IN-DEPTH ANALYSIS

Requested by the ECON committee

Monetary Dialogue Papers, November 2021

European Parliament

The Implementation and Rationale of the ECB's New Inflation Target

Policy Department for Economic, Scientific and Quality of Life Policies
Directorate-General for Internal Policies
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PE 695.474 - November 2021

EN

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Abstract

In July 2021, the ECB's target was revised, specifying that the 2 % inflation rate threshold should be applied symmetrically and with a medium-term orientation. We argue that a symmetric inflation target can significantly contribute to anchoring inflation expectations and to limiting the risks due to the zero- and/or effective-lower bound constraints. The monetary policy strategy revision will play a key role in the policy mix between fiscal and monetary policies for the post-pandemic recovery.

This paper was provided by the Policy Department for Economic, Scientific and Quality of Life Policies at the request of the Committee on Economic and Monetary Affairs (ECON) ahead of the Monetary Dialogue with the ECB President on 15 November 2021.

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

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LINGUISTIC VERSIONS
Original: EN

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Manuscript completed: November 2021
Date of publication: November 2021
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This document was prepared as part of a series on "The ECB's Revised Inflation Target", available on the internet at:
https://www.europarl.europa.eu/committees/en/econ/econ-policies/monetary-dialogue

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For citation purposes, the publication should be referenced as: Benigno, P., Canofari, P., Di Bartolomeo, G., Messori, M., 2021, *The Implementation and Rationale of the ECB's New Inflation Target*, Publication for the committee on Economic and Monetary Affairs, Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, Luxembourg.

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LIST OF ABBREVIATIONS

APP	Asset purchase programme
ECB	European Central Bank
ELB	Effective-lower bound
EP	European Parliament
EU	European Union
FAIT	Flexible average inflation targeting
FED	Federal Reserve
FOMC	Federal Open Market Committee
GDP	Gross domestic product
HICP	Harmonised Index of Consumer Prices
ICT	Information and communication technologies
PEPP	Pandemic emergency purchase programme
TLTRO	Targeted longer-term refinancing operations
ZLB	Zero-lower bound

EXECUTIVE SUMMARY

- **Economic theory suggests that central banks play a key role in determining the price level**. Accordingly, the Treaty on the Functioning of the European Union maintains that price stability is the main goal of the European Central Bank (ECB). The quantitative definition of price stability should, however, be determined by the ECB's strategy. This definition has evolved over time.
- **The ECB's Governing Council has recently provided a new definition of price stability**, implying that the ECB's inflation target is equal to **exactly 2 %**. The target is **symmetric**, i.e., positive, and negative deviations are equally costly. The rule is tempered by the **redefinition of the medium run** and the **introduction of the proportionality principle**, which should provide the necessary flexibility to the conduct of monetary policy.
- **The rationale of the strategy change lies in the decline in the natural rate of interest**. This decline occurred because of several factors: the slowdown in productivity growth, demographic issues, and debt deleveraging processes. After the global financial crisis, the natural rate of interest reached even negative values. A higher inflation target is the appropriate response to the fall in the natural rate of interest.
- **The interaction between the zero-lower bound and the inflation rate does not result in the simple justification of a buffer on inflation**; it also requires an appropriate dynamic adjustment.
- **The Federal Reserve (Fed), too, has revised its strategy**. Just like the ECB, the Fed fixed a 2 % inflation target, although it specified that if inflation were persistently to remain below 2 % for some time, the central bank would have to keep inflation above 2 % for the same period. Here the rule is tempered by the Fed's dual mandate, that is, not only maintaining price stability but also the stability of employment in the macroeconomy.
- **The main flaw** identified in the ECB's new strategy is that it fails to connect the new target to **history dependence** and, hence, to put the ECB's forward guidance on more solid bases.
- **The ECB's revised inflation target will, nevertheless, play a key role in promoting better coordination between the monetary policy and fiscal policies (policy mix)** that will be implemented to foster recovery in the EU post-pandemic environment.

1. INTRODUCTION

The European Central Bank (ECB) has recently revised its strategy (cf. ECB, 2021a and 2021b). At the start of the monetary union (1999), the primary goal of the ECB strictly concerned price stability; and the quantitative definition of this stability was an inflation rate of "below 2 %". This quantitative definition became the ECB's target. The 2003 strategy review changed the target to "below but close to 2 %". Now, according to the 2021 revision of the ECB's strategy, the 2 % has become the reference point so that the medium-term inflation rate should neither exceed nor remain below this symmetric threshold.

The evolution of the ECB's strategy has led to changes in its target, but not in its primary goal (price stability). In this paper, we aim to examine the main strength and weakness of the ECB's new quantitative target in the current framework and to discuss how the revised strategy is likely to shape policy, considering the side effects and interplay between the ECB's secondary goals (e.g., financial stability, and growth and employment) and the effectiveness of non-conventional monetary policy instruments. However, to assess the impact of the new target aimed at pursuing price stability, it is necessary to shortly focus on the analytical meaning of the primary goal.

As explained by the great economists of the past, the value of money is conceived as the "purchasing power of the income unit", where "the concept of purchasing power is based on the concept of price"; and "the numerical measurement of the price level" allows us to apply the value of money not only to individual commodities but also to all commodities, thus defining the "general purchasing power of money" (Schumpeter, 1917-18; Engl. transl. 1956: 162, 165, and 166). In this respect, Wicksell (1898; Engl. transl., 1936: 4) maintains that "[…] if it were in our power to regulate completely the price system of the future, the ideal position, affording common advantage to the overwhelming majority of the various groups of interests, would undoubtedly be one in which […] the general average level of money prices […] would be perfectly invariable and stable". Then, Wicksell (1898; Engl. transl., 119-21) states that the central bank determines the monetary interest rate; and the equality between this rate and the varying natural rate of interest (here to be assimilated to the rate of return on capital) is the condition for price stability.

Similarly, Keynes (1930: 137) affirms: "The conditions for the equilibrium of the purchasing power of money require that the banking system should so regulate its rate of lending that the value of investment is equal to savings". Finally, even if Keynes (1936: 207) emphasises that "there are certain limitations on the ability of the monetary authority to establish any given complex of rates of interest […]", he will recognise that central banks aim at determining these rates to stabilise the general level of prices.

The above quotations stress two important points.

