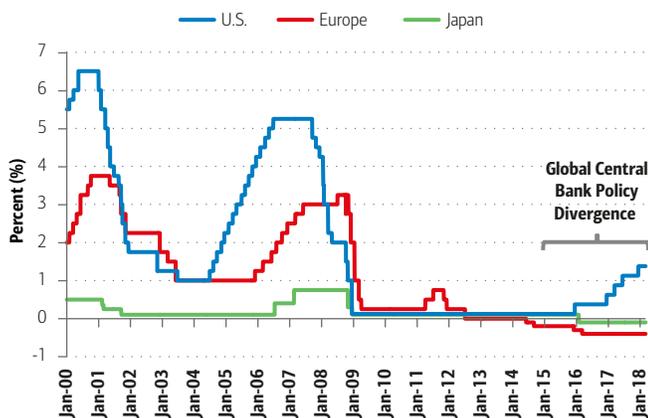


understanding of global central bank activity to comprehend moves in the U.S. rates markets. Unlike Vegas, what happens in Frankfurt and Tokyo rarely stays in Frankfurt and Tokyo.

We lay out below a brief synopsis of ECB and BOJ activity since the 2008–2009 financial crisis, and where they currently stand. It is important to note that both embarked on quantitative easing (QE) after the crisis—in consonance with the U.S.—as well as negative rates, which the Fed steered clear of. Their response to the crisis was not as aggressive as the Fed's, one significant reason both the European and Japanese economies have not performed as strongly, and the ECB and BOJ are several years behind the Fed in terms of policy normalization. Both the ECB and BOJ are still engaged in QE and have not moved off negative rates; both expect QE to continue throughout this year and do not expect any rate hikes. Any change in policy from either central bank could have an outsized effect on U.S. and global markets.

Exhibit 2: Europe's and Japan's less aggressive initial response to the crisis means they are several years behind the Fed



Source: Bloomberg as of March 6, 2018

European Central Bank Review and Outlook¹

As European governments improved their fiscal positions post-crisis, the ECB focused on ensuring functioning financial markets and price stability. After an initial misstep during the crisis—the Fed had already cut rates by 325 bps to 2% when the ECB raised rates 25 bps to 4.25% in September 2008—the ECB lowered its main refi rate to a record low in May 2009. The ECB lent to banks for longer terms and against more collateral types than usual.

Given the tepid initial response relative to the Fed's aggressive rate cutting and capital programs—as well as more diverse and less fully integrated economies, competing national

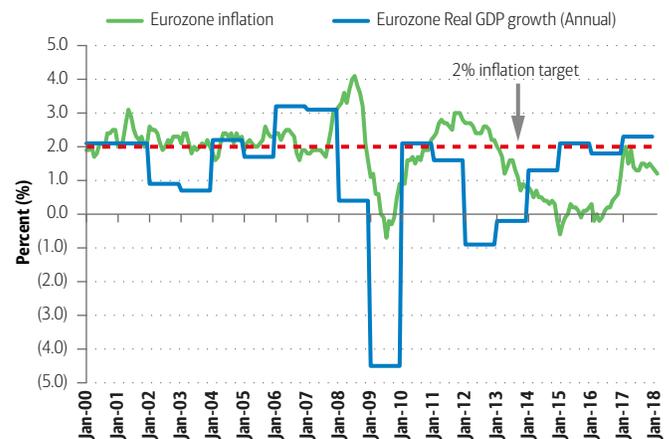
¹ Source: ECB website / speeches
<https://www.ecb.europa.eu/press/key/date/2017/html/sp170316.en.html>
<https://www.ecb.europa.eu/mopo/implement/omt/html/index.en.html>

interests for systemically important banks, and the lack of a unified pan-European banking system—the European economy and banks did not heal as quickly as they did in the U.S. This presaged the European sovereign debt crisis of 2011, which was very disruptive to banks and the whole pan-European economy, only a couple of years after the crisis.

Finally, in November 2011, the ECB again expanded the types of collateral eligible for banks to secure funding, and increased the term available to three years. It also introduced a program to purchase European sovereign bonds in the secondary market to convince investors that there was minimal risk of a sovereign bond being redenominated out of Euros and back into a national currency. This again reduced the systemic risk, but did not allay the larger economic issues. Eurozone GDP again slipped into negative territory.

European banks began to deleverage, but at a later and more gradual pace than U.S. banks. Furthermore, rather than raising more capital or selling assets, European banks primarily reduced lending. Bank private sector loans contracted by more than 2% in 2013. The economy stagnated, headline inflation went negative in 2014, and the ECB lowered its refi rate to only 5 bps in September 2014, before eventually taking it to zero.

