

# The future of monetary policy

## Multi-asset implications

May 2016

### IN BRIEF

- In the aftermath of the first Federal Reserve (Fed) rate hike in nearly a decade, attention has briskly shifted to the future. What's next for policy interest rates? How will central banks deal with their extraordinarily large balance sheets? In this paper, we take an even longer view. What does developed market monetary policy look like in future cycles, and what does it imply for markets?
- Even as central banks experiment with mildly negative interest rates, we believe that balance sheet policies similar to quantitative easing will remain a regular feature of the landscape. Born of necessity when policy rates hit their zero lower bound, quantitative easing emerged to repair markets and ease financial conditions.
- The process of experimentation with “unconventional” policy will continue so long as central banks face the limit of a lower bound on policy rates. One idea that has gained traction is the direct monetization of fiscal stimulus by central banks (i.e., helicopter money). Such policies need to balance the exigency of economic stimulus with the inherent risks, but it is fair to say that they are less unconventional now than they used to be.
- More active balance sheet policy and muted variation in policy rates imply that yield curve steepening and flattening in subsequent cycles will be more moderate. The inversion of the curve that historically preceded recessions may not arise and, if it does, may not send the same signal in future cycles.
- All of these developments are a mixed blessing for multi-asset investors. On one hand, central banks are finding ever more diverse and creative solutions to achieve their mandates. On the other, it suggests that the warning bell coming from the yield curve will be less informative than it used to be about the most worrisome of risk-off outcomes—when the economy tilts into recession. In our view, variations in quantitative easing among central banks will define the degree of monetary policy divergence in the coming years.

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**WHEN CENTRAL BANKERS RATCHETED DOWN OVERNIGHT INTEREST RATES TO ZERO IN 2008-09, THEY PLUNGED INTO UNCHARTED WATERS** by impairing the mainstay of their inflation and output stabilization policies. In response to that challenge, policymakers assembled a broader tool kit of instruments to tackle an even wider set of objectives. Today, central banks at the vanguard of developed market (DM) business cycles are beginning a slow move toward the exit of “unconventional” policies, while those further back in their cycles continue to seek ways to add monetary stimulus. Against this backdrop, we contemplate what these innovations will mean for the implementation of monetary policy in the future and the implications for the “normal” behavior of financial markets over the business cycle.

Equilibrium interest rates—those prevailing when an economy is operating at its potential and inflation meets the central bank target—have been on a steady decline in DM economies, a

decline that should persist well into the future as demographic headwinds and slower trend GDP growth weigh on yields. As a result, drawing policy rates down to zero and deploying quantitative easing (QE) will become a far more frequent occurrence. We argue that since QE acts more directly than policy rates to suppress long-term yields, we expect its more frequent use to temper yield curve dynamics in future cycles. The steepening during periods of economic weakness and flattening during recoveries will likely become more muted. The low levels of fixed income volatility that arose from central banks “leaning” on the yield curve should also repeat themselves in future cycles.

Hence, the future of monetary policy looks to be one with generally larger central bank balance sheets, a multiplicity of policy instruments and milder yield curve fluctuations over the course of the business cycle. In all likelihood, the transition from here to there will be one in which central bank balance sheets shrink from currently elevated crisis-era levels. That process is underscored by the extent of policy divergence among QE-wielding central banks and the large attendant moves in foreign exchange markets. The appreciation of the dollar from mid-2014 through 2015 is the most pronounced case in point. The transition may also be fraught to the extent that winding down central bank balance sheets and falling emerging market currency reserves coincide, which may ultimately put additional downward pressure on DM bond prices.

To be clear, the direction of causality that we highlight in this work runs from economic outcomes to deployment of unconventional policy and to changes in yield curve dynamics. Yield curve dynamics are thus symptom, rather than cause, of policy efficacy; we build on the panoply of research that has demonstrated the efficacy of QE in the wake of the global financial crisis (GFC). But the future of policy will be different in its application from the past, as monetary policy becomes more targeted at parts of the economy that anchor on longer dated interest rates and central banks experiment with alternative approaches to the zero lower bound (ZLB) on nominal policy rates.

## G4 MONETARY POLICY POST-GFC: FROM LAZY RIVER TO OPEN SEA

In past cycles, the conduct of monetary policy could be thought of as steering an ocean liner. The ship (i.e., the economy) is continually buffeted by waves and pulled by undercurrents. The

rudder is used to offset the effect that those factors exert on the course of the ship. In this metaphor, a *perfectly executed* policy is one of path stabilization; to be more precise, appropriately calibrated monetary policy minimizes the deviations of inflation from its medium-term target as well as deviations of output from the economy’s “full employment” level. The rudder is in constant motion in either direction, offsetting the waves while the ship continues along a straight line.

Prior to the global financial crisis, a consensus emerged about the best way to implement monetary policy in order to get closest to that ideal outcome. The elements of the steering mechanism had three principal characteristics. First, the central bank maintains a large degree of independence from the fiscal authority, giving it leeway to make politically unpopular decisions. Second, the central bank operates some form of “flexible inflation targeting,” aiming to hit a publicly announced numerical target for inflation in the medium term. As many observers have noted, this objective leaves a lot of room to pursue policies that stabilize output and unemployment in the near term, so long as the credibility of the medium-term inflation target is preserved.<sup>1</sup> Third, the primary policy instrument is the overnight interest rate.<sup>2</sup> In other words, the ship’s rudder responds roughly in proportion to changes in inflation and the unemployment rate.

The long period of economic stability after this policy consensus emerged in the 1980s—a period called the “Great Moderation,” characterized by three long expansions and by two relatively mild recessions—served only to enshrine this manner of central bank conduct across developed markets. In 2008, however, a wave emerged that was large enough to render the central banks’ single rudder powerless. As G4 policy rates declined to zero, policymakers were confronted with the exigent need to attach new rudders or other stabilizers to the ship and to deal with a host of conceptual questions. First, how should an additional rudder be installed? Presumably, the operation of the second rudder should be complementary and

<sup>1</sup> For example, under the extreme assumption that inflation was always constant at the target level, monetary policy could be used exclusively to nudge the economy back to its full employment level of output.

<sup>2</sup> A notable exception is the Bank of Japan (BoJ), which currently targets the monetary base (the sum of currency in circulation and reserve balances at the central bank) rather than the overnight interest rate. The BoJ switched operational targets from the uncollateralized overnight call rate to the monetary base in April 2013 as part of its Quantitative and Qualitative Monetary Easing program. It augmented that framework in January 2016 when it introduced a negative rate on excess bank reserves. Otherwise, the Federal Reserve, European Central Bank and Bank of England target the federal funds rate, main refinancing rate and official bank rate, respectively.

not work at cross purposes. Second, how is a second rudder used in coordination with the first? That is, is there a well defined and consistent pattern in which the two rudders are deployed? And finally, is it still worthwhile to use a second rudder once the large wave has receded?

In response to these questions, G4 central bankers rewrote the pre-crisis policy consensus. Monetary policy today is a multi-rudder ship. Instruments like QE, credit easing, long-term refinancing operations in Europe and Funding for Lending in the UK are all ways for central banks to lower long-term interest rates or otherwise steady dysfunctional financial markets. Inflation targeting has also taken on broader flexibility. As forcefully demonstrated by the period preceding the financial crisis, stability of inflation and output is far from sufficient to guarantee financial stability. As a result, central banks have now taken on far more active oversight of financial markets. These developments have also arguably blurred the lines between monetary policy and fiscal policy and challenge the notion that the central bank is operationally independent.<sup>3</sup>

In summary, you haven't seen this movie before. The Great Moderation policy consensus has given way to new policy tools, new mandates and new challenges for central banks. Our task is to surmise which of these changes will survive in future business cycles and, for those, to attempt to delineate more concrete implications for asset prices. In the following sections, we narrow our focus on central bank balance sheet policy as most likely to recur in policymakers' tool kits.

