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WHAT U.S. CONSUMERS KNOW ABOUT THE ECONOMY: THE IMPACT OF ECONOMIC CRISIS ON KNOWLEDGE¹

RICHARD CURTIN

Research Professor, University of Michigan, United States

1. Introduction

The worldwide financial crisis has provoked an intense public interest in the performance of the economy.² This heightened interest did not simply represent an intellectual curiosity or a citizen’s interest in determining which public policies would best resolve the economic crisis. These concerns sprang from a direct financial stake. Nearly every person was affected, if not from income declines, job losses, or foreclosure and bankruptcy, then from the evaporation of accumulated wealth in homes, investments, and pension accounts. Nearly nine-in-ten respondents in a representative national sample of U.S. residents wanted to know about recent economic developments in late 2008 even if it was bad news, and nearly eight-in-ten reported that they needed to know about these economic developments in order to make more informed financial decisions (Pew, 2009).

People’s intense demand for economic information has been met by seemingly endless reports in the mass media on nearly every wiggle in every economic statistic imaginable. It would seem reasonable to conclude that the worst economic crisis since the Great Depression has prompted the public to become more knowledgeable about the main statistical indicators on the performance of the economy. Who could not have heard news about changes in GDP, unemployment, or the inflation rate?

Unfortunately, it is a common finding that few people know much about official economic statistics (Curtin 2008; Blinder and Krueger 2004; Blendon *et al.* 1997). The lack of knowledge has been attributed to the limitations in the cognitive capacity of the public, the challenging technical and mathematical jargon used in official announcements, the high costs and low benefits from updating

¹ Email correspondence to: Curtin@umich.edu. Expert research assistance was provided by Alex Wand and Rebecca Marshall.

² According to national surveys of public interest in different news stories, eight of the top fifteen news stories rated by the public’s interest in 2008 were about the economy, three about the election of Obama, three about floods and hurricanes, and one about the Olympics (Pew, 2009).

knowledge of official economic statistics, the absence of a perceived importance of official statistics to people's everyday lives, and even the lack of credibility of the nation's statistical agencies.

Indeed, two years ago at the 2nd World OECD Forum on Statistics, Knowledge, and Policy, I presented a summary of my research on public knowledge of economic statistics that came to the same conclusions (Curtin 2008): only a minority of people could report a specific figure for the current rates of unemployment, inflation, or economic growth, and a surprisingly large minority reported that they had never heard of the statistic or the statistical agency. The 2007 data indicated that knowledge about official statistics was viewed as burdensome, difficult to acquire, and for most people, knowing the official statistics was seen as providing little if any additional benefit to the individual. Importantly, it was not that these indicators were not used in making their economic decisions, but that most people used informal sources of information about unemployment, inflation, and economic growth that were tailored to their economic situation rather than basing their financial decisions on the official statistics for the entire economy. Finally, the costs of acquiring quantitative information on the official statistics was found to be surprisingly high since most newspaper and television reports failed to include the numerical estimates in their reports, preferring to summarize the data in qualitative rather than quantitative terms. Overall, the 2007 study found that the costs of obtaining official economic statistics were higher than had been widely alleged, and the benefits of knowing the official statistics lower than typically assumed.

This research was replicated in 2009 with the aim of critically examining a few of the central findings. However important factors such as cognitive limitations or the jargon used in the official releases, those factors could be considered to be unchanged for the population as a whole from 2007 to 2009. What did change was the performance of the economy, and the change was large enough to demand the attention of nearly all people. Of course, no "natural experiment" is ideal, but the radical shift in the performance of the economy presented a unique research opportunity.

The most important hypotheses about the acquisition of knowledge involve the costs and benefits of economic information. The economic crisis has presumably made the cost of acquiring information about official economic statistics lower, and the benefits of accurate knowledge higher. This implies that the benefits would exceed the costs to a greater extent in 2009 than in 2007, and prompt more people to update their knowledge about the economy. It is important to stress that the economic crisis was expected to raise both the supply and demand for quantitative information about the key economic indicators. Presumably in 2009 the mass media as well as the public would no longer be content with qualitative interpretations of the official statistics that was so common in 2007.

It should be noted that while the cognitive capacity of the population had not significantly changed, it may nonetheless be true that the *negative* rates of change in the CPI and GDP statistics in 2009 represent a greater cognitive challenge than the *positive* rates of growth in 2007. Negative numbers appeared for the first time during the Han Dynasty (202 BC – 220 AD) and only became common in Europe in the 17th century (Dehaene, 1997). Knowledge of positive numbers has an intuitive basis as a counting device, present in all people, from infants to those with little or no formal education (De Cruz, 2006). Negative numbers do not have a natural intuitive basis, and understanding negative numbers relies more on explicit training than on an automatic cognitive process.³ The key difference is that the comprehension of positive numbers is more likely to be effortless cognitive process and the comprehension of negative number is more likely to be an effortful process.

³ Although one of the first rationalizations of negative numbers was as a measure of debt (Dehaene, 1997), many people still have trouble conceptualizing debt as negative savings.

While it would be naïve to anticipate widespread public knowledge of economic statistics in 2009, there could hardly be a more compelling situation than the recent economic crisis to motivate people to acquire accurate information about key economic indicators.

2. Theoretical Framework

The standard economic model has made several highly restrictive assumptions about people's knowledge about economic conditions. The conventional view is that people have full information about all relevant economic conditions. Economic statistics are then updated with each release of official information by governmental agencies. In this simple formulation, the costs of acquiring, processing, and interpreting new information are ignored, as are the variations in potential benefits. The critical implication of these conventional assumptions is that all people are assumed to hold the same information about various aspects of the economy, and update that information at the same time from official sources. There is no information heterogeneity in the standard model.

Modern economic theory does not hold such strict views, however. There are two decisive departures from the standard model: first, rather than simultaneous, updating information occurs in a staggered pattern across individuals and over time, and second, the information that is relevant to people's economic decisions differs across people and over time depending on the characteristics of their situation.

