



# Economic Letter

## Consumers Respond More to Negative News than Positive Info

by Antonella Tutino

► **ABSTRACT:** Consumers, forced to navigate a constant stream of economic information, are often challenged to sort through details and respond to new material. Experiments suggest that people react more forcefully to negative income shocks than to positive ones. Size also matters: Reaction to small shocks is slower relative to the response to big shocks.

**C**oping with a seemingly constant stream of breaking news is a particularly notable modern-day challenge. The amount and frequency of information about the economic environment may appear overwhelming, challenging one's ability to process the implications for personal finances and respond.

The laboratory provides insight into how cognitively taxing it can become for people exposed to changes in the economic landscape to acquire and process information.

The laboratory corroborates an important theoretical point: Consumers react asymmetrically to shocks to income, with positive shocks generating a more muted and delayed effect on spending than negative shocks. Also, individuals acknowledge relatively small shocks with greater delay than bigger ones. Small positive events command less attention than small negative ones.

As a starting point to understanding this phenomenon, assume that people have limited attention to devote to news about their environment, though they still want to make rational consumption decisions. Such an assumption translates into the theoretical construct that sees people as rationally inattentive.<sup>1</sup>

Rationally inattentive consumers are people who have limited cognitive abil-

ity to process information about the world around them. They react to news slowly and imperfectly as a result of their limitations.

For instance, suppose that Congress proposes a tax reform bill that reduces the tax burden on households. Given the complexity of tax policy surrounding the details and timing of implementation, consumers may delay increasing their consumption while they process additional information about how much the new bill actually changes their budgets. As a result, the fiscal stimulus that comes from increased consumption spending might not immediately occur.

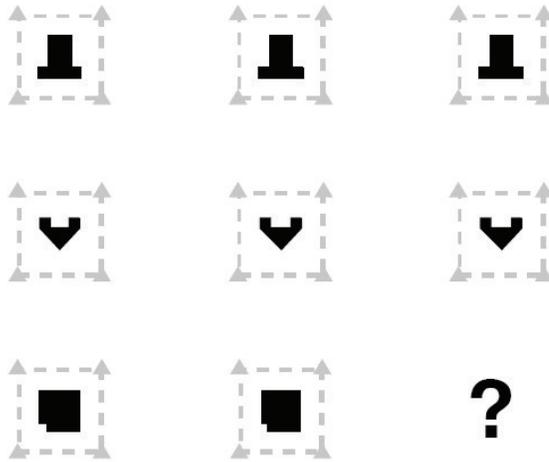
Theoretical study has shown that consumers react asymmetrically to positive and negative news about the economy.<sup>2</sup> Specifically, people react faster and much more strongly to negative shocks by lowering their consumption, while they delay spending in response to positive shocks to their finances.

In a lab experiment detailed here, test subjects were asked to decide how much they wanted to consume after processing information about their income possibilities. Information about income is costly in the sense that greater cognitive skills are required to process more precise information. By choosing how much effort to devote to processing information, people

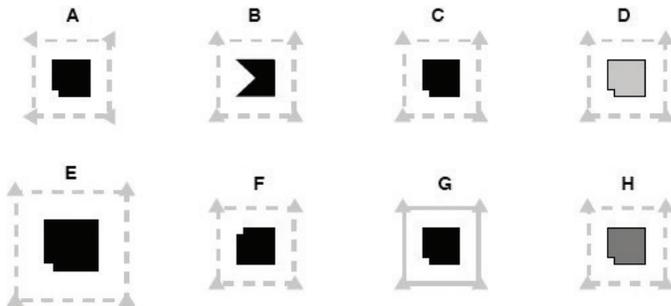
**CHART**  
**1**

Simple Example of Cognitive Tasks

In the array below, what's the missing shape?



Puzzle solution choices



ANSWER: Choice "C."

rationally trade off precision of information and consumption choices.

This asymmetry in the response of consumption to income shocks is novel in the theoretical literature and has important policy implications. When setting a path for monetary policy, a gradual rise in the Federal Reserve benchmark rate may be less disruptive in terms of people's decisions to save and the market's reaction than a steeper rate tightening. This result occurs because gradual changes are absorbed more slowly and trigger much smaller behavioral responses than swift and sizable changes.

### Experiment Design

The basis for the experiment showing this behavior is a theoretical model

where participants in each period choose consumption after receiving a random amount of income.<sup>3</sup> There are no savings. Each period starts with zero wealth and a random draw of income from a uniform distribution. The period begins with a draw of income and ends with the selection of consumption.

Participants do not know the amount of the income draw, and they must decide how much information they want about their current income before consuming. To obtain information about income, participants need to solve a task whose cognitive difficulty is associated with the precision of information. The more difficult the task, the more precise the information.

In the experiment, the possible income draws are contained in a range that arith-

metically can be viewed as residing within the interval [1, 256]. Participants decide how much information they want to acquire by choosing among nine signals whose difficulty levels range from trivial (level zero), which provides no information, to the hardest (level eight), in which the exact amount of income in each period is revealed.