## NEW TOOLS ARE HERE TO STAY

Many of the unconventional monetary policy tools introduced since the global financial crisis—specifically, QE and various credit easing mechanisms—have become permanent and integral parts of the policy tool kit. In this section, we cite four reasons why these tools are here to stay. The first is necessity.

Policymakers will find themselves mired at a zero policy rate with increasing frequency in upcoming cycles, necessitating the use of unconventional policy. Second, QE works in easing financial conditions. Third, it offers new transmission channels compared to policy rates and may be able to target central bank policy objectives more precisely. And four, we argue that the alternatives to conducting monetary policy at the ZLB are fraught with their own difficult—if not insurmountable—trade-offs.

<sup>3</sup> For instance, the purchase of mortgage-backed securities and other private assets by central banks represents an explicit form of credit allocation, which is usually the domain of fiscal policy.

## Reason 1: Policymakers will encounter the ZLB more frequently

One of the defining features of DM financial markets over the past three decades has been the secular decline in real interest rates. Whatever the underlying reason for this phenomenon, whether as a reflection of decelerating economic growth or alternative stories of “secular stagnation,”<sup>4</sup> this trend clearly makes it much more likely that central banks will draw policy interest rates down to zero in future recessions. As illustrated in **EXHIBIT 1A** (next page), eight of 11 U.S. easing cycles since 1955 would have hit the ZLB if they had begun with the federal funds rate at 3.25%, the current median long-term projection of the U.S. Federal Open Market Committee (FOMC).<sup>5</sup> Moreover, this phenomenon is not restricted to the United States. In the United Kingdom, the analogous figure is similar. Seven of 11 Bank of England (BoE) easing cycles since 1960 would have hit zero had they started at a policy rate of 3.25% (**EXHIBIT 1B**, next page).

Over the course of the coming years, for most reasonable calibrations of how the unemployment rate and fed funds rate fluctuate, even a modest recession would push rates back to the ZLB. A deeper one would likely keep it there for years. For instance, in the context of a large-scale macroeconomic model of the U.S. economy, a sustained 1 percentage-point increase in the unemployment rate would reduce the fed funds rate by 2.5 percentage points.<sup>6</sup> With the fed funds rate below 4%, it is therefore nearly certain that a moderate recession would force policymakers to deploy tools other than the policy rate.

## Reason 2: QE works ...

Former Fed chairman Ben Bernanke famously quipped, “The problem with QE is it works in practice but it doesn't work in theory.”<sup>7</sup> Even though the theoretical channels by which bond buying programs work are not fully understood, the bulk of

<sup>4</sup> For example, structurally lower corporate demand for debt in new economy firms or the savings implications of wider income inequality would both increase the stock of savings relative to investment and thus weigh on long-term yields. These factors appear to have broadened out further since the financial crisis to include increased demand for precautionary savings, risk aversion to investment, disappointingly slow productivity growth and higher bank capital requirements. The president of the Federal Reserve Bank of New York, William Dudley, outlined several of these factors in his speech “The Economic Outlook and Implications for Monetary Policy” (May 20, 2014).

<sup>5</sup> The FOMC's median “longer run” forecast of the federal funds rate in its Summary of Economic Projections (March 2016) is 3.25%. We note that according to market-based estimates of the terminal value of the fed funds rate, which have languished far below the FOMC's projections, the ZLB may well be breached with even higher frequency in the future.

<sup>6</sup> Based on the macroeconomic model of the firm Macroeconomic Advisers.

<sup>7</sup> Quote from a Q&A session at the Brookings Institution, January 16, 2014.

Most U.S. and UK easing cycles would have hit the ZLB if begun near 3.25%

EXHIBIT 1A: EFFECTIVE FEDERAL FUNDS RATE AT START AND END OF CUTTING CYCLE

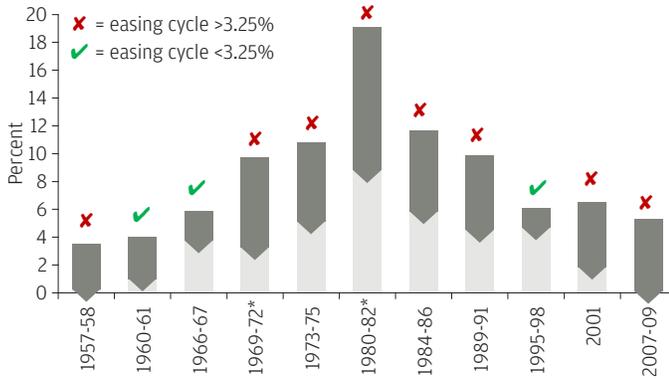
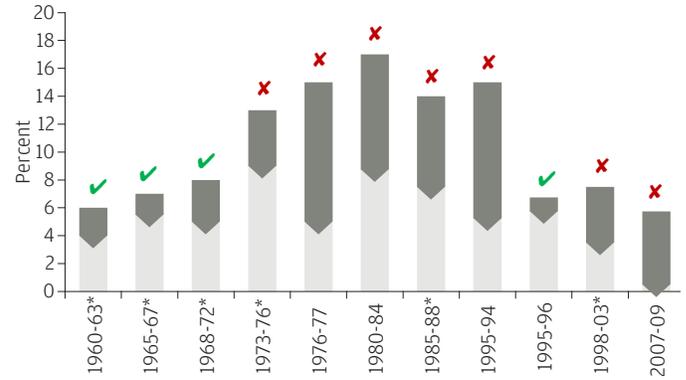


EXHIBIT 1B: BANK OF ENGLAND OFFICIAL BANK RATE AT START AND END OF CUTTING CYCLE



Source: Bloomberg, J.P. Morgan Asset Management Multi-Asset Solutions.

\*Combined easing cycle includes intermittent hikes or pauses.

empirical studies about their effect on markets have concluded that financial conditions eased afterward. In particular, longer government bond yields, which drive a wide array of financial asset prices and contractual payments in the economy, appear to be sensitive to the size of government balance sheets. Indeed, a survey of the academic literature on the U.S. experience shows a decline in the 10-year Treasury yield of roughly 35 to 50 basis points (bps) for each installment of QE.<sup>8</sup>

A second perspective on QE is that it was doled out at a pace proportional to what traditional monetary policy rules would have suggested for an interest rate tool. Combined with our previous observation that financial markets responded to QE,

<sup>8</sup> A summary of empirical estimates from the literature is provided in the Appendix.

this finding implies a degree of substitutability between balance sheet and interest rate policy as a means of easing financial conditions. For instance, in the U.S. and the UK—the two developed markets where we’ve observed fully articulated balance sheet expansions—QE asset purchases tended to accelerate exactly when economic conditions would have warranted a negative policy rate. The two panels of **EXHIBIT 2** show the size of Fed and BoE QE announcements as a percentage of GDP alongside our estimates of the overnight policy rate warranted by economic conditions (estimated using an equation called the Taylor rule).<sup>9</sup>

<sup>9</sup> The Taylor rule policy rate for an economy is computed as the sum of the equilibrium funds rate, a multiple of the inflation gap (i.e., the difference between the inflation rate and the central bank’s target) and a multiple of the unemployment gap (i.e., the difference between the unemployment rate and the long-run natural rate).