2.1 Staggered Updating.

As long as there is any positive cost involved in collecting and processing information, some people will choose to hold views that are sometimes less accurate. The terms "sticky information" or "rational inattention" have been used to describe the impact of costs on the formation process (Mankiw and Reis, 2002; Sims 2003; Bacchetta and Wincoop, 2005; Reis, 2007). These theories postulate that rational consumers may find the costs associated with updating their information on the economy to exceed the benefits. At any given time some people will find it worthwhile to incur the costs, especially if that information is critical to a pending decision. Most of the time, however, rational inattention is the optimal course. Whatever the cause, the process creates staggered changes, whereby, under normal conditions, people's knowledge of economic statistics reflects a combination of current and past information. Mankiw and Reis (2003), Carroll (2003), Khan and Zhu (2006), and Curtin (2006) estimated that rather than continuously updating, most people update their knowledge of economic statistics only a few times a year. However, these are hardly normal times. The sudden and substantial changes in economic conditions would act to synchronize people's knowledge of economic statistics with current information to a much greater extent in 2009 than in 2007.

Staggered changes are created by a wide range of other processes that either encourage or discourage people from updating their information about the economy. Asymmetric responses to economic information results in staggered updating as people bring their knowledge of economic statistics up to date more quickly in response to bad economic news. Akerloff, Dickens and Perry (2000) suggest that bad economic news is perceived by consumers to contain more potentially relevant information about their financial situation. The volume of news also matters, especially the volume of bad news, as well as news that represent a sharp and negative break from the past (Carroll, 2003). Sims (2003) shows that based on information theory the tone and volume of economic reporting affects people's overall views of the economy beyond the information contained in the reports. All of these additional factors also suggest that people's knowledge of economic statistics would be more up-to-date in 2009 than in 2007.

2.2 Relevant information.

It is an artefact of the standard economic model that all agents are assumed to focus on the same definition of inflation, unemployment or economic growth. This assumption reflects the widespread tendency toward the reification of economic data—that is, treating conceptual measures as if they had a concrete existence. While economists justifiably have strong preferences for the measures they have developed based on their theories, it does not follow that all people should adopt that same set of indicators. Indeed, economic theory suggests that people adopt whatever measures prove most useful, considering both the costs of obtaining the information and the benefits that can be achieved by more informed decisions.

It makes no economic sense to assume that people pay attention to an inflation rate that is higher or lower than the one they actually encounter. Empirical research has confirmed a good deal of variance in actual inflation rates across different demographic groups (Hobijn and Lagokos, 2005; Hagemann, 1982; Michael 1979).⁴ The same may be said for employment conditions, as people would naturally pay more attention to job opportunities that are relevant to their own skills in areas where they live. Moreover, the cost to acquire and process private information, however, may be significantly lower and the potential benefit of that information may be significantly higher, leading people to prefer private over official data sources (Curtin, 2003).

It is of some theoretical interest to determine if private information still dominates official economy-wide statistics in times of economic crisis. Although people's preference for private information is widely attributed to its higher relevance and lower costs to individuals, the cost-benefit ratio may shift in times of economic crisis. People presumably have an even greater need for accurate information which could cause them to expand their search beyond their own private network as well as experience declines in the cost of obtaining official information during the crisis. Or it could be that people are even more likely to favour their own private sources, preferring to know more about local job conditions or how the financial crisis has affected homeowners in their neighbourhood rather than nationally. Moreover, people may have greater confidence in locally obtained information, and have more distrust of official statistics.

3. Survey Methodology

The basic measures of people's knowledge of economic statistics were repeated in identical form from the 2007 surveys. All of the questions were asked as part of the University of Michigan's Surveys of Consumers, which is known worldwide for its measure of consumer sentiment. The monthly samples are representative of all households in the United States, with every adult given an equal probability of being selected for an interview. The data were collected in May and August of 2007 and in April and May of 2009, and included a total of 2,016 cases.⁵

⁴ Indeed, the Dallas Morning News ran a story entitled "Consumer Price Index may not reflect your family's reality," and directed readers to a link that calculates the change in the CPI based on how the family actually allocates their spending across eight major categories.

⁵ The report on the 2007 survey was based on the April and May 2007 surveys. Since the April survey included a methodological experiment relating to the cognitive burden of asking questions about official economic statistics, which was found to have a significant effect on the data results, the May survey was repeated in August 2007, and then again repeated in April and May of 2009. The exclusion of the April 2007 survey meant there was consistent wording in the four remaining surveys. It should be noted that this also means that the previously published data for 2007 is slightly different than the survey results included in this article. See Curtin (2008) for the details on this experiment.

The survey measured people's awareness of the official national unemployment rate, the Consumer Price Index (CPI), and the rate of growth in the Gross Domestic Product (GDP). Each question included three core elements: it defined the economic indicator, it defined the official governmental agency responsible for collecting the data, and asked for the published figure. The wording of each question was as follows:

First, the Bureau of Labor Statistics counts people as unemployed if they are not currently working but have been actively looking for work during the prior four weeks. What was the most recent rate of unemployment published by this government agency?

Another economic indicator published by the Bureau of Labor Statistics is the Consumer Price Index, or the CPI. Compared with a year ago, what was the percentage change in overall prices as measured by the Consumer Price Index, or CPI, published by this government agency?

The Bureau of Economic Analysis regularly publishes data on the total amount of goods and services produced in the U.S. This figure is called the Gross Domestic Product and is often abbreviated as GDP. Compared to a year ago, what was the percentage change in the Gross Domestic Product, or GDP, published by this government agency?