1. The three quoted great economists agree that central banks play an essential role in determining the value of money, which is based on prices. It is worth stressing that, in this case, "essential" has a specific meaning: it is impossible to determine the value of money in an economic system based on fiat money without the intervention of the central bank's policy tools. In fact, in such a system, the central bank's liabilities define what a currency is, and what is its value.
2. In so doing, these three authors recognise that one of the main goals of the central bank is price stability.

Different "monetary doctrines" are hence all compatible with the main goal attributed to the ECB by the European Treaties[1]. Keynes (1936) would add that a central bank should also contribute to the selection of the full employment equilibrium in the set of multiple equilibria mainly characterised by involuntary unemployment; Schumpeter (1912) would emphasise that a central bank should also grant liquidity to commercial banks financing innovators and imitators. Nevertheless, their different monetary theories do not substantially question price stability as (one of) the main aim(s) of the ECB.

Our conclusion does not imply that the debate on the ECB should only be reduced to a discussion on its main goal and target. European economic governance has attributed other features to the central bank: for instance, independence from national governments and their fiscal policies; the enforcement of rules with limited room for discretion, and so on. These properties do not correspond to the prescriptions of all the different monetary approaches and have evolved in different periods of the euro area's existence. However, it is not in the scope of the present paper to provide further details on these aspects. Here, it is sufficient to point out that the ECB's goal of price stability has not been influenced by the evolution of the theoretical debate on the central bank's independence or on "rules vs. discretion". On the contrary, this evolution has accompanied the changes in the ECB's conduct and the related revisions of its target.

In principle, the achievement of the price stability goal could be effectively based either on quantitative rules or on discretionary choices related to the phases of economic cycles. In the case of the ECB, the reference to a specific quantitative target (rate of inflation below of 2 %) perfectly corresponds to the prescriptions of strict rules without much room for discretion. In turn, the 2003 change in the ECB's target (below but close to 2 %) allowed the central bank to back the euro area's economic growth in the middle of the first decade of the new century without increasing policy interest rates; and, later, this change was crucial for supporting the launch of unconventional monetary policies without violating the ECB's main goal and strategy. In fact, at the end of 2013 and in the first quarters of 2014, the euro area was at high risk of deflation; and the ECB's first attempts to decrease the probability of deflation by means of conventional monetary policy tools were unsuccessful. Hence, the ECB was legitimised to make recourse to unconventional tools.

The further changes recently made in the ECB's strategy (2 % as the symmetric reference point) seem important for easing the management of the current positive but unstable equilibrium in the policy mix characterising the post-pandemic phase. As we pointed out elsewhere (e.g., Benigno et al., 2021; Buti and Messori, 2021), the current policy mix is quite expansionary and the ECB's balance sheet is accumulating a growing amount of government bonds issued by euro area Member States. Hence, in the near future, an important question will be how to redesign the monetary policy stance in order to obtain a composition of the ECB's balance sheet that is compatible with price stability and, in the meantime, a policy mix that is compatible with the sustainable economic development of the euro area and the European Union (EU).

The above considerations show that the reviews of the ECB's quantitative target have played and can continue to play an important role in supporting changes in the EU's economic system. Moreover, our rudimentary reference to the history of economic analysis suggests that the interaction between the ECB's main goal and the ECB's target is not only empirically significant but also has a theoretical background. The aim of this paper is to provide the readers with a solid feedback on these statements. Its remaining parts are organised as follows. Section 2 explains the process leading to the ECB's current

[1] The reference is to the theories of Wicksell (1898) or Schumpeter (1912), based on banks' credit, as well as to that of Keynes (1936), based on an exogenous supply of money and on the "liquidity preference". Most recently, the same result is expounded by the new-Keynesian/neo-Wicksellian literature (see Woodford, 2003).

strategy review. Section 3 discusses the rationale behind the last revision of the inflation target. Section 4 compares the recent choices of the ECB to the parallel choices of the Federal Reserve (Fed) for the implementation of new strategies. Section 5 concludes the paper.

2. THE REVISION OF THE ECB'S INFLATION TARGET

The Statute of the European System of Central Banks (ESCB) emphasises that, "in accordance with Article 127(1) and Article 282(2) of the Treaty on the Functioning of the European Union", the main objective of the ESCB "shall be to maintain price stability" (see Article 2). The ESCB is defined separately from the ECB: the former represents the central banks of the Member States belonging to the EU, whereas the latter has a legal personality as an EU institution. However, in what follows, we will neglect this distinction. In fact, according to Article 9(2) of the Statute, the ECB is responsible for ensuring that the ESCB pursues its objective and tasks. Hence, from an economic point of view, we can simply state that the ECB aims at price stability. The problem is that the Treaty and the Statute do not offer a quantitative or qualitative definition of price stability. This definition is a task that is implicitly attributed to the ECB Governing Council. As clarified by Article 12(1) of the Statute, "the Governing Council shall adopt the guidelines and take the decisions necessary to ensure the performance of the tasks entrusted to the ESCB […]".

In one of its first meetings (13 October 1998), the ECB Governing Council announced that price stability should be defined as "a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2 %"; and it added that this maximum threshold of the inflation rate should be met over the medium term. Hence, the Governing Council opted for a quantitative determination of the ECB's target. Then, in the meeting of 8 May 2003, it specified that, in the medium term, price stability should require an inflation rate not only below but also "close to 2 %"[2].

This change in the monetary strategy pursuing price stability was justified by several factors. According to the same Governing Council, the experience of the past monetary policy and the analytical results reached in the economic literature suggested to have recourse to an adequate "safety margin" to bring "the risks of deflation" under control, to adjust for "the possible presence of a measurement bias in the HICP", and to consider "inflation differentials within the euro area".

The justifications provided were sound and reasonable. It is understandable that, at the time of the Maastricht Treaty, the risk of deflation or overly moderate dynamics of price levels was not at the top of the European policy-makers' concerns; the previous two decades had been characterised by high inflation and the related difficult processes of price stabilisation in a large part of European countries. Conversely, during the 1990s, price dynamics followed more irregular trends so that the problem of also satisfying a minimum threshold in the inflation rate became a potential policy issue. Moreover, in the same decade, the production system of the EU implemented a rich flow of innovations thanks to firms' massive adoption of the "information and communication technologies" (ICT); and the ICT led to product innovations. Hence, the ICT's outputs implied an overassessment of the inflation rate because the measurement of price dynamics often referred to goods and services whose quality was largely improved even if their label was unchanged (hedonic prices). Finally, the empirical evidence of the euro area shows that a moderate but positive average rate of inflation can be a necessary tool for effectively applying the same monetary policy stance to countries with significant differences in terms of economic cycle and output potential. Policy interest rates cannot fully control the divergences between Member States because these rates are constrained by lower bounds (see Section 3 below).

