STUDY

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Options for the ECB's Monetary Policy Strategy Review

Policy Department for Economic, Scientific and Quality of Life Policies
Directorate-General for Internal Policies
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Abstract

The ECB is the most important institution for the success of the EMU. It started successfully but the crisis revealed weaknesses related to the incomplete nature of the EMU. The ECB was too timid in using its power, which deepened the euro crisis and led to divergences that threaten the viability of the EMU. With suitable modifications of its monetary policy strategy, and better use of the authority delegated to it, the ECB could greatly improve its success in fulfilling its mandate.

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LIST OF ABBREVIATIONS

BIS	Bank for International Settlements
BOJ	Bank of Japan
CPI	Consumer price index
CRA	Credit rating agency
DSA	Debt sustainability analysis
ECB	European Central Bank
ELB	Effective lower bound
EMU	Economic and Monetary Union
ESCB	European System of Central Banks
ESG	Environmental, social, and governance criteria
Fed / FRB	Federal Reserve Board
FOMC	Federal Open Market Committee
FRED	Federal Reserve Economic Data
FSB	Financial Stability Board
GDP	Gross Domestic Product
GFC	Global financial crisis
HICP	Harmonised index of consumer prices
IMF	International Monetary Fund
LTRO	Long term repo operations
NCB	National central bank
NIRP	Negative interest rate policy
OIS	Overnight indexed swap
PCE	Personal consumption expenditures price index

PEPP	Pandemic emergency purchasing program
PSI	Private sector involvement
PSPP	Public sector purchase programme
QE	Quantitative easing
SDW	Statistical Data Warehouse
SGP	Stability and Growth Pact
SNB	Swiss National Bank
SPF	Survey of professional forecasters
TEU	Treaty on European Union
TFEU	Treaty on the Functioning of the European Union
TLTRO	Targeted longer-term refinancing operations
US	United States
YCC	Yield curve control
ZLB	Zero lower bound

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EXECUTIVE SUMMARY

Background

The European Central Bank (ECB) is the most important institution for the success of the Economic and Monetary Union (EMU). It is more independent than its peer central banks of other advanced economies, and it has been entrusted with far broader discretionary authority to fulfil its mandate. However, its record has been uneven. Following a good start, that surpassed expectations, it was challenged during the global financial crisis (GFC) and the euro crisis that followed. Overall, the euro area performed worse than other advanced economies since the crisis. The ECB pursued a policy of lowflation that unnecessarily restricted growth and employment below what could be achieved without compromising price stability. In addition, ECB policies contributed to a sharp macroeconomic divergence within the EMU, a continuing source of fragility.

A unique challenge for the ECB, relative to its peer central banks, is that it serves as the common central bank to multiple sovereign states that do not form a political union. In the absence of a common government and common fiscal policy, the ECB is confronted with political pressure and legal challenges that reflect conflicting national interests. The prohibition of monetary financing and fiscal transfers, in particular, has been invoked to challenge ECB policy. We find that the ECB has the independence and authority to fulfil its mandate better, but has been too timid to use its power, owing to an overcautious interpretation of these prohibitions.

The ongoing review of the ECB's monetary policy strategy can examine improvements on several dimensions. Two weaknesses stand out and demand urgent attention. First is the lack of a precise definition of the ECB's interpretation of its primary mandate of price stability. Unlike all other major advanced economy central banks that have adopted a clear 2% inflation goal as their definition of price stability, the ECB's interpretation remains vague. This makes monetary policy less effective in general, but especially so in the face of adverse developments such as the ongoing pandemic. Adopting a 2% inflation goal the soonest would re-anchor inflation expectations and improve the ECB's ability to promote growth and employment without prejudice to price stability, in accordance to its mandate.

The second weakness relates to the implementation of monetary policy: It has contributed to an excessive fluctuation and widening of the spreads between Member States and has impaired the transmission of the single monetary policy. As it currently stands, the ECB's collateral framework has the propensity to introduce uncertainty about sovereign debt roll-over. The ECB can address this issue by making more effective use of its authority under Article 18 of the Statute of the European System of Central Banks and of the European Central Bank.

We further discuss the role of the ECB in addressing the challenges of environmental sustainability and climate change. The ECB can have a significant effect on the relative financing cost of green technology. This should be considered in the broader context of the substantial spending power of the ECB. The ECB has incredible discretionary authority that can be employed to support various desirable goals. The choice between these goals has large distributional effects, not only between industries, but also between Member States. This choice is political in nature and outside the scope of the ECB's authority.

The ongoing pandemic hit the euro area economy while the adverse consequences of the euro crisis of the 2010s were still lingering. So far, the ECB responded more aggressively to the challenges posed by the pandemic, with important temporary deviations from its underlying policy strategy. These temporary corrections should lead to permanent adjustments to the ECB's monetary policy strategy.

The ECB's monetary policy strategy review presents a unique opportunity for the ECB to examine how to best employ its immense power, in accordance with its mandate, to serve the people of Europe.

Recommendations

1. Adoption of a symmetric 2% inflation goal

A clearly communicated inflation goal anchors inflation expectations and improves the effectiveness and efficiency of monetary policy. In addition, it improves accountability and thereby protects against political pressures. Among the central banks of the world's largest advanced economies, the ECB currently stands out as the only one that has not yet adopted a clear inflation goal. 2% has emerged as a global standard.

2. Implementation of the 2% inflation goal

In implementing a 2% goal, the ECB should consider a policy strategy that accounts for persistent downside misses of the goal. The lower bound on interest rates introduces an asymmetry in the risks relating to the achievement of price stability. To counterbalance this asymmetry, the ECB could tolerate temporary overshoots to its 2% target after episodes of downside misses to ensure that inflation over the long term is consistent with the 2% goal. Such a policy reduces long-term uncertainty about the price level, which reinforces the institution's commitment to price stability over the long term.

3. Economic cohesion

The ECB's monetary policy strategy should support economic cohesion of the Union more strongly than in the past. Economic cohesion of the Union is part of its overarching goals as defined in the Treaty, and therefore part of the broader mandate of the ECB. More directly, however, cohesion is essential for protecting price stability in individual Member States, and thus part of the ECB's primary mandate. Furthermore, lack of cohesion as reflected in divergences of macroeconomic developments across Member States hinders the effective deployment of monetary policy in an even fashion within the EMU, which poses an unworkable challenge to monetary policy.

4. Other objectives

The ECB's broader mandate contains several other objectives, as stated in Article 3 of the Treaty, that are less directly related to monetary policy. For instance, scientific and technological advance, and environmental sustainability, both are important objectives of the Union and demand attention. With respect to economic sustainability, the ECB can and should address it directly by being ecologically mindful and avoiding waste. However, this issue is only vaguely related to the primary mandate and core central banking functions. The ECB should abstain from prioritizing some of the Union's objectives that are only vaguely related to price stability over other objectives. Doing so would be a distraction from the ECB's legitimate tasks, risk its politicisation, and compromise its independence.

5. Impairment of the monetary transmission mechanism

Since the euro crisis, the ECB has repeatedly experienced challenges associated with the effective transmission of its monetary policy across Member States. The temporary measures that have been adopted in the ECB's forceful response to the pandemic have demonstrated that this issue can be addressed better than in the past. We recommend that the ECB draw lessons from this experience to ameliorate *on a permanent basis* the structural weakness that manifested in the euro crisis.

6. Cliff effects in the collateral framework

The ECB's reliance on private credit rating agencies (CRAs) in the determination of collateral eligibility for credit operations produces dangerous cliff effects, and is contrary to best practice as advocated by

the Financial Stability Board (FSB). The ECB has the authority to establish the principles used to evaluate the adequacy of collateral, based on Article 18 of the Statute. Given the prime role of government debt in the monetary transmission mechanism, we recommend that the ECB remove reliance on ratings for sovereign debt.

7. Overreliance on market prices

In evaluating debt sustainability of Member States, the ECB should strictly rely on fundamental factors, instead of the ECB's current practice of relying on market-based interest rate projections. Market prices can be excessively volatile and misleading in times of stress, and relying on them is procyclical. In addition, using market rates for debt sustainability analysis invites the possibility of multiple self-fulfilling equilibria. By relying on market interest rates as an assumption for debt sustainability, the ECB effectively chooses to validate whatever equilibrium is reflected in market rates. This can inhibit the safe equilibrium that the central bank could have chosen to validate instead.