Note that the first question asked was expected to be the easiest to answer: the unemployment rate is widely discussed in the media and the percentage is not a rate of change but a simple proportion. In contrast, the CPI, while widely publicized, is always expressed as a rate of change, and that rate is variously published as a simple month-to-month change, an annualized month-to-month change, or a year-to-year change. This means that the information would typically require more processing and calculation before it is useable by people in their economic decisions. The final question was the most difficult since it concerns a quantity that does not directly impinge on consumers, giving them less incentive to track the figure; moreover, the figure is repeatedly revised, and variously reported as an inflation-adjusted quarter-to-quarter change or annual change.

Some people may not have answered the questions because they simply had not heard an announcement for some time, or even may never have heard of the official agency. Since the hypothesis of staggered updating anticipates such lapses in knowledge, but nonetheless holds that people are aware of the official sources of economic statistics, a follow-up question was asked to everyone who did not know the official figures:

Have you ever heard an announcement of the . . .

... unemployment rate by the Bureau of Labor Statistics?

... Consumer Price Index, or CPI, by the Bureau of Labor Statistics?

... Gross Domestic Product, or GDP, by the Bureau of Economic Analysis?

The expectation is that more people should report a specific rate of unemployment, inflation, and economic growth in 2009 than in 2007, and a comparable decrease in the proportion that had heard of the official statistics but did not report a specific number. The proportion of people that reported that they had never heard of the official statistics should also be lower in 2009 than in 2007 due to the intense media reporting of the economic crisis, but not necessarily if cognitive limitations were the dominant factor.

4. Awareness of Official Economic Statistics

The greatest economic crisis since the 1930s did not significantly raise the public's overall awareness of official economic statistics. The only economic indicator that people were more likely to report heightened awareness was the unemployment rate (see Table 1). The proportion of U.S. adults that reported that they knew of the most recently published official rate of unemployment rose to 58% in the 2009 survey, up from 47% in 2007. While this was a significant increase in awareness, it was still rather small given the extent of the rise in the unemployment rate—the unemployment rate more than doubled, rising from 4.5% in May of 2007 to 9.4% in May 2009. Awareness of the latest GDP figures rose by an insignificant amount, from 23% in 2007 to 25% in 2009, despite the fact that the economy was in a steep recession in 2009 (-6.1%) and was still expanding in 2007 (+3.2%). The data indicated that marginally fewer people said they knew the rate of CPI inflation in 2009, falling from 27% in 2007 to 22% in 2009, as CPI inflation fell from 2.7% to -1.0%. More importantly, one-third of all adults reported in 2009 as they did in 2007 that they had never heard of the official rates of GDP growth or CPI inflation. Never having heard of the official unemployment rate declined from 2007, but it was still unexpectedly high at 15% in 2009.

Based on theories of staggered updating and rational inattention, either the 2007 or the 2009 data judge in isolation could be seen as consistent with the hypothesis. More than three-fourths of all people knew of the official unemployment rate and two-thirds knew about the official statistics on the CPI and GDP. The problem is that according to this hypothesis, more people should have updated their knowledge of the official statistics in 2009 than in 2007. That was only true for the unemployment rate.

Among those that did provide a rate answer, the estimated unemployment rate jumped to 8.5% in 2009 from 5.0% in 2007 (see Table 1). These sample estimates were very close to the actual rates announced by the Labor Department at the time of the surveys: 8.5% in 2009 and 4.5% in 2007. To more accurately assess errors in people's knowledge, the absolute difference was calculated between what people reported (R_{it}) and the latest release of the official statistic (A_t) in percentage points. The median absolute errors treat both overestimates and underestimates equally.

Table 1. People's Knowledge of Official Measures on the Performance of the Economy

| | 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, but didn't know current rate | 33 | 26 | 40 | 41 | 40 | 39 |
| Never heard of official rate or agency | 19 | 15 | 31 | 34 | 36 | 33 |
| DK; NA | 1 | 1 | 2 | 3 | 1 | 3 |
| Total | 100% | 100% | 100% | 100% | 100% | 100% |
| Cases | 1,005 | 1,011 | 1,005 | 1,011 | 1,005 | 1,011 |
| Addendum (medians) | | | | | | |
| People's reports of official rates (R_{it}) | 5.0% | 8.5% | 3.0% | 2.9% | 3.3% | 1.5% |
| Median absolute percentage point error in peoples reports of official rates $ R_{it} - A_t $ | 0.68 | 1.09 | 0.78 | 3.08 | 1.42 | 2.83 |

The median absolute percentage point error in people's estimates of the unemployment rate increased in 2009 to 1.09 from 0.68 in 2007. Some may prefer to look at the ratio of the absolute error to the level of the official statistic as the more accurate assessment. For the unemployment rate this was 0.68/4.5 for a relative error of 15.1% in 2007 and 1.09/8.5 for a relative error of 12.8% in 2009. The errors in people's estimates of the unemployment rate were thus slightly more accurate in 2009 using this modified method. Unfortunately, this type of calculation cannot be done for the inflation and GDP statistics since the actual rates of change were both negative in 2009.

People's estimates of the CPI inflation rate were also less accurate, with the absolute error rising to 3.08 in 2009 from 0.78 in 2007. The same was true for GDP: the median absolute error rose to 2.83 in 2009 from 1.42 in 2007. Unlike in 2007, the headline CPI inflation rate at the time of the survey in 2009 was negative, although the core inflation rate was still positive. To be sure, people reported a slightly lower inflation rate and a much lower GDP growth rate in 2009, but those declines still left the 2009 estimates further away from the actual levels than in 2007. Indeed, whereas in 2007 one-third of all respondents that reported a rate of CPI inflation were within half of a percentage point of the actual rate, just one-in-ten were as accurate in 2009. The same results held for GDP reports: in 2007 one-third were within half a percentage point of the actual rate but only one-in-ten in 2009. The higher degree of inaccuracy may have been due to the negative rates of growth in both prices and the economy in 2009.