Our provisional conclusion is that, at the beginning of the new millennium, the ECB had good reasons to avoid inflation rates that could have systematically been either too high or too low. The impact of the international financial and "real" crises (2007-2009) and the euro area's "doom loop" between the

[2] The Governing Council emphasised the continuity between the two definitions: the new definition was still based on the original one that had worked "satisfactorily" in the previous four years and more of the euro's existence.

sovereign debt crisis and the banking sector's liquidity and insolvency crisis supported *ex post* the decisions taken by the ECB Governing Council in May 2003. At the end of 2008, the monetary policy of the Fed reached the zero-lower bound (ZLB); and from the last quarter of 2013 to the third quarter of 2014, the euro area experienced phases of deflation and the decreases of ECB's interest rates to the ZLB.

Since the end of 2014 the stance of the ECB's monetary policy has been ultra-expansionary due to the recourse to unconventional tools[3]. The announcement and the implementation of a systematic purchase of government and corporate bonds in the secondary financial markets were based on the asset purchase programme (APP). The easing of the open market operations, which fixed negative interest rates on the refinancing of specific groups of banks, were due to the strengthening of the targeted longer-term refinancing operations (T-LTRO). However, even before the deep economic depression triggered by the COVID-19 shock, the attainment of an effective lower bound (ELB) and the pumping of a huge amount of liquidity into the economic system were insufficient to meet the ECB's new quantitative definition of price stability: the average inflation rate remained largely below the maximum threshold of 2 % in the medium term. At least in the short term, the same statement applies to the further easing of the ECB's monetary policy implemented since March 2020: despite the launch of the new pandemic emergency purchase programme (PEPP) and the strengthening of the APP and the T-LTRO III, during the 2020 economic depression, the euro area's price dynamics did not exceed 0.25 %, that is, a percentage far from 2 %.

The current year (2021) is characterised by a strong rebound of the European economy. Even if it is still vulnerable, this rebound coincides with an inflation rate above 2 % in the euro area. On average, the euro area's annual inflation rate to August 2021 was equal to 3 % and that to September 2021 reached 3.4 %. Hence, according to the 2003 target determined by the Governing Council, the ECB should be ready to change its monetary policy stance if the inflation rate stabilises at the levels reached in summer 2021 also in the last months of the current year and in the first quarters of 2022. However, this type of policy initiative would hinder the euro area's possible economic recovery and would nip in the bud any long-term sustainable development. Moreover, it could be unjustified from a substantial point of view. This viewpoint will be developed in Section 3. Here let us just refer to the determinants of subdued inflation. Gros (2021) maintains that the current inflation data are largely due to the unusually low prices of 2020: if we look at the data "over a two-year period that bridges COVID-19", it will follow that the HICP index "has risen only by 1.5 % per year"; and, repeating the same exercise for Germany, we will obtain an average inflation rate "just above 2 % per year" (compared to 4.1 %).

In this perspective, the new quantitative definition of price stability that resulted from a long preparation (starting before the outbreak of the pandemic) and that was adopted by the ECB Governing Council in its meeting of 8 July 2021 has occurred at a very propitious moment. According to the new quantitative definition approved by the Governing Council, "price stability is best maintained by aiming at a 2 % inflation target over the medium term". This obviously means that the 2 % ceases to be the maximum threshold and becomes the symmetric reference point for inflation, in the sense that "negative and positive deviations of inflation from the target are equally undesirable". The concept of symmetry in the conduct of monetary policy is indeed nothing new. Draghi (2016) already specified that "it is equally important that we pursue our objective symmetrically".

As in the case of the previous change in the monetary strategy, there is a continuity between the new definition and the 2003 one. However, there are at least three reasons why the ECB's new target

[3] The evolution of the ECB's monetary policy in the different periods of the euro area's existence and its impact on the economic activities are analysed by Rostagno et al. (2019). A specific focus on the ECB's unconventional monetary policies is offered in Rostagno et al. (2021).

incentivises a more expansionary stance in the euro area's monetary policy and why it can, thus, reduce the risk of a dangerous sudden reverse in its stance and in the stance of the EU's current policy mix.

The first reason is obvious: symmetry means that the quantitative inflation target is 2 % and not below (even if close to) 2 %. The second reason depends on changes introduced in the calculation of the HICP and here neglected (even if we think that these changes are significant and appropriate). The third reason is the most interesting from our point of view: despite the symmetric reference to 2 %, the new strategy allows for an important asymmetry justified by specific economic conditions. This asymmetry applies to an economy "operating close to the lower bound on nominal interest rates", that is, one facing a negative cyclical phase or a negative trend. In this case, it is conceivable to design a monetary policy stance tolerating "a transitory period in which inflation is moderately above target", that is, a period in which the inflation rate is above 2 % even in the medium term. In fact, the most significant risk is an entrenchment of the "negative deviations from the inflation target"; and this risk can be avoided only if an "especially forceful and persistent monetary policy action" is implemented.

3. THE ECONOMICS BEHIND THE STRATEGY REVIEW

Since the 2003 strategy review, important factors have challenged the world economy and the euro area's economic system: the strengthening of globalisation, the 2007-2008 global financial crisis, the European sovereign debt crisis, and the most recent COVID-19 shock. All these factors have concurred with the changes that largely justify the new 2021 strategy review. In fact, they have significantly contributed to an important macro fact that is related to an unobservable but key policy variable: the fall in the natural rate of interest. In turn, this fall is understood to have been at the root of two other macro facts relating to observable variables: namely, a subdued inflation rate which has averaged 1.6 % in the euro area since 2007 (see Figure 1), and a long stay (since mid-2014) of policy rates at the (effective) ZLB.

Figure 1: Euro area annual HICP inflation rate

Source: Datastream.

3.1. The fall in the natural rate of interest

The natural rate of interest is, in an abstract sense, the real interest rate that the economy would reach absent frictions, were employment at the potential level and inflation stable. It represents the real interest rate that the central bank should achieve to better stabilise the inflation rate and output at their targets. Before the 2007-2009 financial crisis, the natural rate of interest was around 2 % at an annual basis. With a 2 % inflation target, the nominal interest rate – the policy interest rate – could thus be settled at 4 %[4].