Suppose that for a given period, the income is 55. The participant can sharpen their knowledge of where in the interval the income is located by selecting from nine levels (or signals) of information, with higher levels requiring completion of increasingly difficult tasks.

A signal of type 0 simply indicates that the amount of income is somewhere between 1 and 256. A signal of type 1, if the task is solved successfully, will tell the participant the income is between 1 and 128—essentially cutting the range in half. A signal of type 2, provided the task is solved, will reveal that the actual income is between 1 and 64, cutting the range by a quarter, and so on.

The width of the interval is progressively reduced toward the true income value as the signal becomes more precise. The task associated with a more precise signal is more difficult.

Tasks are based on nonverbal puzzles designed to measure cognitive ability. A task is undertaken using a 3-by-3 table of images arranged in a pattern, with the image in the lower right corner removed (*Chart 1*). In the example, the shape is the same on each row but differs from row to row.

Participants are given multiple possible correct answers and must identify the correct one from the choices presented in the *Chart 1* puzzle solution. The correct answer would be "c" because it has the right shape and border.<sup>4</sup> In this example, the puzzle is of type 4 complexity. A less-difficult signal would have only three figures to match up with basic squares and no angles. A more difficult type would feature more dimensions added to the task (number of objects, shapes, angles, dimensions of the edges).

Upon successfully completing a task, participants are shown the segment of the partition of the income space where their current income resides. The more difficult the task selected, the smaller the segment

(a more precise signal). Given the information acquired, participants select consumption for that period. If consumption exceeds income, participants get zero consumption for the period.

Once a consumption choice is made, the participants have completed a period and go on to the next one, where they start over with a different income draw.

## Asymmetric Response to News

Analysis of consumption choices by participants reveals speed and precision of consumption responses to changes in income and the asymmetric responses to negative and positive income news.

Consider news that is positive to income (*Chart 2*). The chart illustrates the response among all participants to an income increase at time zero (green line) and the corresponding change in consumption (red line) and informativeness of the signal acquired (blue line).

The chart shows that participants adjust consumption in response to a positive change in income while maintaining the same cognitive effort toward processing information. Consumption responses are subdued with respect to income change, reflecting that there is relatively little information regarding expansion of income possibilities. Participants raise their consumption gradually in response to good news on their finances.

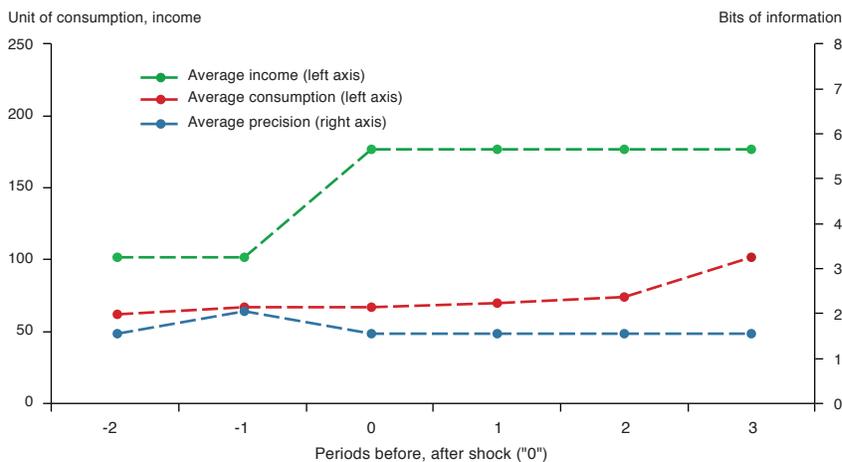
Now consider the aggregated responses of participants to a negative income shock of similar size to the positive one previously presented (*Chart 3*).

Participants decrease their consumption spending in response to negative news on income in a way that is faster and sharper than their response to positive news.

Even with shocks of similar size (in absolute value, equal to about 80 percent of expected income), the asymmetric response of consumption to income innovation can be explained by the fact that if attempted consumption exceeds income, individuals end up consuming nothing in a given period. Since acquiring more precise information is cognitively costly, participants prefer to trade off choosing additional consumption for avoiding expending more effort in processing information.

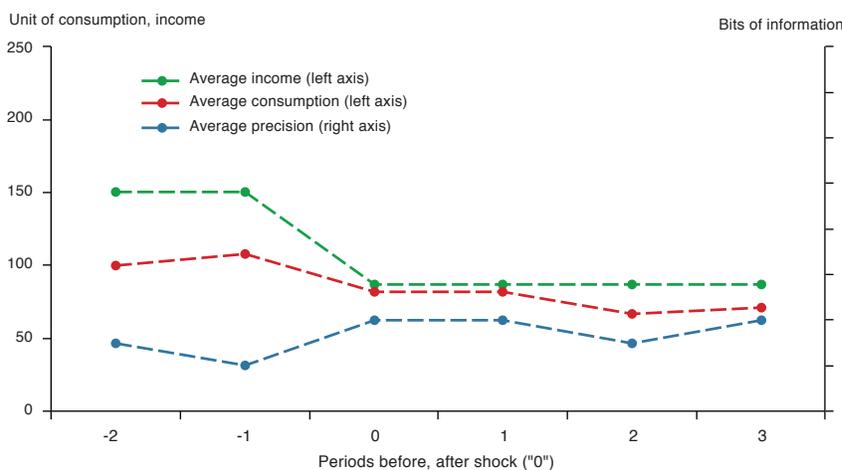
This result matches evidence in the U.S. economy regarding consumers' propensity

**CHART 2** Consumption Response to Positive Income News Delayed, Muted



NOTES: Positive shock to income occurs at period 0, increasing income by about 75 units. Consumption and income units are experimental dollars, with one unit of consumption/income corresponding to \$0.75. SOURCE: Author's calculations.