Table 2. Distribution of Responses to Rates of Unemployment, Inflation and Economic Growth

| Rate Answers | Unemployment Rate | | Consumer Price Index (CPI) | | Gross Domestic Product (GDP) | |
|----------------------------|-------------------|------|----------------------------|------|------------------------------|------|
| | 2007 | 2009 | 2007 | 2009 | 2007 | 2009 |
| Less than or equal to Zero | -- | -- | -- | 16 | 9 | 45 |
| 0.1% to 3.0% | 8 | 3 | 57 | 42 | 41 | 24 |
| 3.1% to 5.0% | 54 | 6 | 23 | 25 | 27 | 13 |
| 5.1% to 8.0% | 27 | 37 | 8 | 5 | 11 | 6 |
| More than 8.1% | 11 | 54 | 12 | 12 | 12 | 12 |
| Total | 100% | 100% | 100% | 100% | 100% | 100% |
| Cases | 498 | 598 | 271 | 217 | 222 | 246 |

The distribution of people's estimates of the rates of unemployment, inflation and economic growth indicate that the CPI rather than GDP was more inaccurate (see Table 2). Whereas 45% of all those that reported a specific GDP rate, reported a negative rate of GDP growth, just 16% reported a negative CPI in 2009. The substantial difference in reports of negative rates of change weakens the hypothesis about the higher cognitive burden of negative numbers but cannot totally reject the impact. People's CPI estimates may have been skewed upward by a higher core rate of inflation, with most of the declines in the headline CPI due to falling energy prices. Nonetheless, it is somewhat distressing that during the worst recession in modern history, official statistics for CPI inflation rate and the GDP growth rate were reported at over 8% by 12% of all people in both 2007 and 2009.

Although the cognitive capacity of the U.S. population could not have meaningfully changed in just two years, people may be less proficient at reporting the negative rates of change that were common in 2009 but not in 2007. The demographic characteristics of the respondents reflect a combination of differences in cognitive capacity, interests, and differences in the benefits of accurate knowledge of

official statistics. People with college degrees can be assumed to have a higher cognitive capacity than high school graduates, even if there are some exceptions. Older respondents are likely to have more experience in understanding the benefits of accurate knowledge of economic statistics, as would higher income respondents who made more decisions that would benefit from accurate knowledge. Males may be more interested in economic matters and have a greater facility with statistics in general.

Table 3. Median Absolute Errors in Estimates of Economic Statistics by Demographic Groups

| | Unemployment Rate | | Consumer Price Index (CPI) | | Gross Domestic Product (GDP) | |
|--|-------------------|------|----------------------------|------|------------------------------|------|
| | 2007 | 2009 | 2007 | 2009 | 2007 | 2009 |
| All Respondents Who Reported Rate | 0.68 | 1.09 | 0.78 | 3.08 | 1.42 | 2.83 |
| Household Income | | | | | | |
| Bottom third | 1.08 | 1.45 | 0.88 | 3.70 | 1.94 | 5.37 |
| Middle third | 0.90 | 1.41 | 0.82 | 3.13 | 1.46 | 2.35 |
| Top third | 0.56 | 0.88 | 0.76 | 2.65 | 1.10 | 1.90 |
| Age of Respondent | | | | | | |
| 18 – 34 years | 0.90 | 1.60 | 1.28 | 3.02 | 1.49 | 3.84 |
| 35 – 54 | 0.81 | 1.26 | 0.80 | 3.06 | 1.43 | 2.91 |
| 55 or older | 0.56 | 1.00 | 0.69 | 3.17 | 1.22 | 2.28 |
| Education of Respondent | | | | | | |
| High School or less | 1.12 | 1.45 | 2.06 | 3.02 | 1.73 | 5.08 |
| Some College | 0.62 | 1.14 | 0.78 | 2.84 | 1.30 | 2.11 |
| College graduate | 0.55 | 0.93 | 0.60 | 3.10 | 1.02 | 2.11 |
| Sex of Respondent | | | | | | |
| Male | 0.56 | 0.63 | 0.72 | 2.63 | 0.94 | 1.83 |
| Female | 1.20 | 1.54 | 1.00 | 3.23 | 1.74 | 5.44 |

As shown in Table 3, along with increases in income, age, and education, the median absolute errors declined in both 2007 and 2009. This consistent relationship indicates how the impact of cognitive capacity, interest, and differences in the derived benefits from accurate knowledge of economic statistics differs across demographic groups. Indeed, the largest errors occurred among the lowest income groups, the youngest, the least educated, and women in both 2007 and 2009. Nonetheless, the 2009 absolute errors were significantly higher than in 2007 across all demographic groups, even among the highest income groups, the oldest and the most educated. Overall, the absolute errors were about twice as large in 2009 as in 2007.

A regression analysis of the errors found that education only had a significant impact on the size of errors for the GDP statistic but not the CPI, casting further doubt on the greater difficulty of negative numbers. No hypothesis that had the potential of explaining why the 2009 errors were significantly larger than the 2007 errors found support in the data. Perhaps the time delays consistent with staggered updating are considerably longer than originally anticipated and negative economic news has considerably less impact on motivations for people to update their knowledge of official statistics. The

data indicate much more heterogeneity across people and larger errors in times of economic crisis. If this was the result of the long lags involved in staggered updating, then it would also mean that people would have a tendency to view economic statistics more negatively after the economy had already begun to improve. A more complete assessment must await an analysis of the perceived importance of information on official statistics and the trust people have in their accuracy as well as an evaluation of the notion that the mass media increased their coverage of official statistics during the economic crisis.

5. Importance and Trust in Official Economic Statistics

While economic models usually include an assumption that all agents have full knowledge of official economic statistics, the data above indicate that official information is not widely known. It is useful to check the underlying assumption that people value exact information on official statistics and whether they trust the official statistical agencies to provide accurate data to the public. Following the questions on knowledge of official statistics, respondents were asked whether they thought it was important to know exact information on official economic statistics, whether they would like additional information on these topics, and whether they trust official statistics to be accurate. The questions were worded as follows:

How important is it for a person like you to have exact information about the rate of unemployment, the rate of change in prices, and the rate of change in the Gross Domestic Product — would you say it is extremely important, very important, somewhat important, not very important, or not important at all?

