European Parliament

A monetary policy framework for the European Central Bank to deal with uncertainty

Monetary Dialogue November 2018

EN

A monetary policy framework for the European Central Bank to deal with uncertainty

Monetary Dialogue November 2018

Abstract

We argue that monetary policy faces different challenges to those faced during the period of the great moderation. Greater uncertainties over the ability of monetary policy to control inflation, the instruments that should be used and their effects on financial stability imply that we need to rethink whether the current framework is appropriate. We recommend a few adaptions to the current framework that would provide greater flexibility to the European Central Bank without departing very far from current practices (to avoid risking the credibility that the ECB has acquired since its inception).

This document was provided by Policy Department A at the request of the Committee on Economic and Monetary Affairs.

This document was requested by the European Parliament's Committee on Economic and Monetary Affairs.

AUTHORS
Grégory CLAEYS, Maria DEMERTZIS, Jan MAZZA (Bruegel)

ABOUT THE EDITOR

Policy departments provide in-house and external expertise to support EP committees and other parliamentary bodies in shaping legislation and exercising democratic scrutiny over EU internal policies.

CONTENTS

LIST OF ABBREVIATIONS

ECB   European Central Bank

OMT   Outright Monetary Transactions

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

- Central banks face new challenges. First, the potential long-term decline in neutral rates of interest in advanced economies could reduce the space for central banks to make policy rates cuts.

- Second, the potential flattening of the Phillips curve (i.e. the weakening of the relationship between inflation and unemployment) in recent decades could reduce the ability of central banks to reach their inflation targets.

- Third, the discussion on whether central banks should also target financial stability has re-emerged as a result of the crisis.

- Fourth, the euro-area architectural framework remains incomplete. The problematic interaction between nineteen different fiscal policies and a common monetary policy, the lack of a stabilisation tool and differences in national macro-prudential frameworks would all suggest significant reforms are needed in these realms to strengthen the overall resilience of the system. However, the probability of seeing material changes before the next recession is relatively low, thus presumably leaving the European Central Bank's pivotal role unchanged.

- More generally, fundamental uncertainty surrounding concepts at the core of the economy and therefore demand management, has emerged. Monetary policy has to navigate without full knowledge of what the post-crisis 'new normal' is going to be.

- In light of these considerations, we recommend that the ECB should update its definition of price stability to target core inflation around two percent per year (allowing a tolerance band on either side of the two percent target), on average, over a longer time horizon.

- Compared to other proposals (such as increasing the targeted inflation level or price-level targeting), our recommendation has the advantage of not departing drastically from the current inflation target and is therefore easier to communicate.

- In our view, monetary policy should not target financial stability. Other more targeted (and country-specific) tools should be deployed to avoid the build-up of financial stability risks. Closer coordination with national macroprudential authorities and greater harmonisation in the use of macroprudential policies are however strongly recommended, as it is now acknowledged that financial and monetary policies are closely interlinked.

1. INTRODUCTION

Monetary policy responses to the financial crisis and its aftermath have been significant and have involved a number of new instruments. As "*the only game in town*" (El-Erian, 2017) these policies have been equally criticised by those that think that monetary policy should have done much more (Sandbu, 2018) and those, in particular in some euro-area countries, who believe that the European Central Bank has done too much for too long (German Council of Economic Experts, 2017). These diverging opinions are the result of the uncharted waters monetary policy has had to navigate and the ensuing uncertainty.

While it remains unclear what the post-crisis 'new normal' will be, three new features will characterise monetary policy in the euro area in the short-to-medium term: large central-bank balance sheets, persistently low and close to zero interest rates, and a potential weakening of the transmission mechanism through which the central bank can affect aggregate demand. These factors could reduce the ability of the central bank to contribute to the macroeconomic policy mix, and therefore also affect demand management.

These features contribute to an overall uncertain environment. It might very well be that the large imbalances that developed in the early 2000s no longer pose an immediate threat, and that the financial system is better and more tightly regulated. However, uncertainties about the real drivers of productivity, ranging from the possible reversal of globalisation to the role of disruptive digital technologies, all contribute to our inability to estimate precisely the neutral rate of interest. At the same time, euro-area governance is by construction fragmented, with 19 fiscal policies and 19 macroprudential policies to match one single monetary policy. This causes delays in responding to shocks, as we saw during the financial crisis, and holds back optimal coordination at the macroeconomic and financial levels. Last, uncertainty about the architecture of Economic and Monetary Union (from finalising banking union to advancing on the centralisation of fiscal tools) contributes to the current environment of uncertainty.

We describe how the macroeconomic environment in which central banks operate is changing and posing new challenges. We argue that, as a result, central banks will have to put in place a systematic approach to managing uncertainty. This implies designing monetary policies that are flexible enough to produce good enough outcomes in a variety of unpredictable circumstances.

To this end, we recommend that the ECB adapts its monetary policy framework in order to manage uncertainty by providing clarity where it is possible and maintain flexibility when and where it is needed, as follows:

1. Change the definition of price stability from "*below, but close to 2% over the medium term*" (generally defined as 18 months to three years) to "*around 2%, on average, over the long term*" (i.e. a much longer time horizon than 18 months to 3 years):

   a. In the current definition of price stability, the word *"close"* suggests that the ECB might actually be targeting implicitly a smaller number, say 1.8 percent. This remains however a matter of interpretation. The lack of clarity and the word *"below"* might suggest that there is a downward bias in the definition. The change of definition from below 2 percent to around 2 percent would be a way of correcting for that without having to go very far from what is currently communicated. However, it would also be important to define tolerance bands around the 2 percent target in order to provide for a clear accountability framework necessary for acquiring and maintaining credibility.

b. The time period over which price stability is measured should be lengthened to increase flexibility. Price stability could be defined as inflation of around 2 percent *"on average"* over, say the business cycle. This will help prevent over-hasty reversals of policies and could have helped to avoid the erroneous interest rate increases of 2011 and, more generally, the current persistence of low inflation. The precise length of the horizon is something that needs to be defined through experimentation with alternative models.

c. The role of core inflation should be emphasised as the only definition of price stability that monetary policy can affect. The inflation index current targeted (the Harmonised Index of Consumer Prices, HICP) is affected by supply shocks, such as oil-price shocks, that monetary policy cannot affect directly. In a framework in which inflation is targeted *"on average"*, targeting headline inflation could be detrimental. While consumers are affected by all prices, it is not clear why the central bank should be judged on outcomes that it cannot control. We recommend that the ECB should be held accountable only for its ability to manage core inflation.

2. Monetary policy and financial stability are intrinsically linked. However, we do not believe that a financial stability objective should be included in the welfare function of monetary policy, because that would jeopardise the ability to pursue price stability. Instead we recommend closer coordination with macroprudential policies in order to achieve good outcomes both in terms of price stability and financial stability

3. We believe that these recommendations will already increase policy space and give greater flexibility in order to help prevent bad outcomes (like deflation) persisting for prolonged periods. However, other instruments should also be considered, for example helicopter money or targeted longer-term refinancing operations (TLTRO) with negative rates (below the deposit rate).

2. CHALLENGES FOR MONETARY POLICY IN THE EURO AREA

2.1. A potential decline of neutral interest rates

Nominal yields have been on a downward path since the beginning of the 1980s (Claeys, 2016). A big part of the story behind this decline has been the fall in inflation and inflation expectations. However, while inflation might have been the most important factor behind this trend from 1980 to the end of the 1990s, most of the decline since 2000 has been the result of the fall in long-term real safe rates at the global level.