8. Communication of policymaker projections

Policy communication could benefit from publishing ECB Governing Council projections, especially about inflation. While staff projections are very useful for understanding the state of the economy, they are less informative than the views of the Governing Council as these can better incorporate policy intentions and show differences of opinion among committee members regarding the outlook. To improve transparency and guidance, we recommend that the ECB publish the Governing Council's projections.

9. Instrument for systematic policy

The ECB could consider communicating the systematic nature of its policy calibration with a benchmark policy rule, similar to the implicit rule that described ECB monetary policy before the GFC. Since the overnight interest rate instrument cannot serve this role well in the current low interest rate environment, the ECB could replace it with a longer-term interest rate or the size of its balance sheet. A rule could explain how the ECB intends to adjust the size of its balance sheet, or its longer-term interest rate instrument, in response to changes in the outlook of inflation. Such a rule would buttress the ECB's commitment to pursue its primary mandate in a systematic fashion. It would also reinforce that the purpose of public sector purchases and lower long term interest rates is the pursuit of the primary mandate alone, and is not to be misunderstood as monetary financing.

10. Protect against politicisation

In designing its monetary policy strategy, the ECB should avoid the appearance that it is willing to deploy its monetary policy instruments to enforce fiscal discipline. Doing so would obviously be outside of the purview of the ECB. Since the euro crisis, the ECB has allowed this appearance to take root. This appearance alone threatens the independence of the ECB and its effectiveness in fulfilling its mandate. We recommend that the ECB reaffirm that "[…] it is not and cannot be the ECB's role to enforce fiscal discipline and to correct shortcomings in the implementation of the Stability and Growth Pact" (Issing, 2005).

11. Historical policy records

The ECB is overly secretive regarding its policy deliberations. Unlike other major central banks, it does not make available to the public detailed minutes or transcripts of meetings, and the staff documents associated with the discussion. This hinders transparency and accountability, and it obstructs historical

policy evaluation that would benefit the ECB's policy assessment process. We recommend that the ECB make historical policy records available, in lightly redacted form, with a 5-10 year delay.

12. Periodic policy strategy review

Periodic strategy reviews are an integral component of transparency, accountability, and the democratic legitimacy of the ECB. The ECB's strategy review in 2003, about five years after the adoption of its original strategy, was constructive and improved policy. We recommend that the ECB embraces the practice of regular strategic reviews in reasonable intervals.

1. INTRODUCTION

A central bank's monetary policy strategy guides policy decisions and ultimately determines the success with which the central bank fulfils its mandate. To be effective, the strategy must be stability-oriented and promote systematic, well-informed, rules-based decisions. At the same time, it must evolve over time, reflecting changes in the structure of the economy, the institutional environment, and society's goals and aspirations. Adaptation of the strategy should also reflect the evolution of policymakers' understanding of best practices. Recognising that even with best intentions, policymaking is never error free, a good policy strategy should help reduce the incidence of errors. With a critical evaluation of performance, flaws or inadequacies in decision-making processes can be identified and corrected. Change can be informed by historical experience, by comparisons with practices of peer institutions as well as by advances in policy research. In democratic societies, in accordance with governance principles for independent institutions, the strategy needs to also respect democratic legitimacy and check the use of discretion, while accommodating shifts in the goals and aspirations of society, within the central bank's statutory mandate.

In this context, the ECB Governing Council's decision to launch a review of the ECB's monetary policy strategy is most welcome. The ECB is a relatively young central bank. Since its founding in 1998, the ECB has undergone only one review of its strategy, in May 2003. A lot has changed since then. The global financial crisis (GFC) presented a "once-in-a century" challenge to the global central banking community, prompting numerous changes in global policy. In its teenage years, right after the GFC, the ECB also faced the unique challenge of the euro crisis—an existential threat to the European project. Since then, the economic performance of the euro area has been notably worse than that of other developed economies, and the euro area has been more vulnerable to adverse shocks. The pandemic of 2020, yet another "once-in-a-century" challenge, added to the urgency of finding solutions to, as of yet, unresolved problems. A review of the ECB's monetary policy strategy presents an opportunity to take stock of the ECB's current framework and decision-making processes; to evaluate the degree to which the ECB has succeeded in properly applying the discretionary authority delegated to it; and to identify how it can better serve the interests of Europe, in accordance with its mandate.

Compared to central banks of other advanced economies, the ECB is unique in that it serves as the common central bank to multiple sovereign states that do not form a political union. The European Monetary Union (EMU) integrates monetary policy under one roof without a comparable integration of fiscal policy. This creates unavoidable tensions and poses a challenge for the ECB unlike any faced by other central banks. It also raises the stakes associated with its success and reduces the margin for error. Monetary policy errors can be far more damaging than the temporary loss of output and employment. They can compromise the political viability of the EMU.

It was well understood at the time that the construction of the EMU, as envisioned in the 1992 Maastricht Treaty, was fragile. The multiple crisis episodes experienced over the past decade would not have come as a surprise to the many monetary experts who had cautioned against a hasty introduction of the common currency. In 1996, Rudi Dornbusch concluded an essay expressing such concerns succinctly: "If there was ever a bad idea, EMU is it." (Dornbusch, 1996, p. 123).

Despite this assessment, the first decade of EMU was more successful than most had anticipated. But the system was not seriously tested during these years and its fragility became apparent with the GFC — its first major test.

From the very beginning, the challenge for the ECB has been to identify and implement a monetary policy strategy that best contributes to the lofty goals of the European Union (EU), in accordance with

its mandate, and in a manner that mitigates the risks posed by the incomplete nature of the EMU. In this regard, the ECB's record has been uneven. The ECB's policy strategy served Europe well during the first several years of its operations but less so over the past decade. In light of the experience of the past decade or so, adapting the ECB monetary policy framework has the potential for a great improvement.

The objective of this study, which has been prepared for the Committee on Economic and Monetary Affairs (ECON) of the European Parliament, is to facilitate the discussion of options for the ECB's monetary policy strategy review. In accordance to the terms of reference, we study a number of pertinent issues, ranging from an assessment of the ECB's track record in achieving its mandate, to a set of policy recommendations regarding the strategy review. As part of our analysis, we explore issues that are common to those faced by other central banks, and lessons that can be drawn from the global policy experience. We pay particular attention to the unique circumstances pertaining to the EMU that make the ECB's challenge more complex.

2. THE INSTITUTIONAL FRAMEWORK

The monetary policy strategy of the ECB must account for the unique institutional framework of the Economic and Monetary Union. A review of the ECB's strategy aims to identify how to improve the institution's contribution to the objectives of the European Union and the aspirations of the European people, within its mandate. This entails understanding how to use effectively the discretionary authority delegated to the institution, within the broader context of the governance of the EMU, and with due respect to the democratic legitimacy of its decisions. This section offers a brief review of this institutional framework and the ECB's mandate.

2.1. The EU, the EMU, and the objectives of the Union

Unlike peer central banks of other advanced economies, the ECB is the common central bank of a number of sovereign states that is a subset of the Member States of the European Union. The European project is a political project. The founders of the EU and the EMU shared a vision that a unified Europe would be a more prosperous and more powerful Europe. The Union would support shared prosperity and preserve peace, a goal of immense significance after the Second World War. Across the Atlantic, the United States of America suggested a path and offered an example of the leverage associated with a large, unified, integrated democracy.

Winston Churchill's 1946 call for The United States of Europe could deliver this goal but was not politically feasible in light of the diversity of European states whose citizens did not share a common European identity. The European unification project proceeded in smaller steps, first reaping the low hanging fruits of free trade, then leveraging that with cooperation in other areas, evolving into the European Union: More unified than a mere confederation of sovereign states governed by a Treaty but well short of the political union that a federation would demand. The introduction of a common currency was meant to further the incomplete political integration process.

