TWO SIGMA

Street View

OCTOBER 2015

BY JEFFREY N. SARET

EXECUTIVE SUMMARY Japanese realized and expected inflation continues to fall short of the Bank of Japan's two-percent target. The BoJ might eventually respond by adopting more quantitative easing, but the Abenomics-inspired hope for Japan's economy continues to fade. As Yogi Berra once said, "It's like déjà vu all over again."

www.twosigma.com

NEW YORK HOUSTON
LONDON HONG KONG

Inside:
Japanese Inflation

JAPANESE INFLATION

THE LATE, GREAT YOGI BERRA, a quintessential American philosopher who also happened to play baseball, once said, "In theory, there is no difference between theory and practice. In practice, there is."[1] This Yogism applies to monetary economics. Nearly every theoretical model predicts higher inflation, or at least higher inflation expectations, when the central bank prints money. In practice, the Bank of Japan's (BoJ) most recent experiment in quantitative easing has not yet lifted the Japanese economy out of its low-inflation trap. Japan's Bureau of Statistics reported in September that core inflation for August fell to -0.1 percent.[2] Expectations for future inflation, both from professional international forecasters and Japanese firms, have also trended down. Declining oil and other commodity prices explain some, but not all, of the disappointing inflation numbers. A more important driver might be the failure (so far) of the monetary and fiscal policy promises constituting Abenomics to fuel the takeoff needed for Japan to escape its low-growth, low-inflation equilibrium. Even long-term hopes for a less sclerotic economic environment seem to be fading. As Yogi more eloquently said, "The future ain't what it used to be."

1 Yogi Berra was a beloved American baseball player and manager. His legacy also includes quirky observations that some would describe as nonsensical but have become enshrined in the American lexicon. Berra recently passed away at the age of 90. For a longer description of his contributions to baseball and a more complete overview of his philosophy, see http://ftw.usatoday.com/2015/09/the-50-greatest-yogi-berra-quotes.

2 The Bank of Japan refers to prices excluding "fresh food" as core inflation.

REALIZED INFLATION REMAINS LOW, AND IT IS NOT JUST BECAUSE OF OIL

Current Prime Minister Shinzo Abe won office in December 2012 by promising drastic economic reforms. He hoped, as Yogi might say, to correct "too many wrong mistakes" of past policy. Abenomics promised (among other things) to jolt monetary policy by setting an official two-percent target for inflation and expanding the Bank of Japan's quantitative easing.

Policymakers inside the government and the BoJ enacted both reforms in April 2013, and the inflation rate responded quickly (Figure 1). Core inflation increased from -0.4 percent to zero between April and May of 2013. Inflation continued to march steadily higher for the next year. In April 2014, core inflation jumped sharply from 1.3 percent to 3.2 percent after the government hiked the VAT by three percentage points. Yogi might have said that inflation rose "pretty far, but it didn't seem like it," because the market recognized that (at least) part of the root cause for the increase in inflation would prove temporary.

Since the tax hike in April 2014, inflation rates have plunged, and not just because of declining global oil prices. Japan's so-called "core core" inflation, or inflation that excludes both food and energy prices, remains less than half of the BoJ's two-percent target. The Japanese government also felt the need to indefinitely postpone a second VAT increase. It seems Abenomics has not yet hit its mark.

EXPECTED INFLATION HAS ALSO TRENDED DOWN FOR BOTH THE SHORT- AND LONG-TERM

Abenomics has also failed to lift expected inflation, an important channel for driving future inflation rates. In economics and elsewhere, expectations and perceptions can influence realized outcomes. Yogi, for example, suggested that his ability to consume food depended on its denomination: "You better cut the pizza in four pieces because I'm not hungry enough to eat six." Similarly, altering the outlook for inflation changes how much inflation will materialize. Sadly, the outlook is not rosy. Professional international economic forecasters as well as Japanese enterprises expect below-target inflation rates for both the near- and longer-term.

Economic forecasters appear more pessimistic. Figure 2 (left panel) plots the median value among forecasters for the year-ahead expected inflation rate. Similar to the realized inflation rate, year-ahead inflation expectations increased from 1.9 percent when the BoJ enacted reforms in April 2013 to more than 2.3 percent six months later.[3] Since then, inflation expectations have mostly trended lower. The most recent estimate (September 2015) for 2016 inflation fell to 0.8 percent.

