Consumer Sentiment Surveys:
Worldwide Review and Assessment

Richard Curtin[*]

Abstract

Consumer sentiment surveys are regularly conducted in at least forty-five countries. The surveys are based on the premise that data on consumer expectations represent a leading indicator of future changes in the macro economy. A series of Granger causality tests indicated that measures of consumer sentiment both predict and are predicted by a wide range of economic variables, although the data exhibit substantial differences across countries and across variables. The predictive performance was not found to be directly related to differences in sampling, question wording, or index construction. Several recommendations are given to enhance the predictive performance of consumer sentiment. First, a new conceptualization of consumer sentiment is now warranted based on changes in the knowledge and sophistication of consumers, the increased availability of economic information, shifts in the composition of demand, and changes due to an aging population. New survey measurement techniques are needed as well. Preliminary data on numeric probability scales indicate that there are advantages and disadvantages to a shift away from the now commonly used verbal likelihood scales. Second, new analysis models are proposed that would disaggregate consumer spending into its components as well as disaggregate the consumer data into separate demographic and economic subgroups. Third, changes in the survey administration are proposed. The shift away from telephone surveys will be due to falling response rates, especially among younger adults; the shift toward internet surveys will be due to their greater capacity to handle much more complex measurement strategies. Finally, the very notion of worldwide harmonization must also evolve; shifting its main focus from the input questions to the output indices so as to encompass a greater range of diversity in measurement methodologies. The basic premise of the consumer sentiment surveys has been affirmed by past measurements, and with appropriate developments, the consumer sentiment surveys can provide even more robust and timely forecasts of trends in the macro economy in the future.

Key Words: Consumer Sentiment, Leading Indicators, Expectations, Survey Methodology

JEL Classification: C42, C82, D84, E27, E32

[*]   Director Surveys of Consumers, University of Michigan; curtin@umich.edu

Résumé

Des enquêtes d'opinion auprès des consommateurs sont régulièrement menées dans quarante cinq pays au moins. Les enquêtes sont fondées sur la prémisse que les données concernant les attentes des consommateurs constituent un indicateur avancé sur les changements futurs de la macro économie. Une série de tests de causalité Granger a indiqué que les mesures de l'opinion du consommateur prévoient en même temps qu'elles sont prévues par un grand nombre de variables économiques, bien que ces données montrent des différences substantielles d'un pays à l'autre et d'une variable à l'autre. La performance de prédiction n'a pas semblé être directement liée aux différences d'échantillonnage, de formulation des questions ou de construction des indices. De nombreuses recommandations sont données afin d'améliorer la performance de prédiction de l'opinion du consommateur. Tout d'abord, une nouvelle conceptualisation de l'opinion du consommateur est dorénavant garantie. Elle est fondée sur les modifications de la connaissance et la complexité des consommateurs, la disponibilité accrue des données économiques, les modifications des éléments constitutifs de la demande ainsi que les changements dus à une population vieillissante. Il est aussi nécessaire de trouver de nouvelles techniques d'évaluation des enquêtes. Les données préliminaires sur les échelles de probabilité numériques indiquent l'existence d'avantages et d'inconvénients liés à un éventuel abandon des échelles de vraisemblance verbale que l'on utilise aujourd'hui. De plus, de nouveaux modèles d'analyse qui désagrègeraient les divers composantes des dépenses du consommateur et qui désagrègeraient aussi les données du consommateur en sous-ensembles démographiques et économiques distincts, ont été proposées. Par ailleurs, des modifications dans la gestion des enquêtes ont été proposées. L'abandon des enquêtes téléphoniques est dû à un taux de réponse décroissant, tout particulièrement auprès des jeunes adultes ; le choix des enquêtes sur Internet s'est fait grâce à leur plus grande capacité à gérer des stratégies d'évaluation plus complexes. Enfin, l'idée même d'une harmonisation mondiale doit aussi évoluer ; en déplaçant la priorité principale de la formulation des questions vers la création des indices de résultat afin de couvrir un plus large éventail de diversité concernant les méthodologies d'évaluation. La prémisse élémentaire des enquêtes d'opinion auprès des consommateurs a été affirmée par des évaluations passées, et avec des développements appropriés, ces enquêtes pourront fournir dans le futur des prévisions des tendances de la macro économie, dans les délais et encore plus solides.

1   Introduction

Consumer sentiment surveys are now regularly conducted in at least forty-five countries around the world, including nearly all developed economies as well as by many developing and emerging market economies. The basic premise of these surveys is that data on consumer expectations contain information about potential future changes in consumer spending and represent a leading indicator for the entire economy. Consumer spending accounts for one-half to two-thirds of all spending in market-based economies, so even small changes in the expenditures of households can have a major impact on the economy. Spending in the U.S. economy totalled $12.5 trillion during 2005. Of that total, $9.5 trillion was spent by consumers while investment spending by business firms was just $1.3 trillion. Indeed, consumers invested more in homes, vehicles, and other durable goods than firms invested in new plants and equipment.

How successful are consumer surveys in providing advance information on potential changes in the macro economy? The overall evidence of its predictive track record is mixed; its performance is uneven across countries as well as across different economic measures within countries and over time.[1] Consumers' expectations are largely formed from information on the standard array of variables that economists typically use in their forecasting models. Thus, the repeated finding that these other economic variables often capture the information contained in consumer expectations should be no surprise. Consumer expectations data are intended to improve short-term forecasts; there is no credible use of the sentiment data for long term forecasts. Sentiment data improves near-term forecasts not just because the data is available sooner than the underlying economic data, but because it contributes independent information about the future course of the economy. Some have lamented that the contribution is small, but so too is the contribution from most other economic variables. The data from consumer surveys is meant to supplement not to replace other economic information.

There is evidence that the amplitude of business cycles have been reduced in OECD countries during the past few decades largely due to declining fluctuations in domestic demand (Dalsgaard, Elmeskov and Park, 2002). Consumers have been devoting an increased share of their incomes to purchases of services, which are much less volatile than expenditures on durable goods. Moreover, the ability of consumer sentiment to forecast cyclical changes in the economy is likely to be coincident with other economic variables

---

[1]   The predictive ability of intentions data in cross-section analysis has been investigated by Klein and Lansing (1955), Mueller (1957), Tobin (1959), Juster (1964), Maynes (1967), and Dunkelberg (1972). Time-series tests were conducted by Mueller (1963), Friend and Adams (1964), Adams (1964; 1965), Suits and Sparks (1965), Ferber (1966), Maynes (1967), Dunkelberg (1969), Fair (1971), and Juster and Wachtel (1972), Garner (1981), Curtin (1984), Fuhrer (1988), Praet and Vuchelen (1989), Hall (1993), Blanchard (1993), Acemoglu and Scott (1994), Cochrane (1994), Huth, Eppright and Taube (1994), Carroll, Fuhrer and Wilcox (1994), Matsusaka and Sbordone (1995), Abderrezak (1997), and Eppright, Arguea and Huth (1998), Danthine, Donaldson and Johnsen (1998), Howrey (2001), Utaka (2003), Curtin (2003), Ludvigson (2004), and Golinelli and Parigi (2004).

during periods of stable economic growth, while the importance of sentiment increases near turning points or as the result of non-economic shocks (Keyfitz, 2004; Golinelli and Parigi, 2004). Insofar as the cycles in the economy have diminished, this may also mean that the forecasting ability of the sentiment index has also declined. Others have disputed this claim, finding that the ability of the sentiment index is not limited to special circumstances (Howrey, 2001).

To be sure, survey measures of economic expectations need to be improved to serve as more accurate indicators of near term changes in the economy. This paper focuses on the development of an overall strategy to guide those necessary changes. The review starts with a theoretical basis of the expectations measures, the measurement methodology, the questions that are now used, and the formulation of the sentiment indexes. Next, empirical tests are conducted for each country to determine how objective economic information influences the formation of consumer expectations, and how consumer expectations foreshadow subsequent economic developments. Based on an understanding of the strengths and weaknesses of the data, the paper recommends some fundamental changes for the future.

Although the influence of most demographic, economic, and institutional aspects of the economy have not changed, three must be highlighted: the changing economic concerns of an aging population, the more rapid transmission of economic information, and the impact of globalization. Aging populations will mean a rising share of consumers will become more concerned about the uncertainties in financial markets and less concerned about the uncertainties in the labour markets. The rapid transmission of information and the growing knowledge and sophistication of consumers will foster more active rather than passive responses on the part of consumers. Moreover, the continued globalization of national economies has meant that financial markets have become increasingly synchronized, and this could increase the transmission of economic shocks in the future.

Three recommendations are made to enhance the ability of consumer surveys to act as leading indicators of macroeconomic trends. First, a new conceptualization of consumer confidence is now warranted, and the revised definition requires new survey measures. New survey measures need to reflect advances in economic theory as well as changes in demographic characteristics and the economic sophistication of the population. The changes may entail modifications to some of the standard questions as well as the additions of some new questions. The goal of worldwide harmonization must yield to differences in implementations across countries so that differences in the characteristics and sophistication of the population can be reflected in the questionnaire. Such tailoring of the questionnaire would still allow full harmonization of the results for the analysis of business cycle developments in individual countries as well as across groups of countries.

Second, the analysis of consumer survey data must adopt a new analysis framework to optimally contribute to the prediction of near-term macroeconomic trends. The optimal design would be to disaggregate the major components of consumer purchases as well as disaggregate the survey data based on the household's demographic and economic characteristics. Predictions of economic behaviour would be done on the disaggregated components of consumer spending with the disaggregated population groups. Forecasts of macroeconomic trends would simply aggregate the resulting forecasts of the individual components.

Finally, rising pressure to reduce costs as well as increase the timeliness of the survey information will mean more diversity across countries in how the surveys are conducted. Internet surveys represent both substantial advantages as well as present significant challenges. The advantages of internet surveys include significant cost savings, the potential for higher quality data, and the near instantaneous availability of the survey results. The disadvantages of internet surveys include significant challenges to maintain the representativeness of the sample and the designation of the respondents. Strategies need to be developed that allows the combination of internet surveys with surveys based on more traditional data collection methods.

These improvements represent significant tasks that require extensive research and an extended period of time for implementation. Trends in current measures must be preserved and linked to trends in any new measures that are devised in the future. The current measures of consumer expectations were devised a half century ago in response to a different economic era. The measurement and analysis of consumer expectations must adapt to changed conditions or suffer the growing irrelevance of its unchanged methods. Given the potential usefulness of measures of consumer sentiment in the future, the only choice is to embrace change and devise robust and innovative solutions for the future.