In order to understand why real rates have steadily declined over the last 15 years, we turn to the concept of the 'neutral rate of interest'. This rate is defined as the equilibrium rate between demand and supply of funds compatible with full employment of capital and labour resources, and with price stability (i.e. inflation around the central bank's target). When the central bank's main monetary policy instrument is the short-term interest rate, the neutral rate is thus an important guide to monetary policy. It is therefore critical to know where this neutral rate is, but unfortunately, this rate is not directly observable. In addition, historical averages of past real rates do not necessarily shed light on the current or future levels of neutral rates, and therefore on the adequate level of interest rates: what was considered normal in terms of interest rates in the past might not be normal in the future. It is therefore necessary to estimate the neutral rate.

In theory, this neutral rate depends mainly on the following factors: the savings behaviour of households and the potential growth rate of an economy (mainly determined by productivity growth and population growth). In a simple model, such as the Solow model (1956), the savings behaviour of households is fully exogenous, so the equilibrium rate depends only on technological change and population growth. In micro-founded models, such as the Ramsey model or New Keynesian models, household preferences (their patience represented by the discount rate, and their inter-temporal elasticity of substitution for consumption) also determine the equilibrium rate in the long run. However, in more sophisticated models, such as Eggertsson and Mehrotra (2014), in which households can transition from borrowing to saving over their lifecycles, an increase in inequality or a tightening of borrowing limits can also impact negatively on the equilibrium rate.

In practice, various empirical approaches have been proposed to estimate the neutral rate, including statistical filters extracting unconditional trends of observed real interest rates, fully-fledged dynamic stochastic general equilibrium (DSGE) models, and even semi-structural approaches. For instance, Holston *et al* (2016), whose main results are shown in Figure 1, used a semi-structural approach to filter the data on output, inflation and short-term interest rates to extract highly persistent components of the natural rate of output, its trend growth rate and the natural rate. They found evidence of variation over time in the neutral rate of interest in all economies they examined (the UK, US, Canada and the euro area), with a clear downward trend since the 1960s, which accelerated after 2008. Their results also indicate substantial co-movement in the estimates of the neutral rate across economies, suggesting global factors play a significant role. These main findings appear to be robust to alternative methodologies. For the euro area, Figure 1 suggests a collapse in the equilibrium real rate after 2008 and even points to a negative value for the last few years.

Figure 1:   Estimates of the neutral interest rate for the US and the euro area, in percent
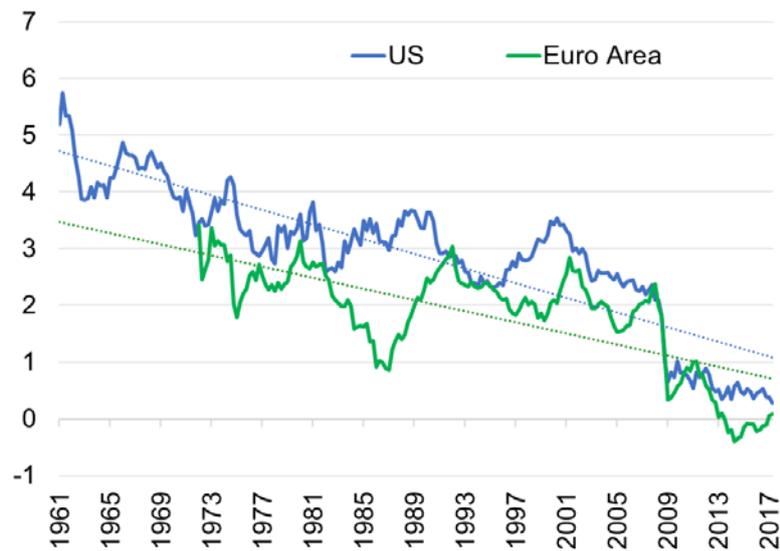
Source: Bruegel based on Holston *et al* (2016).

A strong fall in the neutral rate would reduce significantly central banks' margin for manoeuvre. If the neutral real rate is indeed around zero in the euro area, even if inflation is around the 2 percent target, the ECB's steady-state policy rate would have to be around 2 percent. This would give less leeway to cut rates when the next recession arrives. In order to illustrate the point, the average reduction in the policy rate during recessions since the 1950s was around 500 basis points in the US, and a bit less than 300 basis points in the UK and in Germany (see Table 1).

Table 1:   Average movements in policy rates during recessions in Germany, UK, US

Country	Time Period	Average Policy Rate (%, peak)	Average Policy Rate (%, trough)	Average Policy Rate Change (%)
Germany	1960-2018	5.0	2.4	-2.6
United Kingdom	1955-2018	8.7	5.8	-2.9
United States	1953-2018	8.5	3.8	-4.7

Source: Bruegel based on Deutsche Bundesbank, Bank of England, Fred, NBER, Bloomberg, OECD Composite Leading Indicators.

All else being equal, a lower neutral rate thus mechanically implies that episodes in which monetary policy is constrained by the zero lower bound are likely to be more frequent and longer lasting, and thus central banks including the ECB would need to rely more on their unconventional tools to meet their objectives.

2.2. A potential flattening of the Phillips Curve

The original Phillips curve implied a simple trade-off between unemployment and wage growth, and, as a consequence, between unemployment and inflation that could be exploited by policymakers to fine tune the business cycle. However, Friedman's famous criticism of the Phillips curve (Friedman, 1968) asserted that monetary policy could not sustain unemployment below its *"natural rate"* (determined by structural factors) without leading to accelerating inflation (that is why the natural rate of unemployment is now often referred to as the non-accelerating inflation rate of unemployment or NAIRU). This implied that in the long run the Phillips curve was vertical. In the short-run however, there was still sufficient scope for monetary policy to smooth out fluctuations around the independent path of potential output by affecting cyclical unemployment (the difference between observed unemployment and the NAIRU), and thus inflation.

In recent decades however, the slope of the original Phillips curve appears to have flattened worldwide, i.e. the relationship between unemployment and inflation appears to have weakened (Figure 2). The substantial variability in unemployment has had less effect on inflation, which has remained anchored at relatively low levels in the US and the euro area, despite large swings in the economic cycle.

Figure 2:   Phillips Curves (x-axis quarterly unemployment in percent, y-axis year-on-year quarterly inflation in percent).

Panel A: Germany (1962-2018)   Panel B: the US (1960-2108)
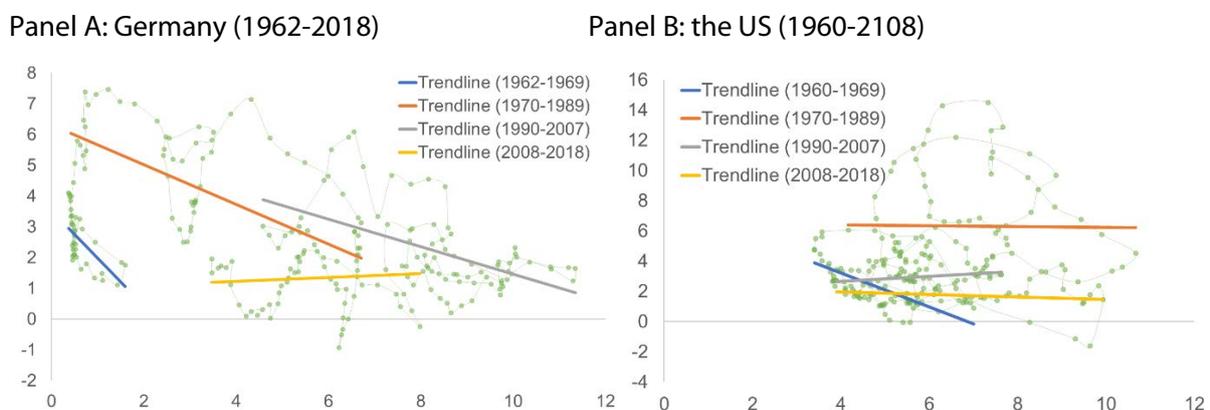
Source: Bruegel based on OECD.

