THE CHALLENGES FOR MONETARY POLICY NORMALISATION IN THE UNITED STATES IN THE CURRENT ECONOMIC SITUATION

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In December 2015 the Federal Reserve System, the central banking system of the United States, raised its official interest rate for the first time after having held it close to 0% for seven years and having embarked on a range of unconventional monetary policy measures to mitigate the impact of the financial crisis. At its latest meeting, in September 2016, the Federal Reserve decided to leave the official interest rate unchanged, although it said that the probability of a future hike had increased. This article reviews some of the features of the expected tightening cycle of monetary policy in the United States in a complex economic situation in which it is likely that it will take a long time for monetary policy to return to normal. This article reviews some of the factors that will influence this process, including monetary policy management and the estimated decrease in the equilibrium real interest rate, in a context in which the official interest rate is close to its effective minimum. From the global standpoint, the shortage of safe assets (which may lead to enduring low levels of the term structure of interest rates), the divergence of its monetary policy stance from that of other central banks, such as the ECB and the Bank of Japan, and developments in emerging economies, particularly China, will also influence monetary policy decisions in the United States.

Introduction

The Federal Reserve's expansionary monetary policy has played a fundamental role in the US authorities' response to the global financial crisis and the Great Recession that followed in its wake. As Chart 1 shows, the length of time it took the economic recovery to pick up speed sustainably led the Federal Reserve to adopt expansionary measures of unprecedented intensity. Thus, the Federal Reserve held the federal funds rate at close to zero (in the 0% to 0.25% range) for seven years between December 2008 and December 2015 (see Chart 2.1), first to stabilise the economy, and then to support the recovery. It also adopted a series of unconventional monetary measures that expanded the Federal Reserve's balance sheet to record levels.[1] This monetary strategy was backed up with a communication strategy known as forward guidance, indicating the future monetary policy stance in order to anchor economic agents' expectations more firmly.[2]

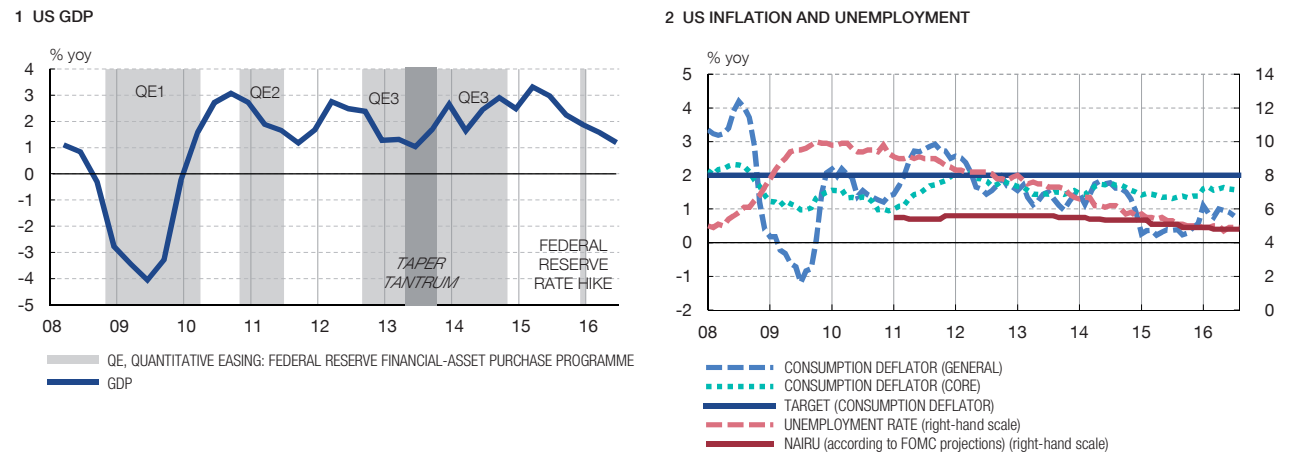
Despite a false start between 2010 and 2011, the recovery in the United States did not gain sufficient traction for the Federal Reserve to consider slowing the rate of monetary expansion until 2013 – and subsequently reversing its decision. In the spring of that year, the Federal Reserve surprised the markets by stating its intention to gradually end the quantitative expansion of its balance sheet when conditions allowed, and in December it announced a timetable for a gradual reduction in its monthly purchases of net assets, which it completed over the course of 2014. Significantly, in May-June 2013 merely mentioning the possibility of slowing the rate of quantitative easing in the future triggered a period of financial market turmoil referred to as the 'taper tantrum'. Although net asset purchases ended in late 2014, the first rise in official interest rates since the crisis, marking the start of monetary policy normalisation in the United States, did not come until December

1 The Federal Reserve's purchases of financial assets (federal public debt, agency mortgage-backed securities (MBS) and federal agency securities) led to a strong rise in deposit institutions' reserves on the liabilities side of its balance sheet. In October 2008 Congress authorised the Federal Reserve to pay interest on these reserves.

2 Before the crisis the Federal Reserve applied forward guidance occasionally and limited to short periods of time.

US GROWTH AND FEDERAL RESERVE TARGETS

CHART 1



SOURCES: Bureau of Labor Statistics, Federal Reserve, Bureau of Economics Analysis and Datastream Thomson-Reuters.

