

Consumer expectations: a new paradigm

Richard Curtin¹

Published online: 18 November 2019
© National Association for Business Economics 2019

Abstract

Most scholars view the expectations held by consumers to be little more than uninformed guesses. Nonetheless, research has repeatedly found a close correspondence between aggregate trends in consumer expectations with the corresponding trends in national statistics. The theory of tailored expectations has reconciled the false paradox of micro-inaccuracy and macro-accuracy by shifting the focus from national data to the conditions people actually face. Processing, interpreting, and learning from economic information are largely accomplished by non-conscious cognitive activity. The inherent social nature of economic expectations generates cascades that can result in self-fulfilling expectations and consumers deserve equal billing with business and the government as having an independent and potent impact on the macro-economy. Lastly, the lament that non-conscious cognitive activity cannot be directly observed should not impede progress toward a more robust theory of economic expectations.

Keywords Rational expectations · Tailored expectations · Consumers · Surveys

Do you like surprises? I was asked that question on the day I began my graduate studies, by George Katona, the professor whose research attracted me to the University of Michigan. He sensed that I was a bit startled by his question, so he explained “When doing analysis, do you like to be surprised by data outcomes, or do you get more satisfaction with outcomes that confirm theory?” I answered that I much preferred to be surprised, as that gave me the opportunity to learn something new. I quickly added that due to my inexperience, most of my surprises vanished upon detailed examination. In the subsequent four decades, as the director of the University of Michigan’s consumer sentiment surveys, that sense of surprise has not diminished, despite the growth in my knowledge and experience. The research story I will share with you involves a long series of fundamental surprises about how consumers form their economic expectations and how those expectations shape the course of the macro-economy.

The competing theories about how expectations are formed are well known (Table 1). The rational expectation hypothesis is the dominant theory in economics, and

bounded rationality holds sway in psychology, as well as among behavioral economists. The economic expectations of ordinary consumers, however, have rarely been described as accurate by either economists or psychologists. The bounds on rationality are believed to be so severe that most scholars view the expectations held by consumers to be little more than uninformed guesses. My first surprise was that my research repeatedly found a close correspondence between aggregate trends in consumer expectations with the corresponding trends in national statistics. This surprise was immediately confounded by repeatedly finding that virtually no individual could correctly cite any national economic statistic. No sound theory could survive the paradox of being correct at the aggregate level and incorrect at the individual level. These results violated common sense.

Given its usefulness at the aggregate level, however, the data have had a lasting impact on economic research as well as policy discussions. Data from the University of Michigan surveys have been part of the Index of Leading Indicators for several decades, because of its predictive performance at the macro-level. Perhaps one of the most surprising findings was that consumers’ year-ahead inflation expectations have been repeatedly shown to rival the accuracy of the inflation expectations of professional economists. This finding was first noted by Ned Gramlich some 35 years ago and just recently by Chen, as well as many

✉ Richard Curtin
curtin@umich.edu

¹ Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, USA



Table 1 Conventional theories of expectations

Rational expectations hypothesis: favored by economists (John Muth)

Focuses on the accuracy of **outcomes**

Justified by the notion that optimal economic decisions require accurate expectations based on all available information

All non-rational factors, such as emotions and social influences, cause biased expectations

Empirical tests are based on national data published by federal statistical agencies

Bounded rationality theories: favored by psychologists (Herbert Simon)

Focused on the **process** of forming expectations

Justified by the notion that people can only follow rational procedures in forming expectations

Bounds on rationality due to incomplete information, incorrect interpretations, or an inability to properly calculate future expectation

Behavioral economics seeks to identify which bounds are associated with what biases so as to create “nudges” to achieve rational outcomes

others in the intervening years (Gramlich 1983; Thomas 1999; Mehra 2002; Curtin 2010; Chen 2019). How could consumers effectively compete with the knowledge, skills, and experience of professional economists? Over the years, I have tested numerous hypotheses, but could never find a coherent explanation for these surprising findings.

Luckily, I directed the perfect research vehicle for understanding how people formed their expectations. I became a more careful and attentive listener to how each respondent described their economic expectations. A fundamental surprise was that most people formed their economic expectations naturally and automatically, without any of the difficulties and challenges that were anticipated by the dominant theories. Following years of research, I was finally able to develop a new robust theoretical framework to explain the accuracy paradox and so much more. The new paradigm is quite distinct from conventional economic and psychological theories in many aspects. My recent book, entitled *Consumer Expectations: Micro Foundations and Macro Impact* (Curtin 2019) provides the details as well as empirical evidence on why and how the new theory of tailored expectations resolves many of the anomalies and shortcomings of orthodox theories.

This study is geared to those findings that are of particular interest to business economists, findings that will enable you to understand consumer expectations as well as how to optimize the design and interpretation of the surveys your firm conducts with your own customers.

The first topic focuses on the most common hypothesis for consumers' lack of knowledge about national economic statistics: namely that the cognitive abilities of most consumers are severely limited, and these limitations produce biased expectations. It was a surprise to find that most consumers were not focused on national economic conditions, but rather on the economic conditions they personally faced in the marketplace. This small shift from a national to a personal perspective had an enormous impact on how and when people formed their economic expectations.

The next topic explores the fundamental purpose of expectations and the mental faculties that are used to form expectations. I discovered that expectations serve a unique evolutionary role, which is to maximize the brain's capacity for conscious rational deliberation. Expectations are formed by the youngest infants and the oldest adults by a natural and automatic process. What was more surprising was that most of the required cognitive tasks of obtaining and interpreting data are performed non-consciously, and performed by mental processes that are similar to the latest developments in econometrics.