This has been particularly the case since the global financial crisis: during the first years of the crisis unemployment increased steadily without leading to sustained deflation, but instead only 'lowflation' (IMF, 2014). Similarly, the subsequent economic recovery and fall in unemployment have not led to a strong surge in inflation either in the US or in Europe (even if the European recovery is much more recent than the US recovery). This flattening of the Phillips curve, although clearer after the crisis, has been also present since the 1980s, even if weaker (Blanchard, 2016). This issue closely relates to the so-called wage puzzle, i.e. the much lower growth in wages than what economic conditions would suggest. For instance, Krueger (2018) estimated that wages in the US should have grown by 1 to 1.5 percentage points faster than they recently have, given the cyclical conditions.

The burgeoning literature discussing this important issue (see for instance Constâncio, 2017, or Carney, 2017), has proposed three main explanations: 1) the NAIRU might be more sensitive than thought to the macroeconomic cycle; 2) an increased monopsony power of employers combined with a general

fall in the bargaining power of employees is keeping wage growth low ; and finally 3) low productivity growth might also explain why wages have failed to catch up with the economic recovery.

Whatever the explanation, factors beyond the control of central banks might be preventing a stronger recovery and tighter labour markets from translating into higher wages and inflation. This, in turn, might explain why in recent years lower interest rates for a prolonged period, and the massive use of unconventional monetary policy tools, have not resulted in a strong surge in inflation. This has two main implications. First, the transmission mechanism from monetary policy to inflation might be weakened and thus it might be more difficult for central banks to reach their targets. Second, this also means that to achieve the same objectives as in the past, monetary policy could be, or even must be, more expansionary than previously. In times of recession, monetary policy could conceivably have to remain accommodative for a longer period. This could raise risks, in particular for financial stability, that cannot be ignored.

2.3.   The interaction between price stability and financial stability

The global financial crisis reignited an earlier debate (Borio and White, 2004; Rajan, 2006) about whether monetary policy should target financial stability. As shown by Agur and Demertzis (2018), the variables targeted by central banks and macroprudential authorities are significantly affected by each other's actions. Monetary policy will affect financial stability, and the pursuit of financial stability will affect the ability of central bankers to fulfil their mandate.

Financial instability can have large negative feedback effects on price stability through a credit crunch, and also on the conduct of monetary policy itself, as the recent global financial and economic crisis demonstrated. When monetary policy is constrained by the zero-lower bound, decision-makers have to resort to unconventional tools with less-clear effects. Also, in the bust phase of the financial cycle, central banks will have to play the role of lender of last resort for solvent banks that face liquidity shortages. The EU Treaty makes price stability the primary mandate of the European System of Central Banks (ESCB, i.e. the ECB and national central banks)[1], but it also requires the ESCB to *"promote the smooth operation of payment systems"*[2] and to *"contribute to the smooth conduct of policies pursued by the competent authorities relating to the prudential supervision of credit institutions and the stability of the financial system"*[3].

Therefore, should monetary policy directly target financial stability? Those who favour leaning against the build-up of financial imbalances with monetary policy instruments (Stein, 2014; Adrian and Liang, 2018, among others) find their argument strengthened by a growing body of empirical research, which shows that the policy rate affects bank risk-taking (Gersl *et al*, 2015; Dell'Ariccia *et al*, 2017). But their opponents argue that this does not necessarily justify an altered mandate for the monetary authority: why cannot financial market supervisors alone take care of financial stability risks (Svensson, 2014)?

We will discuss this further in section 4.2.

2.4.   A highly uncertain environment

The long-term decline in real rates is a reality but the precise estimates of neutral rates at a historically low level should be taken with caution. As strongly emphasised by the German Council of Economic Experts (2015), a lot of uncertainty surrounds these neutral rate estimates, and the confidence intervals

---

[1]   Article 127.1 of the Treaty on the Functioning of the European Union (TFEU).

[2]   Article 127.2 of the TFEU.

[3]   Article 127.5 of the TFEU.

reported in the literature are generally very large. In addition, as Figure 1 shows, their values are also quite volatile.

It is not clear therefore whether the steep decline of the equilibrium rate in 2009 was the result of structural changes or just a temporary fall. Possible relevant structural changes were a quick reassessment of future productivity growth, expectations of hysteresis effects after a big crisis, the breakdown of the financial system and the impact of enhanced regulation and supervision of banks.

However, the decline in real rates could also be due to transitory factors**.** Although the decline of the neutral rate is an intriguing hypothesis, it is still too early to settle the debate. It is very difficult to distinguish the secular from the cyclical trend. The cyclical component could still be very strong in the aftermath of a one-in-a-century crisis. As suggested by Rogoff (2015), the current low-rate environment could more simply be the result of the *"debt super-cycle"*. Unlike the V-shaped recovery of 'standard' recessions, financial crises are often followed by U-shaped recoveries because of the length and the difficulty of the deleveraging process. This would also imply low safe real rates because of the deleveraging taking place after an asset price bust and the move away from risky assets, as shown by Gourinchas and Rey (2016).

In that case, the policy response should be straightforward and two-fold: support the deleveraging process by facilitating debt write-downs and maybe by increasing temporarily the inflation target, while implementing strong micro- and macroprudential policies to avoid a repeat. This could well be a good description of the current European situation in which the banking sector has not been totally cleaned up and private debt is still high. Moreover, given that the global savings glut – one of the main factors put forward to explain a potential fall in the neutral rate – is mostly the result of bad government policies, the low equilibrium rate could also prove temporary were these policies to be changed, as argued by Bernanke (2015). Transformation of the Chinese economic model and the fall in the oil price have already resulted in a reduction in emerging markets' excess savings.

Overall, given the limitations of the estimation methods – in real time in particular – and the fact that cyclical arguments also play a role in the current situation – even if they fail to explain why the decline in long-term real rates preceded the crisis – it is difficult to conclude anything definitive from these estimates of the neutral rate.

The same caution applies to the flattening of the Phillips curves. Before announcing the death of the Phillips curve, other measures of slack than the traditional unemployment rate, cyclical unemployment or even the output gap, need to be considered. The apparent flattening could also be the result of a mismeasurement of the slack in the economy. Structural unemployment could be higher, and the output gap wider, than thought. For instance, other measures such as the level of underemployment or the inactive working-age population give a different labour market picture. This is particularly true for some regions and sectors in the euro area, in which underemployment is still very high. Wolff (2017) provided an example of the need to understand the different forms of slack for the German economy. He argued that although wage developments in recent years appear to be muted by comparison to the quickly declining unemployment rate, the picture might have been blurred by the fact that immigration (from the EU as well as outside) played an important role in recent years in avoiding labour shortages in some sectors.

Overall, these estimates (of neutral rates and of Phillips curve slopes) are important indicators, among others, to inform central banks. However, there is a lot of uncertainty surrounding these measures. This is true for these particular estimates, but this is a more general issue: uncertainty is very high around many variables used by central banks in their assessment of the business cycle (e.g. potential GDP, NAIRU, etc). Technological advancements, the role of disruptive technologies, the emergence of China

as a new global player and the emergence of trade antagonisms even with traditional allies like the US, all play a role in the euro area's productivity capacity.