The Union's noble objectives appear in Article 3 of the Treaty on European Union (TEU), reproduced here, because of its significance for the ECB, as elaborated below:

> "1. The Union's aim is to promote peace, its values and the well-being of its peoples.
>
> 2. The Union shall offer its citizens an area of freedom, security and justice without internal frontiers, in which the free movement of persons is ensured in conjunction with appropriate measures with respect to external border controls, asylum, immigration and the prevention and combating of crime.
>
> 3. The Union shall establish an internal market. It shall work for the sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress, and a high level of protection and improvement of the quality of the environment. It shall promote scientific and technological advance.
>
> It shall combat social exclusion and discrimination, and shall promote social justice and protection, equality between women and men, solidarity between generations and protection of the rights of the child.
>
> It shall promote economic, social and territorial cohesion, and solidarity among Member States.
>
> It shall respect its rich cultural and linguistic diversity, and shall ensure that Europe's cultural heritage is safeguarded and enhanced.

> 4. The Union shall establish an economic and monetary union whose currency is the euro.
>
> 5. In its relations with the wider world, the Union shall uphold and promote its values and interests and contribute to the protection of its citizens. It shall contribute to peace, security, the sustainable development of the Earth, solidarity and mutual respect among peoples, free and fair trade, eradication of poverty and the protection of human rights, in particular the rights of the child, as well as to the strict observance and the development of international law, including respect for the principles of the United Nations Charter.
>
> 6. The Union shall pursue its objectives by appropriate means commensurate with the competences which are conferred upon it in the Treaties."

Without a common federal government, and in light of the unavoidable presence of conflicting national interests, the achievement of these common objectives is not assured. Success depends on mutual trust and cooperation among the governments of the individual Member States, with input from the European Parliament (the only political body elected by the citizens of all Member States), and support from common institutions whose role is spelled out in the Treaty.

2.2. Economic and monetary policy of the Union

Among the Union's institutions two are most important for economic and monetary policy: The European Commission and the ECB. Both are supremely independent from political influence, at least in theory. Independence is of critical importance for the Union to manage the common goal of all its citizens, and protect against undue influence by individual Member States, which would compromise the fundamental principle of equality.

Article 130, Treaty on the Functioning of European Union (TFEU), describes the unparalleled degree of independence enjoyed by the ECB and national central banks (NCBs) in Europe:

> "When exercising the powers and carrying out the tasks and duties conferred upon them by the Treaties and the Statute of the ESCB and of the ECB, neither the European Central Bank, nor a national central bank, nor any member of their decision-making bodies shall seek or take instructions from Union institutions, bodies, offices or agencies, from any government of a Member State or from any other body. The Union institutions, bodies, offices or agencies and the governments of the Member States undertake to respect this principle and not to seek to influence the members of the decision-making bodies of the European Central Bank or of the national central banks in the performance of their tasks."

No other central bank enjoys a similar degree of independence. Given the incredible power of the central bank, this places a premium on ensuring the legitimacy of the discretionary authority it exercises.

The European Commission enjoys a similar degree of independence, described in a separate article in the Treaty. The European Commission serves a special role as the "Guardian of the Treaties", but compliance ultimately depends on the governments of the Member States that retain most executive power.

With respect to the economic policy of the Union, two elements are pertinent to our discussion. Each Member State retains the authority to design its own economic policy. However, the essential role for cooperation and a successful common policy is recognized. The Treaty stipulates close cooperation of Member States' economic policies based on guiding principles that include an open market economy with free competition, price stability and sound public finances. (Article 119) This is important, but challenging to enforce in practice, in the absence of a common government.

This sets the stage for the mandate of the ECB. This is spelled out in Article 127(1) TFEU, which applies to the central banks of all Member States of the Union, including those outside the EMU:

> "The primary objective of the European System of Central Banks (hereinafter referred to as "the ESCB") shall be to maintain price stability. Without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Union with a view to contributing to the achievement of the objectives of the Union as laid down in Article 3 of the Treaty on European Union. The ESCB shall act in accordance with the principle of an open market economy with free competition, favouring an efficient allocation of resources, and in compliance with the principles set out in Article 119."

This paragraph is repeated in Article 2 of the Statute that provides more detail on the legal foundations regarding the functioning of the ECB and ESCB.

Two features of the formulation of the ECB's mandate are worth stressing in the context of examining the ECB's monetary policy strategy. First, the Treaty unambiguously defines "price stability" as the primary objective of the ECB. However, it does not define the meaning of price stability. Effectively, this delegates the task of providing the precise meaning of "price stability" to the ECB itself, which makes this decision a key aspect of the ECB's monetary policy strategy.

As already noted, Article 127(1) applies to all other central banks in the Union, including in Member States outside the EMU that operate in their own currency and can have their own interpretation of price stability. For a Member State outside the monetary union, the specific law governing the mandate of its national central bank needs to be compatible with Article 127(1) TFEU, but the language need not be identical. This results in some notable differences.

For example, the Bank of England Act 1998, contains two pertinent articles. Article 11, with the heading "Objectives", corresponds to Article 127(1) TFEU:

> "In relation to monetary policy, the objectives of the Bank of England shall be—
>
> (a) to maintain price stability, and
>
> (b) subject to that, to support the economic policy of Her Majesty's Government, including its objectives for growth and employment."

This is followed by Article 12, with the heading "Specification of matters relevant to objectives". Article 12 clarifies that, in the case of the Bank of England, the Treasury retains the authority to provide the precise meaning of "price stability". This distinction highlights the larger governance issue associated with the interpretation of the objectives of an independent institution with delegated authority.[1]

The second noteworthy feature of Article 127(1) is that it unambiguously assigns to the ECB the responsibility to contribute to the achievement of all the noble objectives listed in Article 3 of the Treaty, as long as doing so is consistent with price stability. This adds considerable complexity to the task of evaluating ECB policy. Contributing to the achievement of the Union's many goals entails conflicts. In principle, the ECB can do well in contributing to the achievement of one or more of the Union's goals at the cost of not contributing to the achievement of others. Without additional guidance on how to compare the relative merit of these contributions, the basis of an evaluation may not be well defined.

[1] See Tucker (2018) for an extensive treatment of this issue as it pertains to central banks.

2.3. The fiscal governance framework of the EMU

In any economy, sound fiscal policy is a prerequisite for maintaining price stability. In principle, excessive deficits leading to unsustainable debt would raise concerns about the potential for fiscal dominance, leading to high inflation.

Participation in a monetary union creates the potential for a "deficit bias," a concern relating to the tragedy of the commons. Assuming that all other Member States will pursue "sound" fiscal policy, each Member State may be tempted to engage in "excessive" deficits, benefiting from the credibility of the sound policies of all the other states without compromising price stability overall. Of course, this cannot be an equilibrium: if all Member States pursue "excessive" deficits, then, by definition price stability will eventually be compromised. To ensure that a "deficit bias" is avoided by individual Member States, and sound fiscal policy is maintained for the monetary union as a whole, a fiscal framework was put in place at the outset.

The framework is based on the commitment that: "Member States shall avoid excessive government deficits" (Article 126(1) TFEU). The operational details on what constitutes an "excessive deficit" have evolved over time, starting with the so called "Stability and Growth Pact" (SGP) that was adopted before the euro was launched.

Given the interactions between fiscal and monetary policy and the fiscal implications of alternative strategies, a question of particular significance for our purposes relates to the monitoring and enforcement of the fiscal framework.

When the EMU was formed, governments agreed on two reference values for monitoring compliance with the SGP. The overall government deficit of each Member State should not exceed 3% of GDP, and debt should not systematically exceed 60% of GDP. These reference values, and the inflexibility they implied for fiscal policy, attracted justifiable criticism. At one level, they are rather arbitrary limits that may hinder good policy. But they were not entirely arbitrary.

Otmar Issing explained the rationale in his book *The Birth of the Euro*: Under reasonable growth assumptions, a 3% deficit ratio was consistent with debt stabilising at about 60% of GDP, which at the time was roughly equal to the average of the Member States. Interestingly, the assumption about inflation associated with his reasoning was that it would average around 2%.

The monitoring of compliance with the fiscal rules is the responsibility of the European Commission, in its capacity as guardian of the Treaties. Enforcement, on the other hand, is ultimately the responsibility of the political bodies of the Union, and as such far more vulnerable to short-sighted political considerations than would be desirable. This has resulted in calls for the ECB to be more actively engaged in the disciplining of governments of Member States, inviting tensions.

Article 126 TFEU lays out an elaborate procedure on the various steps associated with monitoring and reporting of potential violations, when the Commission judges that there is a risk of "excessive" deficits in a Member State.