Would you like to be more informed about these topics or would you not want any more information about these topics?

In general, on a scale of one to ten, where one is “I do not trust at all” and ten is “trust completely,” how much do you trust official government statistics to accurately measure the rate of unemployment, the rate of change in prices, and the rate of change in the Gross Domestic Product?

Somewhat surprisingly, the importance of official information on the exact rate of unemployment, inflation, or economic growth was viewed to be only slightly more important in 2009 than in 2007 despite the heightened levels of uncertainty about the economy (see Table 4). Moreover, there was no change in the percentage of people who desired more information on official economic statistics in 2009. To be sure, half of all people reported that they would like more information about the performance of the economy in both years, but the economic crisis did not increase the felt need for more official information. It might have been expected that people would have accorded a much higher level of importance to information about the performance of the economy whether the hypothesis about staggered updating was true or false. Moreover, the median absolute errors in people’s reports of the rates of unemployment, inflation, or economic growth were unrelated to the importance of the official data or the felt need for more information. It was true, however, that people who could actually recall a specific rate of unemployment, inflation, or economic growth were also somewhat more likely to find official information more important than those who could not report a rate.

Two-thirds of all people reported a middling or slightly higher degree of trust in the accuracy of official economic statistics in 2009—this question was not asked in 2007. Many fewer people were on the extremes, either having complete trust (9%) or complete distrust (12%). Importantly, people who reported that they mostly trusted the accuracy of official statistics had the smallest absolute errors in their reports of the rates of unemployment, inflation, and economic growth. It is of some importance to note

that the significance of the relationship of trust in the accuracy of the official data had a significant impact even after the demographic characteristics of the household were taken into account for unemployment and inflation rates. Nonetheless, there is no reason to anticipate that trust significantly declined in 2009 from 2007 thus producing greater errors in 2009.

The most common sources of information about the performance of the economy in both 2007 and 2009 were hearing the news on television, followed by newspapers, and the internet (see Table 4). Obtaining information from family and friends or from personal experience was reported by more people than hearing reports on the radio in 2009 (40% versus 35%); it was the reverse in 2007. While 10% of all people said that they never obtained information about the performance of the economy in 2007, this figure dropped to just 5% in 2009. These self-reported sources of economic information closely match the results from media studies. The Pew Research Center has estimated that in 2008, 84% of U.S. adults obtained economic news from television, 64% from newspapers, 48% from the internet, and 40% from family and friends (Pew, 2009).

The change between 2007 and 2009 was largest for obtaining information from family, friends and co-workers (+9 percentage points), followed by television (+7) and the internet (+6). While the increase in television and the internet as a source of economic information is hardly surprising, the increased importance of family, friends and co-workers suggests that informal sources of information on economic statistics rose during the crisis. This increase could reflect cognitive limitations that are overcome by a friend's "translation" into terms that could be more easily understood, or it could reflect the importance of tailoring the information to the individual's own circumstances.

Table 4: Importance of Official Information and Most Common Source of Information

| Importance of Information? | 2007 | 2009 | Trust in Official Statistics | 2007 | 2009 |
|--------------------------------|------|-------|------------------------------|------|------|
| | | | | | |
| Extremely important | 6 | 8 | Do not trust at all (1-2) | NA | 12 |
| Very important | 20 | 23 | Mostly distrust (3-4) | | 15 |
| Somewhat important | 37 | 42 | Middle position (5-6) | | 33 |
| Not very important | 25 | 21 | Mostly trust (7-8) | | 31 |
| Not important at all | 10 | 6 | Trust completely (9-10) | | 9 |
| DK; NA | 2 | 0 | Total | | 100% |
| Total | 100% | 100% | Source of Information | | |
| | | | Television | 80% | 87% |
| | | | Newspapers | 62 | 62 |
| | | | Internet | 42 | 48 |
| | | | Family, friends, co-workers | 31 | 40 |
| | | | Radio | 38 | 35 |
| | | | Magazines | 15 | 13 |
| | | | Never obtain information | 10 | 5 |
| Want More Information?: | | | | | |
| Yes, want more information | 50 | 49 | | | |
| Do not want more information | 48 | 50 | | | |
| DK; NA | 2 | 1 | | | |
| Total | 100% | 100% | | | |
| Cases | 500 | 1,011 | | | |

6. Coverage of Official Economic Statistics in the Mass Media

A critical assumption in testing whether people have accurate knowledge of the current official rates of unemployment, consumer prices, and economic growth is that those rates are communicated by

the government through the mass media. In an attempt to test this assumption, television transcripts and newspaper archives were searched to determine if they contained a report that cited a specific number for the official statistics on the day it was released by the government agency, or during the following three days. A four day window was chosen because most U.S. newspapers are morning editions that are printed before the 8:30 release time of the agency, and since some releases occur on Fridays, a four day window was needed to include the following Monday. A report on the official statistic that did not mention the exact official rate was not counted even if it did occur in the four day window. The same searches were done in 2009 as in 2007. The TV transcripts and newspapers were searched over two sixteen month periods, from January 2006 to April 2007 and from January 2008 to April 2009.

News reports from the five major broadcast networks—ABC, NBC, CBS, CNN, and Fox—were searched.⁶ All-business networks were not included (such as CNBC), even if they were owned by one of the five networks that were included. The official release of the unemployment rate was reported every time on CNN and 92% of the time by ABC and Fox in 2008-09 (see Table 5). Although the official unemployment rate was the most frequently reported number in 2008-09, the percentage of times the exact unemployment rate was reported averaged 83% in 2006-07 and declined to 60% in 2008-09. Exact figures for the Consumer Price Index were reported much less frequently than the unemployment rate, with the 2008-09 average falling to just 35%. This was exactly equal to the 2006-07 average, but the distribution was much more skewed in 2008-09 as NBC and CBS never reported exact figures and CNN and Fox reported the CPI figure about three-fourths of the time.