The next topic examines the impact of affect and social networks on forming expectations. It has been known for some time that affective responses to information occur before people are consciously aware of that same information. What has received much less attention is that when personally relevant information reaches the conscious mind, it is automatically accompanied by an evaluation of that same information. Another surprise was that people process economic information differently during expansions, compared to contractions, and that social networking is a much more efficient method for people to gain an understanding of complex problems.

Finally, I will turn to how consumer expectations influence trends in the macro-economy. Data on consumer expectations are known as leading indicators because of their ability to change direction in advance of the overall economy. Here, the surprise was that consumers have a natural ability to make decisions based on what is called “ambiguous” information—situations where risks are incalculable and conventional theory holds that no rational decision is possible. The final surprise is that self-fulfilling expectations are likely occurrences rather than improbable.

So I'll ask you again: do you like surprises? I hope you do.



1 Knowledge of national economic statistics

I had the opportunity in 2007 to participate in an international project on how consumers assessed the importance of, and how they used, the economic data produced by federal statistical agencies. The initial findings were a disappointment. Those results showed widespread ignorance, so a few years later, in 2009, I repeated those same questions with the hypothesis that consumers would be more knowledgeable about economic statistics when the economy was in recession. Consumers reported in the midst of the Great Recession an unusually high degree of interest in economic data, and the mass media provided an unusually high degree of coverage. The question sequence was as follows: each question first briefly explained the concept—the unemployment rate, the consumer price index, and gross domestic product—then asked respondents if they knew the latest figure announced by the agency, and if not, if they could recall hearing a past announcement, and finally if they had even heard of the economic statistic or the federal agency (Table 2). My hypothesis that people would be more knowledgeable during the Great Recession was not sustained.

The only significant difference was that more people could cite the current unemployment rate. Nonetheless, the errors among those who thought they knew the latest statistic were quite large, and more importantly, the errors were larger in 2009 than in 2007.

These results were stunning. How could so many people avoid the information on these common economic statistics, given the saturated coverage in the mass media, especially in the midst of the worst recession in decades? The critical assumption made by most economists is that the media reports the quantitative figure for the unemployment rate, the CPI, and GDP. To determine what information was made available by the national media, I undertook a careful analysis of media reports from January 2006 to April 2007 and from January 2008 to April 2009 (Table 3). I sought to determine how frequently the federal statistics were cited in a numeric format. Qualitative reports, such as “unemployment rose to new heights” or “the economy sank to new lows” that offered no quantitative information were ignored. Of the top five TV networks, mentions of the quantitative unemployment rate fell to 60% in 2009 from 83% in 2007, despite sharp increases in the unemployment rate. For the CPI, quantitative reports remained at about

Table 2 People’s knowledge of official economic statistics. *Source* Curtin (2019)

What is the rate of ...	Unemployment rate		Consumer Price Index (CPI)		Gross domestic product (GDP)	
	2007	2009	2007	2009	2007	2009
Provided rate answer (%)	47	58	27	22	23	25
Heard of, DK (did not know) rate	33	26	40	41	40	39
Never heard rate/agency	19	15	31	34	36	33
DK; NA	1	1	2	3	1	3
Total (%)	100	100	100	100	100	100
Addendum (medians)						
Reported rates (R_{it}) (%)	5.0	8.5	3.0	2.9	3.3	1.5
Absolute percentage point error in reports $ R_{it} - A_t $	0.68	1.09	0.78	3.08	1.42	2.83

The actual official rates (A_t) reflect the latest data release available on the date the interviews were conducted and do not reflect subsequent revisions

Table 3 Media reports of quantitative economic statistics (2007: January 2006 to April 2007; 2009: January 2008–April 2009). *Source* Curtin (2019)

Percent quoting quantitative statistics in reports of ...	Unemployment rate		Consumer Price Index		Gross domestic product	
	2007	2009	2007	2009	2007	2009
Television—mean 5 networks (ABC/CBS/NBC/FOX/CNN) (%)	83	60	35	35	46	51
Newspapers—mean 22 papers (%)	51	75	57	49	40	52
Washington post only 100% (%)	100	100	100	100	100	100
Wire services (AP, UPI) (%)	100	100	100	100	100	100
Addendum (thousands)	8.2	23.1	12.0	8.5	NA	11.8
Internet access of Govt. sites (k)						



one-third, and for GDP, quantitative reports rose slightly to 51% in 2009.

The same lower coverage of quantitative reports was found in the top 22 newspapers, although quantitative reports on the unemployment rate reached 75% in 2009, up from 51% in 2007. The only newspaper to publish the numeric information every time was the Washington Post, although the Wall Street Journal and the New York Times were close. Note that the wire services, UPI and AP, published the quantitative statistics for every release, implying that the quantitative information was available, but many in the media preferred to only publish qualitative descriptions.

The much more common practice was to summarize the release of the latest statistic by using subjective phrases, such as economic growth had improved or worsened, inflation rose or declined sharply, unemployment surged or plunged, and so forth. It was also apparent that stories on economic statistics were likely to be communicated with facial expression and body language. Most reports on rising unemployment, for example, were accompanied by an interview with someone who had suffered the loss of a job, vividly showing a distraught worker. While the media's motivation may have simply been to expand their audience, neuroscientists discovered that people have a special ability to understand facial and bodily expressions as though they had personally experienced that same events. The impact is even greater when the person enjoys the credibility of belonging to the same social groups. I will return to this important finding that emotions cannot be separated from rational deliberations, often referred to as "Descartes's Error" (Damasio 1994).