2   Theoretical Background

The first measures of consumer confidence were developed by George Katona in the late 1940s as a means to directly incorporate empirical measures of expectations into models of spending and saving behaviour.[2] Katona's now famous dictum was that consumer spending depends on both their "ability and willingness to buy." By spending, he meant discretionary purchases; by ability, he meant the current income of consumers; and by willingness, he meant consumers' assessments of their future income prospects. Katona hypothesized that spending would increase when people became optimistic, and precautionary saving would rise when they became pessimistic.

Katona originally considered "consumer confidence" to be a broad measure of expected changes in income. It was not simply the expected size of a consumer's future income, but the certainty or uncertainty that was attached to those expectations. Thus, an important component of the definition of consumer confidence was that it encompassed both the expected level as well as the expected variance of income. To recognize this dual criterion, the dimension of consumer sentiment was defined as ranging from optimism and confidence to pessimism and uncertainty.

---

[2]   Katona documented the development of his theories in a series of books: *Psychological Analysis of Economic Behavior* (1951), *The Powerful Consumers* (1960), *The Mass Consumption Society* (1964), and *Psychological Economics* (1975). For an overview of Katona's theoretical contributions, as well as a complete list of his publications and biographical information see Curtin (1983).

Discretionary purchases are the things that people buy that are not the necessities of life. All spending categories include discretionary items, with the key provision that discretionary purchases can be postponed. There is no reason to think that consumer confidence should play a role in determining the timing of necessary expenditures. The most commonly studied discretionary purchases are homes, vehicles, and household durables. These are relatively infrequent and large purchases, often involve the use of credit, and are typically planned purchases – just the type of purchases that would reflect both current economic conditions as well as expected future changes. Such expenditures are not properly viewed as current period consumption, but as investments that are intended to yield a future stream of consumption.

Katona foresaw the growing power of the consumer to shape the course of the macro economy resulting from two developments in the second half of the 20th century. First, growth in consumer income as well as asset holdings provided people with greater financial latitude. Income changes could no longer be expected to result in immediate and offsetting changes in consumption. This financial latitude meant that consumers became active decision makers, able to gauge the timing of their spending decisions to best serve their present and future needs. The second change involved the growing importance of consumer "investment" goods – purchases of homes, vehicles, and other large household durable goods. These large and infrequent purchases are more likely to be carefully deliberated decisions, the timing of the purchase can as easily be advanced as postponed, and these purchases frequently involve the risks associated with the use of credit or accumulated savings. As a result, the timing of spending decisions became increasingly dependent on consumers' expectations about future trends in income, employment, prices, and interest rates, and correspondingly less dependent on their past economic situation.

While the description of this paradigm reflects investment spending in advanced economies, Katona thought that the same reasoning applied to developing or emerging market economies. The key difference is that discretionary purchases in less developed economies are not big ticket purchases, but are typically inexpensive nondurable items (inexpensive at least by the standards of advanced economies). The underlying theory, however, remains the same. The same is true for the consumption of services by consumers in advance economies, as some services can be considered discretionary and subject to expectations about future economic conditions. Katona included these qualifications to his basic theory.

Katona did not anticipate, however, the vast impact of the information age on the economic decisions of consumers, the rapid growth in the knowledge and economic sophistication of consumers, the impact of the global economy on domestic economic conditions, and the extent to which consumers would base their spending decision on specific expectations rather than on general economic optimism.

A half-century ago most consumers viewed all aspects of the economy through the single dimension of how it affected their job and income prospects. Today, consumers in advanced economies are more likely to view their future economic prospects as dependent

on a much broader range of expectations, including expected returns on financial assets and real estate holdings, expected inflation rates, pension and health care entitlements, future taxes and government subsidies, as well as job and income prospects. Moreover, consumers are more likely to make distinctions about the direction and size of the expected change among these various economic factors, as well as distinctions between near and long term expected outcomes. Spending and saving decisions are responsive to these distinctions. As a result, there is no longer any presumption that a single index of consumer sentiment could be useful for the prediction of all types of spending and saving behaviour.

Presumably, given the differences in the stage of economic development across countries, along with greater economic development consumers would shift from a sole focus on income to the growing importance of the full array of economic expectations. Nonetheless, the pace of change along this dimension may be accelerated by the equal availability of economic information to anyone with an internet connection, whether they live in Indiana, Italy, India, or Indonesia. Greater information may also result in more rapid growth in economic sophistication. Moreover, the growth in information and sophistication may more rapidly diminish the power of a single index of consumer sentiment in favour of specific indexes for specific spending and saving decisions.

Along with the rise in the importance of a range of economic expectations, there is a growing demand from economists for more precise measures of expectations. As expectations have become more central components of economic models, the theoretical specifications of the desired measures have become more exacting. The ideal measure would specify the characteristics of the complete probability distribution for a precisely defined future event or outcome. Given an estimate of the entire probability distribution for each individual, measures of central tendency can then be supplemented by measures of dispersion to capture the uncertainty that individuals associate with that expectation.

Before I discuss the potential revisions to what is now measured, it is first necessary to document and assess the current survey methods.

3   Survey Methodology

Consumer expectations are typically measured by qualitative questions in population surveys conducted within each country. There are three general areas that are critical for the interpretation of the survey findings: the sample design, question wording, and transformations of the raw data into estimates of consumer sentiment.

The countries included in this analysis are listed in Table 1, along with the two-letter acronym used to identify the countries in later tables. There are representatives of all six inhabited continents, with most of the recent additions in Eastern Europe and Asia. There are other countries, such as India, that are now in the process of starting consumer surveys. In addition to the countries included in Table 1, there are a large number of other countries that have measured confidence sporadically. These countries include many Latin American

nations such as Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Uruguay, and Venezuela. These surveys are typically conducted by marketing research firms and not under the direction of any governmental agency. In addition, consumer sentiment is measured in many cities and local areas around the world, none of which were considered for this paper.

Table 1 **Countries conducting consumer tendency surveys**

AR	Argentina	ES	Spain	NL	Netherlands
AT	Austria	FI	Finland	NO	Norway
AU	Australia	FR	France	NZ	New Zealand
BE	Belgium	HK	Hong Kong	PL	Poland
BG	Bulgaria	HU	Hungary	PT	Portugal
BR	Brazil	ID	Indonesia	RO	Romania
CA	Canada	IE	Ireland	RU	Russia
CH	Switzerland	IT	Italy	SE	Sweden
CN	China	JP	Japan	SI	Slovenia
CY	Cyprus	KO	Korea	SK	Slovak Republic
CZ	Czech Republic	LT	Lithuania	TH	Thailand
DE	Germany	LU	Luxembourg	TW	Taiwan
DK	Denmark	LV	Latvia	UK	United Kingdom
EE	Estonia	ML	Malaysia	US	United States
EL	Greece	MX	Mexico	ZF	South Africa

The ideal design for an international survey would be if all countries used a nationally representative sample, a common method for index construction and seasonal adjustment, a comparable number of interviews conducted at the same time each month and information on response rates and procedures used to construct non-response weights.

There are many variations of these standards in practice. The EU countries use the most consistent survey methodology across all members due to the guidance of the European Commission. Surveys conducted in other parts of the world are generally not harmonized, although the OECD has made progress in recent years in convincing countries to conform to the accepted standards. Nonetheless, there are considerable differences in the economic and population characteristics of the countries that now measure consumer sentiment, and these differences are likely to persist in the years ahead. The ideal design would still focus on the standardization of the measurement methodology, although it could allow variations in question wording that recognizes differences in the stage of development in the economy and in the population.

3.1 Sample design and interview methodology

Most countries have designed their sample so that every adult member of the population has an equal chance of being selected. Nationally representative samples are standard in all developed countries; in emerging economies the samples may be limited to urban centres, such as in China, Malaysia, and Mexico, for example. Such limitations of the national samples are not critical omissions if the areas excluded from the sample do not fully participate in the market economies of their countries.

Of greater importance is survey non-response, especially if there is a differential non-response rate across important population subgroups. Telephone samples have an added coverage problem, namely non-telephone households are excluded by definition. Information on response rates is provided for many of the surveys, but without a common definition, it is difficult to interpret whether a 100% response rate is better or worse than a 60% rate – the range recently reported for EU countries (Nilsson, 2000a). Sample weights are widely used to correct for differential non-response, or in some cases to align quota samples with actual population distributions. Most countries conduct the interviews by telephone, although some countries still conduct in-home interviews.

Some experiments have been done using the survey data collected in the United States which indicates that measures of consumer sentiment are not very sensitive to coverage or non-response bias. In fact, no significant time-series differences in the consumer sentiment index were uncovered when the overall response rate was reduced by two-thirds (Curtin, Presser, and Singer, 2001). This is of course no guarantee that the damaging impact of non-response bias will not be present in any other country or even in the United States in future surveys.

3.2 Questions used to measure consumer sentiment

There were several variations in the types of questions that are now being used to measure consumer confidence. In nearly all of the countries the questions focus on personal finances, general conditions in the economy including jobs and inflation, and intentions to spend or save. Of course, there are slightly different versions of these basic themes across the countries; nonetheless, all of the questions in all countries addressed similar topics. Indeed, the major differences involved variations in the frame of reference: some countries included questions about past as well as expected future changes, and some countries asked about time horizons of six months instead of the more typical twelve month reference period. It should be noted that the questions used to calculate the sentiment indexes are typically drawn from surveys that include a broader range of questions that could be used to supplement or reformulate the current sentiment index.

For the purposes of this discussion, I have separated the countries into three main groups largely based on differences in reference periods. The first group, accounting for more than half of all the countries, uses the harmonized EU questionnaire; the second group uses questions on both past and expected future changes as well as a longer time horizon; and the

final group uses a six month time horizon. These basic groups also differ in the number of question used in the overall confidence index, with the number ranging from three to six.

3.2.1   Question variant 1: EU harmonized

The European Commission governs the methodological standards for more than half of all countries that now conduct consumer tendency surveys. A recent review of the properties of the consumer sentiment index lead to the recommendation of a change from five questions (past and expected changes in general economic conditions, past and expected change in personal finances, and assessments of current buying conditions) to the following harmonized questions (Goldrian, Lindlbauer and Nerb, 2001):

- Expected change in financial situation over the next twelve months

- Expected change in general economic situation over next twelve months

- Expected change in unemployment over next twelve months

- Expected saving over next twelve months.