Domestic Japanese firms appear relatively more optimistic about year-ahead inflation, but they still seem to doubt that the BoJ will achieve its two-percent target within the next five years. Figure 2 (right panel) plots both the year-ahead (light blue) and five-year ahead (dark blue) expectations of inflation based on a BoJ survey of Japanese firms. The average year-ahead inflation expectation for all firms is 1.2 percent. The relatively small difference between manufacturing (+1.1 percent) and non-manufacturing firms (+1.2 percent) suggest factors other than falling energy and commodity prices account for Japan's stubbornly low inflation. Japanese firms do not expect these factors to dissipate anytime soon. Both manufacturing firms (+1.3 percent) and non-manufacturing firms (+1.5 percent) expect inflation to fall short of the BoJ's target for the next five years.

Japanese firms' pessimism has increased since the BoJ first began systematically surveying firms about their inflation expectations in 2014. The orange dots in the right panel of Figure 2 show the results from the BoJ's survey a year ago. Across both types of firms and time horizons, the mean expected inflation has fallen. If the pattern continues, Yogi's truism that a "nickel ain't worth a dime anymore" might require a Japanese translation (in addition to a reevaluation of the logic).

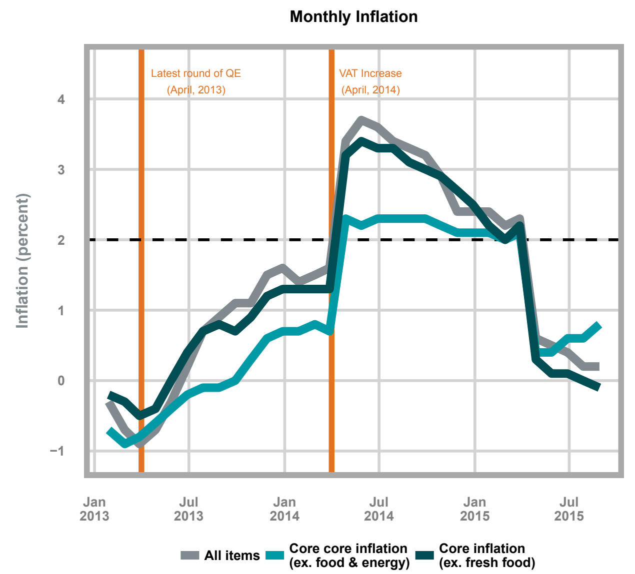
INSUFFICIENT STIMULUS FAILS TO ACHIEVE OBJECTIVES – I.E., IT IS LIKE DÉJÀ VU ALL OVER AGAIN

If Yogi commented on Japan's current predicament, he might argue that "it's déjà vu all over again." Multiple reforms in Japan, including in 2001 and 2010, arrived with much fanfare and promises to forcefully push the economy out of its low-inflationary trap. Despite the lofty ambitions, resolute declarations from policymakers, and initial success, Japan's economy failed to achieve escape velocity. The current inflation data resemble those previous episodes.

Policymakers could argue that it "ain't over 'til it's over." Since "it's tough to make predictions, especially about the future," that may prove true. Still, one can "observe a lot by watching." Watching (and listening) to BoJ governor Haruhiko Kuroda argue that more stimulus is unnecessary[4] makes one wonder what the BoJ observes beyond price levels and measurements of expected inflation to support his contention that Japan is on track to achieve its stated monetary policy goals.

The BoJ's success or failure in achieving its goals matters to the markets for at least three reasons. First, and most obviously, Japan is the world's third-largest economy, and its economic health affects global prosperity. Second, and more imminently, Japan's struggle with inflation for the past three decades inspires the fears and informs the approach of central bankers in the U.S., Europe, and elsewhere. If the