2 Knowledge limitations?

How can people's widespread ignorance of official statistics result in macro-accuracy? The obvious answer is that consumers do not base their economic expectations on the data provided by federal statistical agencies. They base their expectations on the economic conditions they face in the marketplace, and when properly aggregated, it approximates the national figures. This would be true as long as the individual's perceptions of the economic conditions they face were not biased. Indeed, the bounds on people's rationality would apply even if people formed expectations based on their own personal experiences, and so would still produce biased expectations. Empirical tests of cognitive capacities are hard to come by in population surveys, and the best proxy available was the amount of formal education. Tests of the rational expectations hypothesis were performed with education ranging from less than high school to a graduate school degree (Table 4).

As many of you know, the rational expectation hypothesis requires that in regressions of the actual value of an index on expectations, the constant term is zero, and the coefficient on expectations is equal to one with the joint condition requiring the chiquared statistic to be insignificant. In addition, efficiency can be tested by fitting the errors to determine if any information was not fully utilized. For the entire sample, consumer expectations predict actual inflation, explaining 88% of the variance, and the efficiency test was insignificant, explaining less than half of one percent. You will also note that those same results apply to every educational subgroup, with the sole exception being the efficiency test among the least educated. Also note that the proportion of explained variance is highest for the most educated, but the difference

Table 4 Tests of rational expectations hypothesis based on University of Michigan's inflation expectations data (quarterly data 1978–2005). Source Curtin (2019)

	$P_t = \alpha + \beta P_t^{E_{t-1}}$			$e_t = \delta + \varphi P_{t-5}$			
	Unbiased $\Rightarrow \alpha=0$ and $\beta=1$			Efficiency $\Rightarrow \delta=0$ and $\varphi=0$			
	α	B	R^2	χ^2	Δ	φ	R^2
All households	-0.414 (0.533)	1.184 (0.181)	0.884	1.538 [0.464]	0.030 (0.158)	-0.035 (0.039)	0.005
Education							
Less high sch	-0.323 (0.692)	1.148 (0.221)	0.800	0.722 [0.697]	-0.551* (0.195)	0.091* (0.033)	0.051
High school	-0.482 (0.610)	1.208 (0.189)	0.866	1.895 [0.388]	-0.121 (0.167)	0.001 (0.037)	0.000
Some college	0.082 (0.635)	1.064 (0.208)	0.850	1.946 [0.378]	-0.105 (0.204)	-0.009 (0.056)	0.000
College degree	0.113 (0.514)	1.049 (0.175)	0.853	1.960 [0.375]	-0.048 (0.187)	-0.021 (0.049)	0.000
Graduate studies	0.061 (0.588)	0.998 (0.189)	0.876	0.107 [0.948]	-0.027 (0.195)	-0.022 (0.058)	0.000

Standard errors in parentheses; probability level of χ^2 in brackets. All standard errors and covariances calculated using the Newey–West procedure. All estimated equations included a moving average error term. An asterisk indicates significance at the 0.05% level; significance tests on all coefficients except β were for differences from 0.0 and tests on β were for differences from 1.0. R^2 adjusted for degrees of freedom



between the least and most educated was just from 8 percentage points (80% vs 88%).

You may think this was an exceptional example. The same type of analysis was replicated for unemployment expectations in the US as well as in fourteen other countries (Table 5). Aside from the misleading label of "causality," the Granger tests indicate whether unemployment expectations predicted subsequent changes in the national unemployment rate, or whether the actual unemployment rate predicted subsequent unemployment expectations. Note that for two countries, Italy and Sweden, both tests failed. Also note that the least educated subgroups did not distinguish themselves by above average failures across the fifteen countries.

3 Fundamental purpose of expectations

Expectations are formed automatically by natural processes that cover almost every aspect of a person's environment. Economic expectations represent a tiny fraction of the expectations maintained by people, and all expectations are subject to constant revisions to maintain a reasonable degree of accuracy. The fundamental purpose of expectations is to maximize the efficiency and effectiveness of people's mental resources. While this may sound like the quintessential economic rationale for expectations, the justification extends far beyond the traditional bounds of economics.

People's overall cognitive capacity results from both their conscious and non-conscious mental resources. The capacity of the non-conscious mind, however, is orders of magnitude larger than the conscious mind. It has been estimated that humans can process about 11 million bits of information per second non-consciously, compared with just 40 bits of information per second consciously. Since conscious cognitive deliberation is the most prized and most limited resource, people use expectations to exclude from their conscious attention what was already expected. Fully anticipated events attract little conscious attention because they contain no new information. Unexpected events usually draw more conscious attention because they contain new information that could potentially affect their ability to achieve desired goals. People do not ignore what was expected. Most of this information is still processed, some of it consciously, but mostly without conscious awareness. Indeed, some estimates imply that people are only consciously aware of about 5 percent of their total cognitive activity.

The evolutionary purpose of expectations is to maximize the decision potential of the human mind. People's relative capacity for conscious deliberation is not only limited, conscious cognitive tasks are so effortful that they cannot be sustained even over moderate periods of time. By comparison, the non-conscious is virtually unlimited and effortless. Since inaccurate expectations defeats their very purpose, expectations are constantly updated as new information become available.