The sentiment index is defined as the arithmetic average of the four series. This new formulation was derived based on an analysis that used real private consumption as the criterion variable. The EU uses a weighting procedure to aggregate the indexes from the individual countries, with the weights depending on the relative size of total personal consumption expenditures.

3.2.2   Question variant 2: past and future changes

The second major grouping of countries generally follows the U.S. version of the questions. These countries are: Argentina, Australia, Brazil, Canada (Decima), Hong Kong, Indonesia, Mexico, New Zealand, South Africa, Russia, and the United States. Hong Kong and South Africa only use the three forward-looking expectation questions in their confidence indicator. These countries all generally use a form of the following questions:

- Personal financial situation over the past twelve months

- Expected change in personal finances in next twelve months

- Expected change in general economic conditions in next twelve months

- Expected change in general economic conditions in next five years

- Buying conditions for consumer durables

3.2.3 Question variant 3: six-month reference periods

The countries in this group include Canada (Conference Board), China, Japan, Korea, Malaysia, Taiwan, and the United States (Conference Board). The questions in these countries include the following:

- Expected change in family living standards in six months

- Expected change in income in six months

- Expected change in price level in six months

- Current and expected change in business conditions in six months

- Current and expected change in employment in six months

- Buying plans for durables in six months

No country's survey included questions on all of these topics; typically five questions were used. The single common element was the six month horizon.

3.3 *Index formulations*

Nearly all of the countries allow for five potential responses to their questions, ranging from very positive (PP), positive (P), neutral, negative (M) to very negative (MM). Typically, two steps are involved in the computation of the overall consumer confidence index for each country. First, for each question a balance score is computed based on the percentage distribution as:

$$B = \left(PP + \frac{1}{2}P \right) - \left(\frac{1}{2}M + MM \right)$$

The overall confidence index is then simply the average of the balance scores:

$$CCI = \sum_{i=1}^{n} B_i / n$$

For the few countries that coded three instead of five response categories – positive (PP), neutral, and negative (MM) – the same index formula applies except the half-weight terms are simply dropped. More generally, the index formula can be written as:

$$CCI_i = \sum_i w_i B_i^s$$

where w is the weight and B_i^s is the standardized balance score. The standardization is sometimes necessary to equalize the variance contributed by each component to the overall index. For example, an equal variance index would mean that each component question

would be normalized by subtracting the mean and dividing by the variance. The standardized balance score could also include the application of a smoothing factor, such as a moving average that represents the number of months to cyclical dominance (MCD). For the sentiment index, the MCD has been estimated at 2 – 3 months (Nilsson, 2000b). In the analysis included in this paper, the sentiment index that was used is the official published index; there was no attempt to reformulate any country's index data.

4   Interpreting Survey Responses

There are two approaches to determine what these questions measure. The first is an interpretation of the question wording; the second is an interpretation of the responses. In the first approach, the difference between what was asked and what was answered could be considered a form of measurement error if the question wording could be uniquely linked to an objectively observable answer. For example, expected changes in the unemployment rate could be compared with the actual change in the official unemployment rate. Even in this seemingly straightforward case the actual test is only approximate: for example, the EU question asked about the number unemployed, not conditioned on only counting those who are actively seeking work. Moreover, it is unclear whether the reference period of "over the next twelve months" means any instance of unemployment, the average level over the twelve months, or the number unemployed at the end of the period; it is also unclear whether people who work at part-time or temporary jobs while looking for a permanent job should be counted as unemployed. For almost all the other questions, the issues are even more difficult since unemployment has a much clearer objective counterpart than the questions on the "financial position of the household" or "general economic situation" and whether the household would "save any money."

The second approach simply uses an empirical standard to determine what the question measured. For example, it could be hypothesized that the consumer sentiment index measured expectations about the household's income and job prospects. This could be tested by the sentiment index's empirical relationship to changes in real personal disposable income and changes in the employment rate.

Indeed, testing survey measures by their relationship with objective economic measures has typically taken one of two forms: testing what sources of information consumers used to form their expectations, and testing what measures consumer expectations are able to predict. The first approach focuses on the inputs and the latter on the outputs of the decision process. While most have assumed that these two processes are independent, with expectations typically formed in advance of their use in decisions, consumers may be more likely to simultaneously form and use expectations. Indeed, consumers may only form explicit and specific expectations when they perceive a need for their use in making decisions. Prior to the actual decision, consumers may only form more generalized economic expectations – the type of expectations that the more general qualitative questions that are now asked are most likely to capture.

Another variant of these same issues has been framed in terms of whether consumer expectations are backward or forward looking, that is, do consumer expectations indicate what has happened in the past or indicate what will happen in the future. Clearly, expectations about prospective economic changes should incorporate information about the past as well as provide information about the future.

The advantage of directly observing the expectations of consumers is that they reflect private information in addition to the publicly available information on the economy. Moreover, it is this private information that represents the independent additional information that is the unique contribution of survey measures of consumer sentiment. Even for commonly publicized statistics, such as the unemployment rate, consumers rely to a greater extent on private information sources than on official information (Curtin, 2003).

4.1   *Granger causality tests*

A series of Granger causality tests were performed to determine whether the past history of an objective variable predicts the expectation or the expectation predicts the future changes in the same objective economic variable. Of course, the use of the term "causality" is not meant literally, but only to identify the widely used statistical test and should be interpreted as meaning that one variable has the ability to predict future changes in the other.

While there were differences in the question wording across countries, the differences were generally small. Moreover, for any difference in wording to affect the results of a time series analysis, the wording differences must prompt a changing pattern of responses, not simply a difference in levels across all surveys. Thus, for example, differences in the six month and twelve month reference periods would not be relevant for time series analysis if both economic expectations increased or decreased to approximately the same extent. Only if consumers consistently expected, for example, that their economic situation would improve during the next six months and then worsen would there be a chance for the differences to be observed in the time series. In addition, any such regular pattern of difference has been removed by seasonally adjusting the data. The same is true for differences in the wording of other questions.

For each country for which data could be obtained, a series of VAR regressions were run to test Granger causality between the sentiment index and a range of objective economic measure. The objective economic variables included variables generally considered to be determinants of sentiment, namely the unemployment rate, inflation rate, interest rate, and personal income, as well as measures of outcomes that are thought to be influenced by sentiment, such as consumption of durables, vehicle registrations, retail sales, total personal consumption, and gross domestic product (GDP). The selection of the variables was intended to cover a broad range of both informational inputs and behavioral outputs. All of these variables were not available for all of the countries, and the absence of data for any variable is indicated by a dash in the tables. Unfortunately, most of the missing variables related to consumption decisions, including purchases of durable goods and vehicle registrations.

Of the 45 countries identified as having consumer tendency surveys, eight of the countries had an insufficient number of data points on which to base the analysis (or I have simply been unable to obtain the information.) The analysis was thus limited to 37 countries. Quarterly data were used since monthly data was quite rare across most of the countries. All regressions included the latest data available when the analysis was done (usually the first quarter of 2004); the start dates for each equation differed depending on the availability of data for the sentiment index in each country and more often than not, the availability of the objective economic data.

All variables were defined as the year-to-year percentage change in the price adjusted series, with the exception of unemployment, inflation, and interest rates, which were defined as the year-to-year percentage point change. Five lags of all variables were entered into the regressions; the contemporaneous changes in the variables were not used in the regressions so that there was a true time separation between the survey measures and the objective economic variables. It is of course true that since the survey data are generally available well in advance of the objective economic measure they could be used to forecast the same periods economic outcome. Indeed, there are strong theoretical reasons to include the current period's survey measure in these regressions even if they were not available earlier than the objective data (Katona, 1951). Since the purpose of this analysis is not to test the predictive capacity of either the sentiment or the objective data, but to test the interconnections between an independently measured sentiment variable and objective data, a distinct time difference was favored.

All variables in all countries were transformed in the same way to facilitate comparisons across countries and across variables. There was no attempt to transform the data to match differences in the separate variables or by individual countries, or to maximize the observed relationship. These analyses were not designed to provide a definitive test of any specific hypothesis, but rather to generally ascertain the informational content of measures of consumer sentiment.

The results can be summarized as follows: measures of consumer sentiment show a significant correspondence with past changes in economic variables, and measures of consumer sentiment provide predictive information about future changes in those same variables. It should be no surprise that consumer sentiment provides both backward and forward looking information. This duality is as true for variables typically used as inputs to the formation of consumer expectations as it is for measures that reflect behavioral outcomes. A significant relationship between consumer sentiment and other economic variables, however, does not mean that the predictive power of either the sentiment variables or the economic variables was large. In fact, the amount of variance accounted for by the regressions that alternatively used the sentiment variables as an independent and as a dependent variable were quite small (generally less than 10%). There have been numerous analyses that focused on the issue of how much the sentiment data can reduce the mean square error in out of sample forecasts when all other economic variables are included in the regressions (see footnote 2 for a partial list). This analysis is focused on assessing the overall information content of the sentiment variables, its sensitivity to differences in measurement methodology, and its applicability across a wide range of countries and cultures.

4.2 Results by economic variables

Table 2 summarizes the results by variable.[3] The first conclusion is that the information used by consumers to form their expectations is often the same information that the sentiment variable can predict. It should not be surprising that consumers view changes in employment, GDP, or even retail sales as indicators of strength or weakness in the economy and hence influence their level of economic sentiment, and in turn changes in sentiment forecast future changes in those same variables.

Whether you consider the fact that half of all tests on a given variable indicated a significant relationship represents a half-full or half-empty glass is of course a matter of perspective. I often find that psychologists are more impressed than economists, with the latter wondering why the relationship was not universally significant. Any shortfall can be attributed to one of two fundamental errors: the basic hypothesis is flawed or the relationship has been severely diminished due to measurement errors in either the sentiment or the economic variables.

The strongest and most widespread relationship was between unemployment and the sentiment index. In 50% of all countries there was a significant predictive relationship running from changes in the unemployment rate to changes in consumer sentiment, controlling for past changes in the sentiment variable. This indicates unemployment is a powerful determinant of changes in consumer sentiment. It was also true that in 62% of the countries a change in consumer sentiment proved to be a significant predictor in forecasting a future change in the unemployment rate, controlling for past changes in unemployment. Given the importance of wages and job security to the financial wellbeing of families, it is not surprising that whether consumers are optimistic or pessimistic is highly related to the future rate of unemployment; more surprising is that consumer expectations are often correct about year-ahead changes in the unemployment rate. This result supports the notion that consumer sentiment in large part reflects income expectations as well as uncertainty about future wage income.