2015.[3] The focus is now on how this normalisation is likely to progress going forward. This article reviews some of the features of this process, which is still in its early stages and is taking place against a background of complexity and uncertainty.

The next section describes the principles of monetary policy normalisation announced by the Federal Open Market Committee (FOMC), the monetary policymaking body of the Federal Reserve System, and illustrates the slowness of the current process of monetary tightening compared with previous monetary tightening cycles. The third section relates this slower progress with the sluggish rate of economic recovery in the United States and the distance from the Federal Reserve's dual employment and inflation targets. The fourth section reviews a number of additional domestic and global factors that are influencing the Federal Reserve's decisions, such as starting from an official interest rate close to the zero lower bound (ZLB), a substantial drop in equilibrium real interest rate, or the context of divergences from the monetary policy stance of other central banks, such as the ECB and the Bank of Japan, in a much more interconnected world. The article ends with an assessment of the outlook and the challenges for the current phase of normalisation.

The slow process of tightening monetary policy

The unconventional expansionary measures adopted by the Federal Reserve in the wake of the financial crisis[4] led to strong growth of its balance sheet, as can be seen from Chart 2.2. These measures ended in October 2014 when purchases of net financial assets under the third quantitative easing programme (QE3) concluded. Since this time the Federal Reserve has only reinvested principal payments from its holdings of securities, keeping its size unchanged at $4.2 trillion[5] (23.4% of US GDP in 2015).

At its September 2014 meeting, the FOMC updated the principles of monetary policy normalisation[6] that it had first formulated in June 2011.[7] According to these principles, it should be possible to achieve normalisation through the following actions:

3 Monetary policy normalisation is understood to mean a return to monetary conditions consistent with price stability and trend growth of the economy.

4 See, for example, Berganza *et al.* (2014) for a detailed description of the unconventional measures.

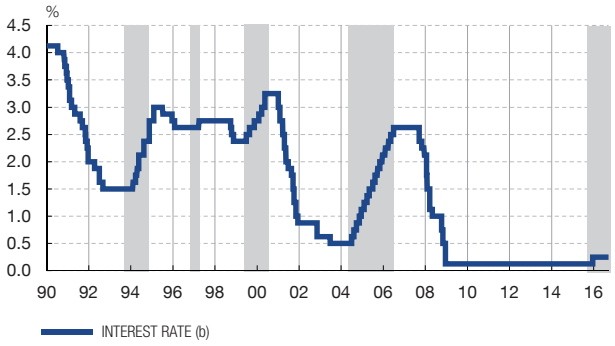
5 This amount breaks down into $2.43 trillion in public debt securities, $1.74 trillion in agency mortgage backed securities (MBS), and the remainder in debt issued by the agencies Fannie Mae, Freddie Mac and the Federal Home Loan Bank. In the case of MBS, reinvestments also take place in the event of early repayment of the underlying mortgage loans.

6 See http://www.federalreserve.gov/newsevents/press/monetary/20140917c.htm.

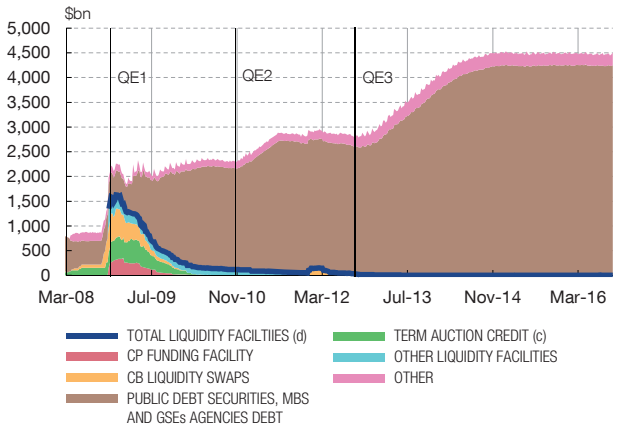
7 In June 2011 the FOMC stated that it would start normalisation by reducing its holdings of financial assets on its balance sheet (without excluding the possibility of sales) and, that once the balance sheet had shrunk significantly,

FEDERAL RESERVE MONETARY POLICY INSTRUMENTS CHART 2

1 TARGET FEDERAL FUNDS RATE (a)



2 FEDERAL RESERVE ASSETS



SOURCES: Federal Reserve, Datastream Thomson-Reuters and Bloomberg.

a The shaded areas mark periods of monetary tightening.
b Upper limit of the target range for the Federal Funds rate as of December 2008.
c Credit facility corresponding to TAF (Term Auction Facility) programme.
d "Total liquidity facilities" includes: Term Auction credit; primary credit; secondary credit; seasonal credit; Primary Dealer Credit Facility; Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility; Term Asset-Backed Securities Loan Facility; Commercial Paper Funding Facility; outstanding principal of loans to American International Group, Maiden Lane LLC, Maiden Lane II LLC and Maiden Lane III LLC; and central bank liquidity swaps.