Table 5 Predictive performance of unemployment expectations by educational subgroups.
Source Curtin (2019)

Country	Expectations predict unemployment rate				Unemployment predicts expectations			
	Education				Education			
	All	Primary	Secondary	Tertiary	All	Primary	Secondary	Tertiary
Austria	0.003	0.002	0.002	0.004	NS	NS	NS	NS
Belgium	0.003	0.008	0.002	0.003	NS	NS	NS	NS
Denmark	0.007	NS	0.015	0.005	NS	0.028	NS	NS
Finland	NS	0.017	0.008	0.008	0.017	0.035	0.014	0.017
France	0.000	0.005	0.005	0.001	0.002	0.014	0.014	0.011
Germany	0.039	0.035	0.034	NS	0.003	0.003	0.001	NS
Greece	0.007	0.005	0.008	0.019	0.029	NS	NS	0.001
Ireland	0.007	0.032	0.033	0.027	NS	NS	NS	NS
Italy	NS	NS	NS	NS	NS	NS	NS	NS
Netherlands	0.031	0.043	0.015	0.009	0.026	0.018	NS	0.041
Portugal	0.041	0.028	0.022	0.013	0.011	0.023	NS	0.006
Spain	0.000	0.001	0.000	0.000	NS	NS	NS	NS
Sweden	NS	NS	NS	NS	NS	NS	NS	NS
UK	0.000	NS	0.030	0.006	0.000	0.000	0.000	0.000
US	0.000	0.000	0.000	0.000	NS	NS	NS	0.007
#Insignificant	3	4	2	3	8	8	11	8

Table entries represent the probability of rejecting the hypotheses that expectations do not predict subsequent unemployment rates or that unemployment rates do not predict subsequent expectations. NS indicates it was not significant at the 5% level



Most economists mistakenly dismiss the functioning of the non-conscious mind, with the notion that every important decision is guided by conscious deliberation. Consider this common example: when you walk or drive to familiar locations, say to work, your behavior usually occurs without conscious awareness of road conditions, traffic, or fellow travelers. Most people arrive at their office without any conscious recollection of the events along the way unless something unexpected occurs. If an unexpected event does occur, say a dog darts into the roadway, or you recognize a colleague also going to work, you immediately become consciously aware of the event. People regularly rely on their non-conscious to guide their behavior in a wide array of tasks, including life-changing events.

The same is true for processing economic information. Unless an inflation or unemployment rate changes in an unexpected manner, it typically receives scant conscious attention. On trips to the grocery store, for example, most people consciously focus on the items they need and do not consciously review the price of each of the many items they purchase. If the price of some particular item has changed significantly, however, then conscious awareness is much more likely. In all cases, the data are still processed non-consciously.

For a moment let us suppose that consumers didn't use non-conscious processing, preferring to process all economic information consciously. Given that the amount of economic information that people are exposed to in their everyday lives is enormous, it could easily dominate their conscious awareness to the exclusion of many other important aspects of life. Or just as likely, the burden of consciously processing information emanating from the many other areas of people's lives could overwhelm and exclude attention to economic issues. Given that expectations cover all aspects of people's lives, conscious processing of all available information to form expectations is quite unrealistic.

There are five important implications of people's use of their non-conscious cognitive resources. First, since people regularly form and revise expectations about a vast array of topics, there is no reason to anticipate that people form and revise their expectations by a unique procedure specifically designed for each topic.

A second implication is that most expectations originate by conscious deliberation, and only subsequently become subject to non-conscious processing and automatic revisions.

A third implication is that consumers use a cost-benefit approach to revising expectations. The conventional view is that consumers automatically update a wide variety of economic expectations when new data are released by federal agencies, creating a "file drawer" of expectations readily available for any potential future use. This presumption rules out a cost-benefit framework, making the conventional

view a type of "insurance" model. In contrast, the new formulation holds that specific decisions must be identified to determine potential benefits, and higher potential benefits support higher formation costs.

A fourth implication is that the benefits are derived from the net improvement in the outcome of the decisions for which the expectation was formed, not on how accurately the expectation matches the corresponding national data. Benefits as well as costs are decision specific. Who could justify wasting their time on calculating and forming a more accurate expectation when the decision only depended on a "ball park" estimate.

Finally, the non-conscious mind is able to learn from the information and independently modify existing expectations. The literature is replete with examples of non-conscious learning, sometimes called implicit learning. The non-conscious procedures used are based on correlations and inductive logic rather than on the type of deductive models that are common in economics. In addition, people naturally prefer to use frequencies rather than probabilities in assessing patterns and interpreting results. Recent innovations in econometrics have also highlighted the forecasting benefits from basic correlation procedures, called factor models. Moreover, the shift toward predictive accuracy in the era of "big data" will also depend on correlations and inductive logic rather than rely on structural and causal models. Some of the major differences between the conventional formulation of expectations and the new theory are shown in Table 6.

4 Reflections of tailored expectations in federal data

What are consumers' objectives in forming their unemployment expectations? Consider the average rates of unemployment across age and education groups over the past quarter century collected by the Labor Department (Table 7). Given the persistent differences across age and education subgroups, which consumer would judge their own prospects by the overall average? The differences are rather large, as shown in the first column, ranging from 9.9% for the youngest to 2.7% for the most educated. Also note that despite these differences, the time series correlations are all extraordinarily high—ranging from 0.93 to 0.99.