When economic conditions warranted negative policy rates, QE tended to follow

EXHIBIT 2A: EXPANSIONARY BALANCE SHEET POLICY IN THE U.S.

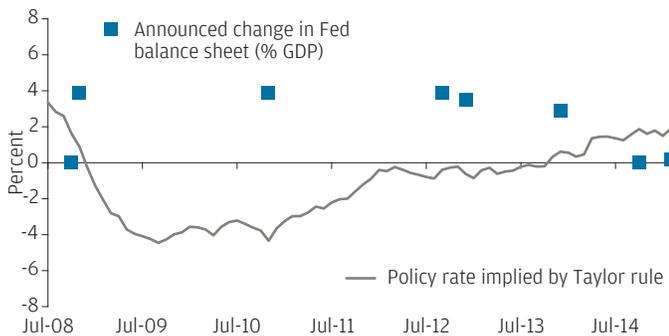
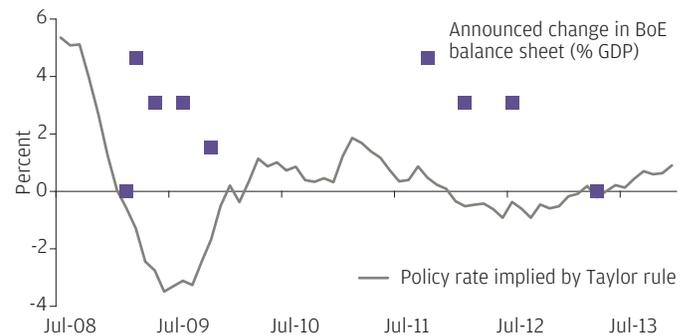


EXHIBIT 2B: EXPANSIONARY BALANCE SHEET POLICY IN THE UK



Source: Haver Analytics, J.P. Morgan Asset Management Multi-Asset Solutions; data as of November 30, 2015.

Japan and the euro area are playing catch-up, with QE later and larger than in the U.S./UK

EXHIBIT 3A: EXPANSIONARY BALANCE SHEET POLICY IN THE EURO AREA

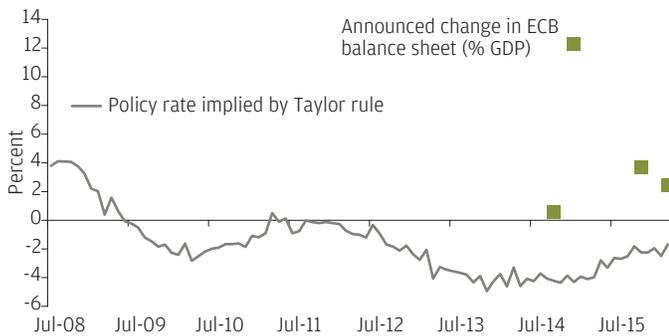
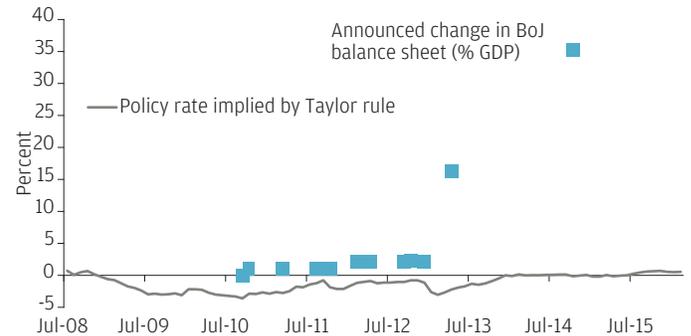


EXHIBIT 3B: EXPANSIONARY BALANCE SHEET POLICY IN JAPAN



Source: Haver Analytics, J.P. Morgan Asset Management Multi-Asset Strategy; data as of November 30, 2015.

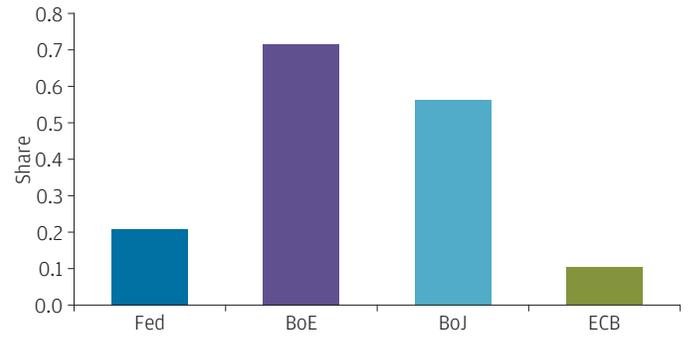
As economic conditions deteriorated in late 2008, the Taylor rule suggested that central banks should set short-term interest rates that were deeply negative in order to provide a countervailing stimulative impulse. However, with nominal interest rates hamstrung at the ZLB, the Fed and the BoE ramped up asset purchases to the tune of 7.5% and 4.5% of GDP, respectively. In the U.S., the subsequent salvos of QE took place against a backdrop of sluggish improvements in economic conditions, ending in a taper of asset purchases once the implied policy rate had moved north of zero. In the UK, the distribution of QE was slightly lumpier, with the BoE responding in 2011 to the deterioration in the economic and inflation outlook amid the eurozone crisis.

The use of QE in the euro area and Japan was less timely but arguably still more or less in line with what economic conditions would have dictated (EXHIBIT 3). The Bank of Japan’s more aggressive recent tack, galvanized by the broader sweep of Abenomics initiatives beginning in 2013, translated into QE announcements on the order of 16% and 35% of GDP. The European Central Bank (ECB) also arrived late to the party with balance sheet expansions of 12% and 4% of GDP in 2015 and 2.5% of GDP in March 2016. When one looks at the size of balance sheet expansion relative to the size of the shock to economic conditions (as measured by the cumulative amount of implied negative rates), G4 central banks are all roughly in the same ballpark in terms of the calibration of their response.

We find that, on average, an implied policy rate of -1% for one month corresponds to an increase in QE worth roughly 0.4% of GDP (EXHIBIT 4).<sup>10</sup> In other words, policymakers have calibrated their responses to low growth and inflation such that balance sheet expansion of 0.4% of GDP is akin to setting the policy rate at -1% for a month.

Central banks expanded balance sheets roughly in proportion to how they would have moved policy rates

EXHIBIT 4: CUMULATIVE CENTRAL BANK BALANCE SHEET EXPANSION AS A SHARE OF CUMULATIVE IMPLIED NEGATIVE POLICY RATES



Source: Haver Analytics, J.P. Morgan Asset Management Multi-Asset Strategy; data as of November 30, 2015.

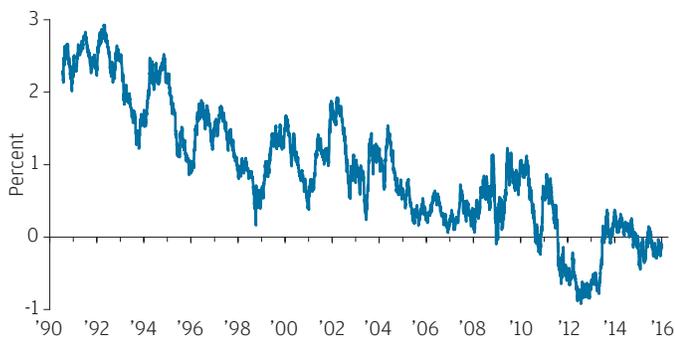
<sup>10</sup> This statistic takes the total balance sheet expansion for each economy and divides it by the cumulative amount of negative implied policy rates during this business cycle.