It is of some importance to emphasize that when predicting future changes in the unemployment rate, for example, the sentiment variable must have accounted for the future changes in the unemployment rate over and above what could be anticipated based on five lags of the unemployment rate. The significance of this relationship is due to private information on potential changes in the unemployment rate (Curtin, 2003).

---

[3] The full set of tables giving the significance levels for Wald tests for Granger causality for each variable within each country are available from the author.

Table 2   **Proportion of Granger causality tests that indicated
a significant relationship by variable**

Variables	Objective Predicts Sentiment	Sentiment Predicts Objective
Unemployment Rate	50%	62%
Consumer Price Index	29%	26%
Short-term Interest Rates	40%	31%
Personal Income	56%	48%
Gross Domestic Product	59%	54%
Total Personal Consumption	36%	51%
Retail Sales	39%	55%
Expenditures for Durables	54%	45%
Vehicle Registrations	23%	46%

The next highest correspondence was between Gross Domestic Product (GDP) and sentiment. Past changes in GDP had a significant impact on sentiment in 59% of the countries, while past changes in sentiment were significantly related to future changes in GDP in 54% of the countries. Given that consumer spending accounts for over half of GDP, these relationships are not surprising. The significant links to future changes in GDP reflect the component questions about the overall economy and have also benefited from private as well as public information.

Changes in personal income indicated a comparable performance on these tests as well: past changes in income predicted future sentiment in 55% of the countries, and past changes in sentiment predicted future changes in income in 48% of the countries. These results again support the notion that – at the present time – sentiment is a broadly based measure of expected income prospects.

Sentiment was more successful in predicting future retail sales and new vehicle registrations. Sentiment anticipated changes in retail sales in 55% of the countries, and anticipated changes in vehicle registrations in 46% of the countries. Perhaps the most difficult to understand is the performance of durable goods expenditures. To be sure, quarterly data on expenditures for durable goods could not be located for most countries. Indeed, I was only able to locate quarterly data for durable expenditures in just eleven of the 37 countries. This is a serious drawback of any analysis of consumer sentiment index, a variable that the index was originally designed to predict. Durable expenditures predicted sentiment in 55% (6) countries, and sentiment predicted subsequent durable expenditures in 45% (5) of the countries – a difference of just one country. Nonetheless, it would seem to be a natural hypothesis that this relationship should be stronger than others, say for example, with GDP.

4.3 Results by country

Another view of the data also provides interesting results, with the findings summarized by country rather than by variable. It could be hypothesized that most of the significant relationships were associated with a subset of the countries, for example, the countries that developed market economies earlier or countries that have measured consumer expectations for a longer time period. Other hypotheses are related to differences in question wording, whether a six or twelve month horizon was used, and so forth. After an examination of the data, these hypotheses can be rejected. To be sure, some cannot be rejected with a good deal of confidence given that there were very few observations on which to base the comparisons.

Overall, I was unable to discern any pattern in the results. For example, the few countries that recorded no significant relationships could be due to the fact that some of the nine variables were missing; indeed, all of the countries that had no significant relationships included fewer than six of the variables.

Table 3 **Proportion of Granger causality tests that indicated
a significant relationship by country**

Country	Objective predicts sentiment	Sentiment predicts objective	Country	Objective predicts sentiment	Sentiment predicts objective
AR	67%	50%	IT	25%	25%
AT	44%	33%	JP	25%	38%
AU	63%	88%	KO	25%	63%
BE	63%	25%	LT	50%	0%
BR	33%	17%	ML	0%	60%
CH	50%	38%	NL	38%	50%
CN	80%	60%	NO	56%	22%
CY	50%	0%	NZ	25%	50%
CZ	43%	29%	PL	20%	20%
DE	33%	67%	PT	43%	29%
DK	44%	33%	SE	56%	11%
EL	0%	17%	SI	17%	33%
ES	25%	88%	SK	29%	29%
FI	22%	33%	TH	17%	83%
FR	33%	33%	TW	20%	0%
HK	57%	57%	UK	33%	44%
HU	43%	57%	US	89%	56%
ID	75%	25%	ZF	43%	71%
IE	75%	75%			

A summary of these results are included in Table 3. Australia, Ireland, and the United States had the highest percentages of significant relationships, closely followed by Argentina, South Africa, China, Hong Kong, Spain, Germany, Hungary, and Thailand. The ability to predict the sentiment variables was much higher than the ability to predict the object variables in Sweden, Belgium, Indonesia, Norway, and Portugal. The sentiment index was much more likely to predict the objective variables in Spain, Germany, Australia, Korea, South Africa, and New Zealand. The smallest relationships were found for Greece, Taiwan, Brazil, France, Finland, Italy, and Slovenia.

This assortment of results cuts across the different questions used to construct the indexes as well as the different time horizons and whether the index included both backward and forward looking questions. The results were also independent of whether it was a developed or emerging economy, if the country had recently started the surveys or the surveys were longstanding, and so forth.

The data appear to suggest that a country's past economic history, the exact questions used to measure consumer sentiment, and the presumed differences in knowledge and sophistication of the populations did not produce corresponding variations in the analytic results across countries. Nonetheless, with so few cases for some countries, this analysis must be considered tentative.

5   New Agenda for Consumer Sentiment Research

It should be clear that the analysis was not intended to assess the ability of current measures of sentiment to act as a leading indicator of near term changes in the macro economy. Nor did the analysis attempt to asses how much variance the sentiment variable could explain in the subsequent changes in the objective variable – even when sentiment was a significant predictor, the explained variation was quite small in most cases.

Nonetheless, the data clearly indicate that sentiment measures contain a good deal of information about future trends in the macro economy. The motivation underlying this analysis was to identify a strategy for developing measures of consumer expectations that are better suited for short term forecasting purposes. While I do not doubt that a refinement of current methods would improve the forecasting performance of the data, it is now time to consider a more substantial break with the past. While the analysis did show some differences across countries and across variables, these differences were not primarily related to variations in sampling, question wording, or index construction. Indeed, the data makes a compelling case that refinements in the current methodology are unlikely to affect its performance as a leading economic indicator.

To be sure, I am not advocating that the current methodology be discarded and new measures adopted in the immediate future. The modifications that will be necessary during the decades ahead, however, will be far reaching. The required program of research is to determine what should be measured and how it should be measured. The goal is to transition

the surveys from the old to the new methodology in a seamless manner, using a series of incremental changes that maintains the comparability of the data over time. The challenge faced in the planning process is to design a series of robust experiments that can independently test the impact of each potential change prior to its implementation.

The three main phases of the transition research program involve what topics should be measured, how they should be measured, and how the data should be modeled in analysis. The theory underlying the sentiment index was developed in a different and simpler era, and its aim was to anticipate rather general trends in consumer spending in the context of a closed economy. It is sometimes assumed that since the goal of forecasting cyclical changes in spending has not changed, the questions used to determine consumer sentiment should remain constant. While this view is generally true, it is not entirely correct.

While income and employment prospects are still the main driving force, there is now a greater range of economic variables on which consumers base their decisions, and these additional economic variables will continue to grow in relative importance in the decades ahead. The borders of nation states no longer restrain information flows nor limit the direct purchase of goods or services by consumers. The economic sophistication and education levels of the population have increased substantially in recent decades. Local economies are becoming virtual global economies as consumers use the internet to seek out information about the price and quality of products and services from around the world. Consumers now more often incorporate into their expectations information that originates outside of their nation's borders, whether due to links from trade or financial markets, or due to more formal arrangements like the EU.

Moreover, aging populations have promoted a shift from the acquisition of consumer durables and the incurrence of debt toward the accumulation of assets and the preparation for retirement. This trend has also accelerated the underlying shift in demand from goods to services. As a result, the composition of cyclical changes in spending and saving behaviour are also undergoing fundamental shifts.

These are significant changes that require a new paradigm for measures of consumer sentiment. Economists have recently embraced a broader range of theoretical models that allow deviations from the classical assumptions of rational decision making. Models are now often based on bounded rationality, limited computational capacities, use of decision heuristics, the impact of framing on decisions, and the persistence of biases. While these models are likely to lead to more accurate predictions, they are much more complex to implement than models based on the traditional assumptions. Moreover, questions have again arisen about causal structures and self-fulfilling prophesies given the renewed recognition that consumers' expectations may themselves influence future economic conditions.

Research on how expectations should be measured involves both the question wording as well as the format in which the interviews are likely to take place. The University of Michigan has begun experiments with probability based measures of expectations, measures that have the capacity to yield estimates of the mean expectation as well as the uncertainty

with which the expectation is held. Although such questions may be difficult to ask and answer in telephone surveys, interviews conducted via the internet offer expanded possibilities in how the questions can be asked and the form in which the answers are recorded, including non-verbal graphical responses.

5.1   New sources of uncertainty

While the main focus of most consumers is now on job and income prospects, a wide range of other factors have grown in importance in recent years. This shift in emphasis will accelerate as a large proportion of the population will begin to retire in the coming decades. As people near retirement age, the importance of labour income declines while the importance of assets and pension entitlements rise. As a consequence, people will increasingly shift their attention from income uncertainties originating in the labour markets to uncertainties about future rates of return on financial assets. Moreover, compared with variations in labour market conditions, variations in the value of financial assets are likely to exhibit more abrupt and larger changes in response to both local and global financial markets. Little is known, however, about how consumers form expectations about future real rates of return on various assets.

Uncertainty about future rates of return on assets will prompt consumers to engage in precautionary declines in spending during retirement in much the same way as it prompted precautionary increases in savings prior to retirement. Understanding how people assess uncertainty must incorporate information on how people form expectations about future needs and how those expectations change as they age. Expectations about longevity and disability, in vivo transfers and bequests, as well as changes in expectations about the provisions of private and public pensions and health care programs will all play a more important role.