The Stability and Growth Pact effectively places upper limits on the deficits of individual Member States that can be implemented in response to adverse macroeconomic developments. The rules are asymmetric in that they may restrict fiscal easing but not fiscal tightening. With insufficient coordination of the fiscal policies of the Member States, this can result in an inappropriately tight overall fiscal stance for the EMU during a recession, thus interacting with monetary policy.

2.4. Prohibition of monetary financing and fiscal transfers

Two additional safeguards meant to promote fiscal discipline and protect price stability were included in the EMU design.

The first was the prohibition of monetary financing, stipulated in Article 123 TFEU:

> "Overdraft facilities or any other type of credit facility with the European Central Bank or with the central banks of the Member States (hereinafter referred to as "national central banks") in favour of Union institutions, bodies, offices or agencies, central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of Member States shall be prohibited, as shall the purchase directly from them by the European Central Bank or national central banks of debt instruments."

The second was the prohibition of fiscal transfers, found in Article 125 TFEU.

> "The Union shall not be liable for or assume the commitments of central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of any Member State, without prejudice to mutual financial guarantees for the joint execution of a specific project. A Member State shall not be liable for or assume the commitments of central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of another Member State, without prejudice to mutual financial guarantees for the joint execution of a specific project."

While meant to provide incentives for sound public finance, these two articles create a potential for misinterpretation that could hinder policy, especially relating to crisis management that might warrant extraordinary coordination among the governments and the central banks of the Union for effective resolution.

The potential for such misinterpretation was manifested during the euro crisis. For example, questions were raised whether the ECB was permitted to purchase government debt as part of quantitative easing operations that many of its peer central banks were also pursuing in the aftermath of the GFC. Although quantitative easing is widely recognised as a monetary policy operation, this did not stop legal challenges against the ECB. As another example, arguments were made that the ECB should refrain from policies that resulted in the reduction of the financing cost of government debt. But since monetary policy is transmitted to the economy through long-term interest rates, such an interpretation would effectively impair the basic function of the central bank in the economy.

2.5. ECB discretionary authority

Together with its supreme independence, the ECB was provided with exceptionally wide-ranging discretionary authority on how to implement monetary policy—pertinent for the operational aspects of its policy strategy. This is evident in Article 18 of the Statute relating to "open market and credit operations":

> "18.1. In order to achieve the objectives of the ESCB and to carry out its tasks, the ECB and the national central banks may:
>
> – operate in the financial markets by buying and selling outright (spot and forward) or under repurchase agreement and by lending or borrowing claims and marketable instruments, whether in euro or other currencies, as well as precious metals;
>
> – conduct credit operations with credit institutions and other market participants, with lending being based on adequate collateral.

> 18.2. The ECB shall establish general principles for open market and credit operations carried out by itself or the national central banks, including for the announcement of conditions under which they stand ready to enter into such transactions."

The ECB's wide authority covers the two basic tools of central banking operations: Asset purchases, and lending operations. Recall that the immense power of central banks arises from their ability to issue potentially unlimited quantities of reserves in their own currency, and use those reserves to purchase assets and/or lend money.

The decisions on what assets to purchase (and correspondingly what assets to exclude from purchases) have a direct impact on the prices of these assets, related interest rates and interest rate spreads.

Regarding collateralised credit operations, the key clause is that they must be conducted "with lending being based on adequate collateral". This gives the ECB incredible discretion through the power to determine what is "adequate collateral" and what is not. This has direct influence on the availability and cost of credit. The precise terms chosen to determine the adequacy of collateral has a direct impact on the prices of assets that can serve as collateral, related interest rates and interest rate spreads.

This is the core of central banking. Discretionary decisions associated with the exercise of the authority granted to the ECB under Article 18 can diffuse or incite market tensions. They can also have immense distributional consequences. For these reasons, a close examination of the exercise of discretion under Article 18 must be an important part of the ECB's monetary policy strategy review.

The exceptionally wide-ranging discretionary authority available to the ECB is not limited to Article 18 of the Statute. The ECB's unparalleled discretion becomes even clearer in Article 20 of the Statute, relating to "other instruments of monetary control":

> "The Governing Council may, by a majority of two thirds of the votes cast, decide upon the use of such other operational methods of monetary control as it sees fit, respecting Article 2."

Compared to its peers, the ECB is not only the most independent central bank, it is also the central bank with the broadest discretionary authority delegated to it: It can effectively act "as it sees fit" to fulfil its mandate. This makes the *interpretation* of the ECB's mandate of paramount importance for the ECB's monetary policy strategy review.

3. HISTORICAL OVERVIEW OF EURO AREA ECONOMY

3.1. Performance of the euro area economy in a global context

A good starting point for evaluating policy in the euro area is a comparison of economic outcomes with the United States (US). The US economy is arguably the most directly comparable to that of the EMU in numerous respects, which has motivated similar comparisons over the years. A speech by then President Trichet offers a point of reference for such comparisons. As he noted on 10 June 2011, the economic performance of the euro area during the first decade or so of its operations was remarkably similar to that of the United States.

Figure 1 compares the annual rate of inflation in the United States and the euro area from 1999 to 2019. The top panel shows the headline inflation measures that the Federal Reserve and ECB respectively have been using to evaluate policy—the personal consumption expenditures price index (PCE) and harmonised index of consumer prices (HICP), respectively. The bottom panel shows core inflation measures that remove from the headline indexes food and energy. (Core measures of inflation facilitate comparisons of underlying policy differences that can be harder to see in headline measures due to the volatility of food and energy prices.)

Trichet noted that from 1999 to 2011, the evolution of inflation in both economies had followed a similar pattern. Inflation averaged close to 2%, in both economies. For the euro area, President Trichet concluded this was a remarkable success. As he noted:

> "Annual inflation over the first 12 years of EMU has been 1.97% on average. This outcome is fully in line with our aim of keeping inflation below, but close to 2% over the medium-term. What is equally noticeable is that it is a better result, in terms of price stability, than in the euro area Member States over the last 50 years." (Trichet, 2011)

Looking at developments since then, however, identifies two small but important changes. Both are more clearly visible in the comparison of the core inflation data. First, for both the United States and the euro area, inflation has drifted downwards since the GFC. This is a reflection of a weakness shared with some other advanced economies. One challenge for several central banks since the GFC has been the persistence of low inflation. This has been a common challenge for the ECB and the Fed and an even greater challenge for some other central banks such as the Bank of Japan (BOJ) and the Swiss National Bank (SNB). For the Fed and the ECB, the evolution of inflation suggests that there was more room for monetary policy accommodation over the past decade or so, which could have raised inflation to be closer to 2%, where it was before the GFC, and would have resulted in higher growth and higher employment in the economy.