Indeed, if one assumed that consumers expected the unemployment rates that they actually faced in the marketplace, there would be substantial differences across the population but high correlations over time. This same pattern has been displayed by the economic expectations collected by the Michigan surveys. While my book details all expectations across even more socio-economic subgroups, it is sufficient to highlight the variations in the Index of Consumer



Table 6 Why, how, and when expectations are formed

Conventional theories	New theory: tailored expectations
Formed by only using conscious cognitive deliberation	Formed by all mental resources, including conscious, non-conscious, and affective mental faculties
Focus on national economic conditions	Focus on economic conditions faced by individuals
Accuracy of expectations judged by national data	Accuracy assessed by decision gains due to expectation
Unbiased expectations require rationality	Expectations need reason and passion
Expectations formed independent of use	Specific decision and context required; context sensitive
Expectations revised when new national data released	Expectations constantly revised, mostly non-consciously
Assume formation costs are always less than benefits	Decisions set highest costs to achieve desired accuracy
Affective and social influences cause bias	Affective and social influences promote accuracy

Table 7 Unemployment rates (BLS Monthly US Data, 1992:1–2019:2, overall mean = 5.9)

Age	Mean	20–24	25–34	35–44	45–54
Means and correlations by age					
20–24	9.9				
25–34	5.9	0.98			
35–44	4.6	0.98	0.99		
45–54	4.1	0.98	0.99	0.98	
55 +	4.0	0.97	0.98	0.98	0.99
	Mean	Less H. sch		High sch	Some college
Means and correlations by education					
Less high school	9.0				
High school	5.6	0.96			
Some college	4.6	0.95		0.99	
College degree	2.7	0.93		0.97	0.98

Table 8 Index of consumer sentiment among subgroups (quarterly data, 1978:1–2019:2; time series correlations between subgroup and all other subgroups)

	Education of householder				
	Less than high school	High school	Some college	College degree	Graduate studies
Means	74.3	83.2	87.8	92.7	91.5
(SE)	(0.82)	(0.99)	(1.02)	(1.01)	(1.05)
Correlations	0.896	0.954	0.951	0.960	0.934
	Age of householder				
	18–34	35–44	45–54	55–64	65+
Means	95.5	89.1	84.7	81.4	76.9
(SE)	(0.96)	(1.04)	(1.04)	(0.97)	(0.84)
Correlations	0.945	0.960	0.973	0.959	0.939
	Household income				
	Bottom fifth	2nd fifth	Middle fifth	4th fifth	Top fifth
Means	75.6	83.2	88.3	91.6	96.5
(SE)	(0.82)	(0.97)	(1.06)	(1.08)	(1.11)
Correlations	0.932	0.967	0.981	0.979	0.956



Sentiment (Table 8). The Sentiment Index shows consistent difference in mean levels across income, age, and education subgroups and consistently high correlations.

This suggests that the usual dismissal of consumer expectations as inaccurate at the micro-level is not fully consistent with the objective of forming expectations about conditions that consumers would actually face. Surely, not all of the differences in expectations reflect rational judgements, but consumer expectations are much more accurate given their intended use than generally thought.

5 The evolution of the human brain

To more fully develop my thesis, a limited discussion of the structure and purpose of the human brain is warranted. The oldest part is the brain stem and the cerebellum, which regulates core bodily functions. The next oldest is the limbic system which controls emotion, memory, motivations, and learning. Each of these elements of the human brain has evolved over millions of years. The prefrontal neocortex, the part responsible for higher order brain functions such as conscious rational deliberation, first developed about 150,000 years ago. Just as the limbic system did not replace the functions of the brain stem and cerebellum, the prefrontal neocortex did not replace the functions of the limbic system. Each operates in an independent and coordinated fashion. The conscious deliberation supported by the prefrontal neocortex is the most prized and most limited of all human mental faculties.

There are several critical aspects of mental functioning that apply to the formation of expectations. First, as a result of the more recent development of the neocortex, there are much larger differences across people in the capacity of the frontal neocortex, especially when compared with the more evenly distributed capacities of the limbic system which benefited from millions of years of development. For the formation of expectations, the most important implication is that non-conscious information processing is more equal across the population than the capacity of conscious processing.

The second important difference is that the limbic system can process information much faster than the neocortex. This speed advantage is well documented and indicates that behavioral responses to a threat, for example, start to occur before the person has any conscious awareness of that threat.

The third difference is that the perception of personally relevant information by the conscious mind (neocortex) is typically accompanied by an evaluation (from the limbic system). No one is indifferent to information about unemployment or inflation, for example; the information is automatically coded with a subjective evaluation when it is consciously perceived. This is the opposite of the conventional notion that an evaluation must await an analysis of the

information. Since an extended discussion of brain science is more technical than many would find interesting, I will leave that discussion to my book.

6 Influence of affect on expectations

The impact of affective states on the formation of economic expectations is pervasive. Affect includes evaluations, moods, and emotions, each of which has a significant influence on the formation of expectations. Whereas evaluations are implicitly tied to specific pieces of economic information, mood, a more general affective state, lacks a single identifiable cause and represents persistent non-conscious evaluations of the environment. Consumer confidence has been aptly described as the mood of the consumer. Emotions are the most intense, arise quickly, are generally brief, and have an identifiable referent. I will briefly describe the main impacts on consumer expectations from each of these affective states.

6.1 Impact of evaluations on question wording

As I have already noted, most perceptions of people's economic situation are automatically associated with an evaluation. The Michigan survey takes advantage of that association by phrasing questions in terms of those evaluations. For example, consumers are asked if their finances improved, remained unchanged, or worsened, whether conditions in the economy are better, unchanged, or worse, whether it is a good or a bad time to buy a house, and so forth. Most consumer surveys worldwide have also adopted this format, called a 3-point verbal likelihood scale. These questions are regularly followed in the Michigan survey with open-ended questions that ask consumers to describe in their own words their reasoning for holding their views.