Given that pension entitlement programs will represent a major share of the incomes of the elderly, some have contended that there is little reason to expect income uncertainty during retirement to have a significant impact on the macro economy. By this same reasoning, it could also be argued that uncertainty about future labour income would not represent a significant problem since even at the worst of times the overwhelming majority remain employed. In addition, this line of reasoning ignores the potential impact of inflation, particularly changes in relative prices that are to the disadvantage of the elderly since not all pension entitlements are fully indexed to inflation nor indexed to the prices of goods and services generally purchased by the elderly.

Moreover, compared with variations in labour market conditions, valuations of financial assets are likely to exhibit more abrupt and relatively larger changes. Shocks in global financial markets are more rapidly reflected in domestic financial markets than in domestic labour markets. To be sure, consumers do not react to every change in asset prices, especially when their investment horizons are long, but among the elderly the horizon is bound to be shorter. Additionally, little is known about the thresholds or conditions which

prompt changes in expectations about future rates of return, whether those factors operate in an asymmetric fashion, how time preferences and risk aversion change as people age, and what sources of information have the most influence on their assessments.

5.2   Low probability events

Loss-aversion theory may help to explain why recoveries in confidence are slow to develop but declines occur abruptly. There have been occasions during the past fifty years that rapid and significant declines in confidence have been caused by unexpected events, and at other times those same unexpected events have only caused a temporary ripple in consumer confidence. While it has been repeatedly observed that apparently similar economic developments have had quite dissimilar effects on consumers' expectations, no theories have yet to be advanced to explain these differing reactions. Research needs to be directed toward understanding the conditions under which similar economic shocks produce quite dissimilar results.

Such theoretical developments are likely to involve the affective as well as cognitive aspects of consumer sentiment. It is the affective components of economic expectations – whether the content of the expectations are judged favorably or unfavorably – that serve to integrate diverse pieces of economic information. Moreover, it is the affective components that enable waves of optimism or pessimism to sweep across the population with great speed.

Whereas slow change allows gradual adaptation, rapid change prompts a disabling sense of uncertainty and disengagement. The inaction caused by such abrupt changes may generate a self-reinforcing process which acts to accentuate rather than mitigate the underlying source of uncertainty and, hence, act as a self-fulfilling prophesy. More generally, attention is being given to how consumers evaluate and incorporate information about low probability events that have potentially large consequences. This task is as important as it is challenging since it directly focuses on the extreme tails of probability distributions where prior research on economic expectations is almost entirely absent.

5.3   Improved measures of expectations

As expectations have become more central components of economic models, the theoretical specifications of the desired measures have become more exacting. The ideal measure would specify the characteristics of the complete probability distribution for a precisely defined future event or outcome (Manski, 2004). Given an estimate of the entire probability distribution for each individual, measures of central tendency can then be supplemented by measures of dispersion to capture the uncertainty that individuals associate with that expectation.

To measure the complete probability distribution of a given expectation requires more detailed and more complex questions. These more demanding questions require a high

degree of motivation on the part of respondents to provide accurate answers, often require respondents to access a greater amount of information from memory, and demand that respondents have greater conceptual and computational skills. These higher demands may cause respondents to refuse to answer the questions resulting in more missing data or cause respondents to simply guess or otherwise provide unconsidered answers resulting in greater measurement errors. In addition to the added cognitive burden, research has indicated that probability measures may reflect systematic biases, including the overestimation of low probability events and the underestimation of high probability events.

5.3.1   Experimental measures

To assess the potential of probability measures, the University of Michigan has begun experimenting with a limited number of probability questions to determine an optimal format of the questions, to assess the cognitive burden of various questions, and to determine how to best minimize any systematic biases in the responses. Thus far the tests have shown mixed results.

On the positive side, probability questions were easily adapted to phone interviews and respondents did not find them too onerous to provide an answer. Eleven probability questions have been asked during the past several years covering three core areas: employment, income, and financial investments. Each questions asked respondents to assess the probability that the:

- Y1: Household income will increase by more than overall prices during next five years

- Y2: Personal income will increase during next twelve months

- Y3: Personal income will increase by more than 10% during year ahead

- Y4: Personal income will increase by more than overall prices during the year ahead

- Y5: Income from social security and job pensions will be adequate for retirement

- J1: Respondent or spouse will lose a job within the next five years that they wanted to keep

- J2: Respondent will lose a job within the next twelve months that they wanted to keep

- J3: Respondent will get a new job at least as good in terms of wages and benefits

- M1: Mutual fund of $1,000 will increase in value during next twelve months

- M2: Mutual fund of $1,000 will increase by at least 10% during next 12 months

- M3: Mutual fund of $1,000 will increase by more than overall prices during next 12 months

Note that all the questions asked about "one-sided" probabilities: the probability of a job loss, the probability of an increase in income, or the probability of a gain in the value of mutual funds. The questions did not attempt to determine the probability distribution across all potential outcomes. Rather the questions focused on the probability of a single outcome

(for example, a 10% increase in income). The first set of experiments thus fell short of specifying the entire probability distribution. This decision was based on the trade-off between the much larger number of questions that would be needed to measure the entire probability distribution of a single topic and the number of topic areas that could be covered in the experiment. The time period each question was asked is shown in Table 4, along with the mean and median of the replies, the extent of missing data and the number of cases.

Table 4 **Summary statistics for probability measures of expectations**

	Probability that . . .	Time Period	Mean	Median	% Miss	Cases
Y1:	Household income will increase by more than overall prices during next five years	1998:01 – 2006:09	40.9	40.4	3.0%	52642
Y2:	Personal income will increase during next twelve months	2002:06 – 2006:09	51.1	50.1	2.2%	26101
Y3:	Personal income will increase by more than 10% during year ahead	2002:06 – 2003:05	30.2	19.0	3.9%	6015
Y4:	Personal income will increase by more than overall prices during the year ahead	2003:06 – 2004:09	36.2	30.1	2.8%	8043
Y5:	Income from social security and job pensions will be adequate for retirement	1998:01 – 2006:09	35.3	29.2	3.4%	52642
J1:	Respondent or spouse will lose job within next five years that they wanted to keep	1998:01 – 2006:09	18.9	9.7	1.3%	52642
J2:	Respondent will lose a job within next twelve months that they wanted to keep	2002:06 – 2004:09	15.0	4.9	1.1%	9052
J3:	Get a new job at least as good as job lost in terms of wages and benefits	2002:06 – 2004:09	47.0	49.8	2.3%	9052
M1:	Mutual fund of $1,000 will increase in value during next twelve months	2002:06 – 2006:09	48.9	50.0	6.2%	26101
M2:	Mutual fund of $1,000 will increase by at least 10% during next 12 months	2002:06 – 2003:05	31.1	25.0	7.6%	6015
M3:	Mutual fund of $1,000 will increase by more than overall prices during next 12 months	2003:06 – 2004:09	40.3	49.5	6.0%	8043

It should also be noted that it is unlikely that the same probability distributions would be measured if the frame of reference was shifted from gains to losses (Kahneman and Tversky,

1979). For example, it is likely that asking about the probability of losing a job is not the inverse of asking about the probability of keeping a job, or asking the probability of income or investment gain is not equivalent to asking about losses. It is likely that responses to questions about gains and losses are not symmetrical. For these initial experiments, the questions referred to the most common frame of reference for the respondents, namely losses about jobs and gains about income and investments.

5.3.2   Incomplete use of probability scales

The extent of "don't know" responses is typically taken as an indication of the difficulty of the question, and in this case the relatively low missing data rates suggest that most respondents did not find these questions too difficult (see Table 4). For the probability questions about job prospects, missing data rates ranged from 1.1% to 2.3%, missing data rates on income prospects were higher, ranging from 2.2% to 3.9%, and missing data rates for the questions on returns to investments in mutual funds were the highest, ranging form 6.0% to 7.6%. This pattern was not surprising and indicates the greater difficulty in estimating stock market returns than income or job prospects. Nonetheless, the relatively low levels of missing data indicate that these questions were not perceived to being too difficult to answer.

A closer inspection of the data does raise more concerns. More troublesome is that the full range of probability scale was not utilized by respondents. Across the eleven questions just 2% to 6% of all respondents gave answers that did not indicate near certainty (probabilities of 0% to 5% or 95% to 100%) or were not rounded responses (multiples of 10 or 25 and 75). Indeed, about half of all respondents gave certain or near certain responses or responded 25%, 50% or 75%, a virtual five point scale. Most of the rest of the responses were multiples of 10.

Why did the vast majority of respondents choose so few points out of the range from 0 to 100? The most common answer is that the responses represent "rounded" estimates. There have been several hypotheses suggested to account for this pattern. Given the potentially high cognitive burden of these questions, some have suggested that respondents simply report the first satisfactory answer that comes to mind and these estimates are often rounded (Krosnick, 1999). Others have suggest that digit preference is a widespread phenomenon, exhibited by nearly all responses to open-ended numeric questions of all types (Baker, 1992; Edouard and Senthilselvan, 1997). The digits that are favored are precisely those that constituted the vast majority of the responses to the probability questions, namely multiples of 10 plus 5, 25, and 75. Others have suggested that people retrieve the most accessible data from memory, and that is the mode rather than the mean or median of the underlying probability distribution (Lillard and Willis, 2001). This "modal choice" hypothesis suggests that the data that is easiest to retrieve is where the probability distribution reaches its peak.

Table 5 **Summary statistics for probability measures of expectations**

Probability that . . .	Certain (0% or 100%)	Near Certain (1-5% or 95-99%)	Quarter Rounding (25%,50%, 75%)	Ten Rounding (10,20,30, 40,60,70, 80,90)	All Other Responses	Total
Y1: Household income will increase by more than overall prices during next five years	18	4	27	48	3	100%
Y2: Personal income will increase during next twelve months	32	7	20	38	3	100%
Y3: Personal income will increase by more than 10% during year ahead	36	7	17	37	3	100%
Y4: Personal income will increase by more than overall prices during the year ahead	26	7	23	40	4	100%
Y5: Income from social security and job pensions will be adequate for retirement	23	6	22	45	4	100%
J1: Respondent or spouse will lose job within next five years that they wanted to keep	45	5	14	34	2	100%
J2: Respondent will lose a job within next twelve months that they wanted to keep	45	12	10	31	2	100%
J3: Get a new job at least as good as job lost in terms of wages and benefits	21	5	25	45	4	100%
M1: Mutual fund of $1,000 will increase in value during next twelve months	10	6	31	47	6	100%
M2: Mutual fund of $1,000 will increase by at least 10% during next 12 months	15	8	25	47	5	100%
M3: Mutual fund of $1,000 will increase by more than overall prices during next 12 months	11	7	31	46	5	100%

Economists have interpreted such results as exhibiting a "near rationality," whereby the rounding represents the level of precision that is associated with differences that matter to the respondent. A more traditional economic interpretation involves balancing costs and benefits: people want to minimize computational costs so they compute detailed probabilities only to

the extent that the finer detail would affect their decisions. These explanations also favour rounded numbers.