In combination with the ZLB on the policy interest rate, a natural rate of interest lower than 2 % can create significant problems for the economy. Suppose that the natural rate of interest settles at – 3 %. With a 2 % inflation target, this implies that the nominal interest rate should be fixed at – 1 % to stabilise

[4] This computation considers as valid the "Fisher equation", for which the nominal interest rate is the sum of the real interest rate and the inflation rate (Fisher, 1930). See also Sun and Phillips (2004).

the economy. However, such a nominal interest rate level is not a feasible outcome in economic systems in which cash (coins and banknotes) circulates. Lack of arbitrage opportunities would prevent agents from borrowing at negative rates and invest in cash[5]. Therefore, the ZLB constraint implies that the actual real interest rate should be settled at least at – 2 % in our economic systems because of the zero-nominal interest rate minus the 2 % of inflation. Therefore, the actual real interest rate would be above the ideal – 3 % dictated by the natural rate of interest, and it will thus prevent the desired stabilisation of inflation as well as of economic activity. The economic system would experience an overly high real interest rate with contractionary effects, which could reduce economic activity and be likely to bring the inflation rate below its 2 % target.

It should be emphasised that these effects can trigger a dangerous spiral, which tends to lead to a disinflationary and eventually to a deflationary trap. A lower inflation rate with a zero-nominal interest rate would further raise the lowest actual threshold of real interest rates, again bringing down the inflation rate, and so forth, up to the point of reaching a deflation. At this stage, the economy would experience positive actual real interest rates no matter the zero-interest rate policy followed by the central bank, and in contrast to the ideal negative natural rate of interest. The risk of this spiral has become quite likely in recent years. Estimates for several advanced economies and for the euro area show a steady decline of the natural rate of interest starting from values above 4 % in the 1970s to around 2 % in the 1980s. After the global financial crisis, this decline has led to figures below zero for the euro area.

The theoretical literature underlines several factors responsible for the fall in the natural rate of interest: the slowdown in productivity growth, demographic factors, and debt deleveraging processes.

In a high-growth economy, the equilibrium between savings and investment is compatible with high real interest rates. With a slowdown in economic growth, the real interest rate should fall to satisfy the macroeconomic stability conditions. In the advanced economies, there is a decline in the growth rate of potential output that is largely due to a decline in the growth rate of total factor productivity (see Lane, 2019). Hence, the natural rate of interest decreases, and the real interest rate should also decrease to stabilise the inflation rate and the economy.

The second factor influencing the natural rate of interest is demographic. During the last decades, advanced economies have been experiencing a process of demographic transition towards low fertility and mortality: individuals have fewer children and live longer with the consequence that the number of elderly people increases with respect to the working-age population. The macroeconomic consequence of these structural changes points towards a reduction in the natural rate of interest (see Brand et al., 2018). On the one hand, a decrease in the labour force and labour supply raises the capital-to-labour ratio even without additional investment; on the other hand, with everything else being equal, an increase in life expectancy raises the saving rate. These trends reduce the natural rate of interest, and thus the real interest rate required to stabilise the economy. One could maintain that the increase in the saving rate is partly offset by the increasing incidence of the elderly people who are prone to dis-save (see Modigliani, 1976). However, empirical evidence shows that, in the euro area, elderly people (65-74 years of age) own financial wealth that is largely above the average of the other age classes (see Eurostat, 2020).

The 2007-2009 global financial crisis has further led to a substantial fall of the natural rate of interest,

[5] We are aware that, since mid-2014 and – *a fortiori* – since April 2016 and March 2020, the ECB has utilised various monetary tools to create opportunities of arbitrage even at negative interest rates. However, from a theoretical point of view, it is possible to neglect this point. In fact, our analysis would remain valid, if the ZLB was replaced with an ELB characterised by negative policy interest rates. The validity of our reasoning only requires the existence of an ELB. In the following pages, to simplify the matter, we will refer to the ZLB as the minimum ELB.

so much as to reach negative values (e.g., Hong and Shell, 2019: 1). The loss of opportunities in financial markets, because of the debt overhang, has created incentives for borrowers to repay their debt and reduce their leverage. These decisions have possibly had the effect of limiting disequilibria and bankruptcies in some sections of these markets. However, the implementation of debt reduction by some agents leads to higher savings at given interest rates. Hence, to meet an aggregate balance, it is necessary to reduce savings in other parts of the economy; and this reduction can be only triggered by a fall in the natural rate of interest. It follows that there is a third factor requiring a fall in the real interest rate to stabilise the inflation rate and the economy.

It is worth noting that there are other factors responsible for the decline in the natural rate of interest. Let us just recall the increasing inequality in wealth and income distribution, the impact of the globalisation of capital markets, and the excess of net savings in various advanced economic areas (the euro area included). We cannot analyse these factors in detail in this paper. It is sufficient to stress that a low level for the natural rate of interest, combined with the (effective) ZLB, represents a serious burden on economic activity and could put downward pressure on inflation and constrain the economy at very low nominal interest rates.

3.2. Inflation buffer

A higher inflation target is the appropriate policy response to the fall in the natural rate of interest for at least two reasons. Under normal conditions, a higher inflation rate implies a higher nominal interest rate for a given stabilising real interest rate; therefore, a higher inflation rate leaves policy-makers with more room for action if adverse economic shocks require a fall in the policy interest rate. Thus, hitting the ZLB becomes less likely. The second reason for a higher inflation target is justified by the stimulating effects that this target can have when the economy is at the ZLB. A higher inflation target, if embedded appropriately in inflation expectations, can reduce short and long-term real interest rates stimulating the economy and shortening the duration of the trap at zero interest rates.

These two reasons have certainly played a role in the ECB's recent strategy review aimed at fixing the target symmetrically at 2 %, rather than below but close to this threshold. A positive inflation buffer is justified by other notable reasons that need to be mentioned: the presence of downward nominal rigidities, euro area cross-country inflation differentials and measurement errors.

The presence of downward nominal rigidities justifies a positive inflation rate. Let us assume that, despite their rigidity, nominal wages are constrained to adjust downward to overcome a macroeconomic disequilibrium. This decrease tends to cause a recessionary shock on the demand side and a parallel significant fall in the economic activity, so that the real wages would remain too high in terms of the required initial adjustment. As a consequence, a large part of the population (mainly workers) would be worse off without significant improvements at the macroeconomic level. In this situation, a positive inflation rate "greases the wheels", allowing for a fall in real wages even if nominal wages do not decrease, thereby reducing the adverse effects of the contractionary shock[6]. As discussed in Bobeica and Sokol (2019), nominal wage rigidities were still a persistent phenomenon in the euro area immediately before the pandemic shock.