One could argue that structural uncertainty is always present. We argue here however that it is very difficult to see where current shifts are leading. This lack of knowledge implies that policies cannot be designed to fit only one set of outcomes but should instead prepare for the possibility of many and different outcomes. Central banks need therefore to design policies that will be effective for a variety of different outcomes. In other words, they need to have good policies in place and they also need to provide adequate insurance for a variety of different outcomes. We therefore believe that the framework needs to have built-in flexibility that will allow a structural approach in terms of preparing for what is unknown (Ben Haim *et al*, 2018).

2.5. A challenging European institutional framework

In addition to these macroeconomic and financial challenges faced by central banks all around the world, the ECB has to meet another important challenge: the euro-area economic governance framework is incomplete and inadequate to face shocks, and is – by construction – heavily fragmented between national authorities and centralised institutions.

The first problem for the ECB is that the euro area's current macroeconomic policy framework is not able to provide enough stabilisation in deep downturns and ends up relying on the ECB as a result (Claeys, 2017). Fiscal policy in particular does not play its countercyclical role fully, for several reasons.

First, fiscal policy in the monetary union is much more constrained than outside of it because the risk of default is higher given the prohibition of monetary financing. Institutional innovations during the crisis with the creation of the Outright Monetary Transactions (OMT) programme and of the European Stability Mechanism (ESM) have only partly relieved the constraints. Second, the EU's fiscal rules are still imperfect and do not permit enough counter-cyclicality (in good times to build room for manoeuvre for later and in bad times to support growth). Third, given the multi-country nature of EMU (with 19 different treasuries), fiscal coordination between countries is inadequate and thus the aggregate fiscal stance can deviate from what would be optimal from an aggregate euro-area perspective. As a result, macroeconomic policy in the euro area can be strongly suboptimal because the euro-area aggregate policy mix will tend to rely too much on monetary policy, which faces the constraint of the effective lower bound.

Many different proposals have been made for how to improve the euro area's macro framework, depending on the degree of integration preferred: the issuance of Eurobonds by a common treasury, a more minimalistic stabilisation tool at euro-area level, an overhaul of the fiscal rules, reform of the ESM/OMT framework, among others (see for instance Claeys, 2017). However, it is unlikely that the macro policy framework will evolve significantly in the very near future, and thus it is likely that the framework will still be inadequate when the next recession hits. Even if the framework has improved in recent years, there is a good chance that the ECB will have to step in once again from a stabilisation perspective.

The second issue is that, in addition to facing 19 different fiscal authorities, the ECB also has to face 19 macroprudential authorities to match a single monetary policy (even with ESRB coordination). This prevents timely responses to external shocks, as we saw at the start of the financial crisis, and optimal coordination at the macroeconomic and financial levels.

Finally, the lack of clarity in terms of the future EMU architecture (from finalising banking union to advancing on centralization of fiscal tools) also contributes to the current environment of uncertainty.

3. ADAPTING THE ECB'S FRAMEWORK TO FACE THESE CHALLENGES

3.1. The current framework

The primary mandate of the ECB, as laid out in Article 127.1 of the Treaty on the Functioning of the European Union (TFEU), is to ensure price stability in the euro area and, without prejudice to this objective, to support the general economic policies of the Union. To fulfil its primary mandate, the ECB Governing Council adopted in 1998 the following quantitative definition of price stability: "*price stability is defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%*". In 2003, the Governing Council clarified that in the pursuit of price stability it aims to "*maintain inflation rates below, but close to, 2% over the medium term*".

The ECB's main instruments until the crisis were its three short-term policy interest rates (the main refinancing operation rate, the deposit rate and the marginal lending rate), with which it sought to control short-term market rates (the Euro OverNight Index Average, EONIA) and ultimately to influence the rest of the yield curve.

But when short-term rates reach the zero lower bound, central banks need to rely on unconventional tools to affect directly the medium and long-term parts of the yield curve. Central banks have developed a diverse array of tools to do that: forward guidance (i.e. communication about the likely future course of monetary policy), negative policy rates and, most importantly, changes in the size, composition and maturity of their balance sheets, mainly through asset purchases and massive long-term refinancing operations.

Since 2008, the ECB has gradually applied all of these policies. First, it reduced its policy rates, and now, at -0.4 percent, its deposit rate is in slightly negative territory. The ECB also very quickly provided long-term lending to European banks with favourable conditions through long-term refinancing operations and targeted longer-term refinancing operations. Since 2013, the ECB has provided forward guidance on the future path of its policy interest rates. Finally, the ECB has put in place a diversified asset purchases programme that originally included asset-backed securities and covered bonds, but which was vastly expanded in 2015 with the inclusion of sovereign and European supranational bonds and, later, of corporate and local government bonds.

3.2. Is the current framework suitable to face new challenges and an increase in uncertainty?

The ECB framework has proved flexible (even if it sometimes adjusted more slowly than in other jurisdictions during the crisis) and, as discussed in section 3.1, its toolbox expanded greatly during the crisis. A lower neutral rate implies that episodes in which monetary policy is constrained by the effective lower bound are likely to be more frequent and longer. This implies that the ECB would need to rely more heavily on these unconventional tools.

However, our understanding of the effects of asset purchases, for example, is not complete. A growing body of empirical literature (see for instance Weale and Wieladek, 2016; Meinusch and Tillmann, 2016; ECB 2017) concludes that quantitative-easing (QE) programmes implemented around the world have boosted inflation, output and employment. However, given their relative novelty, it is more difficult to measure the impact of asset purchases, and the purchases themselves have been more difficult to calibrate than conventional interest rate cuts. More importantly, given the particular institutional arrangement of EMU (as discussed in section 2.4), the use of these policies has been politically controversial in some countries, which delayed their implementation in the euro area. As a result, the

ECB's quantitative easing programme started six years after the beginning of asset purchases by the Fed and the Bank of England. And if the fall in the neutral rate implies a need for more frequent and decisive use of such unconventional tools, such a reluctance to use them might lead to permanent suboptimal monetary outcomes in the euro area.

At the same time, the self-imposed constraints put in place by the ECB Governing Council when it created its sovereign asset purchase programme in 2015 could reduce drastically the scope of asset purchases in the future. The ECB Governing Council decided to put in place a 25 percent issue limit and a 33 percent issuer limit on Eurosystem holdings for its sovereign asset purchases. The 25 percent issue limit in particular was imposed to prevent the ECB from having "*a blocking minority in a debt restructuring involving collective action clauses*" (ECB, 2015). This indicated that the ECB did not wish to be in a position in which it had the power to block a potential vote on the restructuring of a euro-area country's ECB-held debt, because not blocking such a restructuring could be interpreted as monetary financing of a member state. On the contrary, if a majority of creditors with collective action clauses would accept a restructuring of some bonds, the ECB could do nothing against such a restructuring and would have to accept it. In that case, this would not be seen as monetary financing and would therefore not be in contradiction to the EU Treaty.

In September 2015, the issue share limit was increased from 25 percent to 33 percent for debt securities not containing collective action clauses, to increase the maximum amount that the Eurosystem can hold of a particular issue. This allowed the Public Sector Purchase Programme to continue for longer than was originally possible under the previous rules.

However, given the massive purchases between March 2015 and the end of 2018, if QE had to be activated again, this rule would limit drastically the possible purchases because the holdings of bonds of major countries are already approaching the 33 percent limit (Figure 3).

