a highly significant micro predictor of voter turnout in a logistic regression across 35,848 CSES respondents to 29 country elections. Birch confirmed this latter result with another logistic regression in which voter turnout in 2001 was predicted by 1997 trust in electoral fairness in the British Household Panel Survey. Further verification of the impact of European trust on voting is provided by Bechtel (2012) whose true-value regressions confirmed this effect ($p < 0.000001$) in the 2006 and 2008 European Social Surveys.

6.2.3 Economic Anxiety as a Deterrent to Satisfaction, Trust, and Voting

The causal chain from satisfaction to trust to electoral participation constitutes an important linkage for any democracy. The results in Table 3 show that economic anxiety, as measured by the items in Table 1, erodes each of these soci-

etal desiderata. These findings pinpoint the negative political effects exerted by the loss of household income and purchasing power beyond their direct economic effect on consumer spending.

6.3 Psychological Impact

The self-evident goal of rational consumption and democratic participation is the improvement of the quality of life. The life-quality literature largely ignored subjective financial hardship (in contrast to actual household income) until T. Bechtel (2007) showed that economic distress affected German and English happiness. Bechtel (2011) generalized this finding to the pan-European level. Table 3 here further confirms that the anxiety accompanying loss of household income and purchasing power negatively affects life quality. The true-value coefficients in Table 3 calibrate this effect against other societal impacts of economic anxiety, also at the pan-European level. The specter haunting this type of anxiety, i.e. unemployment, has been described by Samuelson and Nordhaus (1985, pp. 207-209) in their classic text Economics:

> However large the economic costs of unemployment, a recounting of dollars does not adequately convey the human, social, and psychological toll that persistent periods of involuntary unemployment bring. ⋯ recent studies indicate that unemployment leads to a deterioration of both physical and psychological health − higher levels of heart disease, alcoholism, and suicide. ⋯ other studies indicate that involuntary joblessness is a highly traumatic event for many people.

These words lend added meaning to our economic-anxiety and life-quality items in Tables 1 and 2. Clearly, the reduction of economic anxiety, and the attendant improvement in life quality, should be global goals of behavioral economics in this new century.

Acknowledgements

This article makes use of the true-value regression theory appearing in Bechtel (2010; 2011; 2012). The author appreciates the support given this work by the University of Florida's Warrington College of Business Administration. Our cross-national regressions were obtained by user-friendly access to the European Social Survey. Norwegian Social Science Data Services (NSD) is the data archive and distributor of the ESS data. None of the ideas or analyses here may be attributed to the European Social Survey or the University of Florida.

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Received February 26, 2012; accepted May 22, 2012.

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