There is another explanation emerging from neuroscience that asserts that people do not possess such fine detail but hold coarser probabilities in memory. In this explanation rounding does not reflect the additional cost of cognitive processing but reflects the true state of their knowledge as most people only maintain "rounded" numbers in memory (Dehaene, 1997). This hypothesis has other implications, including that probabilities would not generally adjust to small changes but only after some threshold was reached, and that sudden and unusually large change in probabilities could result when the new information exceeded the threshold.

5.3.3   Errors in probability assessments

The experimental questions allowed another test of how well the respondents understood the underlying task. Respondents were asked about the probability that their income would increased during the year ahead and then asked about the probability that their income would increase by more than 10% during the year ahead (questions Y2 and Y3). A conjunctive error appears if a respondent judged the probability of getting any increase in income was lower than the probability of getting a 10% increase in income. There are two possible exceptions to this test of the conjunction fallacy. The first is if a respondent expected an income decline with certainty, then the probability of any increases as well as the probability of an increase of 10% could be zero; the second is if the respondent expected an increase of more than 10% with certainty, then both probabilities could be 100%.

When the two responses were compared on more than five thousand cases, 53% of all replies were consistent in that respondents assigned a lower probability to getting a 10% increase than to getting any income increase at all. Another 14% reported zero probabilities to both questions, and 6% reported that both probabilities were 100%. If these are also assumed to be consistent, a total of 73% provided consistent probabilities (see Table 6).

Inconsistent replies to the two probability questions were given by a total of 27%, but the majority of these errors were recorded when respondent assigned the same probability to both expecting any increase as well as expecting a 10% increase. Just 8% of the sample gave different probabilities that were inconsistent. Some of these equal probabilities may have resulted from the tendency of respondents to round their answers and may not reflect a true inconsistency. Nonetheless, providing equal probabilities to two questions that span a relatively large difference in income expectations seems to indicate that these respondents did not understand the underlying notion of probabilities or even of percentages.

The same overall pattern was found to the questions on the probability of any positive increase in a mutual fund and the probability of a 10% gain (questions M1 and M2). Although the majority of respondents (54%) provided consistent probabilities, a somewhat larger percentage reported inconsistent probabilities to the mutual fund question compared with income expectations. Again, most of the inconsistent replies involved identical probabilities.

Inconsistent replies that were not equal were recorded twice as frequently for mutual fund investments compared with income expectations (16% versus 8%). While rounding and digit preference may be expected to be even more likely responses to questions about future returns on investments, it is still rather disappointing that even a 10% gain was judged equal to any gain at all by one-quarter of all respondents.

Table 6 **Consistent and inconsistent probability responses to questions on expected income gains and expected gains in the value of mutual funds**

	Personal Income		Mutual Fund	
	10% Gain	Real Gain	10% Gain	Real Gain
Consistent with probability of any increase in income/mutual fund – Total	73	69	60	56
Both 0%	14	12	5	2
Both 100%	6	5	1	2
Other consistent replies	53	52	54	52
Inconsistent with probability of any increase in income/mutual fund – Total	27	31	40	44
Equal probabilities	19	20	24	27
Other inconsistent replies	8	11	16	17
Total	100%	100%	100%	100%
Cases	5724	7731	5438	7359

The questions on the probability of income and mutual fund increases were also followed by an alternative set of questions about real gains, that is, the probabilities of gains after an adjustment was made for changes in the overall level of inflation (questions Y2 and Y4 and questions M1 and M3). The consistency test is much less rigorous in this case since the level of inflation was relatively low; at the time these data were collected the inflation rate was about 2.5% (CPI-u). Surprisingly, the number of consistent replies was quite close to the 10% experiment for both the income question (52% versus 53%) and the mutual fund question (54% versus 52%). Moreover, similar proportions gave equal non-zero probabilities to both the 10% experiment as well as the comparison to inflation adjusted gains. For the question on personal income, 27% gave equal probabilities for any gains and an inflation adjusted gain, which was identical to the percentage in the 10% experiment. Even for the mutual fund experiment, the two percentages giving equal probabilities were quite close (24% versus 27%). Again the data suggest that either the probabilities given by respondents were rounded and cover a broad range or that a significant number of respondents didn't understand the concept of probabilities.

The data on whether the respondent gave consistent or inconsistent replies can also be examined within demographic subgroups. The standard hypotheses are related to age, education and income. The higher the education, the higher the cognitive capacity; advancing age tends to diminish cognitive capacity, and higher income households presumably have greater experiences with evaluating economic information. Table 7 indicates that the replies for the questions on the probability of any sized income increase compared with the probability of a 10% income increase, and Table 8 show similar data for the replies concerning mutual funds. The other two comparisons between nominal and real gains are not shown but exhibited similar patterns.

The demographic data on income expectations do indeed indicate that giving a zero probability to both questions is most common among those over age 65, reported by 33% compared with just 5% among those under 35. Similarly, probabilities of 100% were recorded more often by those under 35 than those over 65 – 11% versus 1%. Overall, consistent replies were more frequently given by younger, more educated, and by those with higher incomes.

The demographic distributions for the question on mutual fund gains show generally similar results, although the differences among demographic groups were generally wider. Among the least educated, 51% provided inconsistent replies for mutual fund gains compared with just 32% among those with college degrees. This same difference is mirrored by income groups as well. Somewhat surprisingly, there was little difference across age groups for the mutual fund probabilities.

Table 7 **Consistent and inconsistent replies to probabilities
of income increases by demographics**

Probability of Any Sized Gain versus 10%+ Gain in Income	Consistent Replies				Inconsistent Replies				
	Both 0%	Both 100%	Other Consis.	Sub-total	Equal Prob.	Other Incon.	Sub-total	Total	Cases
Age of Respondent									
18-34	5	11	53	69	21	10	31	100%	1354
35-64	12	5	56	73	20	7	27	100%	3400
65 or older	33	1	42	76	15	9	24	100%	937
Education of Respondent									
High School or less	18	4	46	68	21	11	32	100%	1928
Some college	13	6	52	71	20	9	29	100%	1301
College graduate	12	7	58	77	17	6	23	100%	2472
Income of Household									
Bottom third	19	5	42	66	23	11	34	100%	1397
Middle third	13	5	55	73	19	8	27	100%	1851
Top third	10	6	61	77	17	6	23	100%	2022

Table 8 **Consistent and inconsistent replies to probabilities of gain
in mutual funds by demographics**

| Probability of Any Sized Gain versus 10%+ Gain in Income	Consistent Replies				Inconsistent Replies				
	Both 0%	Both 100%	Other Consis.	Sub-total	Equal Prob.	Other Incon.	Sub-total	Total	Cases
Age of Respondent									
18-34	3	1	56	60	22	18	40	100%	1294
35-64	5	1	54	60	25	15	40	100%	3284
65 or older	11	1	47	59	24	17	41	100%	828
Education of Respondent									
High School or less	6	2	41	49	30	21	51	100%	1759
Some college	5	1	55	61	23	16	39	100%	1239
College graduate	5	1	62	68	19	13	32	100%	2415
Income of Household									
Bottom third	6	1	47	54	26	20	46	100%	1291
Middle third	6	1	51	58	24	18	42	100%	1776
Top third	4	1	61	66	22	12	34	100%	1983

5.3.4 Aggregate comparison of probability and verbal likelihood scales

While no rigorous comparison between the results based on probability scales and verbal likelihood scales is possible at the level of the individual respondent, some time series comparisons are possible. Given that the data are intended to act as a leading indicator of changes in the macro economy, the time series tests may be the most appropriate if not the most rigorous test of the underlying theory. Unfortunately, only a few questions have been asked over a long enough periods for time series testing (questions Y1 and J1).

Figure 1 shows the correspondence between the probability of real income gains (Y1) and a verbal likelihood question about real income expectations. Instead of asking about the probability of real income gains, the verbal likelihood question is a typical three point scale that asks whether their incomes are expected to increase faster than prices, prices are expected to increase faster than their incomes, or if both are expected to increase at the same rate. The correspondence is quite close between these two series (time series correlation of 0.8). The close correspondence is all the more surprising given the significant difference between the two questions: the probability question asks about the next five years and the verbal likelihood questions about the year ahead; the probability scale only asks about expected gains not expected gains and declines in real income; and the probability scale allows 100 different gradations of responses compared with just one-point "increase" code on the verbal likelihood scale. This comparison implies that either respondents failed to

understand these crucial differences in the wording of the questions or that respondents were either unable or unwilling to expend the resources to make the required distinctions.

Figure 1 **Real Income expectations: Numeric probability versus verbal likelihood measures**
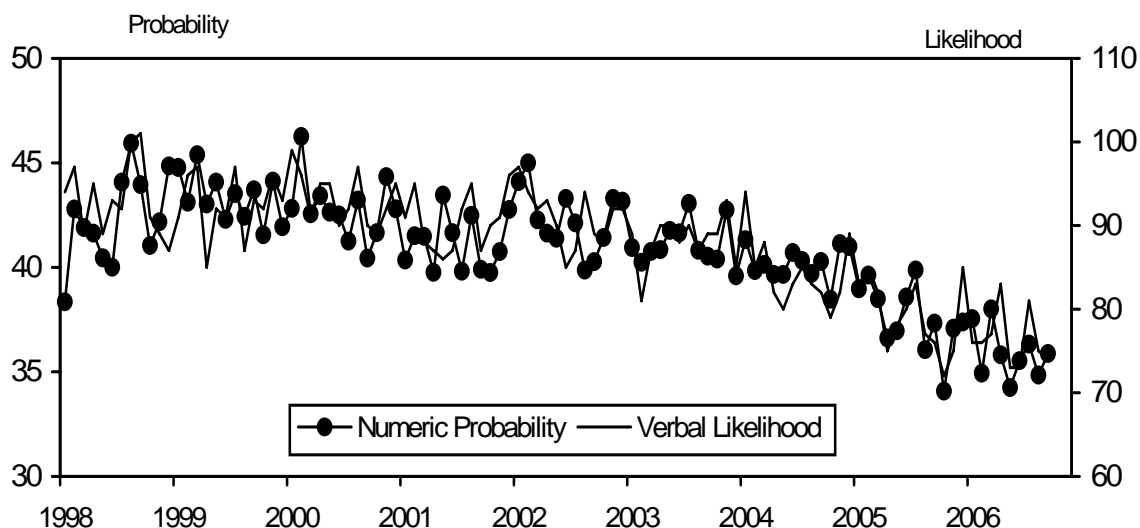

The job probability measure (J1) was compared with the actual unemployment rate to determine the correspondence of the survey data with the actual developments in the U.S. unemployment rate. The contemporaneous time-series correlation with the probability of job loss and the unemployment rate was 0.78 (see Figure 2). This rather high correlation was recorded despite the fact that the probability measure asked about job losses over the next five years. Although the question on the probability of job loss during the year ahead (J2) would seem to have a greater correspondence with the current national unemployment rate, the time series correlation was much lower at just 0.15 (and insignificant with 28 observations).