Figure 3:   Share of eligible sovereign bonds held by the Eurosystem

Share of eligible bonds held by the ESCB by end-2018
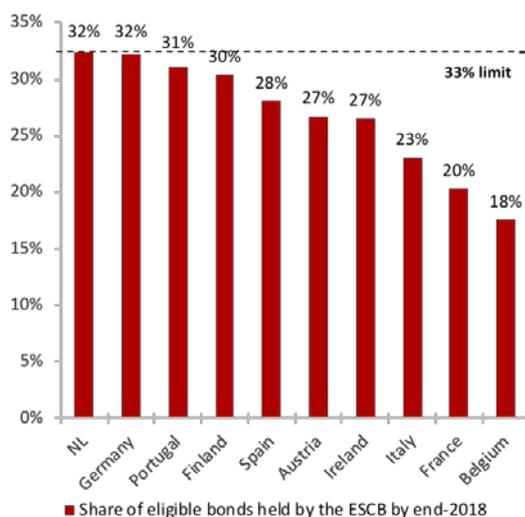
Source: Ducrozet (2016). Note: updated estimates as of November 2018[4].

---

[4]   Updated by Frederik Ducrozet, who we thank for sharing his updated estimates with us and allowing us to publish them.

Naturally, one solution would be for the ECB to relax this rule, a risk that it appears at the time of writing unwilling to take. One could consider however, whether the current limits achieve the right balance between running the risk of monetary financing against the risk of the ECB not meeting its price stability objective.

For instance, the risk of monetary financing of an AAA-rated government such as Germany or the Netherlands appears to be currently negligible and should not act as a constraint on the implementation of the asset purchase programme and the fulfilment of the ECB's mandate. In order to facilitate the implementation of its QE programme, should it need to use it again, the ECB should thus waive the 25 percent limit, at least for well-rated countries. However, the mere existence of this rule indicates clearly that the ECB remains uneasy about the idea of purchasing the sovereign bonds of member states, and that some members of the Governing Council do not yet consider QE a conventional tool that should be used as much as necessary.

Another way to reduce long-term yields without buying too many bonds could be to put in place a 'yield curve control' policy, similar to that currently implemented in Japan (BoJ, 2016). If this type of policy is deemed credible by markets, the reduction of long-term interest rates could be obtained with fewer asset purchases than with a simple QE programme. However, it would be very difficult to put in place this type of policy in the euro area given that using such a strategy, which would lead to announcing a target level of interest rate for a given country, would not be compatible with maintaining the pretence of market discipline over the public finances of member states.

As far as negative rates as concerned, next time it is needed to relax the ECB's monetary policy stance, the ECB could try to go deeper into negative territory than it has so far (at time of writing the deposit rate is fixed at -0.4 percent). However, recent data released by the ECB (2018) shows that cash hoarding by banks has increased significantly as a result of negative deposit rates – even if the sums at stake are still marginal compared to the overall amount of excess reserves. This suggests that the ECB might have already reached its effective lower bound and that it might be difficult to go below that in the future (especially if banks have already built up the capacity to store cash in order to avoid the negative deposit rate). Also, the potential side-effects on bank profitability and lending capacity could reduce such an instrument's effectiveness in terms of stimulating growth and inflation in a bank-based financial system (even if this argument might be overstated, as shown by Demertzis and Wolff, 2016, on the evidence so far). Potential solutions to these problems include taxing paper currency (as suggested in Agarwal and Kimball, 2015; or Kimball, 2015) or abolishing it altogether (Rogoff, 2016). But these solutions might be too extreme and, most importantly, highly unpopular in some member states.

Overall, we believe that the addition of asset purchases and negative rates to the ECB's toolbox was absolutely necessary and helped to fight deflationary pressures in the euro area. However, given the limits of these instruments they might not be sufficient in the next crisis. What else can be done?

All major central banks in advanced economies set an implicit or explicit numerical goal in terms of inflation, and employ the tools at their disposal accordingly. However, the difficulties experienced in reaching the inflation target have strengthened the case of those advocating a revision of the framework used by central banks, or, at least, their tools. We explore this in the next section.

4. WHAT IS THE POSSIBLE EVOLUTION OF THE ECB'S MONETARY FRAMEWORK?

4.1. Adjusting the definition of price stability to increase flexibility

The treaty that sets out the ECB's mandate mentions price stability as a primary objective, without setting an explicit numerical target, time horizon or particular variable to target. The precise definition of price stability is defined by the ECB Governing Council (and was even clarified in 2003).

This means that the definition could be changed again by the ECB if necessary. Possible alterations to the definition could thus include: 1) the level of inflation targeted; 2) the choice of the particular price index to target: headline inflation or core inflation (i.e. inflation excluding volatile energy and food prices); 3) the choice of explicit tolerance bands instead of a ceiling, 4) the choice of the time horizon: medium-term versus over the cycle, for instance; and ultimately 5) the choice whether to target a growth rate, a level or any other measure of prices as long as they are consistent with some form of price stability.

To increase flexibility and face new challenges, we thus recommend changing the definition of price stability in the following way: *"below but close to 2 percent over the medium term"* (generally defined as 18 months to 3 years) should become *"around 2 percent, on average, over the long run"* (i.e. a much longer time horizon than 18 months to 3 years). There would be a number of advantages of such a change compared to the current framework.

First, in the current definition of price stability, the term '*below but close*' suggests that the ECB targets implicitly a smaller number than 2 percent. Former ECB chief economist Otmar Issing (2003) explained that inflation expectations should be between *"1.7 percent and 1.9 percent"*, an indication that the ECB was targeting roughly 1.8 percent. It is not obvious why there needs to be room for interpretation at the level of defining the inflation objective. We think that this adds unnecessary noise in the pursuit of price stability and, importantly, negates the possible coordination benefits of having an explicit, clear and well-understood numerical target (Demertzis and Viegi, 2008). Given this lack of clarity, the word 'below' can be interpreted to mean that the ECB has a downward bias in its definition. Changing the definition to make it two-sided, around 2 percent, is a way of correcting for that without having to go very far from what is currently communicated.

It would also be important to define tolerance bands around the 2 percent target as a way of having a clear accountability framework. Tolerance bands should be numerically defined so it is known what is acceptable inflation and what is not. This would be an additional improvement to the current definition in which 'below' does not provide the same level of clarity. The tolerance bands need to be carefully chosen so that the target remains a good signal. Broad bands are easier to meet (necessary for credibility) but narrower bands are more precise. With the help of simulations, Demertzis and Viegi (2010) demonstrated how important it is for the target to be clear (no noise), for bands to be defined and for an appropriate width of the bands to be chosen. These are important ingredients in improving the clarity of the current definition of price stability.

Second, the period over which price stability is measured should be lengthened to increase flexibility. Price stability could be defined as inflation around 2 percent *"on average"* over, say, the business cycle[5]. This will help prevent too-rapid reversals of policies and could have helped to avoid the erroneous 2011

---

[5] The typical length of the business cycle in the euro area since the 1970s has been quite variable but has been on average around 9-10 years according to the CEPR business cycle dating committee (see https://cepr.org/content/euro-area-business-cycle-dating-committee).

interest rate increases and more generally the current persistence of low inflation. In addition, this would allow the ECB to let the economy overheat after periods of undershooting the target. As a result, if economic agents expect the ECB to behave this way, this would reduce real rates further in downturns and also avoid time inconsistency in the ECB's forward guidance communication (because the ECB promise could be judged as not credible if it says it will maintain rates at a low level for a long period while it needs to react quickly to maintain inflation strictly below 2 percent). Average inflation targeting would thus strengthen the role of inflation expectations as an automatic stabiliser to alleviate the problem caused by the zero lower bound (as formalised for instance by Nessen and Vestin, 2002).

In practice, this means that monetary policy, provided it is credible, will have long term expectations anchored at the inflation target, which then allows the medium-term expectations to deviate from this target by as much as needed to account for shocks. For example, in the case of a deflationary shock, medium term expectations will increase above the target, and thus real rates will decrease which will help eliminate the effects of the shock. By contrast, in the current regime, credible monetary policy implies medium-term expectations are anchored at the target and therefore the change in the real rate will not help as much.