### Reason 3: ... but QE works differently

In addition to the demonstrated efficacy of QE and the fact that it appears to have been applied as a substitute for traditional tools, QE simply operates differently from policy rates. In general, central banks' helmsmanship of economic expansions consists of both steering financial conditions in the right direction and sending a signal about the future stance of policy. QE contributes along both of these dimensions but in different proportion to the overnight policy rate. It works in large part by suppressing the term premium demanded by investors to hold duration and therefore has a disproportionate effect on longer term yields. Indeed, implementation of QE has corresponded to sustained declines in term premia (**EXHIBIT 5**).

#### The U.S. term premium has been declining

EXHIBIT 5: U.S. 10-YEAR TERM PREMIUM COMPUTED USING KIM-WRIGHT METHODOLOGY



Source: Haver Analytics, J.P. Morgan Asset Management Multi-Asset Strategy; data as of April 7, 2016.

To understand how this is different from the use of conventional policy instruments, it helps to recap the main ways that QE works to suppress longer dated yields. First is that central bank bond buying signals that policy rates will remain lower for longer, and this mechanically pulls down the path of short-term rates priced into long bond yields. In this sense, QE is part and parcel of central bank forward guidance. In terms of these signaling effects, there is little distinction between balance sheet policy and interest rate policy; lowering interest rates also affects longer dated yields, in part by signaling a lower path for rates or the potential for future cuts.

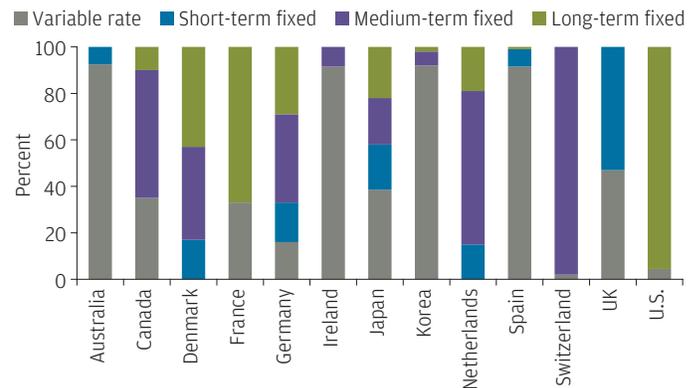
The second channel through which QE operates is called “preferred habitat.” According to this narrative, bond investors have preferences for specific bond maturities and need to be

compensated by an extra risk premium to sell those maturities. When central banks buy up longer duration bonds, the fact that there are some “unwilling” sellers has the effect of driving up the price of long bonds (which drives the yield down). This channel differentiates QE from conventional instruments insofar as it compresses the term premium instead of (or in addition to) signaling a lower path for policy rates. Through the purchase of specific securities, such as Treasuries or mortgage-backed securities, QE has also given rise to policies that are more targeted at imbalances in narrow economic sectors.

In principle, these sources of differentiation between conventional and unconventional policy could make QE desirable as a complement to the policy rate in future cycles. These complementarities are evident from a variety of perspectives. The first is that the effects of QE will likely be more market-specific. Since QE works disproportionately at the long end of the yield curve, its effects will radiate through the economy largely through sectors anchoring to longer yields. Those sectors, in turn, have varying degrees of importance across countries. **EXHIBIT 6** shows the composition of interest rate types for mortgage loans in an array of economies. At one end of the spectrum is the U.S., where mortgages are dominated by long-term fixed rate loans. Moving along the spectrum, Canada, Denmark, France, Germany, Japan, the Netherlands and Switzerland all use primarily fixed rate instruments.

#### QE will have varied effects across mortgage markets with different loan types

EXHIBIT 6: INTEREST RATE TYPES FOR MORTGAGE LOANS

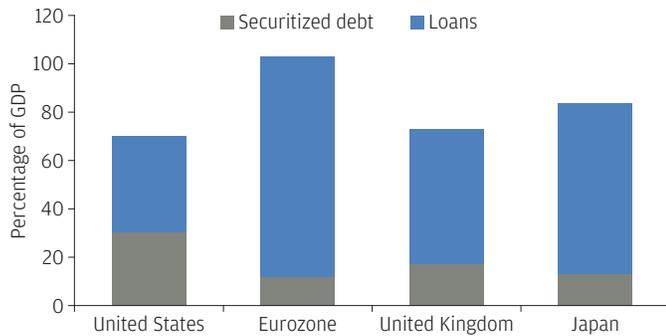


Source: Michael Lea, “International Comparison of Mortgage Product Offerings,” Research Institute for Housing America (2010).

Since long-term fixed rates anchor to 10- and 30-year Treasury yields, suppression of term premia via QE will have more palpable effects on the housing sectors in those countries. Where mortgage rates are primarily variable, rates anchor to fluctuations in short-term interest rates and, as a result, household balance sheets are more sensitive to the evolution of policy rates. On that end of the spectrum, Australia, Ireland, Korea and Spain are primarily variable, with the UK split fairly evenly between fixed and variable rate loans. Analogous international differences arise in the corporate sector, where the intensity of borrowing either by taking loans or by issuing bonds varies substantially across countries (EXHIBIT 7). Nonfinancial corporate borrowing in the U.S. is roughly evenly divided between bank loans and bonds, whereas the same statistic for Europe and Japan is much more skewed toward bank loans.

**Corporate financing in the U.S. is comparatively bond-intensive**

EXHIBIT 7: NONFINANCIAL CORPORATE BORROWING BY TYPE



Source: Bank of Japan, European Central Bank, Federal Reserve Board, UK Office for National Statistics, J.P. Morgan Asset Management Multi-Asset Solutions; data as of March 31, 2016..

Outcomes across the G4 economies have varied due to structural economic differences that cause QE to ease financial conditions through a variety of channels. Thus far, we’ve emphasized the role of QE in lowering long-term Treasury yields, but doing so has knock-on effects for both exchange rates and valuations of risk assets. As a result of these knock-on effects, there exists a wide array of outcomes in the distribution of QE easing effects across these channels. For instance, the eurozone and Japan have benefited relatively more from export competitiveness, given the greater depreciation of their currencies and relatively large export shares of their economies.

Wealth effects are greater wherever retail equity ownership is high, as in the U.S. In the U.S., unlike the UK, residential home refinance was especially important during the recession because of the preponderance of long-term fixed rate mortgages and high rates of home ownership. In the eurozone, where bank lending is an especially important contributor to overall credit growth, we have seen the clearest credit impulse in anticipation and in the aftermath of the ECB’s initiation of QE in early 2015.

**Reason 4: Lack of viable policy alternatives**

Before jumping to the conclusion that QE is inexorable, what are some alternatives to frequent encounters with the ZLB and deployment of central bank balance sheets? There are two modifications within central banks’ existing monetary policy framework that could potentially help avoid the ZLB: setting higher inflation targets or attempting to push nominal interest rates below zero. Both are beset with significant implementation challenges, which make their usefulness relatively limited. We also explore the feasibility of an even more extreme change in central bank operating procedures—monetary-financed fiscal spending, or “helicopter money”—in a separate section, “Helicopter money: The final frontier?” (see page 9).