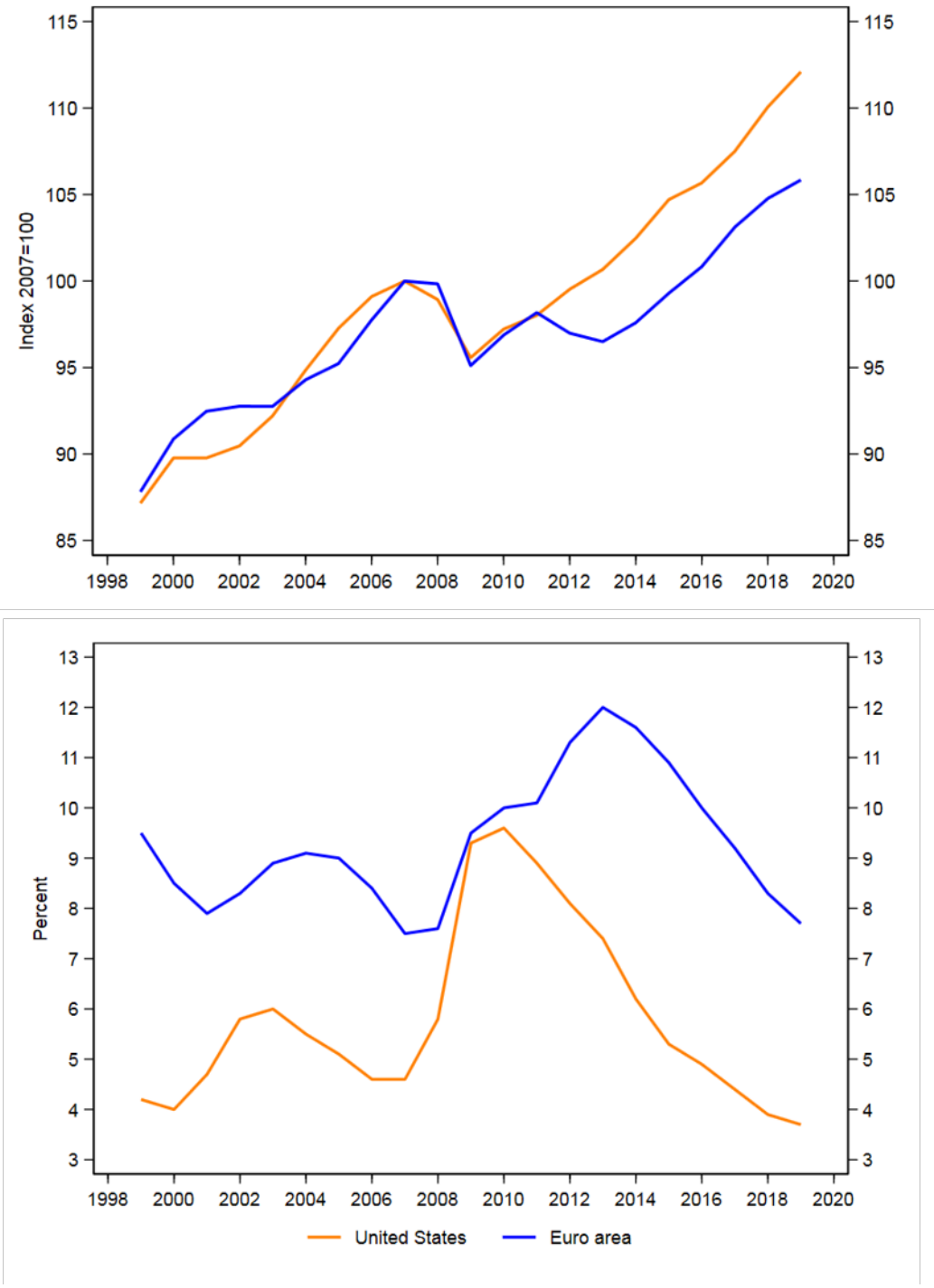
That said, it should be noted that ex post evaluation of actual inflation data, as shown in the figure, is not sufficient to identify whether monetary policy decisions in this period reflect "mistakes". After all, policy evaluation of this nature should be predicated on information available in real time. Sometimes policymakers may rely on information that is subsequently revised and proves wrong. Nonetheless, the small persistent bias in inflation outcomes from what might be preferable, demands scrutiny as it may suggest weaknesses in some elements of monetary policy strategy that could have provided more robust guidance. Indeed, the small persistent bias in realised inflation since the GFC has been an important reason behind the Federal Reserve's recent change in policy strategy, which we discuss later on.

Figure 1: Headline and core inflation: Euro area and United States

Source: ECB Statistical Data Warehouse (SDW), and Federal Reserve Economic Data (FRED), Federal Reserve Bank of St. Louis.

The second observation is that the miss in inflation is more pronounced in the euro area. While inflation was similar in the two economies until about 2011, on average, a persistent deviation has become noticeable since then. Indeed, core inflation in the euro are over the past several years has averaged closer to just 1%. This development has been given the moniker "lowflation" by the International Monetary Fund (IMF).

Figure 2: Real GDP per capita and unemployment rate



Source: AMECO, European Commission.

Figure 2 (top panel) compares the evolution of real GDP per capita. Again, as Trichet had noted in 2011, this was similar in both economies before and during the GFC as well as the early stages of the recovery

from the associated recession. However, this similarity did not last. Soon after Trichet delivered his remarks, the euro area experienced a second severe recession.[2]

Looking back, the GFC left deep scars in both economies. Among other consequences, this has contributed to an increase in inequality and has been a source of discontent. By 2019, US per capita GDP was about 7 percentage points below where it would have been had the pre-GFC trend continued. But the euro area did worse. Since 2012, GDP per person has remained consistently 5-6 percentage points below where it would have been had the euro area managed to keep up with the performance of the US economy. As of the end of 2019, the data suggested a continuing gap.[3]

Comparison of the unemployment rate, in the bottom panel of Figure 2 paints a similar picture. In the aftermath of the GFC, the euro area economy has underperformed notably. The recession that started in 2011, pushed unemployment even higher from an already elevated level due to the GFC. In contrast, US unemployment was already improving.

If the average inflation rate until 2011 represented a remarkable success, as Trichet suggested at the time, the "lowflation" that followed implies that ECB monetary policy has been overly tight, both in absolute terms but also relative to the Federal Reserve. Since more accommodative monetary policy would have resulted in higher growth and higher employment for the euro area as a whole, consistent with price stability, this demands closer examination.

3.2. Monetary policy

Monetary policy was eased considerably around the world during and after the GFC. However, since inflation outcomes were lower than central banks would have preferred, policy must have been too tight. Multiple factors likely contributed to monetary policy being overly tight since the GFC around the world. The fact that multiple central banks, including the Fed and the ECB, undershot inflation suggests that there are some common factors. But given that the extent of the undershooting has been greater for the ECB, we also need to examine whether factors specific to the ECB, such as potential constraints that may have obstructed the monetary policy process due to the nature of the EMU, could have played a role.[4]

An important common factor is the global low interest rate environment and the secular decline in the natural rate of interest. This had two implications that would have resulted in policy being tighter than desired. First, consider the degree of policy accommodation suggested by comparing the *actual* real interest rate to the *natural* real rate of interest. The slow learning process of the decline in the natural rate of interest implies that, for a period that lasted several years, policymakers thought the natural rate of interest was higher than they later recognised. The implication is that actual policy was tighter than they thought it was, for quite some time.[5]

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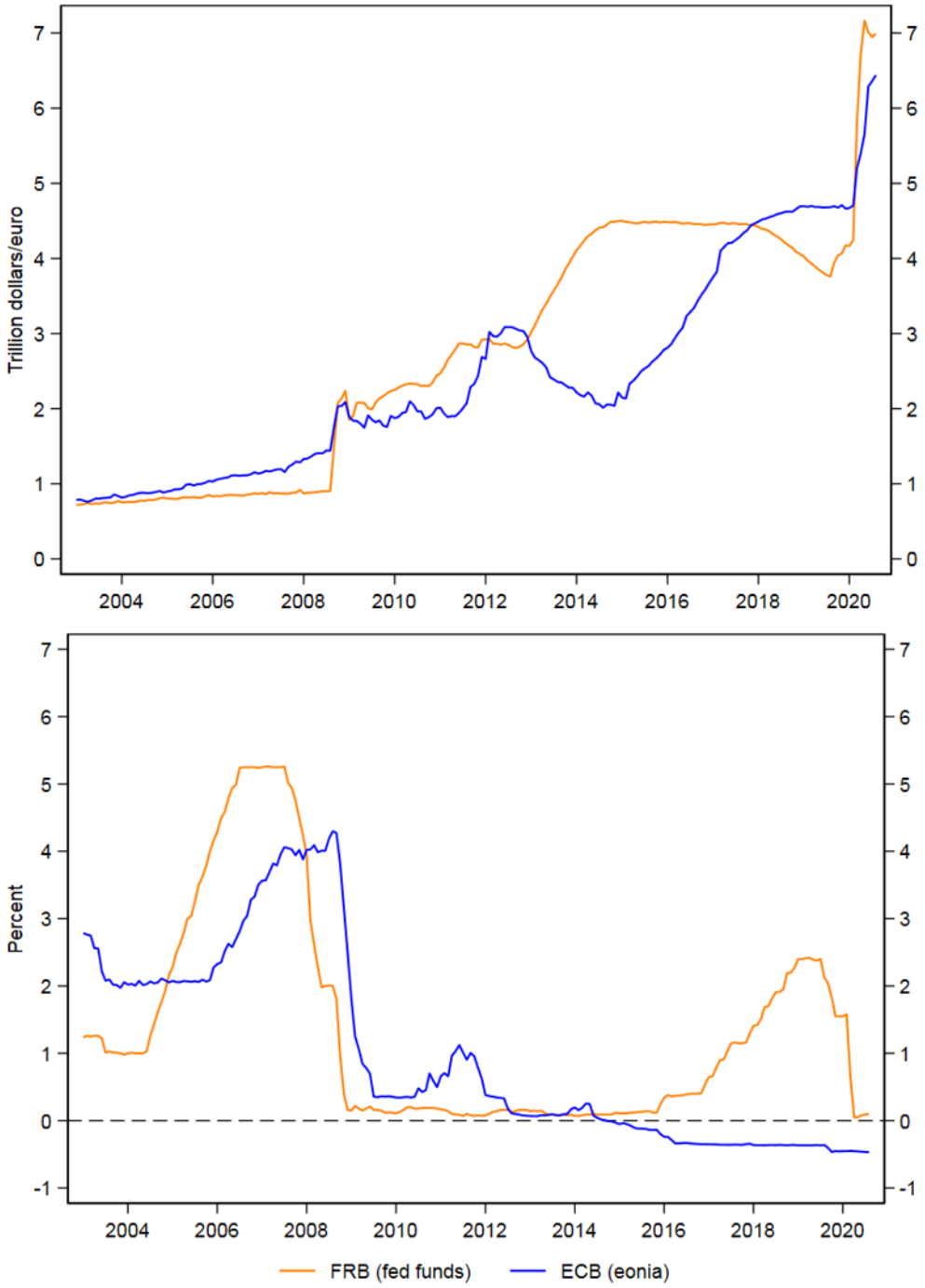
[2] The Euro Area Business Cycle Dating Committee identified 2011Q3 as the peak of the post-GFC recovery and 2013Q1 as the end of this recession. In contrast to the recession associated with the global financial crisis, this second recession was unique to the euro area among advanced economies. See Euro Area Business Cycle Dating Committee (2015).