— Increases in the target range for the federal funds rate[8]. In order to implement this target range, the Federal Reserve has an interest rate that it pays on excess reserves (IOER), which operates at the upper limit of the range, and a rate for overnight reverse repurchase agreements (ONRRP) at the bottom limit.

— Gradual and predictable reduction in holdings of financial assets by halting reinvestment of principal payments as they mature, and leaving MBS sales as a residual option for the final phase of the normalisation process, with agents being given advance notification of this strategy.

— The FOMC has subsequently indicated that it will raise official interest rates a number of times before starting to shrink the balance sheet.

— Over the long term, the Federal Reserve will only hold the securities it needs to implement monetary policy (mainly public debt securities), thus minimising the possible effect of its asset holdings on the allocation of credit to the various sectors of the economy.

Following its September 2014 meeting, at which these principles of monetary normalisation were set out, the FOMC published its quarterly projections predicting four monetary policy rate increases of 25 basis points (bp) over the course of 2015.[9] However, no increase took place until the December 2015 meeting, when the FOMC raised the target range for the federal funds rate by 25 bp to 0.25%-0.5%. This was the first increase since the financial

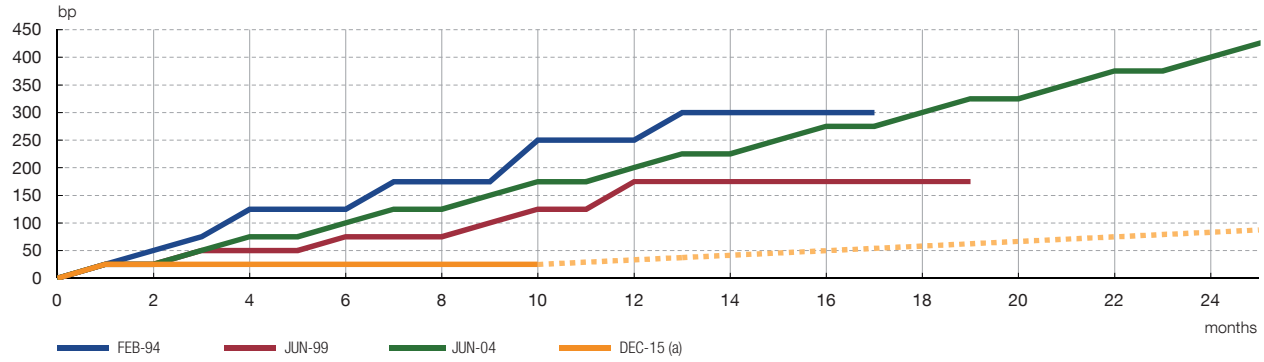
it would raise the federal funds interest rate. However, the more limited capacity to project the effects of changes in the size of the balance sheet and the financial market reactions observed during the 'taper tantrum' led the FOMC to change the principles of monetary normalisation.

8 The Federal Reserve's target interest rate, the federal funds rate, is a weighted average of the interest rates on all the transactions in the federal funds market, the market in which depository institutions lend funds maintained at the Federal Reserve to other depository institutions overnight.

9 According to the median of the individual projections presented by the members of the FOMC.

CHANGES IN THE TARGET FEDERAL FUNDS RATE IN PREVIOUS RATE HIKE CYCLES AND IN THE CURRENT CYCLE

CHART 3



SOURCES: Federal Reserve, Datastream Thomson-Reuters and Banco de España.

a FOMC projections (September 2016) shown as dotted line.

crisis (see Chart 2.1). Since this first movement there have been no further increases to date (September 2016), despite four 25 bp increments in 2016 being forecast in the quarterly December 2015 projections.

In general the members of the FOMC envisage the path of official interest rate increases over the coming years to be much gentler than in previous monetary tightening cycles, and the process is expected to last much longer. As can be seen in Chart 3, this path is markedly different from the rate of tightening observed in the most recent cycles of monetary policy normalisation, beginning in February 1994 (a total increase of 300 bp in the target federal funds rate over 13 months), June 1999 (175 bp over 12 months) and June 2004 (425 bp over 25 months).

The following two sections analyse the possible factors underlying the slow rate with which normalisation is expected to progress. First, cyclical issues are considered, relating to the dual target of monetary policy – price stability and maximum employment – and then other factors more specific to the current situation are examined.

The macroeconomic situation and monetary policy stance

In 1977, the US Congress amended the law governing the Federal Reserve System to establish a dual mandate for monetary policy, aiming to promote maximum employment and stable prices. Since 2012 the FOMC has published a document setting out its targets under the dual mandate in January of each year. The price stability target is defined as a year-on-year inflation rate of 2%, measured using the Personal Consumer Expenditures (PCE) deflator. The Federal Reserve's loss function with respect to this target is symmetrical (i.e. deviations on the upside and downside are equally important). In the case of maximising employment, the FOMC does not set a specific value for any particular labour market variable, but it does publish a long-term unemployment rate in its quarterly projections. Analysts equate this with the non-accelerating-inflation rate of unemployment (NAIRU).