**1. Higher inflation targets.** Nominal interest rates reflect in part expectations of future inflation. As such, a result of DM central banks’ success in taming inflation since the early 1980s (at which time inflation expectations anchored near 2%) has been a decline in interest rates. By analogous reasoning, raising the medium-term inflation target—from the 2% rate now common to the G4 and other major economies—would distance the average future policy rate from the ZLB, producing less frequent and shorter encounters.

So why not target, say, 4%? For one, moving the target mid-stream can have the undesirable consequence of casting doubt on the credibility of monetary policy. The outcome could unhinge inflation expectations by undermining confidence that the target would not be reassessed again in the future. That might discourage some forms of lending and long-term investment, cause businesses to expend fruitless effort minimizing cash holdings, and instill higher inflation risk premia in bond yields. It would also represent a significant shift in real wealth from creditors to debtors, including indebted governments. And, in the absence of a corresponding shift in the way that pensions calculate benefits, it could be especially costly for retirees, as higher inflation would erode the real value of their fixed nominal pension payouts.

**2. Negative nominal interest rates.** Another alternative to hitting the ZLB is to ignore it. Recent experience demonstrates that central bank policy rates are able to go more deeply negative than previously thought without causing markets to malfunction. The pioneers of negative interest rate policy have predominantly been safe-haven-currency economies where the supply of bank deposits is relatively inelastic. In 1972, the Swiss National Bank first introduced negative nominal interest rates on foreign deposits in an attempt to curb the franc’s appreciation. More recently, the Danish National Bank, Sweden’s Riksbank, the ECB and BoJ have all moved short-term policy rates into negative territory. And one FOMC participant has even suggested a negative policy rate for the U.S.<sup>11</sup>

Negative rates may yet attain their natural limit, at which point depositors simply withdraw their money and hold cash. While recent central bank innovations imply that policymakers have some additional wiggle room on rates before having to deploy their balance sheets, they do not imply that the lower bound on nominal rates does not exist. Until governments do away with paper currency (in favor of electronic currency or some alternative), the policy rate cannot be set arbitrarily negative and may only reach as far below zero as it costs to hold physical currency securely. And given that a Taylor rule-implied policy rate for the U.S. economy was roughly -4% during the depths of the global financial crisis, it is unlikely that negative rates could fall far enough to meaningfully reduce the necessity for unconventional policy tools.

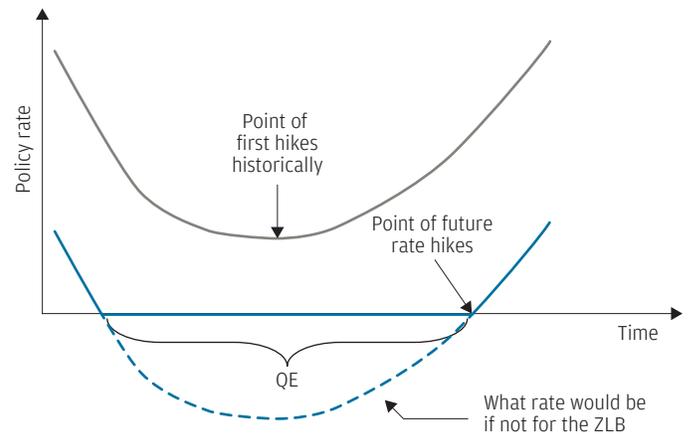
## THE FUTURE OF YIELD CURVE DYNAMICS

Why does the occurrence of the ZLB and QE *in steady state* matter for investors? We believe that the most direct effects will manifest themselves in the level and cyclical nature of the Treasury yield curve. Because QE targets the long end of the yield curve, the average yield for longer duration bonds will decline. To be sure, long yields have already been on a long-term declining trend, but central banks’ more frequent “leaning” on the long end of the yield curve via QE will add weight.

There is also a mechanical relationship between the zero lower bound constraint on policy rates and the normal fluctuations in the steepness of the curve. As illustrated in **EXHIBIT 8**, a normal easing and tightening sequence over the course of the business cycle is truncated by policy rates’ inability to breach the lower bound. As a result, the change in the spread between short- and long-term yields is not as large in periods of either monetary easing or tightening.

### The ZLB implies big differences in yield curve dynamics over the economic cycle

EXHIBIT 8: AN ILLUSTRATION OF HOW THE ZERO LOWER BOUND DISTORTS INTEREST RATES



Source: J.P. Morgan Asset Management Global Multi-Asset Strategy.

Chart is a highly stylized interpretation of historical and future yield curve dynamics. For illustrative purposes only.

<sup>11</sup> According to the FOMC’s Summary of Economic Projections in September 2015.

## HELICOPTER MONEY: THE FINAL FRONTIER?

Unconventional central bank policies have become much more commonplace in the past few years, blurring the lines between fiscal and monetary policy and raising questions about central bank independence. Arguably, central bank-financed fiscal stimulus—“helicopter money”—would be the logical endpoint of this progression, the port of call if the next recession strikes while policy rates are still low and central bank balance sheets still bloated. Indeed, some distinguished commentators—notably Ben Bernanke—suggest the era of the central bank helicopters has already arrived.

There are several issues to untangle here. First, what is helicopter money, and how exactly does it differ from the other unconventional tools of the central bank kit? Second, would it actually work? And finally, is it even possible within the confines of institutional arrangements that were in some cases designed expressly to make monetary financing of government budgets impossible?

### How does it work?

The idea of helicopter money was first proposed by Milton Friedman in 1948, when he said that a government could always, in principle, tackle a problem of weak demand by printing dollar bills and scattering them from a helicopter. Nominal GDP would inevitably increase, as long as people picked up the money and spent it. The only question was how the increase was divided between real output growth and inflation.

The mechanics of a real-life helicopter drop today would be different, since the whole thing would happen electronically, but the basic idea is the same. The government announces that it has decided to give USD500 to all citizens via their bank accounts, for example—or it undertakes some other form of fiscal stimulus—and to pay for that spending, commercial banks are credited with an equivalent amount in new central bank reserves. At the same time, the government would credit the central bank with a perpetual non-interest bearing bond, functionally equivalent to cash. The bond would prevent the central bank from having a hole in its balance sheet—a liability to the banking system with no corresponding asset.

This sounds like a free lunch for the public and the private sector, and in many ways it is, but only as long as the central bank doesn't have to pay interest on those additional reserves. In the end, the helicopter drop must be paid for, either via additional reserve requirements for banks—to remove the need to pay interest on at least that part of reserves—or through future seigniorage revenues after inflation moves back to its target.

If neither of these things happened, the central bank would be making a loss and end up needing a subsidy from the government for the newly created money, which would rather defeat the objective. The ECB's chief economist, Peter Praet, captured the accounting aspect in a recent interview, when he defined helicopter money as “giving to the people part of the net present value of future seigniorage, the profit [the central banks] make on future bank notes ... all central banks can do it. [They] can issue currency and ... distribute it to people.”

With all the talk of helicopters, readers would be forgiven for thinking that this kind of monetary financing was a million miles away from what central banks do today. It isn't. The Bank of Japan currently owns 298.7 trillion yen of Japanese government bonds. That's nearly a third of the entire stock and around 60% of Japanese GDP, and the share keeps going up because the bank is buying more bonds than the government is issuing to finance its deficit. If the BoJ announced it was writing off all of that official debt and replacing it with a perpetual non-interest bearing bond from the government, the balance sheet consequences would be exactly the same as those of a modern-day helicopter drop.

Would this accounting change do anything to stimulate the economy that the bond purchases alone had not already achieved? Proponents say it would, by reassuring households and businesses that the public balance sheet was a lot healthier than they thought. But, of course, the net effect would not be so positive if investors decided that the default risk on the remaining stock of Japanese debt had gone up.