For the non-homogeneous characteristics of the national economic systems, the euro area is subject to important variations in the inflation rates across Member States. Each national economy faces different structural costs, handles different degrees of market competition, and is able to implement different adjustments to either common or country-specific shocks. To minimise the impact of these

[6] This result would be achieved more effectively and with minor social costs if the purchasing power of low nominal wages was protected by means of adequate social mechanisms.

peculiarities and different adjustments, a positive inflation rate is required. Let us simply underline that, were the inflation target for the overall area at zero percent, countries in expansion would record positive inflation rates while countries in recessions would face a costly deflation. Targeting a positive inflation rate for the area avoids the situation in which countries facing adverse shocks need to adjust through a fall in prices. Finally, as recalled in Section 2 with respect to the adoption of new technologies, measurement errors are also a reason for a positive inflation rate. In fact, these errors imply a positive inflation bias.

All these arguments support the setting of a positive inflation target as a buffer. By moving the target from a range between zero percent to 2 %, as in the original 1998 framework, to close to 2 % in the 2003 revision, and to the focal point of 2 % in the last revision, the ECB has been able to take account of all the above reasons in an appropriate way. The largest part of these reasons was, actually, already discussed in the 2003 revision (see also Section 2, above). However, the new 2021 strategy review has been justified by a series of unfortunate events that have characterised the last fifteen years and that have strengthened the need for an inflation buffer.

3.3. Overshooting the inflation target after ZLB episodes

The interaction between the ZLB and the inflation rate does not result in simply justifying a buffer on inflation; it also requires an appropriate dynamic adjustment. The Governing Council's statement of the 2021 review is suggestive of this further crucial aspect when it endorses some of the conclusions reached by the theoretical literature on the topic. Point six of the ECB's new monetary policy strategy says that:

> *"[T]he Governing Council recognises the importance of taking into account the implications of the effective lower bound. In particular, when the economy is close to the lower bound, this requires especially forceful or persistent monetary policy measures to avoid negative deviations from the inflation target becoming entrenched. This may also imply a transitory period in which inflation is moderately above target."*

Not only does the 2021 review re-establish a symmetric target, but it also goes in the direction of justifying upward transitory deviations of the inflation rate from the target.

The literature on the ZLB has characterised the optimal exit from shocks that bring the economy to the ZLB by underlining three peculiar features of the adjustment: a prolonged period of monetary policy accommodation, inflation overshooting at the time of exiting the ZLB, history dependence (see among others: Krugman, 1998; Eggertsson and Woodford, 2003). These three features lead to three related implications.

The first implication is that monetary policy should be very accommodative, where the degree of accommodation is measured by the stay at the ZLB which should still be longer than the duration of the shock. This means that, even if the natural rate of interest reverts to normal values so that the lift-off of the policy interest rate from zero could be feasible, the ECB should instead remain committed to keeping this policy rate at the ZLB for some additional quarters. The second implication is that the inflation rate should exceed the inflation target at the same time in which the natural rate of interest returns to normal conditions. The third peculiar implication is that policy should be history dependent, meaning that the ECB should undo the negative gaps experienced during the trap with positive gaps at the exit in a way as to make up output and inflation losses.

The above implications can be intuited in a simple way. The ZLB is a constraint that prevents the optimal adjustment because, under significant perturbations to the economy, this adjustment would

require the policy interest rate to go negative. A prolonged accommodative policy is justified on the grounds that it can make up the "overly" restrictive policies the central bank is constrained to follow because of the ZLB. The zero-interest-rate policy should last longer because it must compensate for the periods in which rates should have gone negative.

Inflation overshooting reduces the costs of the ZLB when the economy is adversely hit by a recessionary shock. An economy in a liquidity trap is an economy with an overly high level of savings with respect to what would be optimal (that is, net savings equal to zero). In this situation, the effective real interest rate exceeds the natural rate of interest. Given that the nominal interest rate is prevented from falling beyond the ZLB, the real interest rate can be lowered thanks to the expectations of the price level being sufficiently higher in the future. Therefore, inflation expectations should sufficiently rise to be compatible with a lower long-run real interest rate. In a similar way, to the requirement of a longer stay at the zero bound, the higher inflation rate at the exit can also compensate for the periods in which the policy rate was constrained by the ZLB. All these policies stimulate a faster recovery and reduce the duration of the trap as well as the related costs.

History dependence is an important feature of the adjustment to avoid that "bygones are bygones". The economy should not only recover but also follow a path that makes up the losses and negative gaps experienced during the stay at the ZLB. It is likely that during this period, the economy has experienced both a recession and a period of below-target inflation; and both these factors have usually produced a departure from the before-crisis nominal GDP trend. The optimal response to such a shock is to reconnect the nominal GDP path to the pre-crisis trend. Such an objective can only be achieved if the gaps accumulated in the past are appropriately accounted and compensated for by future gains. This is the reason why inflation should overshoot the target; otherwise, the previous trend would never be reached.

There is an additional problematic key aspect of these three implications. Each of these implications involves commitments to future actions that, once the time of their implementation arrives, might no longer be optimal and therefore will unlikely be pursued. Given that expectations of economic agents are critical for the recovery, the lack of credibility regarding the actual future implementation of such accommodative policies could undermine the recovery by nullifying the effects of any policy announcement.

This problem is made more dramatic by another failure in the ECB's 2021 strategy. We acknowledge that this strategy partially accounts for the desiderata emphasised by the literature, because the ECB allows for "a transitory period in which inflation is moderately above target"; and this specification underlines the ECB's commitment to enable the inflation rate to overshoot the target. However, the 2021 strategy leaves completely undetermined the direction and the magnitude that these deviations should have with respect to the losses faced during the period the economy was at the ZLB. There is no history dependence in the ECB's policy implementation. Hence, this policy could be insufficient for shaping expectations in the right direction, for it leaves open the quantification of what "transitory" and "moderately" mean, risking that agents would expect policy to contract at the first inflation scare.

The next Section will further discuss this point in connection with the Fed's review strategy.

4. THE IMPLEMENTATION: FED VS. ECB

The Fed has also recently revised its strategy to raise its inflation targets. Actually, the Fed had moved earlier (August 2020), and the ECB followed (July 2021). Although the picture was broadly the same, the responses of the two central banks cannot be treated identically. There are common points but also significant differences.