Table 5. Media Reports of Economic Indicators from Official Statistical Agency

| | Unemployment Rate | | Consumer Price Index (CPI) | | Gross Domestic Product (GDP) | |
|---|-------------------|------|----------------------------|------|------------------------------|------|
| | 2007 | 2009 | 2007 | 2009 | 2007 | 2009 |
| Television --- Average 5 networks | 83% | 60% | 35% | 35% | 46% | 51% |
| ABC | 63 | 82 | 19 | 18 | 44 | 24 |
| CBS | 56 | 12 | 63 | 0 | 25 | 12 |
| NBC | 100 | 24 | 13 | 0 | 31 | 18 |
| Fox | 94 | 82 | 31 | 71 | 50 | 100 |
| CNN | 100 | 100 | 50 | 88 | 81 | 100 |
| Newspapers --- Average 22 papers | 51% | 75% | 57% | 49% | 40% | 52% |
| USA Today (2009 circulation 2.2 million) | 44% | 59 | 63 | 65 | 50 | 53 |
| Wall Street Journal (2009 circulation 2.1m) | 100% | 100 | 88 | 100 | 81 | 100 |
| New York Times (2009 circulation 1.0m) | 100% | 100 | 100 | 100 | 94 | 100 |
| Los Angeles Times (2009 circulation 0.7m) | 75% | 100 | 100 | 88 | 75 | 76 |
| Washington Post (2009 circulation 0.7m) | 100% | 100 | 100 | 100 | 100 | 100 |

⁶ Total viewership for the primetime nightly newscasts on ABC, CBS, NBC, CNN and Fox totalled 26.1 million in 2008 (Pew, 2009).

Exact GDP figures were reported about half the time in both periods, but again in the 2008-09 period there were considerable differences across the networks: CNN and Fox reported GDP figures for every release and ABC, CBS, and NBC reported exact figures for one-fourth of the releases. Overall, more exact figures for all figures were reported by CNN, followed by Fox News. It should be noted, however, that CNN and Fox had just a 13% share of total viewership of the nightly newscasts. If the 2009 figures were adjusted for differences in viewership, the average proportion of newscasts that included the exact unemployment rate was 47% (down from 60%), the exact CPI rate was reported by 15% (down from 35%), and the GDP rate was reported by 29% (down from 51%). Who would have guessed that exact figures for these key economic indicators would be reported less often during the crisis?

The generally infrequent reports of exact figures for these economic statistics stand in sharp contrast to the greater coverage devoted to the economy by all five networks. From the start of 2007 to the end of 2008, the proportion of news coverage on the economy rose from 0.5% to 26.3% across all news media (Pew, 2009). Rather than focusing on the official statistics on unemployment, inflation, and economic growth, the news reports focused on the financial crisis, declines in housing and stock prices, subprime loans, foreclosures, bankruptcies, Wall Street and auto bailouts, and a myriad of other economic problems. Overall, the many facets of the economic crisis appear to have overwhelmed and displaced the more traditional measures of the performance of the economy.

Replicating the 2007 search of news stories in U.S. newspapers was affected by the declining number of newspapers and declining readership in 2009. A total of 27 newspapers were searched in 2007, each having a circulation of more than 400,000 as of March 2006. Only 22 of these newspapers were still published and met the much reduced 2009 circulation criteria of just 250,000 as of March 2009.⁷ The total circulation of the newspapers was 21.1 million at the start of 2006, and just 13.4 million at the start of 2009. Table 5 also includes the statistics for the five top papers in terms of circulation. Note that USA Today, the paper with the highest daily circulation, more closely mirrors the average reporting habits of all 22 of the largest U.S. newspapers.

Newspapers are often read by more than one person, with a 2006 estimate that on average 2.3 persons read each copy (according to the Newspaper Association of America). Ignoring that some people read more than one paper each day, the number of people reading each copy in circulation was 48.6 million in 2007 and 30.8 million in 2009, a decline of 37%. The overall level newspaper readership was estimated to be barely higher than the 26.1 million that viewed nightly newscasts on TV.

Three papers in the 2008-09 period cited every release of the official rates for unemployment, inflation, and economic growth (Wall Street Journal, New York Times, and the Washington Post), an improvement over just one paper in the 2006-07 time period (Washington Post). USA Today, the paper with the largest circulation, cited the official figures just over half the times in both periods. Across all papers searched, the unemployment rate was reported more frequently in 2008-09 than in 2006-07, rising to 75% from 51% of the official releases. The official figures for the CPI were reported slightly less frequently in 2008-09 (49%, down from 57%), and the official figures for GDP were reported more frequently (52%, up from 40%). While the official statistics were reported somewhat more frequently, the rise in frequency hardly matches the severity of the 2009 recession or the professed interest in the economy by the public.

⁷ The newspapers included in both the 2007 and 2009 searches, in order of 2009 circulation, were: USA Today, Wall Street Journal, New York Times, Los Angeles Times, Washington Post, New York Daily News, New York Post, Chicago Tribune, Houston Chronicle, Arizona Republic, Denver Post, Long Island Newsday, Dallas Morning News, Minneapolis Star Tribune, San Francisco Chronicle, Boston Globe, Plain Dealer, Philadelphia Inquirer, Newark Star-Ledger, St. Petersburg Times, Atlanta Journal Constitution, and the San Diego Union-Tribune.