[3] Since this comparison is done with annual data, the last observation reflects 2019 and does not contain information about 2020, and the impact of the ongoing pandemic. We return to the pandemic later on.

[4] Honohan (2018) usefully distinguishes between real and imagined constraints on ECB monetary policy since the GFC. Hartmann and Smets (2018) and Rostagno et al. (2019) provide detailed descriptions of ECB monetary policy during its first two decades.

[5] This is a simple manifestation of the larger problem associated with misperceptions regarding natural rates—a key reason why monetary policy strategy must put a premium on robustness (Orphanides and Williams, 2002).

Figure 3: Monetary policy: Euro Area and United States



Source: ECB SDW, and FRED, Federal Reserve Bank of St. Louis.

The second implication of low interest rates is that the room for easing monetary policy with interest rate cuts to counter a recession was more limited during the GFC than in earlier recessions. During the GFC, this room was quickly used, leading to an encounter with the zero lower bound on nominal

interest rates (ZLB).[6] In late 2008 and early 2009, both the Fed and the ECB quickly cut interest rates to close to zero (Figure 3, bottom panel). This did not provide sufficient policy accommodation to counter the deep recession.[7] To provide additional accommodation, central banks can resort to quantitative easing, which supports bond and other asset prices, thereby providing monetary accommodation even if the short term interest rate remains unchanged (Figure 3, top panel). Quantitative easing can take many forms, all associated with oversupplying reserves to the monetary system, which expands the central bank's balance sheet. A central bank can issue reserves and use them to purchase domestic government bonds (as the Fed has favoured and the ECB adopted later), or to lend to financial institutions that in turn can purchase other assets (the approach originally favoured the ECB with long-term refinancing operations [LTROs] and related programs). Quantitative easing can also be implemented by issuing reserves to purchase foreign assets, the approach favoured by the Swiss National Bank.

Since a central bank can potentially issue unlimited quantities of reserves in its own currency, Quantitative easing (QE) can be potentially unlimited. In principle, QE can be employed to provide as much accommodation as needed to prevent lowflation. However, before the GFC, only the Bank of Japan had utilised QE in the modern era so its potency was quite uncertain. Coupled with concerns about potential side effects, QE was introduced with some caution. In the case of the Fed, as can be seen in ECB SDW, and FRED, Federal Reserve Bank of St. Louis, QE was introduced in steps. The largest expansion was launched in 2013, when the Fed recognised that the monetary accommodation already in place was not sufficient to raise inflation close to 2%. This expansion was open ended and was discontinued only when the Fed had confidence that inflation was about to stabilise at 2%. The Fed subsequently judged that it needed to withdraw some of this accommodation, and started raising interest rates. In light of this experience with QE, the Fed could comfortably be more decisive in its response to the pandemic in 2020, as will be discussed in more detail later.

While the ECB similarly expanded its balance sheet from 2008 to mid-2012, it appears to have faced additional explicit and/or implicit constraints that resulted in unusual hesitation and limited this expansion. The exact causes of the ECB's unusual hesitation are not easy to determine from publicly available information alone. Quite possibly they may have included political pressure and/or concerns about legal challenges both of which could have been perceived as posing threats to the institution. Balance sheet operations have far more visible fiscal implications than short-term interest rate adjustments. In the context of the EMU, this attracted both criticism and legal challenges.

Whatever the exact cause, this hesitation led to a policy error. As can be seen in the top panel of Figure 3, from the summer of 2012 and until the end of 2014, while the Fed expanded its balance sheet the ECB engineered a contraction that reduced the size of its balance sheet by one third. This tightening of monetary conditions and policy divergence with the Fed, resulted in the downward drift in inflation shown in Figure 1. By the time the ECB decided to start expanding its balance sheet again, in 2015, inflation was already at a lower level. And once again, the ECB hesitated to expand its balance sheet as aggressively as was necessary to raise inflation towards 2%, where it had been before the GFC.

[6] More recently, this is also referred to as the effective lower bound (ELB), to accommodate the possibility of somewhat negative interest rates.

[7] The ZLB constraints policy because currency notes in circulation earn a nominal interest of zero. While somewhat negative interest rates can be engineered on bank reserves (indeed the ECB moved in that direction in recent years), too negative rates cannot be sustained as long as the central banks continues to supply, simultaneously, notes earning the much higher interest rate of zero.

3.3. Divergence of outcomes within euro area

The discussion so far examined macroeconomic outcomes and monetary policy for the euro area as a whole. This, however, obscures the most significant complexity faced by the ECB in the aftermath of the GFC—what eventually became the euro crisis. Looking only at the euro area as a whole obscures the divergence of economic performance during this period.

A good starting for this discussion is a speech by then President Draghi in 2014 that, similar to the earlier speech by Trichet, included comparisons between the euro area and the US. After observing that the US and euro area fared similarly during the GFC, and until early 2011, Draghi discussed the divergence due to the euro crisis, from 2011 on.[8] Draghi observed that in the euro area, in contrast to the GFC that had affected all euro area economies, "virtually all of the job losses observed in the second period were concentrated in countries that were adversely affected by government bond market tensions." (Draghi, 2014, p. 296). From Chart 2 in his presentation, five Member States stood out as relatively more vulnerable: Spain, Greece, Ireland, Italy and Portugal.

Figure 4 presents data to illustrate Draghi's observation. The figure shows the evolution of the unemployment rate for the twelve original Member States of EMU, split into two groups: The five "more vulnerable" Member States, and the remaining 7 less vulnerable ones. (These are Austria, Belgium, Germany, Finland, France, Luxemburg and the Netherlands.) Because structural unemployment rates differ, we normalise the unemployment rate for each Member State by subtracting the average for that state in the period before the GFC (1999-2007). The graph therefore shows the relative development of unemployment since the GFC.