It is important to highlight that this does not come without risks. An extended horizon implies less controllability from instrument to target. This has to be weighed against the flexibility needed to deal with uncertainty.

Third, this change in the definition of price stability should be combined with a move to target core inflation, because targeting headline inflation in such a framework could be detrimental. If the central bank targets inflation 'on average', temporary supply shocks to energy or food prices would have to be compensated for by lower inflation later (see figure 4 in 2008 for example), which is not desirable. Targeting core inflation circumvents this issue. More generally, there needs to be a clarification of the fact that monetary policy can only affect core inflation directly. Naturally, the ECB could change its policies to affect core inflation by as much as needed in order to compensate for the variability caused by energy and food prices. But manipulating core inflation components to bring headline HICP to target would simply add to the variability of inflation and would thus reduce welfare. It is true that consumers are affected by all prices included in the headline HICP basket, not just core prices. But that implies that the ECB is accountable for something that it cannot affect directly. We recommend that the ECB makes a clear distinction between the two variables and remains accountable only for its ability to manage core inflation.

Figure 4:   Core and HICP inflation rates in the euro-zone (1999-2018)
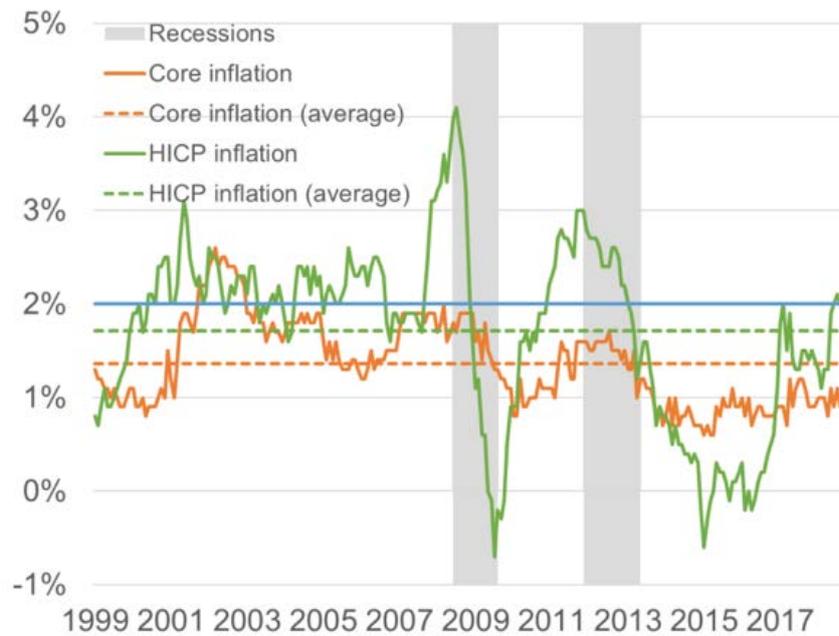
Source: Bruegel based on Bloomberg and CEPR.

Our suggestion to change the definition of price stability in such a way shares some characteristics with the discussion on increasing the inflation target (Blanchard *et al*, 2010). This discussion received an important impetus after the then Fed Chair Janet Yellen acknowledged it was a relevant issue in one of her last press conferences (Yellen, 2017). The main argument put forward by Blanchard *et al* (2010) and shared by Janet Yellen, is that aiming for higher inflation avoid periods of disinflation more effectively. Having an inflation target at the two-year horizon at a slightly higher level would provide greater policy space for the interest rate to move before landing on the effective lower bound. If the cost of falling prices is very high, then we must avoid the problem by overshooting in the other direction.

The natural next step to the logic is that if one were to aim to achieve something higher than 2 percent – say 4 percent as Blanchard *et al* argue – within the two-year horizon, it would help achieve 2 percent on average over the longer run. In other words what changes here is that the definition of price stability still holds, but evaluated over a longer period than two years. So, if putting up with a higher inflation rate in booming times is sufficient to ensure the zero-lower bound is avoided in recessions, the objective of price stability is better served. In the process, the target becomes an instrument for managing uncertainty over the medium term. And it is a more robust method because it avoids very distortionary outcomes more effectively.

We argue that the exact calibration of how much longer the horizon would be requires experimenting with a number of models. One option would be to align it with the length of the business cycle. The definition of price stability at 2 percent would then need to be evaluated as an average over one full business cycle. We argue that with such a design, uncertainty would be managed more effectively, because the design provides greater flexibility.

In addition, our suggestion about the change to the definition of price stability would be less radical than other proposals. It would be less complex than an outright increase in the target or to a move towards price-level targeting and would thus avoid the risk of damaging the central bank's credibility

or de-anchoring inflation expectations. But targeting an average over a long period would share some of the advantages of these proposals. As with price-level targeting, it would be easier for economic agents to plan long-term investments and it would reduce risks related to long-run contracts. As in the *"lower-for-longer"* proposals (advocated by Bernanke, 2017, or by Reifschneider and Williams, 2000) our framework would allow for some overheating after recessions. This would lead to lower real rates during recessions and would thus increase the policy space.

Changing the definition of price stability, although an important step towards providing the ECB with a more flexible framework, might not be sufficient given the possible limitations of the ECB's tools (discussed in section 3.2). We would therefore not exclude exploring the possibility of using instruments that have not been used during the crisis: for instance, helicopter money (i.e. direct injections of cash into the economy by the central bank) or targeted longer-term refinancing operations with negative rates below the deposit rate.

However, one caveat of our recommendation is that putting in place accommodative monetary policy for a longer time in order to let an economy overheat after a recession (whatever the instrument used to reach that objective, be it conventional or unconventional) could lead to a financial-stability risk. That is why we need to come back to the issue of what needs to be done if there is a substantial divergence between the price stability objective and the financial stability objective.

4.2. What should the ECB do if price stability and financial stability diverge?

In theory, the interest rate is not the best instrument for fine tuning the financial cycle. Agur and Demertzis (2018), for instance, showed that the effect of monetary policy on financial stability varies in direction depending on the part of the financial cycle the economy is at. They show that at the top of the financial cycle an interest rate reduction, for example, encourages banks to take risks. At the bottom of the financial cycle however, when a deleveraging process typically takes place, an interest rate reduction does not necessarily increase risk-taking by banks, and might even reduce it.

In practice, empirical evidence also leads to criticism of the interest rate as an instrument to manage financial imbalances. Posen (2009) examined episodes of bubbles in 17 countries in the period prior to the crisis and argued that it was difficult to find a clear relationship between interest-rate tightening and the growth rate of asset prices. Similarly, for the United Kingdom, which experienced a major housing bubble before the crisis, Bean *et al* (2010) estimated that additional increases in the Bank of England's main rate by several percentage points would have been needed to stabilise house prices. Such interest rate increases would have reduced inflation to significantly below the Bank of England's 2 percent target, and would have had significant negative effects on output. A further problem in targeting financial stability with monetary tools is that monetary policy tightening might not actually have the desired effect of reducing financial imbalances. As pointed out by Svensson (2014), Swedish monetary policy at the beginning of the 2010s was a bad example of a central bank trying to implement an aggressive *"leaning against the wind"* policy, which led to high costs in terms of economic activity and a major undershooting of its inflation target. Faced with a rising household debt-to-income ratio, the Riksbank increased its policy rate from 0.25 percent in July 2010 to 2 percent in July 2011. As a result, inflation fell quickly and was around zero for more than two years, well below the 2 percent target, ultimately forcing the central bank to reverse its actions. However, although the Riksbank initially aimed to ward off the threat to financial stability from household over-indebtedness, the household debt-to-income ratio was not affected by the 2010-11 policy of tightening and in fact the ratio continued to increase in real terms because of the very low and even negative inflation rates.