Table 1 shows the values of the unemployment gap (observed unemployment – long-term unemployment), the inflation gap (inflation rate – 2%) and the underlying inflation gap (underlying inflation rate – 2%)[10] at the start of the last four cycles of monetary normalisation. In the case of

10 The FOMC defines the inflation target in terms of general PCE, but pays particular attention to core PCE when deciding monetary policy. Core PCE excludes food and energy prices, which tend to be more susceptible to supply shocks (for example, climate factors and/or OPEC decisions) which are unrelated to demand-driven inflationary pressures and over which the FOMC has no control.

MACROECONOMIC CONDITIONS AT THE TIME OF THE FIRST OFFICIAL INTEREST RATE RISE TABLE 1

	Feb-94	Jun-99	Jun-04	Dec-15
Target federal funds rate	3.0	4.8	1.0	0-0.25
Unemployment rate	6.6	4.2	5.6	5.0
Long-term unemployment rate (FOMC estimate)	6.5	5.3	5.0	4.9
"Unemployment gap" (pp)	0.1	-1.1	0.6	0.1
Labour conditions index (Federal Reserve Board)	-51.9	100.5	-22.3	93.8
Nominal wages (yoy %)	2.6	3.5	2.0	2.0
General inflation (PCE) (yoy %)	2.2	1.4	2.1	0.2
Core inflation (PCE) (yoy %)	2.5	1.3	1.9	1.3
Target inflation (PCE) (yoy %)	2.0	2.0	2.0	2.0
"Inflation gap" (pp)	0.2	-0.6	0.1	-1.8
"Inflation gap (core)" (pp)	0.5	-0.7	-0.1	-0.7
Inflation expectations (long term) (yoy %) (Univ. of Michigan)	3.3	2.8	2.9	2.6
Federal funds rate derived from Taylor (1999) with core inflation	4.55	5.05	2.65	2.75

SOURCES: Taylor (1999), Datastream Thomson-Reuters and Federal Reserve Board (most recent data available at time of FOMC meeting).

the employment target, at the start of the last monetary tightening cycle, in December 2015, the unemployment gap was almost closed. However, doubts have arisen within the FOMC as to whether the unemployment rate adequately captures the slack in the labour market in the current economic situation [see Berganza (2014)], as discussed in the next section.

As regards the price stability target, in December 2015 inflation measured using the core PCE price index was well below its 2% reference value, as had been the case since May 2012. Moreover, headline inflation was close to 0%, unlike the situation observed in previous monetary policy normalisation cycles. This was mainly as a result of the drop in oil prices since mid-2014. In this context, most of the members of the FOMC have interpreted US inflation as being kept low by transitory factors such as cheaper oil, in conjunction with the rising dollar and cuts in prices of healthcare services [Dolmas, (2016)], deriving in part from the health reform brought about by the Affordable Care Act.

The baseline scenario used by the FOMC's members assumes that, if inflation expectations are well anchored, inflation will progressively converge on its target as labour market slack decreases and the effects of the transitory factors wears off – as has been observed to be happening gradually over the last few months. Therefore, the anchoring role of inflation expectations is crucial to returning to the inflation target. As Table 1[11] shows, surveys have found expectations not to be very far from those at the start of previous cycles of monetary policy normalisation.

The Taylor rule (1999) makes it possible to encapsulate central bank decision-making in a highly stylised form. This rule describes a simple relationship between the variables defining the FOMC's dual mandate and federal funds rate. The most general formulation is:

$$it = \rho\, i_{t-1} + (1-\rho)\,[r^* + \pi_t + \alpha\,(\pi_t - \pi^*) - \beta\,(u_t - u^*)]$$

where it is the target federal funds rate in period t, r* the equilibrium real interest rate on federal funds or the natural interest rate, which is defined as the real interest rate consistent

11 These inflation expectations refer to the Consumer Price Index (CPI). Historically, inflation calculated based on the CPI has been approximately four tenths of a percent higher than that calculated using the PCE. Inflation expectations extrapolated from financial-market variables are not included as they are not available for previous cycles.

with full employment and the central bank's medium-term inflation target, avoiding its being influenced by the transitory shocks affecting the economy.[12] Historically the value assigned to this equilibrium real interest rate was 2%. π_t is the inflation rate in period t, π^* is the target inflation rate (the difference between these two rates is the inflation gap shown in Table 1), ut is the unemployment rate in period t and u* is the long-term structural rate of unemployment (the difference between these two unemployment rates is the unemployment gap shown in the table). The coefficient ρ defines the degree of inertia in the rule, the coefficient α is its responsiveness to deviations in inflation from its target, and the coefficient β is the responsiveness to deviations in the unemployment rate from its long-term level. The last two chairs of the FOMC have generally used a version of the rule in their speeches and presentations[13] that establishes the following values for the coefficients: $\rho = 0$; $\alpha = 0.5$ and $\beta = 2$; they also use core inflation, for the reasons given in footnote 10.