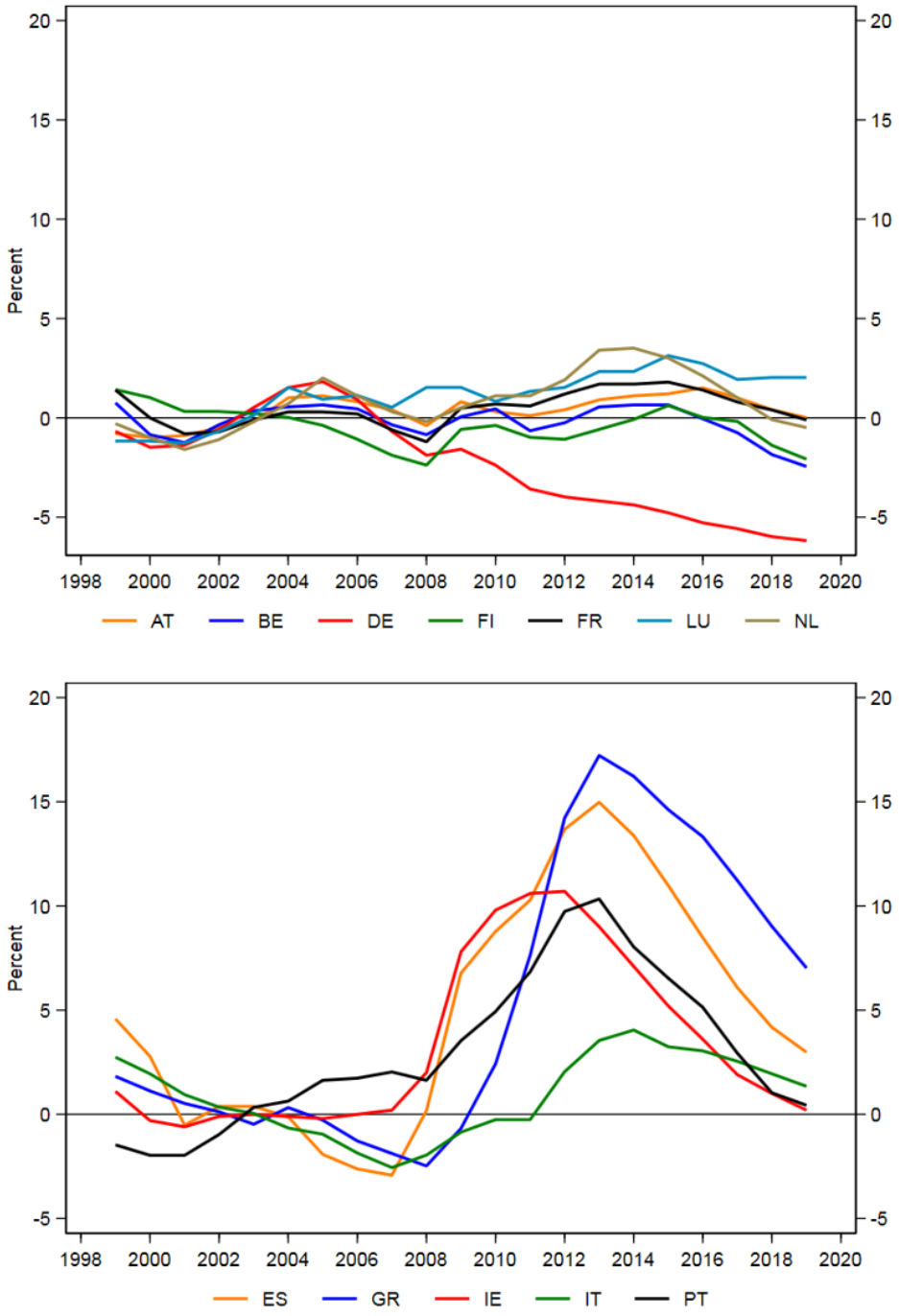
As can be seen, the decomposition confirms Draghi's observation. While the unemployment rate rose dramatically for the five "more vulnerable" Member States and persisted at a relatively high level for many years, no similar increase is evident in the rest of the euro area.

Figure 5 presents data for inflation for the twelve Member States split in the same fashion. This also shows a troubling difference in the experience of the two groups. The "more vulnerable" group experienced periods of sharp disinflation or deflation. No discernible difference in the inflation outcomes during the euro crisis appear for the less vulnerable group.

The heterogeneity of macroeconomic performance is startling. Outside of a monetary union, the vulnerable economies would have been able to implement easier monetary policy to soften the impact of the recession that followed the GFC. In the monetary union, these Member States could obviously not adjust monetary policy to that end. At the same time, ECB monetary policy did not shield these Member States even partially from the asymmetric shock they experienced. The ECB could have aimed to keep inflation steady on average, in the euro area as a whole, rather than pursue a policy of lowflation. If such a more accommodative policy had been pursued, the sharp recessions experienced in the group of more vulnerable Member States would have been shallower. The cost would have been somewhat higher inflation in the less vulnerable Member States. Such balancing of costs and benefits is the outcome one would have expected in a well-functioning monetary union in response to an asymmetric shock.

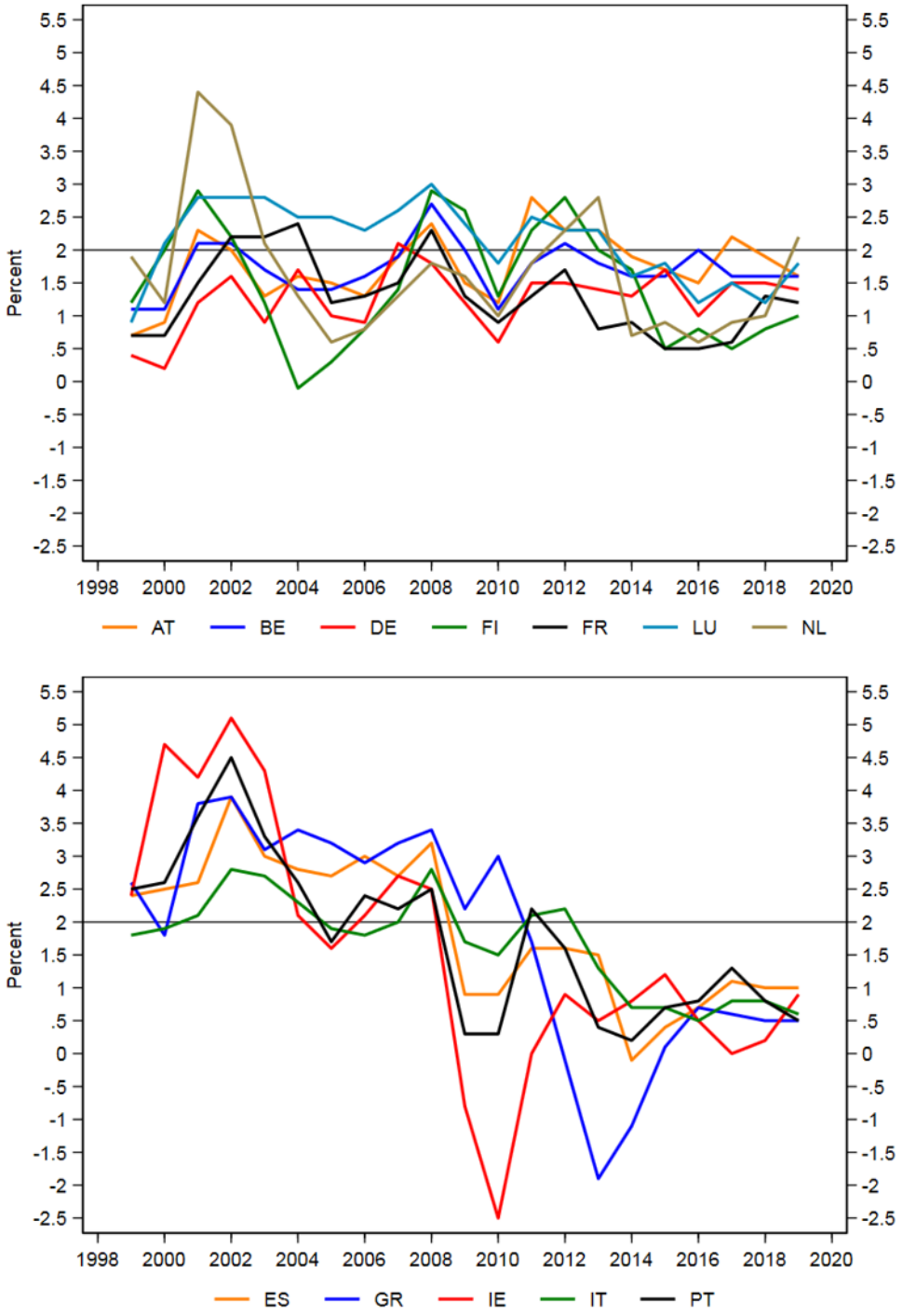
[8] He referred to the euro crisis as the "sovereign debt crisis". In Chart 2 of his talk, the start date of the crisis was noted as 2011. No end date was given.

Figure 4: Unemployment rate relative to pre-GFC average



Source: AMECO and authors' calculations.