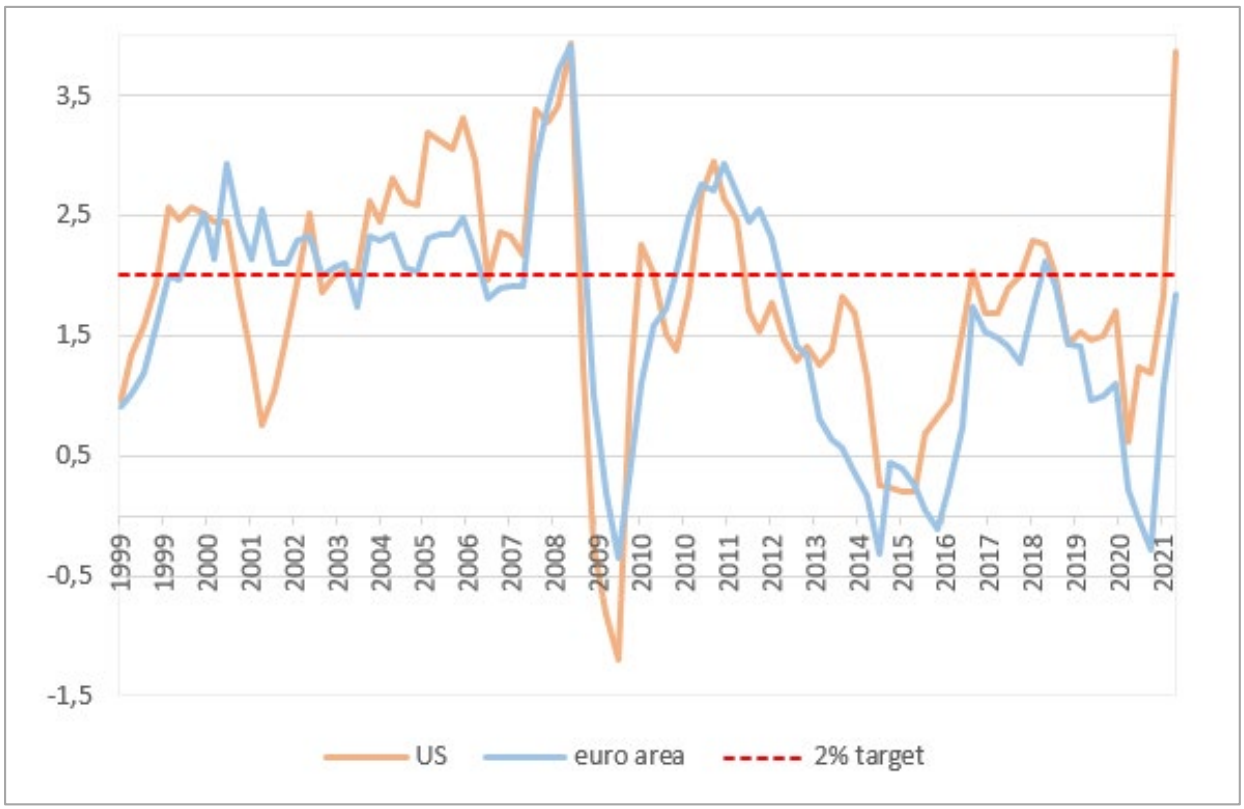
Let us start with the common points. Both institutions pointed to the downward shift in real interest rates that were required to stabilise the economy, and the consequent high risk of hitting the (effective) ZLB during downturns. As a result, both central banks argued in favour of higher inflation rates and inflation expectations as a preventive remedy for the risk of being constrained by the ZLB. This position is based on descriptive evidence. Figure 2 plots the inflation rate dynamics since 1999 in the two economic areas. After the financial crisis, inflation is systematically below the 2 % in both cases. Even if referring to the entire sample, the average inflation rate remains below 2 %. The average inflation rate of the United States is equal to 1.4 % in the pre-strategy review period (2013-2020), while it is equal to 1.8 % for the whole sample. Analogously, the average inflation rate of the euro area is equal to 1.6 % over the period from 2003 to 2021, that is, when this rate should have been "close to but below 2 %". Moreover, it is equal to 1.2 % in the period after the global financial crisis and before the strategy review (2009-2021); again, the figure is definitely below, but not quite close to 2 %.

In both strategy reviews, the inflation target is fixed at 2 %. However, the specific strategies adopted by the Fed and ECB differ in their general objective, as well as in the perimeter and the tools utilised.

The Fed reiterated its firm commitment to realising its statutory mandate from Congress, that is, promoting maximum employment, stable prices, and moderate long-term interest rates. However, it revised not only its inflation target but also the other components of its monetary policy framework, and mainly the policy tools and the communication practices. The Fed motivated its strategy review with the growing awareness of the structural transformations of the economy and, more specifically, with the observed structural decline in the natural rate of interest[7] and with the diminished sensitivity of inflation to the slack in productive resources (see also Powell, 2021).

[7] Estimates of the natural rate of interest in the United States show that this rate declined from above 2 % in the period preceding the 2007–2009 recession to less than 1 % in the following years.

Figure 2: Inflation rates in the US and in the euro area



Source: Fred (St. Louis Fed).

On 27 August 2020, the Federal Open Market Committee (FOMC)[8] introduced a new regime of inflation targeting, which can be labelled as flexible average inflation targeting (FAIT). The FOMC:

> *"judges that longer-term inflation expectations that are well anchored at 2 percent foster price stability and moderate long-term interest rates and enhance the Committee's ability to promote maximum employment in the face of significant economic disturbances. In order to anchor longer term inflation expectations at this level, the Committee seeks to achieve inflation that averages 2 percent over time, and therefore judges that, following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time."*

In describing its new strategy, the Fed highlights the importance of employment (and financial stability) at least on a par with the goal of price stability, thus confirming its dual mandate[9]. It also underlines that the objective of medium-term employment cannot be precisely specified in quantitative terms, so that there is a certain degree of discretion in the conduct of monetary policy:

[8] This Fed committee, which is in charge of determining the monetary policy of the area, is composed of twelve members: the seven components of the Board of Governors, the president of the New York Fed, and four out of the eleven presidents of the other Federal Reserve Banks selected on a rotating basis.