Economists would prefer to ask respondents to identify the full probability distribution of some expectations, say an expected change in income. This type of question is much more difficult for respondents as it requires a good deal of conscious deliberation since humans naturally think in terms of frequencies, not probabilities. Even if the probability questions are harder, if they also produce data that have a higher predictive accuracy, they should be adopted. The Michigan survey asks several questions in both the standard 3-point likelihood scales as well as 100-point probability scales. While I will not go into a full analysis of each of these scales, I will show you that in terms of time trends, the two scales resulted in nearly the exact same information (Fig. 1). This identity indicates that despite the major differences in response scales, consumers based their responses on the same underlying evaluations. The two scales are not equal in terms of respondent burden, the degree of missing



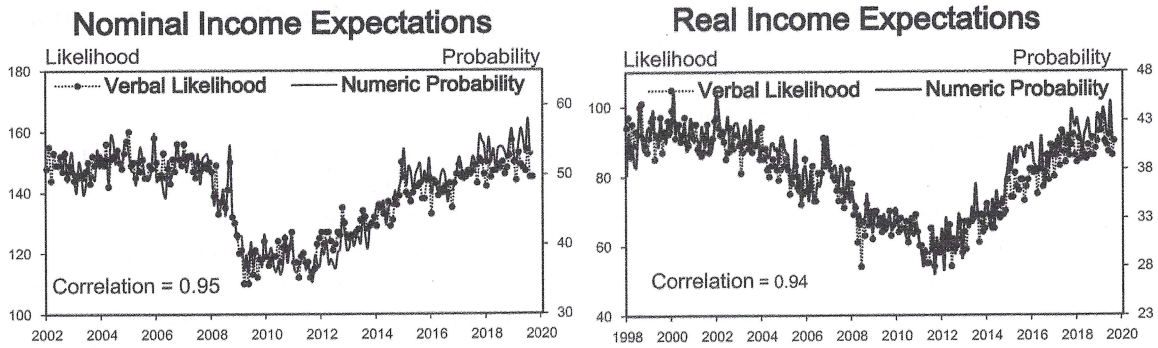


Fig. 1 Probability versus verbal likelihood measures

data, or the length of time it takes to obtain a response; for these issues, the 3-point likelihood scales are preferred.

6.2 The impact of moods on information processing

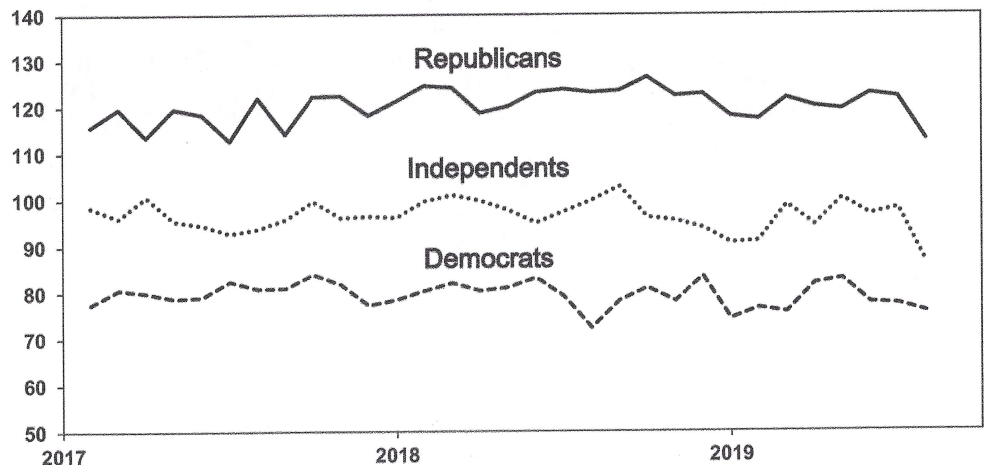
Perhaps the most important psychological characteristic of mood is that it determines how information is processed. A pessimistic mood signals that the current situation is problematic and fosters the use of conscious processing of new information, especially negative events. In contrast, an optimistic mood favors more non-conscious information processing, even of contrary information. When an optimistic mood prevails, there is little reason to consciously process negative events, with the consumer often described as resilient. Optimistic consumers do not ignore negative economic information, but still process it non-consciously.

Consider the dynamics of the repeated cycles in consumer sentiment: as consumers become increasingly optimistic, they increasingly shift to non-conscious processing of economic information, and when consumers become pessimistic, they increasingly shift toward conscious processing of economic information. Thus, the reliance on conscious and non-conscious information processing shifts along with the

economic cycle. Long expansions typically promote non-conscious processing of information, which discounts contrary signals, and can at times lead to so-called irrational exuberance. The same is true in the presence of economic troughs where all attention is focused on negative news, acting to lengthen and deepen the downturn. These risks always exist, but those events are too sparse to make an empirical assessment based on the half century record of the Michigan survey.

I initially thought that these shifts were exclusively generated by economic cycles, but have recently come to appreciate that extreme partisanship can also shift how consumers judge economic information. While the impact of partisanship on consumer expectations did not originate with Trump, the Michigan surveys have never before found partisanship to dominate economic expectations to the extent that it has during the past few years. Since President Trump first entered office, the gap between Democrats and Republicans in overall consumer confidence has been quite wide and persistent (see Fig. 2). Republicans have consistently expected robust economic growth and Democrats have consistently anticipated a recessionary decline. These differences were supported by consumers' perceptions of

Fig. 2 The index of consumer sentiment: partisan impact since Trump's election



economic developments. The survey regularly asks consumers whether they had heard of any recent developments in the economy, and if they had, to explain what they had heard in their own words. The resulting data indicate near perfect selective perception of recent economic developments, with Democrats consistently reporting very negative developments and Republicans consistently reporting very positive economic developments (Table 9). There is nothing “fake” about these perceptions of economic news as they truly reflect differences in the opinions of consumers. The differences resulted from the mood of Republicans, who favored non-conscious processing and resilience, compared with the mood of Democrats, who favored conscious processing of potential negatives.