Monetary tightening for reasons of financial instability might have other unintended effects, especially in open economies. An increase in capital inflows because of higher interest rates can partially offset the dampening effect of higher rates on credit. Higher interest rates might also lead to a currency appreciation. Capital inflows and/or currency appreciation could accentuate the shift from the tradable to the non-tradable sector that often takes place when there is a real-estate boom. Or, as shown by Nelson *et al* (2015), a monetary tightening can also cause a migration of activity from the regulated banking sector to the shadow-banking sector.

To summarise, the various issues we have reviewed show that the main monetary policy instrument, the interest rate, is too broad and too blunt, and is ultimately quite ineffective in dealing with the build-up of financial imbalances. More generally, it makes little sense to pursue two objectives – price and financial stability – using the same instrument (as argued by the Tinbergen's rule). These two objectives can coincide but when they don't, when business and financial cycles are desynchronised, a trade-off between them emerges. Drehmann *et al* (2012) argued that this could often be the case given that financial cycles are much longer than traditional business cycles. Moreover, in the case of a monetary union like the euro area, a "*leaning against the wind*" monetary policy could be even more difficult to put in place because financial cycles in different countries are not necessarily synchronised (Merler, 2015).

More targeted and suitable measures than monetary policy should be used to deal with financial stability risks, as discussed in more detail in Claeys and Darvas (2015). However, a potential limitation of macroprudential tools is that they can be subject to regulatory arbitrage, in the same way as financial institutions moved away from microprudential regulation towards the shadow-banking sector before the crisis[6]. In Europe, the creation of the European Systemic Risk Board in 2010 and the delegation of some macroprudential authority to the ECB by the Single Supervisory Mechanism regulation are beneficial, in our view. However, possibly because of diverging national interests, macroprudential supervision is shared between the ECB and national authorities. The ECB can only apply those tools in order to seek to influence lenders' behaviour – as categorised by Blanchard *et al* (2013) – but cannot apply tools aimed at controlling borrowers' behaviour, such as loan-to-value ratios and debt-to-income ratios[7]. The ECB's limited remit might well be the weakness of the institutional arrangement, but the practice of macro-prudential policies will show if this limitation is severe or if cooperation between the ECB and national authorities, under the watch of the European Systemic Risk Board, ensures the proper implementation of the various macroprudential tools.

---

[6] Cerutti *et al* (2015) showed that the use of macro-prudential policies can be associated with relatively greater cross-border borrowing, suggesting that countries might face issues of avoidance.

[7] Macroprudential policies are relatively new, especially in advanced economies, so evidence of their effectiveness is still limited. However, the recent literature assessing these measures has found some encouraging results. In particular, carefully-set limits on ratios such as the loan-to-value ratio and the debt-to-income ratio could help to tame financial imbalances (see the literature review in Claeys and Darvas, 2015).

5. CONCLUSIONS

Ten years after the start of the financial crisis, we ask whether the current monetary policy framework that the ECB has followed remains appropriate. We have argued that the space in which central banks operate is less conducive to effective monetary policies and the environment has become structurally more uncertain.

We therefore argue that it is important to find ways for monetary policy (and indeed other policies) to manage uncertainty systematically. We have argued that altering the ECB's definition of price stability might be a crucial part of providing such flexibility. However, our policy recommendations do not depart drastically from the current framework, in recognition of the fact that radical change is not needed and that a total overhaul might jeopardise the long-earned credibility that the ECB has acquired over the last 20 years.

There remain two issues in our view that require more discussion and elaboration if our recommendations are to contribute to better (i.e. welfare improving) monetary policy.

First is the issue of redistribution. We acknowledge that the ECB in its exercise of monetary policy has neither the mandate nor the tools to make and pursue redistribution policies. These are the direct responsibility of governments where we also believe they belong. However, monetary policy does have implications for wealth redistribution, at the very least between lenders and savers, and monetary policy should therefore be implemented in awareness of what shape this redistribution takes. But beyond that, we believe central banks have a role to play in informing the policy debate about the distributional impacts of their policies. A very clear example of this could be to include an analysis of the distributional impacts of their policies in the regular publications that all central banks provide (e.g. for the ECB in its economic bulletin).

Second, communication is a very important tool in any central bank's toolkit. In times of structural uncertainty however, communication becomes harder and possibly less effective. What is the sense in communicating about things that we do not know? In our view communication remains an important tool even in times of uncertainty, provided it adapts by shifting the emphasis from communicating what little it knows, to informing how its actions prepare the economy better for the unknown. In this respect policies, as we have argued in this paper, need to be chosen not just to address very specific circumstances, but to take account of many different possible outcomes. Communication, similarly, needs to inform why the policy choices made protect monetary policy objectives in a range of possible outcomes. Far from diminishing the role of communication, we believe that uncertain times require a lot of information about what types of 'insurance' we put in place to deal with many different types of 'unknowns'.

We believe a policy framework that changes in the way that we have suggested, and a communication approach adapted to the need to manage uncertainty, can provide a credible strategy for committing to price stability.

REFERENCES

- Adrian, Tobias and Nellie Liang (2018) 'Monetary Policy, Financial Conditions, and Financial Stability', International Journal of Central Banking 14(1): 73-131.

- Agarwal, Ruchir and Miles Kimball (2015) 'Breaking Through the Zero Lower Bound', IMF Working Papers No. 15/224.

- Agur, Itai and Maria Demertzis, (2018). "Will Macroprudential policy Counteract the Monetary Policy Effects on Bank Behavior?" Bruegel Working Paper, No. 1.

- Bank of Japan (2016) New Framework for Strengthening Monetary Easing: "Quantitative and Qualitative Monetary Easing with Yield Curve Control", September 21, 2016, available at https://www.boj.or.jp/en/announcements/release_2016/k160921a.pdf.

- Bean, Charles, Matthias Paustian and Adrian Penalver (2010), 'Monetary Policy after the Fall', Proceedings - Economic Policy Symposium - Jackson Hole, 2010: 267-328.

- Ben-Haim, Yakov, Maria Demertzis and Jan Willem van den End. (2018). Fundamental uncertainty and unconventional monetary policy: an info-gap approach, Economic Modelling, Volume 73, June, pp 55-70.

- Bernanke, Ben (2015) 'Why are interest rates so low, part 3: The Global Savings Glut', Brookings Blog, 1 April.

- Bernanke, Ben (2017) 'Monetary Policy in a New Era', Brookings Institution, 2 October 2017.

- Blanchard, Olivier (2016) The US Phillips Curve: Back to the 60s? PIIE policy brief, available at https://piie.com/publications/pb/pb16-1.pdf.

- Blanchard, Olivier, Giovanni Dell'Ariccia and Paolo Mauro, 2010, Rethinking Macroeconomic Policy, IMF Staff Position Note, February 12, 03.

- Borio, Claudio and William White, 2004, Whither monetary policy and financial stability? The implications of evolving policy regimes, BIS Working Paper No. 147.

- Carney, M. (2017) '[De]Globalisation and inflation', 2017 IMF Michel Camdessus Central banking Lecture.

- Claeys, Grégory (2016) The decline of long-term rates: bond bubble or secular stagnation symptom, Bruegel Policy Contribution No 2016/16.

- Claeys, Grégory (2017) The missing pieces of the euro architecture, Bruegel Policy Contribution No 2017/28.

- Claeys, Grégory and Zsolt Darvas (2015) 'The Financial Stability Risks of Ultra-loose Monetary Policy, Bruegel Policy Contribution No 2015/03.