If monetary financing is measured by the net impact on the burden of government debt, then it has almost certainly already occurred in the countries that have seen significant quantitative easing by the central bank. By reducing government bond yields all along the yield curve, sovereign bond purchases have directly reduced debt servicing costs, not just in the short run but probably in the long term as well. This is quite evident in eurozone countries where new government debt is being issued at an implied negative yield; investors, in effect, are taking a haircut on the face value of the debt right from the start. More generally, one could argue that the decline in bond yields in 2015 and early 2016 has quietly enabled a loosening of fiscal policy in several eurozone countries. Public debt ratios are set to fall slightly in 2016 in a number of countries, even as primary deficits—a nation's fiscal deficit, excluding interest payments on its debt—are being revised up.

## HELICOPTER MONEY: THE FINAL FRONTIER? (CONT'D.)

“Quietly” is the operative word. The balance sheet implications might be the same as those of outright helicopter money, but the practical implications are rather different. And so are the political ones.

### Going from theory to practice

When Ben Bernanke suggested in 2003 that Japan might undertake up-front monetary financing of a fiscal stimulus, he argued that this would be more effective in raising nominal GDP than a bond-financed fiscal boost, even in the context of QE. We will never know whether the Japanese would have done better taking his advice. But most would agree that central banks' sole reliance on private portfolio rebalancing and the private lending channel to support nominal demand has not been an unadulterated success in Japan or the eurozone. For all its risks, an explicit monetary-financed fiscal expansion could start to look like the lesser of two evils to those who worry about the distorting effects of prolonged periods of low or negative rates for asset prices and private debt.

If the theory of Ricardian equivalence—which holds that a small proportion of any fiscal package stimulus will be spent, because households will save more in anticipation of tax increases or spending cuts to come—has any relevance (and it seems to apply to a certain extent in several eurozone countries), then something closer to a helicopter drop is likely to be more effective than either the backdoor monetary financing we have seen recently or more traditional forms of monetary and fiscal stimulus. A fiscal stimulus explicitly financed by the central bank would also have a better chance of reaching every household and so allay worries about the distributional consequences of QE.

But all these arguments assume that central bank helicopters can take flight without fatally undermining either the banks' institutional independence or their credibility in controlling inflation. It is doubts on this score that have rightly weighed on policymakers before now. In most countries, central bank independence was hard won and has been in place for less than a generation. If the monetary authorities' independence

or their credibility were fatally damaged, the long run negative consequences for the economy could far outweigh the short-term stimulus afforded by calling in the helicopters.

For the policy to be worth the risk, any central bank would need to be able to show that it had an effective framework in place to prevent the additional bank reserves from leading to excessive inflation as the banks put the money to work via the credit multiplier—for example, by imposing adjustable reserve asset requirements. (Arguably, any unconventional policy that boosts central bank liquidity raises the same multiplier concerns.) In the case of a central bank-financed fiscal stimulus package, governments would also need to demonstrate that the money would indeed be spent and would contribute to both short- and long-term growth. That might be an easier condition to meet now, after years of squeezed public investment, but it is not a foregone conclusion.

“Accidental” and opaque forms of public debt reduction and monetary financing are one thing, but the political and even legal obstacles to explicit forms of monetary-financed stimulus are much greater. The taboo against explicit central bank financing is still operating in most of the developed economies, particularly in the eurozone, where Article 123 of the Maastricht Treaty expressly forbids central banks from buying debt directly from governments. That said, the barriers against monetary-driven fiscal stimulus look a lot weaker than they did even a few years ago. The ban on monetary financing technically applies to all European Union members, including the UK, and not just to the members of the currency union. But recent history suggests that the framework for independence in the UK is more open to innovation and collaboration between the fiscal and monetary authorities than we have seen elsewhere. Even in the eurozone, we have seen that policymakers will improvise when they have reached the point of seeing no palatable alternative.

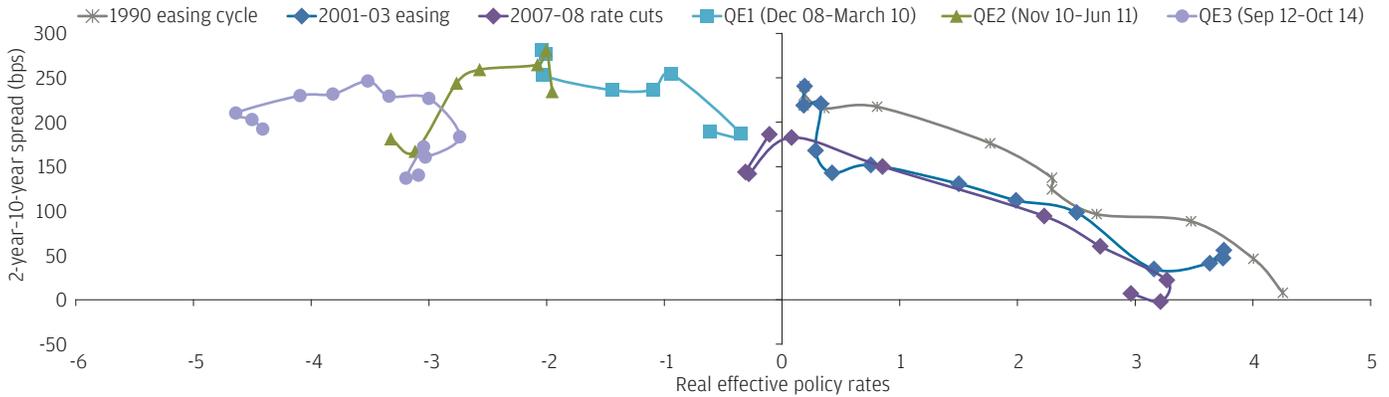
In sum, if another downturn threatens while policy rates are still close to zero and balance sheets are still enlarged, it is a reasonable assumption that at least one central bank will abandon the pretense and monetary financing will complete its move from the unthinkable to the merely “unconventional.”

This effect on spreads is apparent for the U.S., even after only one business cycle. As illustrated in **EXHIBIT 9** (next page), policy easing during the previous three recessions has corresponded to a fairly monotone and steady increase in the steepness of the yield curve. Moreover, even after policy rates

hit zero, the first instance of QE was successful in pushing the curve ever steeper as markets built in expectations of recovery in response to aggressive action by the FOMC. However, further QE struggled to steepen the yield curve beyond the 250bps mark, where it remained range-bound thereafter.

The yield curve has steepened less with QE than in conventional easing cycles

EXHIBIT 9: CURVE SHAPE BETWEEN 2-YEAR AND 10-YEAR TREASURY YIELDS FOR DIFFERENT VALUES OF THE REAL EFFECTIVE POLICY RATE



Source: Haver Analytics, J.P. Morgan Asset Management Multi-Asset Strategy; data as of March 31, 2016.

A similar dynamic can be seen for tightening episodes, which traditionally correspond to a flattening of the yield curve. In the previous three cycles, absent lower bound constraints and QE, curve steepness meandered steadily lower as policy pushed up short-term rates (EXHIBIT 10). However, since the taper tantrum and subsequent beginning of Fed policy normalization, yield curve steepness has not responded in the usual manner and remains effectively range-bound.