Using these parameters and values, and the existing core inflation and unemployment rates at the start of each cycle of monetary policy normalisation, it is possible to calculate the appropriate federal funds rates according to the Taylor rule. As shown in Table 1, which sets out the results of these calculations, at the start of all the normalisation cycles the federal funds rate actually set by the FOMC at the time was below that suggested by the Taylor rule. However, it is in the most recent cycle that the difference was biggest, and without taking into account the fact that the quantitative easing measures are equivalent to an even lower interest rate. What can explain the fact that, despite this major difference, the first rate rise in the cycle beginning in December 2015 took place much later than in previous expansions, and the planned rate of increases is slower than in all the other cycles considered? The following section reviews various specific factors helping explain the current low levels of official interest rates and the slowness of the rate at which they are expected to rise.

Some constraints specific to the current phase of monetary policy normalisation in the United States

The current monetary policy cycle is characterised by a series of specific features that help explain the low federal funds rate and its deviation from the level suggested by the classic Taylor rule. Five factors need to be borne in mind: i) uncertainty over the degree of economic slack, particularly in the labour market; ii) the drop in the natural interest rate (r*); iii) changes in the supply and demand for safe assets, depressing their yields; iv) the proximity of official rates to the ZLB, which creates specific risks should it be necessary to reverse any rate increases; and v) the external environment, particularly the divergence from monetary policy in other developed economies, and the indirect effects on the US economy of the impact of its monetary policy decisions on the global environment (spillbacks). The context is therefore complex and uncertain, making managing monetary normalisation particularly challenging.

UNCERTAINTY OVER THE SLACK IN THE LABOUR MARKET

The uncertainty as to whether the unemployment rate measures the use of labour market resources accurately has already been mentioned. This uncertainty is due to several causes. Firstly, the reduction in the unemployment rate is partly explained by the decline in the labour market participation rate. As this is partly driven by cyclical factors, it could reverse as the expansionary phase gains traction, thus expanding the labour supply. Another factor operating in the same direction is the unusually large number of people working part time who would prefer to work full time. For these reasons, the Federal Reserve usually refers to a labour market conditions index that encapsulates a broad

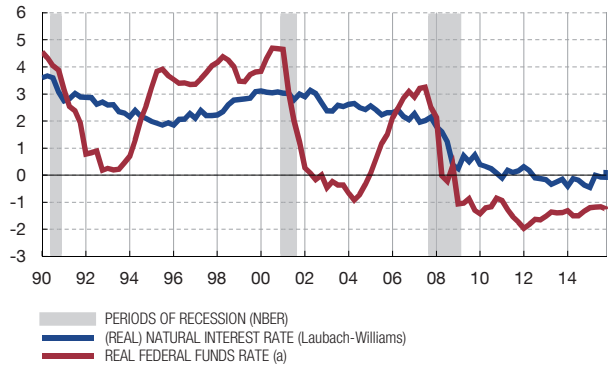
12 Economic theory shows this interest rate to vary over time and that it is defined by changes in agents' preferences (discount rate), technology, and the rate of population growth.

13 J. Yellen, Jackson Hole symposium (August 2016) (http://www.federalreserve.gov/newsevents/speech/yellen20160826a.htm).

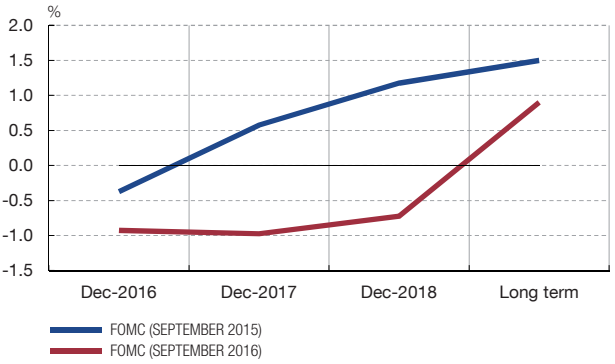
NATURAL INTEREST RATE

CHART 4

1 REAL FEDERAL FUNDS RATE AND (REAL) NATURAL INTEREST RATE (Laubach-Williams)



2 IMPLICIT REAL INTEREST RATE IN A TAYLOR RULE (b)



SOURCES: Laubach and Williams (2016), Federal Reserve, Bureau of Economics Analysis and Datastream Thomson-Reuters.

a Calculated as the difference between the federal fund interest rate (quarterly average) and the moving average of four months' annualised quarter-on-quarter core inflation (calculated from the personal consumption expenditure deflator).
b Derived from Taylor Rule using FOMC inflation and unemployment rate projections (September 2016).

range of labour-market variables to complement measures of idle capacity. According to this index, which is also included in Table 1, the labour market appears to have less slack than in previous cycles of monetary tightening, with the exception of the cycle begun in June 1999 (the higher the value, the less slack in the labour market). Some analysts suggest that slow nominal wage growth is the most robust indicator of the persistence of a degree of slack in the labour market. Nevertheless, if low inflation is taken into account, real wage growth is close to the (modest) gains in productivity. In any event, in the months following the first increase in the federal funds rate, the unemployment rate fluctuated around the long-term rate, the labour-market conditions index dropped and nominal wages accelerated, reaching rates over 2.5%.