FIGURE 1

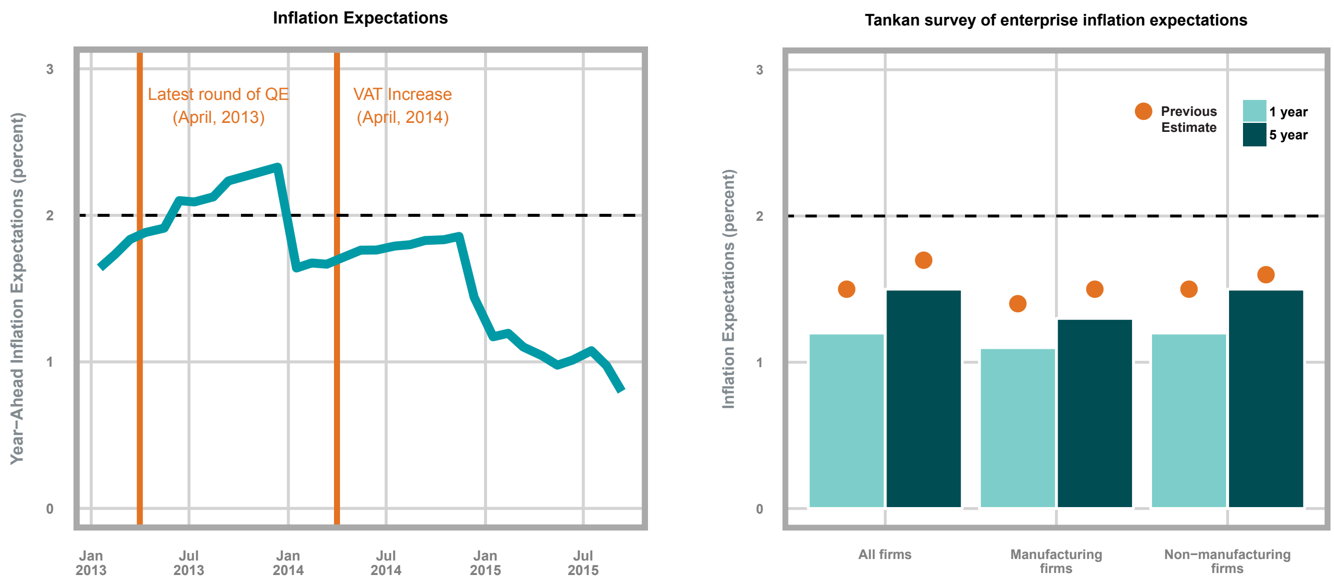


Notes: Data from the Statistics Bureau.

3 Inflation expectations in December 2013 forecast 2014 inflation rates. These 2014 rate included the three percent VAT increase.

4 See, for example, http://www.cnbc.com/2015/10/11/bank-of-japan-governor-kuroda-says-inflation-in-line-indicates-october-easing-unlikely.html

FIGURE 2



Notes: Left panel plots median forecast for year-ahead inflation based on data from Consensus Economics. Right panel based on data from the Bank of Japan's Tankan Survey of Enterprises.

BoJ fails to realize its objectives, other central bankers may reevaluate their own approaches. Third, and most ominously, Japan's inflation struggles may relate to changing preferences for saving and investment among an aging and shrinking population. This demographic challenge appears most acute in Japan but hangs like a Damoclean sword over the heads of policy makers in other developed, and some large developing, markets. Perhaps Yogi, the seemingly perpetual optimist, would offer this advice to market participants and monetary policymakers in Japan and elsewhere: "When you come to a fork in the road, take it."

INTERESTING TECHNOLOGY-RELATED ARTICLES

Two Sigma is a technology company that applies a rigorous, scientific method-based approach to investment management. We draw upon a diverse set of fields to inspire our technology, including artificial intelligence and distributed computing. Occasionally, we read articles in the popular press that describe applications of technology that we find interesting, thought-provoking, and relevant for people thinking about improving the investment management process. Below is a subset of the articles we read this month. Please do not view the inclusion of these articles as an endorsement by Two Sigma of their viewpoints or the companies discussed therein. Two Sigma welcomes discussions (and contributions) about these and other such technology-related articles.

"Hurricane Joaquin Forecast: Why U.S. Weather Model Has Fallen Behind" by Nate Cohn, *New York Times,* October 2, 2015 (http://www.nytimes.com/2015/10/03/upshot/hurricane-joaquin-forecast-european-model-leads-pack-again.html).

More powerful computational systems make better weather predictions than their less sophisticated competitors. "By early 2013, the European [storm forecast] model had nearly 10 times the raw computing capacity of the Global Forecast System, or G.F.S., which is run by the National Weather Service. There were other problems, too, and the cumulative effect was obvious and irrefutable: The G.F.S. was doing worse than its rivals, and it played out in high-profile cases, like Sandy." A similar result applied to forecasts of the more recent Hurricane Joaquin.

"Why Your Gadgets Can Now 'See' in 3-D" by Jack Nicas, *The Wall Street Journal,* October 15, 2015 (http://www.wsj.com/articles/more-devices-gain-3-d-vision-1444859629).

Advanced computational machines are developing skills that mimic human capabilities. "Faster, cheaper computer processors are enabling more devices to 'see' in three dimensions, spawning drones that can avoid trees, robots that can skirt furniture and security cameras that can tell a homeowner from an intruder." The approach is similar to how humans see. "Many of the new devices combine images from two side-by-side cameras... Until recently, such an approach would have been too expensive, bulky and power-hungry."

IMPORTANT DISCLAIMER AND DISCLOSURE INFORMATION