**CHART 3** Consumption Response to Negative Income News Relatively Quick, Strong



NOTES: Negative shock to income occurs at period 0, reducing income by about 50 units. Consumption and income units are experimental dollars, with one unit of consumption/income corresponding to \$0.75. SOURCE: Author's calculations.

to save additional income in the presence of uncertainty.<sup>5</sup>

The experiment allows further investigation of the asymmetry as it relates not just to the sign of the shock but also to the size.

For example, positive news of a 10 percent increase in expected income goes virtually unnoticed, failing to stimulate consumption (*Chart 4*).

This finding is particularly interesting because it shows the limitations of fiscal and monetary policy when it seeks to increase growth by stimulating consump-

tion spending. In an uncertain world with abundant news about the economy, stimulus can be ineffective simply because people need time and cognitive resources to properly assess how much a change in the economic environment really affects their pocketbooks.

Finally, this result matches the empirical evidence revealed following the federal tax rebate on consumption spending in 2001. The rebate did not prompt U.S. households to significantly increase spending, failing to generate an anticipated economic boost.<sup>6</sup>

## Policy Implications

Lab experiments can usefully aid exploration of consumption responses to policy changes affecting people's wealth and income. In particular, when individuals' limitations processing information are taken into account, there is a failure to react quickly and precisely to policy changes.

This lack of enthusiastic consumer reaction may give pause when lawmakers contemplate the actual effects of fiscal stimulus to spur economic growth by increasing consumer spending via tax law change. More generally, the results point to a limitation of fiscal and monetary policy to translate into consumption and real activity changes when people are hard-pressed to fully process information about the anticipated changes.

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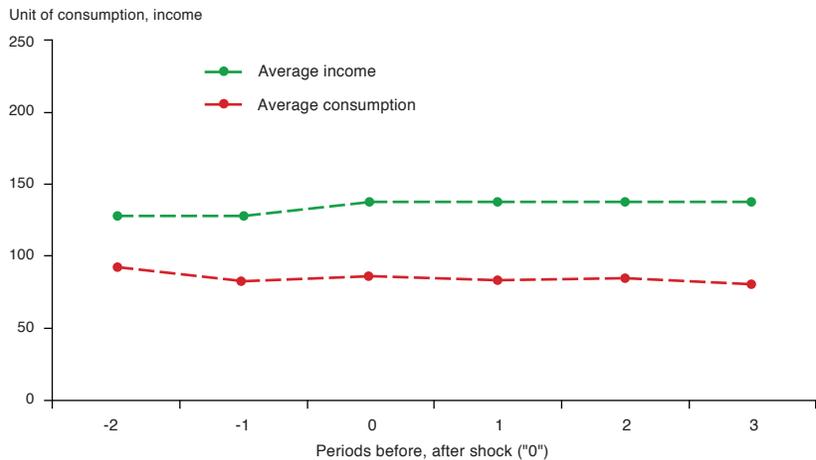
## Notes

<sup>1</sup>See "Rationally Inattentive Consumption Choices," by Antonella Tutino, *Review of Economic Dynamics*, vol.16, no. 3, 2013, pp. 421–39.

<sup>2</sup>See note 1.

## CHART 4

### Policy to Increase Income Modestly May Not Boost Consumption



NOTES: Positive shock to income occurs at period 0, with income increasing by about 35 units. Consumption and income units are experimental dollars, with one unit of consumption/income corresponding to \$0.75.

SOURCE: Author's calculations.

<sup>3</sup>See note 1.

<sup>4</sup>Option "a" is incorrect because the little triangles on the border point in the wrong direction. Option "b" is incorrect because it has the wrong shape. Option "d" is incorrect because the shape is the wrong shade. Option "e" is incorrect because the shape is the wrong size. Option "f" is incorrect because the shape is turned the wrong way. Option "g" is incorrect because the border is not dashed. Option "h" is incorrect because it is the wrong shade.

<sup>5</sup>See "Myopia, Liquidity Constraints and Aggregate Consumption: A Simple Test," by John Shea, *Journal of Money, Credit and Banking*, vol. 27, no. 3, 1995, pp. 798–805.

<sup>6</sup>See "Household Expenditure and the Income Tax Rebates of 2001," by Nicholas S. Souleles, Jonathan A. Parker and David S. Johnson, *American Economic Review*, vol. 96, no. 5, 2006, pp. 1,589–610.

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