[9] *"The Committee judges that the level of the federal funds rate consistent with maximum employment and price stability over the longer run has declined relative to its historical average. Therefore, the federal funds rate is likely to be constrained by its effective lower bound more frequently than in the past. Owing in part to the proximity of interest rates to the effective lower bound, the Committee judges that downward risks to employment and inflation have increased. The Committee is prepared to use its full range of tools to achieve its maximum employment and price stability goals."*

> *"the maximum level of employment is a broad-based and inclusive goal that is not directly measurable and changes over time owing largely to nonmonetary factors that affect the structure and dynamics of the labour market. Consequently, it would not be appropriate to specify a fixed goal for employment; rather, the Committee's policy decisions must be informed by assessments of the shortfalls of employment from its maximum level, recognizing that such assessments are necessarily uncertain and subject to revision."*

As we already stressed, the ECB's 2021 strategy review implies an inflation target strictly equal to 2 %. The main difference from the previous target ("below but close to 2 %") is marked by the emphasis on the symmetry: the ECB's new strategy implements "the price stability objective in terms of an unambiguous and symmetric target". The 2003 formulation of the target tended to lead "[…] to possible ambiguity about the level of the inflation aim and a perception of the aim being asymmetric, which – in proximity to the effective lower bound – may have contributed to the low-inflation environment". Symmetry in the inflation target means, instead, that negative and positive deviations of inflation from the target are equally costly and undesirable. Therefore, the ECB would be ready to act with the same strength in case of an inflation rate either higher or lower than 2 %.

It is important to stress that the setting of the ECB's new target is accompanied by two further concepts: medium term and proportionality. The first concept already played a significant role in the older strategies. Now, it is however underlined that the orientation to the medium term "[…] allows the Governing Council to cater in its monetary policy decisions for other considerations relevant to the pursuit of price stability". On the other hand, the principle of proportionality, which is mentioned with insistence in the review, allows the ECB to combine the commitment to a symmetric inflation target with some discretion margins in the implementation of monetary policy. It is, in fact, emphasised:

> *"that faced with large adverse shocks, the ECB's policy response will, as appropriate and based on a careful proportionality analysis, include an especially forceful use of its monetary policy instruments. In addition, closer to the effective lower bound, it may also call for a more persistent use of these instruments. This may also imply a transitory period in which inflation is moderately above target."*

The final part of the last quotation suggests that these two concepts, which are ancillary to the 2 % symmetric target, can offer the ECB some degrees of freedom in approaching the 2 % inflation target (Bini Smaghi, 2021). As explicitly argued in the new strategy review:

> *"the medium-term orientation provides flexibility to take account of employment in response to economic shocks, giving rise to a temporary trade-off between short-term employment and inflation stabilisation without endangering medium-term price stability. It also allows the ECB to take account of financial stability, where appropriate, in view of the interdependence of price stability and financial stability. The use of such flexibility could also be the result of a careful proportionality assessment of the appropriate policy measures."*

This quotation has, at least, two implications. First, the definition of "medium term" refers to a time window for achieving the inflation target which is different from that imposed by the lags of monetary policy. Secondly, the reference to proportionality confirms the statement included in the quotation at the end of the previous paragraph: in special circumstances, the ECB is likely to tolerate an inflation rate above the 2 % target for longer than the medium term.

In this respect, the definitions of medium term and proportionality go in the same direction as the Fed's claim that it would not be appropriate to specify a quantitative goal for active monetary policies,

recognising that assessments of the shortfalls of employment are uncertain and subject to revision. In the case of the euro area, the mandate of the central bank is narrower and, as such, less binding; however, the ECB should account for the additional constraints due to the lack of a political union.

This common point in the new inflation strategies of the Fed and the ECB is strengthened by other important similarities. Both central banks stress the downward shift in the natural rate of interest and the consequent growing risks of hitting the (effective) ZLBs during downturns. Consequently, in some way, both institutions also emphasise the need for the inflation rate to be higher on average than in the past. The theoretical literature concludes that policies of nominal GDP targeting are a good approximation of what policy-makers should achieve when shocks bring the economy to the ZLB. However, differently from the ECB, the Fed explicitly refers to a target defined on an average 2 % inflation rate through time: if the inflation rate is below the target for a given percentage and a given number of periods, the new strategy will require that the Fed pursue an inflation rate above the target for the equivalent percentage and periods. It is worth stressing why this strategy emphasises the crucial differences between the ECB's symmetric target and its possible tolerance of a higher inflation rate when the economy hits the ZLB.

The Fed's new target implies that, if the economy is in a period of prolonged low-price dynamics and high unemployment, subsequent monetary policies will push prices above the 2 % target and will thus also ensure low unemployment for an equally long-time period. This strategy highlights a well-known point: the conditions of the real economy and employment are prominent in the Fed's dual mandate, whereas they are subordinated goals in the ECB's mandate. However, there is another main difference. Let us assume that the economies of both areas are hit by a period of high inflation and that the consequent restrictive monetary policies lead to a downturn in the economic and inflation cycle just after a prolonged time lag. In the United States, the reference to the average inflation rate would imply that the Fed's monetary policy should continue its restrictive stance for an equivalent time lag despite the economic recession. On the contrary, in the euro area, the ECB should immediately switch to an expansionary monetary policy due to the symmetric costs associated with the deviations from the target.