The AP and UPI wire services carried reports for every release of the latest official rates of unemployment, the CPI and GDP in both 2007 and 2009. If we presume that the 22 papers with the largest circulations and the five television networks all had access to the wire reports, the lack of complete coverage would be an active decision of the editors to not carry the report. It was likely to reflect a judgement about the newsworthiness of the latest figures given their viewers' interests. Given that the Wall Street Journal, New York Times and Washington Post all have readers with higher than average education and incomes, these papers may have included the exact figures from a judgement about their reader's interest, with the opposite decision made by papers like USA Today. Nonetheless, most of the media preferred to emphasize the qualitative and more subjective aspect of these economic statistics rather than report the exact figures.

The distribution functions of the AP and UPI wire services have been supplanted in recent years by the simultaneous internet releases of the official statistics. The news wires (and others) still have the advantage of viewing the results early (in a locked room) so they can also provide commentary at the time of the release. Nonetheless, people from around the globe can access the same data the instant it is released via the internet. Moreover, a rising number of people favour getting the news about the official statistics on the internet, whether from the official site or from the many other websites that post similar information. Like television and newspapers, some websites report full information, some partial, and some mixed with commentary.

An assessment of the frequency of reports of the official figures on the internet is both straightforward and complex. The straightforward answer is 100% since the official releases of the unemployment, inflation, and economic growth rates are first reported on the internet by the statistical agencies. The answer is more complex in that in the many versions of the official releases that most people actually access, the official number may or may not be included. While using an internet search engine, such as Google, would find numerous mentions (and interpretations) of all the official reports, it would require some additional effort to locate the official number.

The total number of accesses of the official news releases on the Bureau of Labor Statistics and the Bureau of Economic Analysis websites provides some gauge of interest in the official figures. The news release of the unemployment rate by the BLS was accessed 23,056 times on May 8, 2009, well above the 8,243 accesses on May 4, 2007. The news release for the Consumer Price Index, also posted on the BLS website, was accessed 8,522 times on May 15, 2009, down from 11,959 accesses on May 15, 2007.⁸ These differences mirror the lower television and newspaper coverage of the CPI figures compared with the official unemployment rate. These are relatively small numbers, but unlike TV viewership or readers of newspapers, every release contained the appropriate numbers. Still, the number that directly access the official releases would disappear when calculating the total mass media audience.

Overall, this review of the dissemination of official economic data suggests that people's lack of knowledge about official economic statistics can be attributed in part to the inadequate communication of that information by the mass media. The unemployment rate was the exception, with reports of the official unemployment rate more frequently reported, and people's knowledge of the unemployment rate was more accurate. The coincidence is suggestive but does not prove causation given that there may have been higher demands on the part of the public for accurate knowledge rather than just a greater supply of information.

⁸ The GDP figures were posted on the BEA website on May 29, 2009, with the news release on May 29, 2009 having 11,849 accesses (no 2007 data available). The data are from personal communications with Reggie Simons of the BLS Division of Enterprise Web Systems and Alec Minor, Web Manager, Bureau of Economic Analysis.

The one conclusion that is inescapable is that there are substantial costs that people incur when updating information about economic statistics, significantly higher than the near zero cost that is typically assumed in economic models.

7. Informal Knowledge about the Performance of the Economy

The questions about people's knowledge of official data by federal agencies can be compared with other questions that simply ask about unemployment, prices, and economic growth. Unlike the prior questions, which identified the official governmental agency responsible for collecting the data and asked for the most recently published figure, these alternate questions simply asked respondents about likely changes in unemployment, prices, and the economy. Less technical jargon was used to define each of these economic concepts, and the questions focus on the next twelve months rather than changes over the past twelve months. It should also be noted that these questions were asked prior to the questions on the official economic statistics, and the questions were separated in the questionnaire by dozens of other questions that took more than five minutes to ask. The questions were worded as follows:

How about people out of work during the coming twelve months — do you think that there will be more unemployment than now, about the same, or less?

During the next twelve months, do you think that prices in general will go up, or go down, or stay where they are now? By what percent do you expect prices to go (up/down) on the average during the next twelve months?

Now turning to business conditions in the economy as a whole — do you think that during the next twelve months conditions will be better, or worse than they are at present, or just about the same?

The questions on expected trends in unemployment and business conditions were measured using qualitative scales while the question on expected inflation is based on a quantitative response scale. The qualitative responses on unemployment and GDP cannot be directly compared with the answers to the quantitative questions, except for one comparison: the percentage of people who responded that they did not know the answer. For both questions, the percentage of “don't know” responses totalled just 1% in both the 2007 and 2009 surveys. It is of some importance to note that the qualitative responses about the unemployment rate and potential economic growth have an excellent track record in predicting changes in the unemployment rate (Curtin, 1999, 2003) and the growth rate in GDP (the expectations index is part of the U.S. composite index of leading economic indicators).

The response to the quantitative question on the expected inflation rate is directly comparable to the question about the official CPI. This question has been analyzed repeatedly over the past decades, and found to be predictive of the actual subsequent change in overall prices (Gramlich, 1983; Grant and Thomas, 1999; Thomas, 1999; Mehra, 2002).⁹ Thomas (1999: 141-142) summarized his findings by noting that “...consensus household inflation forecasts do surprisingly well relative to those of the presumably better-informed professional economists.” Indeed, the median consumer forecasts of year-ahead inflation rates “...outperformed all other forecasts in the 1981-1997 period on simple tests of accuracy as well as on tests for unbiasedness.” Mehra (2002, page 35) also finds that Michigan's median inflation expectations outperforms the expectations of professional economists and forecasters: “They are

⁹ Similar comparisons were done for year-ahead forecasts of the national unemployment rate. Curtin (1999, 2003) found that consumers' forecasts of the year-ahead unemployment rate outperformed those of professional forecasters as well as forecasts from two prominent macroeconomic models.

more accurate, unbiased, have predictive content for future inflation, and are efficient with respect to economic variables generally considered pertinent to the behaviour of inflation.”