- Constâncio, Vitor (2017), 'Understanding and Overcoming Low Inflation', Conference on "Understanding inflation: Lessons from the Past, Lessons for the Future?", Frankfurt am Main, 21 and 22 September 2017.

- Dell'Ariccia, Giovanni, Luc Laeven, and Gustavo Suarez (2017) Bank leverage and monetary policy's risk-taking channel: Evidence from the United States, Journal of Finance 72(2), 613-654.

- Demertzis, Maria and Nicola Viegi (2008). "Inflation Targets as Focal Points", International Journal of Central Banking, Vol. 4 No. 1, March, 55-8.

- Demertzis, Maria and Nicola Viegi (2010). "Inflation Targeting: a Framework for Communication", B.E. Journal of Macroeconomics (Topics), Vol. 9, 1.

- Demertzis, Maria and Guntram B. Wolff (2016) What impact does the ECB's quantitative easing policy have on bank profitability? Bruegel Policy Contribution No 2016/20.

- Drehmann Mathias, Claudio Borio and Kostas Tsatsaronis (2012) 'Characterising the financial cycle: don't lose sight of the medium term!', BIS Working Papers 380.

- Ducrozet, Frederik (2016) 'Bond scarcity under new ECB QE rules – It Ain't Over Till It's Over', Pictet Wealth Management Flash Notes, 14 December 2016, available at: https://perspectives.pictet.com/wp-content/uploads/2016/12/Flash-Note-FD-ECB-QE-bond-scarcity-14-December-2016-1.pdf.

- ECB (2015) Implementation aspects of the public sector purchase programme (PSPP), 5 March, http://www.ecb.europa.eu/mopo/liq/html/pspp.en.html.

- ECB (2017) Decision 2015/774 of the ECB of 4 March 2015 on a secondary markets public sector asset purchase programme (ECB/2015/10) amended in 2015, 2016 and 2017 https://www.ecb.europa.eu/ecb/legal/pdf/celex_02015d0010-20170113_en_txt.pdf.

- ECB (2017), 'Impact of the ECB's non-standard measures on financing conditions: taking stock of recent evidence', Economic Bulletin, Issue 2.

- ECB (2018) 'The cash holdings of monetary financial institutions in the euro area', available at https://www.ecb.europa.eu/pub/economic-bulletin/articles/2018/html/ecb.ebart201806_03.en.html#toc6.

- El-Erian, Mohamed (2017), The only Game in Town: Central Banks, Instability and Avoiding the Next Collapse, Random House, New York.

- Eggertson, Gauti B. and Neil R. Mehrotra (2014), 'A Model of Secular Stagnation', NBER Working Paper No. 20574.

- Friedman, Milton (1968) 'The Role of Monetary Policy', The American Economic Review 58 (1):1-17.

- German Council of Economic Experts (2015) Annual Report 2015-16, Chapter 4, available at https://www.sachverstaendigenrat-wirtschaft.de/fileadmin/dateiablage/gutachten/jg201516/wirtschafts-gutachten/chapter_four.pdf.

- German Council of Economic Experts (2017) Annual Report 2017-18, Executive Summary, available at https://www.sachverstaendigenrat-wirtschaft.de/fileadmin/dateiablage/gutachten/jg201718/17-11-07_Executive_Summary.pdf.

- Gersl, Adam, Petr Jakubík, Dorota Kowalczyk, Steven Ongena, and José-Luis Peydró, 2015, Monetary conditions and banks´ behaviour in the Czech Republic, Open Economies Review 26(3), 407-445.

- Gourinchas, Pierre-Olivier and Hélène Rey (2016) 'Real Interest Rates, Imbalances and the Curse of Regional Safe Asset Providers at the Zero Lower Bound', NBER Working Paper No. 22618.

- Holston, K., T. Laubach and John C. Williams (2016) 'Measuring the Natural Rate of Interest: International Trends and Determinants', Working Paper Series 2016-11, Federal Reserve Bank of San Francisco.

- IMF (2014) Euro Area – "Deflation" Versus "Lowflation", IMF blog March 4, 2014, available at https://blogs.imf.org/2014/03/04/euro-area-deflation-versus-lowflation/.

- Issing, Otmar (2003) Press seminar on the evaluation of the ECB's monetary policy strategy, May 8, 2003 available at: https://www.ecb.europa.eu/press/pressconf/2003/html/is030508_1.en.html.

- Kimball, Miles s. (2015) 'Negative Interest Rate Policy as Conventional Monetary Policy', National Institute Economic Review, National Institute of Economic and Social Research 234(1): 5-14.

- Krueger, Alan B. (2018) 'Reflections on Dwindling Worker Bargaining Power and Monetary Policy', Luncheon Address at the Jackson Hole Economic Symposium.

- Meinusch, Annette and Peter Tillmann (2016) 'The macroeconomic impact of unconventional monetary policy shocks', Journal of Macroeconomics 47(A): 58-67.

- Merler, Silvia (2015) 'Squaring the cycle: capital flows, financial cycles, and macro-prudential policy in the euro area', Bruegel Working Papers 11000.

- Nelson, Benjamin, Gabor Pinter and Konstantinos Theodoridis (2015) 'Do contractionary monetary policy shocks expand shadow banking?', Bank of England working papers 521, Bank of England.

- Nessén, Marianne and David Vestin (2005). "Average inflation targeting." Journal of Money, credit and Banking, p837-863.

- Posen, Adam (2009) 'Finding the Right Tool for Dealing with Asset Price Booms', Speech at the MPR Monetary Policy and the Economy Conference, London (1 December).

- Rajan, Raghuram G. (2006) Has finance made the world riskier? European Financial Management 12(4): 499-533.

- Reifschneider, David and John C. Williams (2000) 'Three Lessons for Monetary Policy in a Low-Inflation Era', Journal of Money, Credit and Banking 32(4): 936-966.

- Rogoff, Kenneth (2015) 'Debt supercycle, not secular stagnation', remarks at Closing Panel, Rethinking Macro Policy III, IMF, Washington DC, 16 April.

- Rogoff, Kenneth (2016) The Curse of Cash, Princeton: University Press.

- Sandbu, Martin (2018) 'The devastating cost of central banks' caution', Financial Times, August 7, available at https://www.ft.com/content/23c4a184-997d-11e8-ab77-f854c65a4465.

- Solow, Robert M. (1956) 'A contribution to the Theory of Economic Growth', The Quarterly Journal of Economics 70 (1): 65-94.

- Stein, Jeremy C., 2014, Incorporating financial stability considerations into a monetary policy framework, Speech at the Federal Reserve Board, Washington D.C., March 21, 2014.

- Svensson, Lars E.O., 2014, Inflation targeting and "leaning against the wind", International Journal of Central Banking 10(2), 103-114.

- Yellen, Janet (2017) Transcript of Chair Yellen's June 14 2017 Press Conference, available at https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20170614.pdf.

- Weale, Martin and Tomasz Wieladek (2016) 'What are the macroeconomic effects of asset purchases?', Journal of Monetary Economics 79: 81-93.

- Wolff, Guntram (2017) 'German wages, the Phillips curve and migration in the euro area', Bruegel blog, November 29, 2017, available at http://bruegel.org/2017/11/german-wages-the-phillips-curve-and-migration-in-the-euro-area/.

We argue that monetary policy faces different challenges to those faced during the period of the great moderation. Greater uncertainties over the ability of monetary policy to control inflation, the instruments that should be used and their effects on financial stability imply that we need to rethink whether the current framework is appropriate. We recommend a few adaptions to the current framework that would provide greater flexibility to the European Central Bank without departing very far from current practices (to avoid risking the credibility that the ECB has acquired since its inception).

This document was provided by Policy Department A at the request of the Committee on Economic and Monetary Affairs.