Exhibit 3: Eurozone GDP has recovered, but inflation is still well below target



Source: Bloomberg as of March 9, 2018

With deflation a real risk and rates basically at zero, the ECB was approaching the limits of conventional monetary policy. It therefore introduced three new initiatives:

1. Negative interest rates on its deposit facility;
2. Asset purchase programmes (APPs) of private and public debt; and,
3. Targeted longer-term refinancing operations (TLTROs).

The deposit facility (depo) rate is the rate offered to banks for deposits with the ECB, analogous to the Fed's discount rate. It has been negative since 2014 and is currently -0.40%. Negative depo rates brought overnight rates down and flattened the yield curve, providing financial easing.

APPs—a form of QE—are central bank purchase of assets directly from markets. APPs decrease market rates, lower risk premia, ease financial conditions and encourage higher asset prices overall. The ECB APPs focus on covered bonds—secured funding more common in Europe—asset-backed securities, sovereign and corporate bonds. However, due to spillover effects and “portfolio rebalancing,” they also encourage higher asset prices indirectly in other markets, for instance equities.

TLTROs are designed to directly stimulate bank lending to the economy. They are targeted operations, providing funding to banks up to four years, and linked to the participating banks' lending patterns. Banks have borrowed at the depo rate if they demonstrate strong performance in loan origination.

In total, these non-conventional strategies have been effective. Eurozone real GDP is currently growing at 2.3% year-over-year, and core inflation—while not out of the danger zone—is at least positive and stable at 1%. Financial conditions are easy, rates are low and markets are functioning.

To mitigate the risks of an economic slowdown, but correct course back to a normal monetary policy, the ECB laid out a game plan in October 2017 to carefully reduce its unconventional monetary policy over the coming years. Currently, their quantitative easing programs are set at €30 billion purchases per month, a reduction from €60 billion starting in January 2018. Purchases will remain at this level until at least September, at which point they can be extended, if necessary, to foster a sustained increase in the rate of inflation. The ECB has also committed not to raise rates until “well past” the end of its asset purchase programs. (Most participants expect that if the ECB does not extend QE past the September deadline, it will remove purchases gradually via a “taper.”)

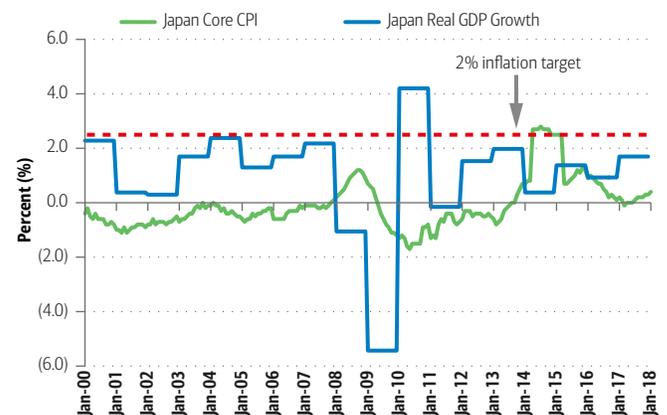
Mario Draghi, president of the ECB, reiterated this view at the March ECB meeting, where he echoed a dovish and patient outlook for monetary policy, and echoed October's game plan. The ECB has the benefit of seeing how the Fed's plan operates and the markets react, and have the ability to follow a similar script if it is successful, or learn from any missteps along the way.

Bank of Japan Review and Outlook²

Japan is a unique case, afflicted by moderate but persistent deflation since the 1990s, when the Japanese asset bubble burst. The BOJ had a 0% rate policy as early as 1999, and then switched to targeting reserve balances from 2001 to 2006. BOJ Governor Kuroda has referred to this as “the world's first quantitative easing.” The BOJ also committed to follow its policy until inflation was 0% or above, a commitment now referred to as “forward guidance.”

While Japan was not as significantly impacted by the financial crisis—Japanese banks were actually a source of capital for some U.S. firms—the crisis did cause deflation to return after CPI had moved positive in 2006. The BOJ introduced “comprehensive monetary easing”—reducing interest rates, purchasing Japanese government bonds (JGBs), corporate bonds and stocks, and creating special long-term lending facilities—similar to other central banks. While this forestalled a larger drop in economic activity and serious price declines, it did not ultimately prevent the persistent deflation Japan was becoming accustomed to.