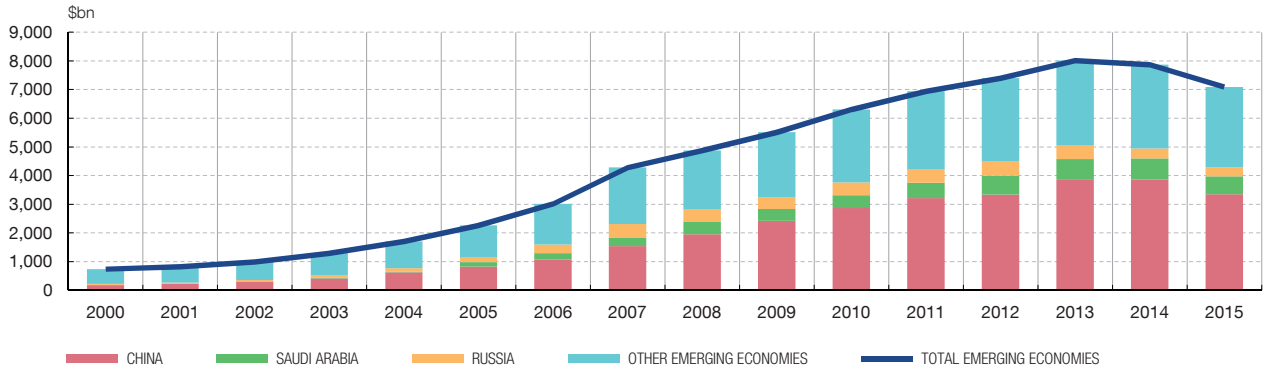
REDUCTION IN THE NATURAL INTEREST RATE

In order to calculate the Taylor rule a proxy is needed for the natural interest rate, as it is not possible to observe directly. As discussed in the previous section, this variable has traditionally been assigned a value of 2%. However, some authors, such as Laubach and Williams (2016), estimate that the natural interest rate[14] in the United States has been changing, fluctuating in the 2% - 3% range between the early nineties and the start of the Great Recession, when there was a sharp drop. As can be seen in Chart 4.1, since 2010 it has been close to zero (or even slightly negative).

Underlying this drop – which may prove to be permanent – is low productivity and population growth, population ageing, and low investment. In other words, lower growth potential, which also needs to be factored into the monetary policy rule calculation via the unemployment rate gap or output gap.[15] Summers (2014) highlights that advanced economies are suffering from an imbalance between a rising propensity to save and a declining propensity to invest, resulting in a savings glut which weighs on demand and lowers the natural interest rate (resulting in 'secular stagnation'). Other analyses [e.g. Hamilton *et al.* (2015)] agree on identifying the downward trend in the natural interest rate, but they also highlight the high level of uncertainty in the estimates of this variable's future course, making it difficult to gauge the monetary policy stance.

14 These authors use a multivariate model taking into account changes in inflation, GDP and interest rates.
15 See Carlstrom and Fuerst (2016).

INTERNATIONAL RESERVES CHART 5



SOURCES: International Monetary Fund (international financial statistics) and Datastream Thomson-Reuters.

The FOMC implicitly foresees a gradual recovery in the real interest rate and reaching the equilibrium rate in the medium term. Based on the Committee members' quarterly projections for inflation, the unemployment rate and the target for the federal funds rate, it is possible to estimate the equilibrium value proxy using the Taylor rule described above.[16] As Chart 4.2 shows, based on the September 2016 projections, this estimate of the real interest rate would remain in negative territory until 2018, rising progressively in the following years. Over the long term the real interest rate would be around 1%, a value that has gradually declined in recent years (by more than 125 bp since 2012). Throughout this period the monetary policy stance would continue to be expansionary as the real interest rate would remain below the equilibrium rate.

CHANGES IN THE SUPPLY AND DEMAND FOR SAFE ASSETS

One key feature of how the global economy has developed in recent years is the growing shortage of safe assets.[17] In other words, the supply of safe assets has not been able to keep up with global demand for them, which has driven down their yields. Indeed, some authors suggest that this shortage of assets could cause a liquidity trap when the lower bound for interest rates is reached, such that the market for safe assets will only be rebalanced with a drop in income [see Caballero, Fahri and Gourinchas (2016)].

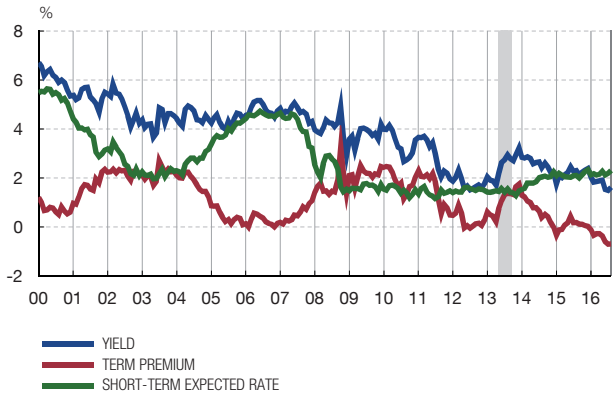
Over the period 2000-2007 emerging countries' international reserves experienced strong growth as a form of self-insurance in the wake of a series of balance of payments crises from 1998 to 2000 (see Chart 5). Moreover, China and a number of commodities exporters posted substantial current account surpluses, which were reflected in very strong growth in their international reserves, much of which was invested in the assets mentioned above. On the supply side, the developed countries' improved fiscal position over the period led to public debt's growing more slowly than global GDP, although new instruments were created, such as MBSs, which expanded the supply of assets considered safe. Globalisation and financial development therefore encouraged imbalances between both emerging and advanced countries' savings and investment, leading, on the aggregate level, to the phenomenon known as the savings glut [Bernanke (2005)].