Aside from the issue of whether the survey data led or lagged the unemployment rate, the survey measure seems to be quite volatile when compared with the unemployment rate. Indeed, in the last year or so the proportion of false to true signals seems particularly high (see Figure 2). The same type of instability is found if the data are averaged into quarterly observations.

The basic problem appears to be that the sampling errors have overwhelmed any real change in how respondents judge the probability of a job loss. Even if the measure was an accurate leading indicator of changes in the unemployment rate, its instability would mean that the series would give nearly as many false signals as true indications of change in joblessness. Indeed, during the past several years, the probability of job loss repeatedly recorded reversals in trend, with the size of the reversals equal to about half of the range from its peak to the trough values.

Figure 2 **Probability of job loss versus national unemployment rate**
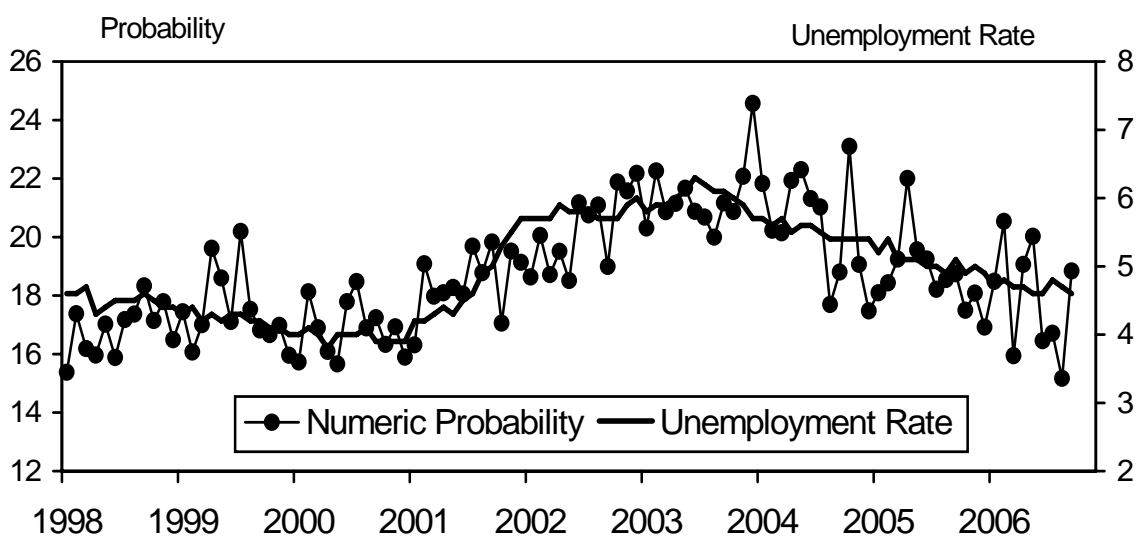
The interquartile range of the time-series realizations of probabilities about future job losses was just 3.1. The average standard error of the monthly time-series observations was 1.1. Thus, the interquartile range of the job probability measure is less than 3 times the standard error of the monthly estimates. In comparison, the monthly data for the Index of Consumer Sentiment has an interquartile range that is more than 10 times the size of the standard error of the estimate. Even when the data are averaged to quarterly observations (1500 cases), the interquartile range remained at 3.1 and the standard error of the quarterly observations was reduced to 0.65, or just under 5 times the estimate's standard error. This suggests that very large sample sizes would be needed for more precise estimates of change; for example, a sample of 10000 observations would reduce the standard error of the estimate to 0.25 or about 12 times its interquartile range.

Although these experiments are not complete, the preliminary results are as challenging as they are promising. The comparison of the probabilities of real income change and the verbal likelihood scales indicated that these two approaches yield nearly identical results. While some may take this as a reason to adopt the probability measures, the data also indicated errors in the probability judgements. Moreover, the results for the question on the probability of job loss indicated some substantial methodological problems, including a limited response range as well as a relatively high instability in the responses. Unfortunately, this amounts to a one-sided comparison since the more traditional likelihood measures were not subjected to such scrutiny.

These difficulties certainly do not recommend an immediate and widespread shift from verbal likelihood to numeric probability measures. Nonetheless, some measures may be usefully asked in the probability format. The identification of which areas hold the most promise for probability questions remains a high priority task. Given the long lead times required to develop

and test new survey measures, such experiments should be encouraged and funded in the coming years.

5.4   Development of a new analysis strategy

Expanding the research potential of the survey data is also part of our development plans. I will mention just two shortcomings of the most common analytic models, both involving aggregation. First, most models do not disaggregate the major components of consumer demand; second, most models do not disaggregate household data into demographic and economic subgroups to make those forecasts.

Macro models that use "consumer sentiment" for all purposes miss one simple fact: no single index of consumer expectations can be devised to accurately predict all types of consumer expenditures at all times. Consumer expectations for interest rates, inflation, income, jobs, stock prices, home values, economic policies, to name just a few, have moved independently and often in opposite directions during the past several years. Although these are all factors that determine people's expectations about their future real income, each of these factors has a very different impact on spending on homes, vehicles, household durables, travel, and so forth. More accurate forecasts require disaggregating consumer expenditures into its major components and then utilizing the most appropriate information on consumer expectations to forecast each component. The individual forecasts of the component series can then be combined to produce estimates at higher levels of aggregation.

Cyclical changes in total personal consumption expenditures are dominated by spending on durable goods, and it is for these discretionary purchases that consumer expectations were originally designed to predict. To be sure, some spending on non-durables and services represent discretionary purchases, but most of the expenditures in these categories are relatively insensitive to changes in expectations. For these expenditures, the best use of the survey data would be to utilize the data to generate forecasts of the more usual explanatory variables, such as income, employment, and prices in advance of their official release by government agencies. As shown by the analysis in this paper, the sentiment data contains reliable information about future changes in these variables.

Consumer expectations can only provide reliable information on the near-term future; they are useless for long term forecasts. Without doubt, in the long run income and consumption form a cointegrating relationship, with consumption a relatively constant proportion of income. Long term growth in consumption is tantamount to long term growth in income. It is only in the short run that the growth rates in consumption and income diverge. Indeed, the permanent income and life-cycle hypotheses provide for compelling reasons why they should diverge, namely so that consumers can maximize lifetime utility by smoothing consumption. Moreover, when a particular divergence has been observed, sooner or later the divergence will reverse itself, as is true of any cointegrating relationship. Indeed, to admit to the ephemeral nature of consumer sentiment is not to acknowledge a theoretical deficit; rather, it is the very strength of consumer expectations for the analysis of business cycles since it indicates the direction, the timing, and the extent of the divergence.

To capitalize on this aspect of consumer sentiment data, the data should be disaggregated by demographic and economic subgroups. Analysis based on particular income, age, or regional groups has already shown promise. For example, some purchases are dominated by younger consumers, by higher income consumers, by urban consumers, and so forth. Such disaggregated forecasts can be recombined before publication. The disaggregated data are immediately released for income, age, and regional subgroups to promote the use of these new forecasting models.

This same goal could be approached from an entirely different angle. Consumer survey data are typically published so that the results are representative of all households in a particular country. No recognition is given to the differential economic impact of these households as the highest income household is given the same weight in the index as the lowest income household. Case weights could be devised to account for the differential economic status of individual households. The EU now does something similar when combining the data from different countries to form a sentiment index for the entire community; only in that case each country's data is weighted by the proportion of total spending. The same type of procedure could be applied within countries as well as across countries. Thus, for example, for the income and age groups that spent the highest amounts on discretionary purchases would be given correspondingly higher weight in computing the index within each country.

6   Changes in Sample Design and Survey Administration

Along with the challenges of developing new questionnaire content, the surveys face increasing pressure to change the sample design and the means by which the surveys are administered. Just as few argued that telephone surveys were superior to face-to-face in-home surveys thirty years ago, few would now argue that internet surveys are superior to telephone surveys. The outcome of the same comparison made ten or twenty years from now, however, is not obvious.

Change is sometimes motivated by the push from deteriorating conditions, and sometimes by the pull of potential improvements. The move from in-home surveys to telephone surveys was almost entirely due to push from rising costs; there was little if any pull from the greater research potential of telephone surveys. The shift away from telephone surveys will not be primarily determined by higher costs but by the push of falling response rates; the shift toward the internet will also be due to the ability of internet surveys to handle much more complex research measurements. Just like the first steps toward the use of the telephone, the initial uses of the internet will be to collect experimental and supplemental data and then to gradually over time become a dual-mode survey. Much of the learning about how to best use internet surveys will be accomplished by the more rapid development of this tool for business surveys.

The pull of internet surveys is substantial for both respondents as well as survey organizations. Respondents could view online information about the research project, check the project's credentials, consult privacy and confidentiality pledges and other information about the protection of human subjects, and complete the interview at a time that best meets

their own schedule. Survey organizations could utilize more complex questionnaires, multi-media content, design questions and response codes using graphical as well as verbal methods, provide background information, provide definitions and question instructions, and automatically generate additional probes to clarify and resolve any inconsistencies.

The promise of internet administered surveys is as great as the methodological innovations that are required to produce scientific estimates. There are several significant problems that must be resolved before the internet can be used to conduct interviews. These issues include the lack of coverage of the entire population, the inability to select a representative sample of households, and the inability to verify which person within the household actually answered the questions. The most likely first step would be to utilize a dual-mode design whereby all traditional survey design features are maintained and respondents are given the choice to either complete the interview on the phone or on the internet. This narrows the potential differences to how responses to the same question differ depending on how the interview was administered.