Exhibit 4: Japan has seen persistent, moderate deflation for the greater part of two decades



Source: Bloomberg as of March 9, 2018

When Shinzo Abe was elected to a second term as Prime Minister in 2012, he declared economic revival an urgent issue for Japan; he considered “prolonged deflation ... to be shaking ... the foundations of trust in society that ‘those who work hard shall be rewarded.’”³ His administration announced the “three arrows” of so-called “Abenomics”: aggressive monetary policy, meaningful fiscal policy, and structural reforms to promote private investment and increase Japan's competitiveness.

² Source: BOJ website

https://www.boj.or.jp/en/announcements/press/koen_2016/data/ko160414a1.pdf

³ http://japan.kantei.go.jp/96_abe/statement/201301/28syosin_e.html

The BOJ quickly followed suit on their arrow. It introduced a 2% CPI target, similar to what the Federal Reserve did in 2012. In April 2013, it introduced a new initiative, “quantitative and qualitative monetary easing,” or QQE. (Qualitative easing refers to changing a particular *quality* of money, for example its interest rate. Quantitative easing refers to changing its *quantity*—that is to say, how much there is. Simply said: qualitative easing changes the *price* of money, while quantitative easing changes the *amount*). QQE consisted of forward guidance—committing to 2% inflation to raise the public’s inflation expectations—and large-scale purchases of JGBs. Combined, this lowered the entire yield curve, short and long.

“QQE with a Negative Interest Rate” was introduced in January 2016, after the 60%+ drop in oil prices caused concerns about global economic growth. The BOJ introduced a -0.1% rate on bank balances to further reduce real rates; an unusual move believed necessary because Japanese rate policy was stuck at the “zero lower bound.” This can pressure the profitability of banking institutions—especially if the curve is very flat or inverted—which in extreme circumstances may harm financial stability. In 2016, the BOJ instituted “QQE with Yield Curve Control,” applying not only the -0.1% rate on bank balances but an approximate 0% on 10-year JGBs, ensuring that there was at least some positive slope to the yield curve. It also strengthened forward guidance with an “inflation-overshooting commitment”—expanding the monetary base until CPI exceeds the 2% stays above target in a stable manner.⁴

Similar to the ECB, this puts the BOJ several years behind the U.S. in terms of monetary policy. Kuroda expects inflation to reach its 2% target in fiscal year 2019 (from April 1, 2019 to March 31, 2020) and expects to discuss policy normalization in that timeframe if inflation performs as expected. Therefore, no rate hike is expected this year. While some have suggested the BOJ should increase the 10-year JGB target from 0% before inflation hits 2%—a steeper yield curve would be a welcome reprieve for some banks—Kuroda recently said he was “cautious and negative” on such an idea. Nevertheless, while stimulating inflation is the top priority and normalization is a distant concern, any commentary that can be perceived as hawkish has the ability to move both the US\$ / ¥ and global rates, and can

increase overnight volatility in both the rate and credit markets. However, unless a shift in sentiment is really being telegraphed, these moves should be short-lived and present opportunities.

The Takeaway

The sun is beginning to set on the extraordinary monetary policies initiated by the world’s central banks after the financial crisis. The Fed—having led the way with the most aggressive response—has already turned the corner by ceasing quantitative easing, raising rates off the zero bound, and allowing its balance sheet to passively wind down. The ECB is several years behind the Fed, and the BOJ is even further behind the ECB. This places both the ECB and BOJ in the catbird seat; they can monitor the Fed’s success, and adjust their own policies accordingly. The Fed is blazing a new trail that makes an easier and less risky path for other central banks to follow.

The temporarily diverging rate paths and policy stances of the world’s central banks do create unique cross-currents. All things being equal, the U.S. inflation outlook, Fed Funds rate increases, passive Fed balance sheet run-off, fiscal policy and additional Treasury supply should be pushing longer-term U.S. rates higher. However, the global rate environment is—for the time being—a very effective governor on the pace of how fast those rate can rise. We believe, therefore, that additional long-term rate rises from here will most likely be a grind higher.

This underscores the importance of understanding both the current trajectory of foreign central bank policy, and how the markets may react should that evolve in a different way than currently anticipated. While we are not overly concerned, we would note that German government bonds are still yielding below the core Eurozone inflation rate—and have been for most of the last three years. This is a level of extremely rich valuation that has the potential to correct quickly and violently, if U.S. history is any guide. The last two times the U.S. saw government bond yields this far below core inflation for an extended time period preceded both the Taper Tantrum in 2013—when 10-year rates rose ~140 bps to 3% in four months—and the 2016 presidential election, after which 10-year rates rose ~125 bps to 2.6% in five-and-a-half months. Following global central bank activity helps us understand and anticipate the potential for such moves in the future.

⁴ https://www.boj.or.jp/en/announcements/release_2016/k160921a.pdf

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