16 The FOMC has explicitly stated that it wants to situate the real interest rate below the equilibrium rate so that monetary policy is accommodative. Therefore, the value of r* obtained from the Taylor rule using the FOMC forecasts (which is shown in the chart) would not be the equilibrium rate, but would represent its lower bound.

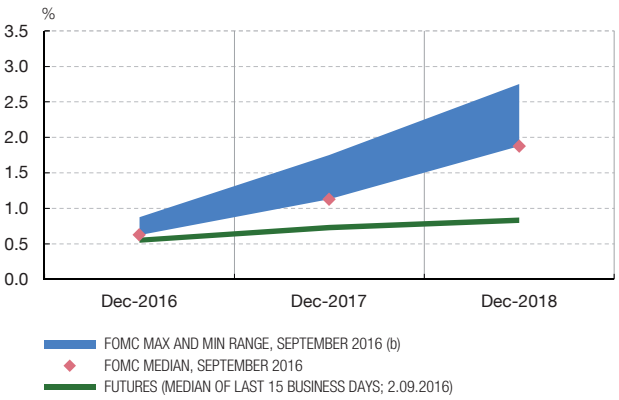
17 Although the precise definition of "safe financial asset" can vary, the category generally includes highly liquid assets with a low probability of default and low currency risk, such as many developed countries' government bonds. As well as facilitating financial transactions (by serving as collateral), safe assets are essential for highly risk-averse public and private investors such as pension funds and insurance companies. The scale of the supply and the development and depth of its markets makes US government debt the quintessential safe asset.

LONG-TERM INTEREST RATES AND FEDERAL FUNDS RATE PROJECTIONS CHART 6

1 COMPONENTS OF TEN-YEAR US TREASURY BOND YIELD (a)



2 FEDERAL FUNDS RATES PROJECTIONS (FOMC) AND EXPECTATIONS (FUTURES)



SOURCE: Federal Reserve Bank of New York.

a The shaded area marks the 'taper tantrum'.
b Excludes the three highest and three lowest projections.

Following the 2008 global financial crisis assets such as MBSs in the United States (except those insured by GSEs) and sovereign debt issued by certain euro-area countries, ceased to be considered 'safe assets'. On the demand side, emerging countries' international reserves began to shrink in 2014, but this reduction was more than offset by the accumulation of safe assets by many developed countries as a precautionary measure, given the heightened uncertainty, and by the banking sector, for regulatory reasons. All these factors have continued shifting the supply and demand curve for safe assets and depressing their yields.

Therefore, as in the previous cycle of monetary policy normalisation, excess savings in the emerging countries made it possible to keep long-term interest rates stable (Greenspan's conundrum),[18] the current persistent shortage of safe assets is keeping term premium[19] levels and the yield curve low or even negative (see Chart 6.1).

OFFICIAL INTEREST RATES CLOSE TO ZERO

The zero lower bound (ZLB) on nominal interest rates constrains central banks' capacity to respond to negative shocks in the real economy or to deflationary processes.[20] Prior to the crisis, ZLB episodes were not considered to be of practical relevance. The structural models of the US economy and the shocks observed in the past suggest that simple monetary policy rules with a 2% inflation target ensured that federal fund rates only hit zero on a small number of occasions and that these episodes were short-lived. However, keeping rates near zero for an extended period, partly as a result of the lower natural interest rate mentioned earlier, has called past findings into question and makes it

18 In his February 2005 testimony before the Committee on Banking, Housing, and Urban Affairs of the U.S. Senate, Federal Reserve Chairman A. Greenspan observed that long-term rates had trended lower despite the 150-bp rise in the FOMC's target for the federal funds rate. Rejecting a variety of possible explanations for the behaviour as implausible he called it a "conundrum".

19 The term premium is defined as the compensation agents demand to invest in a fixed income security over a long period rather than investing in shorter-term instruments (and reinvesting over the remaining maturity of the longer-term instrument). Chart 6 gives the breakdown by Adrian, Crump and Moench (2014). The premium can take negative values, which would represent the case of an investor with a strong preference for guaranteeing a yield over a long period of time and avoiding the risk of reinvesting at a lower yield.

20 In reality the concept of effective lower bound (ELB) has come to be used instead of ZLB, as in recent years several central banks, including the ECB, have situated their official interest rate in negative territory, demonstrating that the cost of holding cash is greater than previously thought. Moreover, in its 2016 stress test exercise the Federal Reserve included a scenario in which three-month interest rates were held at -50bp for an extended period of time.

conceivable that ZLB episodes could become more frequent and longer-lasting [Chung *et al.* (2011)].