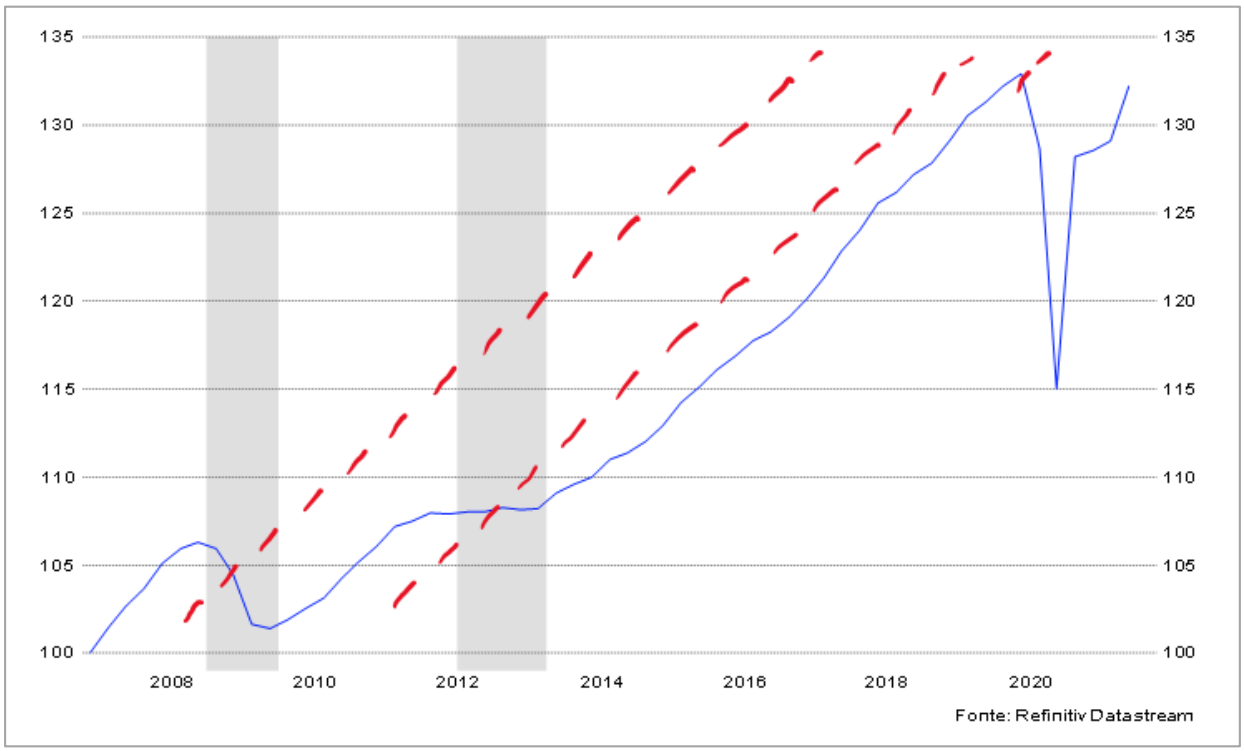
It would be inappropriate to conclude that the ECB's new strategy is more effective than the Fed's for at least two reasons. First, the dual mandate of the Fed would weaken the pro-cyclical stance of monetary policy characterising the paradoxical case examined above. The prominent role of employment and economic stability in the Fed's main goals would kick in, appropriately trading off the overly high past inflation with the overly high current unemployment. Secondly, due to its average 2 % target over a given horizon, the Fed accounts for history dependence: periods of below-target inflation are made up by periods of above-target inflation. Therefore, as we noticed above (see Section 3), the Fed is in the condition to make credible commitments to its future monetary policy and to influencing agents' expectations. On the contrary, the ECB's monetary policy cannot make such commitments because it cannot be based on history dependence.

Let us add that these two aspects are not sufficient to overturn the previous hypothesised hierarchy in the relative effectiveness of the ECB's and the Fed's new strategies. In this respect, it is sufficient to note that the dual mandate of the Fed risks undermining the strength of history dependence. According to the first aspect, the 2 % target of the average inflation rate can be overcome by the other component of the dual mandate; however, if this possibility becomes common knowledge, the credibility of future monetary policy commitments will largely vanish. The conclusion is that both central banks have difficulties making commitments about their future monetary policies, although for different reasons.

To give a partial illustration of the above discussion, consider Figure 3 which plots the nominal GDP of the euro area since 2007. As can be seen, the 2007-2008 crisis produced a significant contraction in

nominal GDP, which recovered at the end of 2009 with a trend that was below the one it would have followed had there been no crisis. In a similar way, the recovery after the 2011-2012 sovereign debt crisis assumed a trend which was also below the pre-crisis one. Let bygones be bygones. The optimal response would have been to reflate the economy in a way as to reconnect its nominal GDP path to the pre-crisis trend. This reflation did not happen because inflation was below target during that period, averaging to only 1.5 % during the period 2008-2019 (see Figure 1 above).

Figure 3: Euro area nominal GDP



Source: Datastream.

Note: The blue line denotes the actual trend in the nominal GDP of the euro area, whereas the three red dashed lines denote the hypothetical trends that nominal GDP would have followed in absence of the respective recessions of 2008-2009, 2011-2012 and 2020.

Following the recession due to COVID-19, inflation as well as the nominal and real GDPs have now picked up. However, the ECB's statement of the new strategy review does not specify until which point inflation will be tolerated. A direction in terms of nominal GDP or average inflation targeting would have clarified the magnitude of the reflation needed for a complete recovery.

5. CONCLUSIONS

Price stability remains at the heart of the ECB's mandate, and the monetary policy strategy specifies the quantitative terms of this goal. In the 2021 review of its strategy, the ECB has clarified that a 2 % inflation target must be applied symmetrically with a medium-term orientation. Symmetry towards 2 % is the main novelty of this recent review.

These changes in the ECB's strategy can appear negligible. In our paper we show, instead, that a 2 % symmetric target can significantly contribute to anchoring inflation expectations and limiting the risks of ZLB constraints by also allowing for the possibility of inflation temporarily and moderately overshooting the target. This new target can, thus, improve the effectiveness of monetary policy and promote better coordination between monetary policy and fiscal policies (policy mix) in the EU.

These improvements do not mean that the ECB's new strategy is without flaws. In the paper, we support the adoption of a symmetrical target on the basis of the optimality of building an inflation buffer against the fall in the natural rate of interest and the higher frequency of ZLB episodes. However, the ECB's new strategy fails to connect the new target to history dependence and, hence, to put the ECB's forward guidance on more solid bases. In any case, a critical comparison with the new strategy implemented by the Fed in 2020 shows that overcoming this weakness is not an easy task.

Our general conclusion is that the new strategy represents an important step towards improving the effectiveness of the European policy by also endorsing the recent advances in the monetary policy literature. However, the main challenge for European policy in the post-pandemic period is centred on the evolution of the policy mix and, more specifically, on the related possibility of building stable coordination between national fiscal policies and a centralised EU fiscal policy. An efficient monetary policy can positively contribute to this aim; and the new symmetric ECB's strategy can strengthen this contribution. Nevertheless, the crucial issue in this context remains the construction of a partial but permanent centralised fiscal policy.

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In July 2021, the ECB's target was revised, specifying that the 2% inflation rate threshold should be applied symmetrically and with a medium-term orientation. We argue that a symmetric inflation target can significantly contribute to anchoring inflation expectations and to limiting the risks due to the zero- and/or effective-lower bound constraints. The monetary policy strategy revision will play a key role in the policy mix between fiscal and monetary policies for the post-pandemic recovery.

This paper was provided by the Policy Department for Economic, Scientific and Quality of Life Policies at the request of the Committee on Economic and Monetary Affairs (ECON) ahead of the Monetary Dialogue with the ECB President on 15 November 2021.

PE 695.474
IP/A/ECON/2021-50

PDF ISBN 978-92-846-8694-0 | doi:10.2861/80054 | QA-05-21-320-EN-N