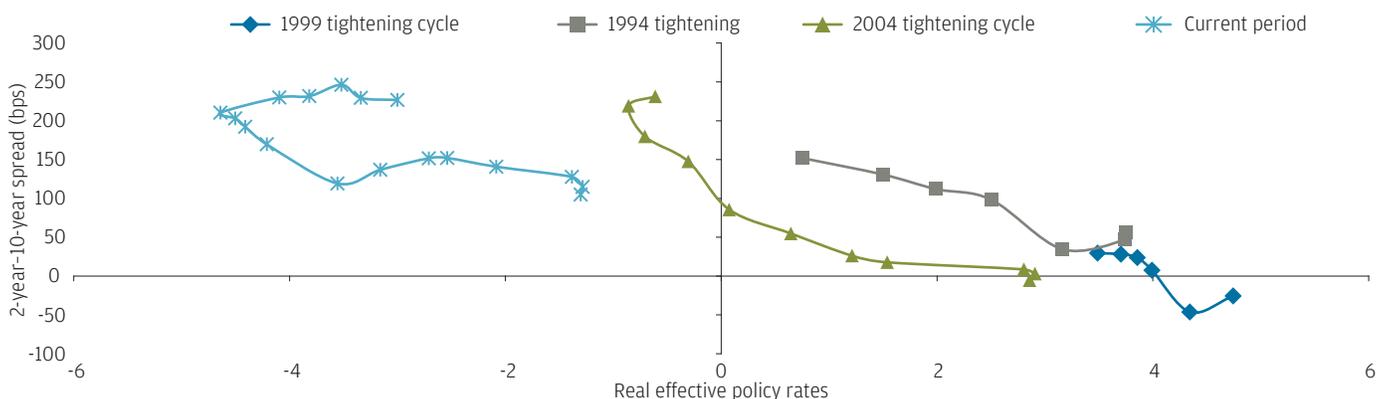
We conclude from these observations that even if policymakers are successful in pushing effective real interest rates more deeply into negative territory in future cycles, the usual patterns observed in yield curve dynamics will become more muted. This owes to the fact that balance sheet policy is simply not reflected to the same extent in yield curve steepness as in fluctuations in the policy rate. Whereas a typical easing cycle

steepens the curve by lowering short rates against the backdrop of relatively stable long rates, the ZLB now impairs the ability to go lower at the short end while simultaneously compressing term premia at the long end.

A few caveats are in order for our assessment that yield curve dynamics become less pronounced over time. The dynamics will depend a lot on the sequencing of policy tool usage. In the current cycle, policymakers drew down the policy rate to zero, deployed QE, began to raise the policy rate and then planned to eventually normalize the size of the central bank balance sheet. One could imagine alternative scenarios in which the balance sheet is deployed while policy rates are still positive or the balance sheet is normalized prior to raising rates. In these scenarios, the idea that curve dynamics become more muted is qualitatively similar, but the response of the level and steepness

The yield curve has flattened less when QE is involved than during conventional tightening cycles

EXHIBIT 10: 2S10S CURVE SHAPE FOR DIFFERENT VALUES OF THE REAL EFFECTIVE POLICY RATE



Source: Haver Analytics, J.P. Morgan Asset Management Multi-Asset Strategy; data as of March 31, 2016.

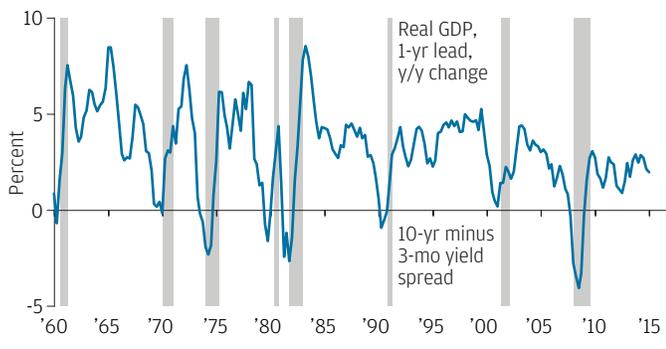
of the curve may well be quite different. There is also the consideration of how policymakers intend to reduce their balance sheets from currently elevated levels; policymakers at the Fed and BoE have indicated this will not take place until the process of rate normalization is well under way.

### Dimmer signals from the yield curve

Perhaps the most weighty implication of lower and flatter yield curves for multi-asset investors is the distortion in the curve's signal about future economic growth. Previous business cycles were characterized by fairly regular steepening and flattening dynamics, with steeper curves signaling market expectations that growth and policy rates would be higher in the future and flattening or inverting curves signaling expectations of lower growth and policy rates. As a case in point, the vast majority of U.S. recessions have been preceded by a sharp flattening if not outright inversion of the yield curve as the cycle matured (EXHIBIT 11).

### An inversion of the yield curve has preceded a large share of U.S. recessions

EXHIBIT 11: YIELD CURVE STEEPNESS OVER THE BUSINESS CYCLE

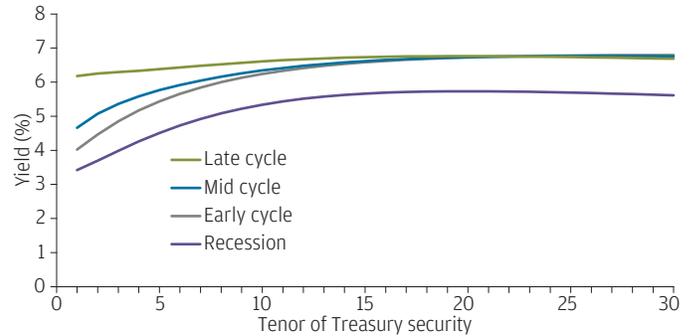


Source: Bloomberg, U.S. Bureau of Economic Analysis, J.P. Morgan Asset Management Multi-Asset Strategy. Recessions are based on NBER classification.

Hence the yield curve serves as an important warning sign of the most worrisome outcomes for risk assets. According to our own classification of business cycle phases, the Treasury curve tends to be fairly steep between recession and mid-cycle, when equity returns generally outpace those of bonds (EXHIBIT 12).

### Typical business cycle dynamics entail a flattening of the curve from trough to peak

EXHIBIT 12: AVERAGE TREASURY YIELDS IN VARIOUS STAGES OF THE BUSINESS CYCLE



Source: Bloomberg, U.S. Bureau of Economic Analysis, J.P. Morgan Asset Management Global Multi-Asset Strategy. Average par yields, based on data from November 1, 1985, through December 31, 2008.

Note: Recessions are based on NBER classification; early, mid, and late stages of the expansion are determined by the output gap being below, within or above  $\pm 0.3$  standard deviations.

In late cycle, however, when the yield curve is basically flat, bond returns generally outperform equities. As such, if the ZLB and QE mitigate yield curve dynamics over the course of the cycle, the clarity of the signal diminishes markedly.<sup>12</sup>

One implication of this change is to invalidate a commonly used recession probability indicator, which is the spread between the 10-year Treasury note and the three-month Treasury bill.<sup>13</sup> Standard econometric models based on the yield curve currently imply a recession risk of zero in early 2016, based on the relative steepness of the yield curve. We view this estimate to be implausibly low, given that the economy is in the seventh year of the current expansion and that most economic indicators are somewhere in the mid-cycle phase. While we don't believe that a recession is imminent, the probability is above zero—we currently peg the odds of recession at just above the long-run average of 14%. More generally, we are casting a critical eye on what the yield curve tells us about future growth.

<sup>12</sup> Japan's longer experience with ultra-low interest rates suggests that yield curves might not invert with short rates under 1%, where the unsecured overnight call rate has been since 1995. (The rate has also, for the most part, been against the zero lower bound since 1999.) Yet although the Japanese yield curve flattened ahead of each of the recessions during this period (i.e., those beginning in 1997, 2000, 2008 and 2012), it never inverted as it did from 1989 to 1991.