What is of interest for the present analysis is the differences in responses to the two questions on inflation. The biggest difference between the two questions was that one question was on the official rate published by a government agency and the other simply asked about the rate of change in prices. Whereas one form of the question required knowledge of a government announcement of an official rate, responses to the other question could be answered from more informal information, including personal experience. Unfortunately, no data were collected for a direct test of this hypothesis, although several interesting comparisons are possible.

Perhaps the most dramatic comparison is that 81% of those who said that they had never heard of the official CPI nonetheless provided a percentage inflation rate they expected during the year ahead (see Table 6). Among those who said that they had heard of the CPI but didn’t know the current rate and among those that reported knowledge of the official CPI, 91% reported an expected inflation rate. Nearly all of the respondents knew something about trends in overall prices, although most confessed ignorance of the official CPI.

Another indirect test is to compare the answers given by people on the informal question across the different responses to the question on the official CPI (see Table 6). The data indicate that the median inflation rate was slightly lower among those who provided a CPI rate of inflation and slightly higher among those who said they never heard of the CPI, an overall range of about one-half of a percentage point. The data also suggest that a major barrier confronted by people was that they did not know the official CPI rate published by the Bureau of Labor Statistics, not that they did not have any knowledge of price trends. This provides strong support for the hypothesis that people use informal rather than formal or official sources of information on price trends as a guide to their economic decisions.

Table 6: Responses to Expected Inflation Questions by Responses to Question on Official CPI

| Knowledge of Official CPI Rate | Provided Rate Answer | | | Expected Rate of Inflation | | |
|---|----------------------|------|-------|----------------------------|------|-------|
| | 2007 | 2009 | Total | 2007 | 2009 | Total |
| Provided answer to official CPI rate question | 89% | 93% | 91% | 3.0% | 2.7% | 2.8% |
| Heard of, but didn’t know official CPI rate | 92% | 90% | 91% | 3.3% | 2.6% | 3.1% |
| Never heard of official CPI rate or agency | 78% | 84% | 81% | 3.5% | 3.1% | 3.3% |
| Total sample | 87% | 88% | 88% | 3.3% | 2.8% | 3.1% |

8. Conclusions

The purpose of the second survey of people’s knowledge of official economic statistics was to more rigorously test the hypotheses put forward to account for the dismal state of knowledge documented in 2007. At that time, it was argued that updating information on official statistics occurs in a staggered pattern across individuals and over time. People make decisions about whether to update information depending on the costs of acquiring, processing, and interpreting new information compared with the potential benefits of the new information. Given that the 2007 data were collected when unemployment, inflation, and economic growth were relatively favourable and stable, most people might not be willing to undergo the costs of updating for the minor benefits they could anticipate.

It was hypothesized that the recent financial crisis and economic downturn would motivate people to update information more frequently which would result in more accurate knowledge of current economic statistics. The benefits from updated information would more than likely exceed the acquisition costs given the large changes in economic conditions. Rational inattention hardly seems plausible given the widespread impact of the financial crisis on people's economic situation. Asymmetrical information processing, where negative economic news is typically seen as more important to an individual's economic decisions than positive economic news, would also accelerate the updating process. Indeed, all of the hypotheses put forward in 2007 pointed toward greater awareness of the official statistics in 2009.

Unfortunately, people were no more knowledgeable of official economic statistics in 2009 than in 2007. The widespread lack of knowledge of official economic statistics would appear to provide little if any support for the hypotheses of staggered updating, rational inattention, or asymmetrical information processing. This negative conclusion is based on the premise the cost of updating information about official statistics was lower, the benefits higher, the cognitive burdens of obtaining and processing information were unchanged, and that official statistics were the most relevant measures for people to use in making their own financial decisions.

The costs of acquiring the latest statistics, however, were still high as there was a surprising lack of reports in the mass media of the official rates of unemployment, inflation, and economic growth. Rather than reporting of the official economic statistics more often during the worst economic crisis in the past half century, the data indicated incomplete reporting of the official statistics. The media did enlarge their qualitative descriptions of the economic crisis rather than highlighting the official figures. Moreover, the cost of acquiring information on official statistics may have been even higher in 2009, given that people would have to sort through a much larger volume of media reports in order to find the official statistics.

The cognitive resources needed to acquire and process information on official statistics has remained largely unchanged, but the negative numbers for the CPI and GDP statistics represent greater challenges. The unemployment rate was more frequently known with greater accuracy than the CPI or GDP had the advantage of requiring fewer cognitive resources to understand simple percentages, and fewer cognitive resources to comprehend positive numbers.

Finally, the benefits of accurate information on official economic statistics may not have increased in 2009 compared with 2007. There is no reason to expect that people would seek out information about an inflation or unemployment rate that they did not face. Rather than economy-wide information, it is more likely that local information is the most appropriate as inputs in people's economic decisions. Local unemployment rates for jobs that individuals are qualified are more important than national unemployment rates, and people that consume a greater proportion of their incomes on certain products or services would naturally view the potential benefits of information on those products or services greater than information on the overall inflation rate. More generally, the information that is most relevant to people's economic decisions is likely to differ across people and over time depending on the characteristics of their situation. The implication of the primacy of these more specific information needs increases the importance of what economists call "private" compared with "public" information.

The survey included other economic measures that were more aligned with people's usual economic experiences. Answers to questions about trends in unemployment, inflation, and economic growth were nearly universal, standing in stark contrast to responses to the knowledge questions on the official rates. To be sure, there was one critical difference: these alternate questions did not ask what happened in the past, but asked people about their expectations of the future, which is more relevant

information for economic decisions. The general lack of knowledge of the official CPI does not mean that people do not know about inflation, only that they do not know the official rate most recently published by a governmental agency. Private knowledge about expected price trends, as well as unemployment and economic growth, was widespread, and past analyses has shown those expectations to be relatively accurate.

Such a complex overall assessment of the public's knowledge of economic statistics is much less surprising than the premise that people would consistently use their scarce resources to monitor official economic statistics published by government agencies.

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