A context of heightened uncertainty, with a negative output gap, inflation persistently below its target, and official interest rates close to the ZLB, such as that currently characterising the United States, makes a monetary policy advisable that is more accommodative than in other circumstances, given the asymmetry of its effectiveness. This is particularly true against the backdrop of inflation expectations that are near all-time lows.[21] Under these circumstances there is more room to respond to inflationary pressures (by tightening monetary policy) than deflationary pressures, as at the ZLB unconventional measures may not be perfect substitutes for interest rate policies. Indeed, the costs and benefits of unconventional instruments are uncertain and their effect seems to diminish as the balance sheet grows or the longer rates remain close to the ZLB [see, for example, Engen *et al.* (2015)]. Therefore, a comparative delay in raising interest rates would lead to higher economic activity and inflation than with a Taylor rule that did not take this uncertainty into account [Evans *et al.* (2015)].

CYCLICAL DIFFERENCES BETWEEN ECONOMIES, SPILLOVERS AND SPILLBACKS

One final point to note is the lack of synchronisation between the economic cycles in the main developed economies, which has resulted in a divergence between their monetary policy stances. Thus, while monetary policy has begun to be tightened in the United States, over the past two years it has remained more expansionary in the euro area and Japan. These differences correspond to rates of growth of over 2% in the United States, making it possible to return to pre-crisis levels of economic activity, whereas in Japan growth has been weaker, with wide fluctuations, and in the euro area the scenario remains one of moderate recovery, but with unemployment still high relative to levels that are considered neutral.

The United States is a core part of the international financial system and the dollar's reserve currency role means that US monetary policy influences financial variables worldwide. US monetary policy therefore has a clear spillover effect as it influences the global financial cycle [Rey (2013)], and this also applies in the case of unconventional measures. By the same token, the international situation also influences the US economy, making it an indirect route of transmission of the impact of the Fed's monetary policy decisions (rebound or spillback effects). Thus, according to the IMF, the expansionary measures in the euro area in 2014-2015 and the worsening of its growth outlook exerted downward pressure on long-term interest rates in the United States, through flows into the US public debt market [IMF (2015)].

US monetary policy decisions are also bound up with developments in the emerging economies. For example, the 2013 'taper tantrum' affected global financial markets, and in particular those of developing countries, delaying the start of the reduction in asset purchases by the Fed until 2014. More recently, one of the main reasons why the expected interest rate rise in the United States was delayed until December 2015 was the uncertainty over the global environment, and its impact on the dollar exchange rate, which arose mid-year due to the doubts over growth in emerging economies, and particularly China. There was also a further drop in the oil price, which caused significant market turbulence, all of which influenced FOMC decisions. Indeed, tightening of monetary policy in the United States could produce spillback effects via China if a rising dollar exchange rate pulls up the renminbi with it, resulting in a sharper slowdown in the Chinese economy. However, recent reforms made in China's exchange rate regime lessen this possibility.

21 See Alichi *et al.* (2015) and Curdia (2016).

Challenges, outlook and risks of the current process of monetary policy normalisation in the United States

The current process of monetary tightening in the United States is facing challenges that did not arise in previous cycles. The fact that the change in the monetary cycle is taking place as the economy emerges from a financial crisis on the scale of the global financial crisis is one of them. As mentioned, there are difficulties measuring the strength of the recovery in both the financial sector and real economy, particularly in the case of the labour market. Moreover, as the official interest rate is close to zero and inflation expectations near record lows, the asymmetric nature of the risks faced by monetary policy needs to be taken into account.

The FOMC has indicated that it will maintain an expansionary stance for some considerable time, during which the real interest rate will remain below the equilibrium rate. It also forecasts a path of rate hikes lasting significantly longer than in previous cycles. Although there was an improvement in the macroeconomic situation in 2016, in particular in the US labour market, in the external environment there are still doubts about China's growth and, since 23 June, there has been uncertainty surrounding the implications of the United Kingdom's exit from the EU.

Indeed, financial markets are discounting a markedly slower cycle of rate rises for federal funds rates than projected by members of the FOMC (Chart 6.2). So far, the markets have tended to be proven right in this divergence in opinion, which has been present throughout the current monetary policy normalisation cycle.[22] The risk of having to cope with a sudden and unexpected rise in long-term interest rates (mainly through a rise in the term premium) was one of the Federal Reserve's concerns in the wake of the financial crisis. Avoiding a 'taper tantrum' like that in 2013 demands an ongoing communication effort from the Federal Reserve on how the transition towards normalised monetary conditions will be implemented so as to reduce uncertainty, and above all, to avoid derailing the recovery.

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22 Some of the reasons given to explain this difference are: i) the chair of the Federal Reserve would forecast fewer rate increases than the median member of the FOMC, and the markets anticipate that the FOMC will end up converging on this position; ii) the FOMC attaches more importance to financial stability, which is exposed to more risks with low interest rates; iii) the FOMC members' projections consider the central scenario, while those of the markets take into account more negative scenarios with a probability higher than zero; and iv) the neutral rate of interest considered by the market would be lower than that considered by the FOMC.

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