Note that when the two parties are weighed by the respective population proportions, the average is nearly identical to the trend in expectations among Independents. The Michigan survey has recorded persistent differences across many socio-economic characteristics, and those differences have not diminished its predictive ability due to the high correlations at the aggregate level, as I have already shown.

Table 9 Partisan Impact on Economic News Heard

Economic news heard	Favorable news (%)	Unfavorable news (%)	Net
Democrats	33	83	- 50
Independents	55	57	- 2
Republicans	89	28	+ 61

6.3 The impact of emotions on expectations

Emotions serve an essential function by forcing the formation of an expectation when potential risks are unknowable. Keynes used the term “animal spirits” to describe this ability to surmount Knightian uncertainty and thought its use was relatively rare. In the new theory of expectations, emotions can serve as the functional equivalent of the cognitive faculties they sometimes replace. Consumers regularly use this equivalence to form expectations around turning points in economic cycles. This allows shifts in consumer expectations to occur before changes in the economy, and so acts as a leading economic indicator. Despite the absence of rational assessments in a traditional sense, the turning points in consumers’ expectations nonetheless have proved remarkably accurate of subsequent trends in GDP (see Fig. 3). Since economic theory puts most emphasis on accurate predictions, there is no reason to dismiss the benefits of emotions.

Needless to say, in the above discussion of how affect shapes expectations, nowhere did I mention that affective states can promote biased expectations. They certainly can, and often do cause biased expectations. There is no clearer evidence of biased expectations than the data I just presented for Democrats and Republicans. A more typical analysis cites some bias linked to emotions and then discounts all the other beneficial impacts of affective states on expectations. In contrast, I have put forward the notion that reason as well as passion is required to form expectations, and so have focused on those elements of passion that improve the accuracy and timeliness of expectations.

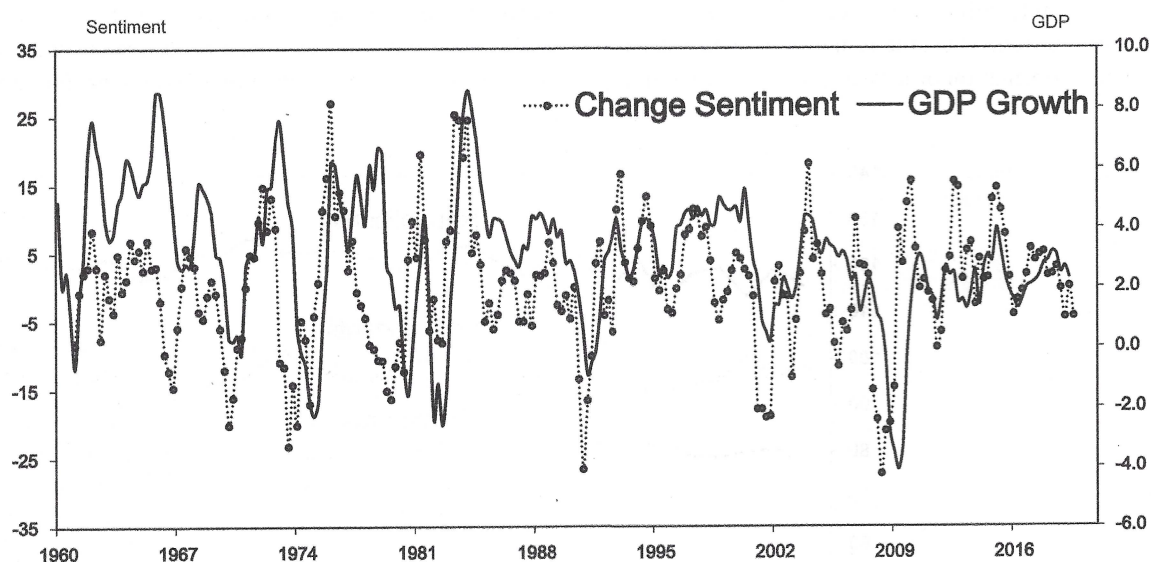


Fig. 3 Annual changes in consumer sentiment and annual changes in GDP, 1960–2018



7 Impact of social networking on expectations

The fundamental social nature of humans has a significant impact on how people form their economic expectations. The most common type of social communication is emotional displays, whether voluntary or involuntary. Unlike language, emotional displays are universally understood, due to a much longer period of evolutionary development. Facial and body language dominate human communication. Scientists have found that people have a special ability to understand and empathize due to the actions of mirror neurons. Those neurons act in a nearly identical fashion whether an event is personally experienced or experienced by someone else.

More generally, people understand that their economic futures are inextricably linked to the actions of others. Most people realize that members of the same social networks can often serve as good proxies for how their own economic situation may change. Moreover, empirical research has shown that social networks are more capable than individuals in solving complex problems.

Social influences play an important role in creating self-fulfilling expectations, both in the positive and in the negative directions. It is widely accepted that a so-called inflationary psychology can itself cause higher inflation, and a deflationary psychology can itself cause falling prices. The issue of self-fulfilling expectations, however, has a much broader scope, and is hardly rare. Every upturn as well as downturn in consumer sentiment is driven at some point by social forces that caused cascading optimism or pessimism across the population.