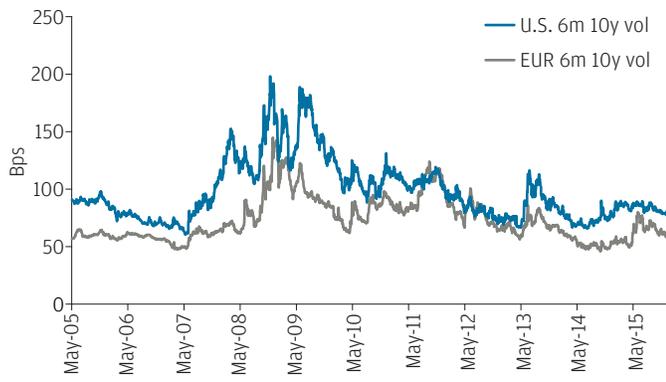
<sup>13</sup> For example, see: Arturo Estrella and Frederic Mishkin, "The yield curve as a predictor of U.S. recession," *Current Issues in Economics and Finance* (1996): 2:7.

## Lower fixed income volatility

One other noteworthy characteristic of monetary policy in the future is that fixed income volatility during recessions and the early stages of expansions is likely to diminish. Again, mechanical factors are at play. With short rates pinned at the zero lower bound and QE signaling that rates will remain there for the foreseeable future, greater certainty regarding the expected path of future rates engenders lower volatility of longer term yields and the prices of securities that depend on those yields. This outcome is fairly self-evident in the U.S. and euro area, where bond volatility declined dramatically in tandem with active balance sheet policy by central banks (**EXHIBIT 13**).

### Fixed income volatility declines in QE regimes

EXHIBIT 13: FIXED INCOME VOLATILITY



Source: Bloomberg, J.P. Morgan Asset Management Multi-Asset Strategy; data as of January 8, 2016.

## CONCLUDING THOUGHTS

We've argued that policymakers have reached the point of no return regarding QE in the wake of the financial crisis. Our reasoning is essentially that the bound imposed by interest rates hitting zero will not be overcome anytime soon. Even as central banks tinker with modestly negative policy rates as a means of providing additional easing, we are skeptical that they can achieve deep enough rate cuts to avoid deploying balance sheet policy altogether.

A permanent role for QE in DM monetary policy has important implications for how policy works and how it radiates through financial markets. As we've documented, the effects of QE are concentrated at the longer end of the yield curve and, as such,

the channels through which they stimulate the economy are somewhat different from conventional policy. More generally, QE is but one of several ways that policy tools have evolved to become more targeted.<sup>14</sup>

This newfound specificity of policy instruments is not without its drawbacks. For one, a multiplicity of policy tools places an additional burden on central banks to be transparent and predictable in the coordination of their interest rate and balance sheet policies. The FOMC has already moved in this direction by publishing a set of "exit principles" detailing the sequence of steps it will undertake as it normalizes policy. However, this set of principles will eventually need to be expanded and refined, ideally in a manner that does not infuse too much uncertainty into the way that policy responds to changes in the economy.

In addition to the learning process in the implementation of QE, there are potentially other deep-seated implications of broadening monetary policy, which is now at the extreme boundaries of its remit. For one, central banks are grappling with whether to use "macro-prudential" regulation or monetary policy to safeguard their economies from systemic financial stresses. In 2010, the Dodd-Frank Act granted greater responsibility to the Fed in terms of financial stability, with instructions that the U.S. central bank "prevent or mitigate risks to the financial stability of the United States that could arise from the material financial distress or failure, or ongoing activities, of large interconnected financial institutions." The Bank of England has also explicitly expanded its mandate in this regard. Because governments have included macro-prudential policy and financial stability within the objectives of central banks, there is an inherently greater chance that conflicts among objectives will arise. FOMC participants have, on balance, maintained that macro-prudential monetary policy is not the best tool to address financial stability concerns, since its effect on financial vulnerabilities is not well understood and it risks causing bigger misses on the committee's inflation and employment mandates.

<sup>14</sup> Another example is the discount window lending practices of central banks, which have taken on added importance as a response to financial stress. For instance, the Funding for Lending Scheme in the UK is a credit easing measure designed to reduce borrowing rates for households and small business enterprises by providing low cost funding to banks. The program specifies that both the cost and quantity of subsidized funding directly depend on bank lending to certain sectors of the economy. In contrast to QE, which acted to reduce borrowing rates for safe assets (and by extension the absolute level of bank funding costs), credit easing more directly targeted the spread between bank financing rates and core government bond yields.

The response to the crisis has also blurred the traditional lines between fiscal and monetary policy. By affecting the cost of credit for specific sectors of the economy, monetary policy is acting to redistribute economic activity, an allocative role normally played by the fiscal authority. The upshot of increasing overlap between fiscal and monetary policy is that central bank independence may come under increasing strain, an extremely undesirable outcome from the perspective of most central bankers. The most dire implication of losing independence would be that the monetary authority's credibility to fight inflation, so hard won in the early 1980s, would begin to erode. The desire to maintain arm's length between monetary and fiscal authorities means that central banks will still probably prefer to use policy rates rather than QE in upcoming business cycles, given the choice. More generally, that preference will likely galvanize central bankers to resist policies that have the appearance of direct coordination with fiscal authorities.

But the process of experimentation with “unconventional” policy will continue so long as central banks face the limit of a lower bound on policy rates. One idea that has gained traction is the direct monetization of government debt or fiscal stimulus by central banks (i.e., permanent QE, or helicopter money). Such policies will ultimately need to balance the exigency of stimulating the economy with the inherent risks to central bank independence, but it is fair to say that they are currently less unconventional than they used to be. In our view, the same attributes that make QE compelling as a permanent policy instrument could also spell out its limits in the medium term.

## APPENDIX: LITERATURE REVIEW ON THE EFFECTIVENESS OF QE

### In the U.S., QE lowered bond yields

| Research paper   | Estimated decline in 10-yr yield (bps) |
|--|--|
| <b>QE1 (DEC 2008–MAR 2010)</b>                             |  |
| <i>USD1.25trn MBS, USD300bn Treasuries, USD72bn agency</i> |  |
| Gagnon (2011)  | 36-80                                  |
| Krishnamurthy (2011)                                       | 100                                    |
| D'Amico (2013)   | 20-30                                  |
| D'Amico (2012)   | 35                                     |
| <b>QE2 (NOV 2010–JUNE 2011)</b>                            |  |
| <i>USD600bn Treasuries</i>                                 |  |
| Krishnamurthy (2011)                                       | 25                                     |
| D'Amico (2012)   | 55                                     |
| Meaning (2011)   | 20                                     |
| Swanson (2011)   | 15                                     |
| <b>MATURITY EXTENSION (OCT 2011–DEC 2012)</b>              |  |
| Hamilton (2012)  | 22                                     |
| Meaning (2012)   | 17                                     |
| <b>QE3 (SEP 2012–OCT 2014)</b>                             |  |
| <i>USD823bn MBS, USD790bn Treasuries</i>                   |  |
| Engen (2015)   | 60                                     |

Source: Arvind Krishnamurthy and Annette Vissing-Jorgensen, Brookings Institution Paper 2011, J.P. Morgan Asset Management Multi-Asset Strategy.

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## INVESTMENT INSIGHTS

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