7   Concluding Remarks

Change is the only constant in economics. There is a growing recognition that there has been a substantial change in how people evaluate and utilize economic information in managing their financial affairs. The changes have been far reaching, expanding the conceptualization of consumer sentiment and challenging the traditional measurement methodology. As populations age, concerns shift from the uncertainties of the labour market to uncertainties about future real rates of return on financial assets including their pensions. Moreover, as more countries measure consumer sentiment at earlier stages in their economic development, there is a growing gap across countries in the economic sophistication of consumers. The old research paradigm must adapt in order to advance our understanding of the role of the consumer in shaping macro economic trends during the 21st century.

No specific changes in question wording or survey methodology have been proposed, although such changes will certainly be required. What I have proposed is a research agenda to help guide the future development. Explicit recommendations have been avoided because the very notion of harmonization must also evolve so as to encompass more diverse measurement methodology. We must abandon the notion that one index will be suitable for all predictive purposes, that the same questions will be suitable in all countries, and that all interviews need to be conducted in a single interviewing mode rather than allow the mode of interviewing to vary in order to achieve the highest response rate. While there still needs to be a clear standard for the integration of the findings from sentiment surveys, the methods of harmonization must be shifted from the input questions to the output indices.

A broad range of independent research projects will make the necessary advances in theory and survey methodology. A broad diversity in approaches should be encouraged as the best means to promote scientific advancement. While there is no urgency to produce new results in the immediate future, such fundamental changes mean that new data must be

collected and tested for some years before being widely adopted. There is no better time than the present to begin this challenging research agenda.

References

Abderrezak, Ali.1997. "Consumer expectations and cyclical durations," *Quarterly Review of Economics and Finance* 37:4, pp. 843-54.

Acemoglu, Daron and Andrew Scott. 1994. "Consumer confidence and rational expectations: Are agents' beliefs consistent with the theory?" *Economic Journal* 104, pp. 1-19.

Adams, F. Gerard. 1964. "Consumer attitudes, buying plans, and purchases of durable goods: A principal components, time series approach," *Review of Economics and Statistics* 46:4, pp. 347-55.

Adams, F. Gerard. 1965. "Prediction with consumer attitudes: The time series - cross section paradox," *Review of Economics and Statistics* 47:4, pp. 367-78.

Baker, Michael. 1992. "Digit Preferences in CPS Unemployment Data," *Economic Letters* 39:1, pp. 117-21.

Blanchard, Olivier (1993), "Consumption and the recession of 1990-1991," American Economic Review 83, no. 2: 270-4.

Carroll, Christopher D.; Jeffrey C. Fuhrer and David W. Wilcox. 1994. "Does consumer sentiment forecast household spending? If so, why?" *American Economic Review,*pp. 1397-408.

Cochrane, John H. 1994. "Shocks," *Carnegie-Rochester Conference Series on Public Policy* 41, pp. 295-364.

Curtin, Richard. 1984. "Consumer attitudes for forecasting," in Advances in *Consumer Research*, Thomas C. Kinnear, ed. Association for Consumer Research, pp. 714-17.

Curtin, Richard T. 1983. "Curtin on Katona. Contemporary Economists in Perspective," Henry W. Spiegel and Warren J. Samuels, eds. New York: Jai Press, pp. 495-522.

Curtin, Richard, Stanley Presser and Eleanor Singer. 2001. "The Effects of Response Rate Changes on the Index of Consumer Sentiment," *Public Opinion Quarterly* 64:4, pp 413-28.

Curtin, Richard. 2003. "Unemployment Expectations: The Impact of Private Information on Income Uncertainty," *Review of Income and Wealth* 49:4, pp 539-54.

Dalsgaard, Thomas; Jorgen Elmeskov and Cyn-Young Park. 2002. "Ongoing Changes in the Business Cycle: Evidence and Causes," OECD.

Danthine, Jean Pierre; John B. Donaldson, and Thore Johnsen. 1998. "Productivity growth, consumer confidence and the business cycle," *European Economic Review* 42, pp. 1113-40.

Dehaene, S. 1997. *The Number Sense: How the Mind Creates Mathematics.* New York: Oxford University Press.

Dunkelberg, W. C. 1969. *Forecasting consumer expenditures with measures of attitudes and expectations.* Michigan: University of Michigan.

Dunkelberg, W. C. 1972. "Impact of consumer attitudes on behavior: A cross-section study," in *Human Behavior in Economic Affairs*, Burkhard Strumpel, James N. Morgan and Ernest Zahn, eds. New York: Elsevier.

Edouard, L and A. Senthilselvan. 1997. "Observer Error and Birthweight: Digit Preference in Recording," *Public Health* 111:2, pp. 77-9.

Eppright, David R.; Nestor M. Arguea and William L. Huth. 1998. "Aggregate consumer expectation indexes as indicators of future consumer expenditures," *Journal of Economic Psychology* 19, pp. 215-35.

European Commission. 2004. "The Joint Harmonised EU Programme of Business and Consumer Surveys," OECD, Directorate General Economic and Financial Affairs.

Fair, Ray C. 1971. "A Short-Run Forecasting Model of the United States Economy," in *A Short-Run Forecasting Model of the United States Economy*, Ray C. Fair. Lexington, ed. Massachusett: Heath.

Ferber, Robert. 1966. "Anticipations, statistics and consumer behavior," *American Statistician*, pp. 20-4.

Friend, Irwin and F. Gerard Adams. 1964. "The predictive ability of consumer attitudes, stock prices, and non-attitudinal variables," *Journal of the American Statistical Association* 59, pp. 987-1005.

Fuhrer, Jeffrey C. 1988. "On the information content of consumer survey expectations," *Review of Economics and Statistics* 70:1, pp. 140-4.

Garner, A. 1981. "Economic determinants of consumer sentiment," *Journal of Business Research* 9, pp. 205-20.

Garner, A. 1991. "Forecasting consumer spending: Should economists pay attention to consumer confidence surveys?" *Economic Review*, pp. 57-71.

Goldrian, G.; J.D. Lindlbauer and G. Nerb. 2001. "Evaluation and Development of Confidence Indicators Based on Harmonised Business and Consumer Surveys," OECD, Directorate General Economic and Financial Affairs.

Golinelli, Roberto and Giuseppe Parigi. 2004. "Consumer Sentiment and Economic Activity: A Cross-Country Comparison," *Journal of Business Cycle Measurement and Analysis* 2:1, pp. 147-70.

Hall, Robert E. 1993. "Macro theory and the recession of 1990-1991," *American Economic Review* 83:2, pp. 275-9.

Howrey, E. P. 2001. "The Predictive Power of the Index of Consumer Sentiment," *Brookings Papers on Economic Activity* 1, pp. 175-216.

Huth, William L.; David R. Eppright and Paul M. Taube. 1994. "The indexes of consumer sentiment and confidence: Leading or misleading guides to future buyer behavior," *Journal of Business Research* 29, pp. 199-206.

Juster, F. Thomas 1964. *Anticipations and Purchases*. Princeton: Princeton University Press.

Juster, F. Thomas. 1969. "Consumer anticipations and models of durable goods demand," in *Economic Forecasts and Expectations*, Jacob Mincer, ed. New York: Columbia University Press for NBER.

Juster, F. Thomas and Paul Wachtel. 1972. "Anticipatory and objective models of durable goods demand," *American Economic Review* 62:4, pp. 564-79.

Kahneman, Daniel and Amos Tversky. 1979. "Prospect theory: An analysis of decision under risk," *Econometrica* 47:2, pp. 263-92.

Katona, George. 1964. *The mass consumption society*. New York: McGraw-Hill.

Katona, George. 1960). *The powerful consumer: Psychological studies of the American economy*. New York: McGraw-Hill.

Katona, George. 1951. *Psychological analysis of economic behavior*. New York: McGraw-Hill.

Katona, George. 1975. *Psychological economics*. New York: Elsevier.

Keyfitz, Robert. 2004. "U.S. Consumers and the War in Iraq," *Business Economics* 39:2.

Klein, L. R. and J. B. Lansing. 1955. "Decisions to purchase consumer durable goods," *Journal of Marketing* 20, pp. 109-32.

Krosnick, Jon M. 1999., "Survey Research," *Annual Review of Psychology* 50, pp. 537-67.

Lillard, Lee and Robert Willis. 2001. "Cognition and Wealth: The Importance of Probabilistic Thinking," Michigan Retirement and Research Center, Working Paper no. 2001-007.

Ludvigson, Sydney. 2004. "Consumer Confidence and Consumer Spending," *Journal of Economic Perspectives* 18:2, pp 29-50.

Manski, Charles F. 2004. "Measuring Expectations," *Econometrica* 72:5, pp. 1329-76.

Matsusaka, John G. and Argia M. Sbordone. 1995. "Consumer confidence and economic fluctuations," *Economic Inquiry* 33, pp. 296-318.

Maynes, E. Scott. 1967. "An appraisal of the consumer anticipations approaches of forecasting," American Statistical Association, Proceedings of the Business Economics Statistical Section of the American Statistical Association, pp. 114-23.

Mueller, Eva. 1957. "Effects of consumer attitudes on purchases," *American Economic Review* 47:6, pp. 946-65.

Mueller, Eva. 1963. "Ten years of consumer attitude surveys: Their forecasting record," *Journal of the American Statistical Association* 53, pp. 899-917.

Nilsson, Ronny. 2000a. "Consumer Surveys: Methodology, Analytic Use, and Presentation of Results," OECD.

Nilsson, Ronny. 2000b. "Confidence Indicators and Composite Indicators," paper presented at CIRET Conference, Paris.

Praet, P. and J. Vuchelen.1989. "The contribution of consumer confidence indexes in forecasting the effects of oil prices on private consumption," *International Journal of Forecasting* 5, pp. 393-7.

Suits, Daniel B. and Gordon R. Sparks. 1965. "Consumption regressions with quarterly data," in *Brookings Quarterly Econometric Model of the United States*, J. S. Duesenberry and others, eds. Chicago: Rand McNally.

Tobin, James. 1959. "On the predictive value of consumer intentions and attitudes," *Review of Economics and Statistics* 41:1, pp. 1-11.