8 Macro-impact of consumer expectations

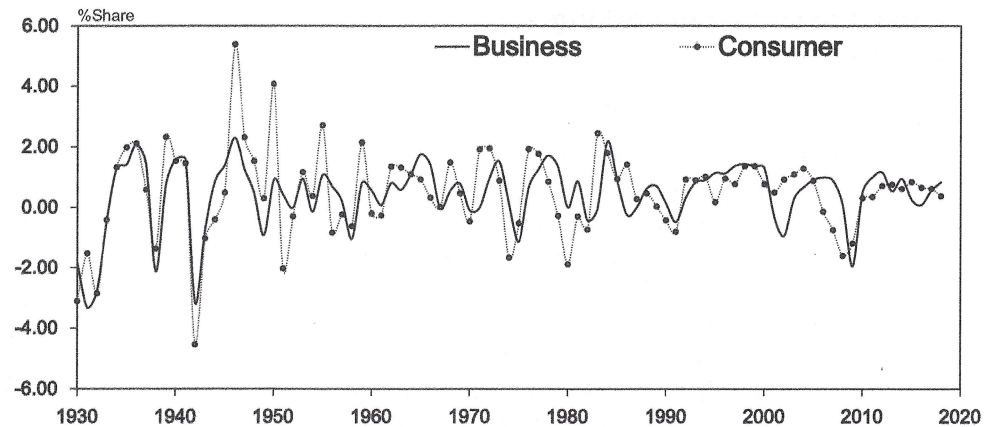
Conventional theory holds that the consumer has no impact on whether the economy slips into recession or moves toward recovery and growth. Indeed, all recessions are generated exogenously due to some policy misstep, exogenous force, or autonomous shift. When classical economic theory was developed by Adam Smith and others, consumers' living standards were at subsistence levels and had been unchanged at those low levels for hundreds of years. Since consumers spent all their income on necessary expenditures, Keynes famously proposed that consumption was a function of income. Keynes discounted the independent role of consumers in the macro-economy and believed only the business and government sectors could influence the pace of economic growth. Keynes and many others have ignored the fact that consumers have

Table 10 Percentage shares of GDP by decade. Source: Bureau of Economic Analysis

	1930-1939	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2018	1930-2018
Total consumption (%)	78.1	62.3	66.3	64.4	65.5	67.0	69.0	72.3	67.9	68.1
Housing and durables (%)	9.6	9.7	14.4	13.2	13.8	13.0	12.5	13.4	10.4	12.2
Business investment (%)	7.1	7.3	10.2	10.9	12.2	13.6	12.6	12.7	13.1	11.2



Fig. 4 Contributions to total changes in GDP from consumer and business investments, 1930–2018



generally invested as much or more than business in new plants (houses) and equipment (vehicles, durables, etc.) to improve output (living standards). Since the 1930s, consumer investments accounted for 12.2% of GDP compared with 11.2% among business firms (Table 10).

Moreover, changes in consumer spending generally occurred before changes in business investment (Fig. 4). When the Industrial Revolution first began, it may well have been that the production process sparked gains in income and therefore consumption, but the “Field of Dreams” notion that if you “build it, consumers will buy it” is long gone. It is hardly a stretch to hold that it is the prospects for consumer demand that motivate firms to invest and produce. While there are exceptional products that can create their own demand, those exceptions prove the rule.

9 Were you surprised?

Were you surprised? I hope, like me, you have learned something new about how consumers form their expectations, and how those expectations impact the macro-economy. The major points that I have learned can be summarized as follows. First, the evolutionary purpose of expectations has provided a new and compelling rationale for the accuracy of expectations. Second, the theory of tailored expectations has reconciled the false paradox of micro-inaccuracy and macro-accuracy by shifting the focus from national data to the conditions people actually face. Third, processing, interpreting, and learning from economic information is largely accomplished by non-conscious cognitive activity. Fourth, forming accurate expectations relies on reason as well as passion. Fifth, the inherent social nature of economic expectations generates cascades that can result in self-fulfilling

expectations. Sixth, consumers deserve equal billing with business and the government as having an independent and potent impact on the macro-economy. Lastly, the scientific lament that non-conscious cognitive activity cannot be directly observed should not impede progress toward a more robust theory of economic expectations.

References

- Chen, Yiqun G. 2019. *Inflation, inflation expectations, and the Phillips curve*. CBO Working Paper 2019-07. Washington DC: CBO.
- Curtin, Richard C. 2010. Inflation expectations and empirical tests: Theoretical models and empirical tests. *Inflation Expectations* 56: 34–61.
- Curtin, Richard C. 2019. *Consumer expectations: Micro foundations and macro impact*. London: Cambridge University Press.
- Damasio, Antonio R. 1994. *Descartes' error*. New York: Putnam.
- Gramlich, Edward M. 1983. Models of inflation expectations formation. *Journal of Money, Credit and Banking* 15 (2): 155–173.
- Mehra, Yash P. 2002. Survey measures of expected inflation: Revisiting the issues of predictive content and rationality. *Economic Quarterly-Federal Reserve Bank of Richmond* 88 (3): 17–36.
- Thomas Jr., Lloyd B. 1999. Survey measures of expected U.S. inflation. *Journal of Economic Perspectives* 13 (4): 125–144.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Richard Curtin is a Research Associate Professor at the Survey Research Center, Institute for Social Research, University of Michigan. He conducts monthly surveys of consumer attitudes, expectations, and behavior and calculates monthly indices of consumer sentiment and expectations, which is one of the nation's leading economic indicators. His work includes studies of the impact on the economy of 9/11 as well as economic forecasting and the psychology of consumer confidence.