Figure 5: Heterogeneity in core inflation



Source: ECB SDW.

However, another interpretation is available. As Honohan (2018) recounts, some policymakers framed the divergence in economic outcomes very differently. The relatively good performance of some states, and in particular the exceptional performance of the EMU's largest economy, Germany, could serve as benchmark. Underperformance relative to this benchmark could be attributed to "self-imposed national policy errors" (p. 9). According to this view, additional policy accommodation would thus be

undesirable: It could have obstructed the necessary structural reforms underperforming states should have adopted.

3.4. The euro crisis

The divergence of outcomes in the euro area after the GFC reflected errors in crisis management, mostly by euro area governments, that compromised the trustworthiness of sovereign debt issued in the common currency.

The recession associated with the GFC led to a deterioration of the fiscal condition of all Member States (as it did elsewhere around the world). This tested the fiscal framework associated with the common currency and raised questions about how potential rollover crises in government debt issued in the common currency would be handled.

Before the crisis, EU governments had mutually agreed to support the safe asset status of the government debt of all Member States. This was hardwired in European Directives pertaining to the regulation of the financial sector, with regulations that explicitly favoured government debt over other assets, consistent with practices in other advanced economies. However, treating sovereign debt as a safe asset in the context of the EMU worked across purposes with the incentives for fiscal discipline that was considered critical for the success of the EMU.

Should governments have continued to support the safe asset status of government debt while dealing with the fiscal stress exposed by the GFC or not? When the euro was introduced, no crisis management mechanism was put in place for dealing with temporary liquidity problems that a Member State might experience. The gap was patched with a series of decisions taken in the aftermath of the GFC, but the solution adopted was to elevate the credit risk associated with sovereign debt issued by most euro area governments and resulted in the adverse economic outcomes associated with the euro crisis.

A brief discussion of two crisis mismanagement episodes is warranted in light of their implications for the transmission of the monetary policy in the euro area and the ECB's monetary policy strategy.[9]

One of the clearest examples of the mismanagement of the euro crisis was the decision to inject unnecessary credit risk in euro area sovereign debt markets on 18 October 2010. This was decided at the sidelines of a Summit meeting in Deauville that brought together the heads of states of Russia, Germany and France. Germany and France together represent about half of the euro area, which gives their joint decisions clout. Remarkably, in light of how predictably costly this decision was for other Member States, other governments went along: The Franco-German decision taken in Deauville was formalised as a European agreement at the European Council meeting in Brussels on 28-29 October 2010, despite ECB objections that were communicated to the governments at that meeting by ECB President Trichet.

Deauville introduced the Private Sector Involvement (PSI) doctrine for euro area sovereign debt. The concept was that whenever a euro area Member State faced liquidity difficulties associated with rolling over its debt, losses would be imposed on the private creditors, regardless of whether the Member State's debt was sustainable and the government was solvent.

[9] There were many more: Wyplosz (2014) characteristically calls the euro crisis "A near-perfect case of mismanagement." Given the complex interaction of many contributing factors, there is considerable diversity of views on their relative importance for understanding the euro crisis. Studies that have contributed to this debate include Bini-Smaghi (2013), Wolf (2014), Baldwin et al (2015), Wyplosz (2016) and Brunnermeier et al (2018).

Effectively, capital losses would be imposed on private sector participants holding government debt, even when this was unnecessary and undesirable. The PSI doctrine reversed long-standing global principles for crisis management. For example, in providing temporary financial assistance to countries facing liquidity problems, the IMF avoids debt restructuring when a country's debt is sustainable. Default is disruptive to the economy, and when unnecessary it is avoided. But the message of Deauville to potential investors of euro area sovereign debt could not be clearer: Euro area sovereign debt should no longer be considered a safe asset, even if debt was sustainable and the government issuing it had no intention of defaulting on it. Concern about rollover crises raised risk spreads in government bond markets and led to a severe fragmentation in financial markets, unwinding the progress that had been made with the adoption of the common currency. Because the debt of one Member State in the common currency can be easily substituted with that of any other, the euro became a driver of instability, leading to abrupt capital outflows from more vulnerable Member States towards less vulnerable Member States.

The disruption was similar to the "sudden stops" experienced by emerging market economies issuing debt in foreign currencies.[10] ECB Vice President Constâncio later characterised the outcome as "demotion" of national public debt:

> "First, the absence of any mechanism to respond to acute liquidity squeezes and "sudden stops" in the sovereign bond market, linked with the demotion of national public debts to debt with default risk. Panicking in markets, fragmentation and contagion without change in fundamentals, threatened the collapse of the whole project. No one had thought about the possibility of capital flows "sudden stops" within the European monetary union." (Constâncio, 2018.)

Although the most destructive form of the PSI concept that was introduced in Deauville was later abandoned, the disruption it created in the supply of safe assets in the euro area has yet to be resolved. Euro area government debt continues to be perceived as riskier than debt of similar advanced economies outside the EMU.

The second case of mismanagement we wish to highlight relates to the decisions taken at the Euro Summit in Brussels on 26 October 2011. It highlights how the introduction of risk in government debt was further leveraged into a negative feedback loop between government bonds, banks, and growth in the more vulnerable Member States.[11]

At that Summit, governments first established the precedent that private investors should expect, with some probability, to be wiped out if they purchased euro area government debt. Second, they decided to significantly raise bank capital requirements, calculated after marking down the value of government debt in bank portfolios using the depressed prices caused by the elevated perceptions of credit risk. The idea behind this decision was that a credible recapitalisation of the banking system in the euro area would have promoted growth. Indeed, this would have been the expected outcome if the governments had also adopted, simultaneously, another proposal that was on the table: To activate common euro area resources to provide the capital that would be needed by banks to meet the elevated capital requirements. However, this crucial part of the original joint plan was rejected. The result was to create a capital crunch that led to an abrupt credit contraction in the more vulnerable Member States. Indeed, this was the main driving force behind the sharp contraction in employment

[10] In their search for a common narrative of the euro crisis, Baldwin et al (2015) also point to the "sudden stop" aspect as of the crisis.

[11] Praet (2013) discusses this adverse feedback loop in greater detail. Agreement on the statement associated with this meeting, dated 26 October, was actually only reached in the wee hours of the following morning. This was likely a factor for the shortcomings of the decision.

and economic activity that followed, and explains why it mostly affected the more vulnerable Member States.

3.5. Impairment of the monetary policy transmission mechanism

In his 2014 Jackson Hole speech, President Draghi attributed the 2011 recession in the euro area, and its heterogeneous effects, to "[a] shock emanating from the sovereign debt crisis" (Draghi, 2014, p. 296). The sky-rocketing interest rates in the affected countries did two things: constrained fiscal policy, and interrupted the transmission of the expansionary monetary policy stance to these vulnerable states. They were hit by a combination of restrictive fiscal and monetary conditions, which naturally resulted in a deep recession.

This is well illustrated by the development of interest rates.[12] The top part of Figure 6 depicts the 2-year overnight indexed swap (OIS) rate for the US, Japan and the euro area and serves as a summary indicator for monetary policy in these three economies. The bottom part of the figure shows the spreads of yields of government bonds with respect to the OIS, which is informative regarding episodes when the monetary policy transmission is impaired. It shows spreads for the US, Japan and, for the euro area, its four largest Member States: Germany, France, Italy and Spain. Before the crisis, no country, either inside or outside the euro area experienced stress. Since the euro crisis, this has changed. In late 2011, the stress in Spain and Italy was so large that monetary conditions tightened even as the ECB was easing its policy. Even France experienced stress, but only briefly. Germany's spread over OIS, on the other hand, became negative. The differences reflected the introduction of credit risk in Deauville, and subsequent blunders, such as the decisions at the 26 October 2011 Summit. The associated changes of financing cost of the affected governments came about without any changes to their fundamental data or policies. This suggests the driver was adverse self-fulfilling dynamics, which can arise in government bond markets in the presence of multiple equilibria (see Box 1).[13] As ECB Vice President Constâncio aptly explained later,

> "The issue stems from the fact that the demotion of national public debt to debt with default risk opens the door, as in any other asset market, to episodes of acute liquidity stress with investors panicking or speculating, leading prices and yields to levels not justified by changes in fundamentals." (Constâncio, 2018)

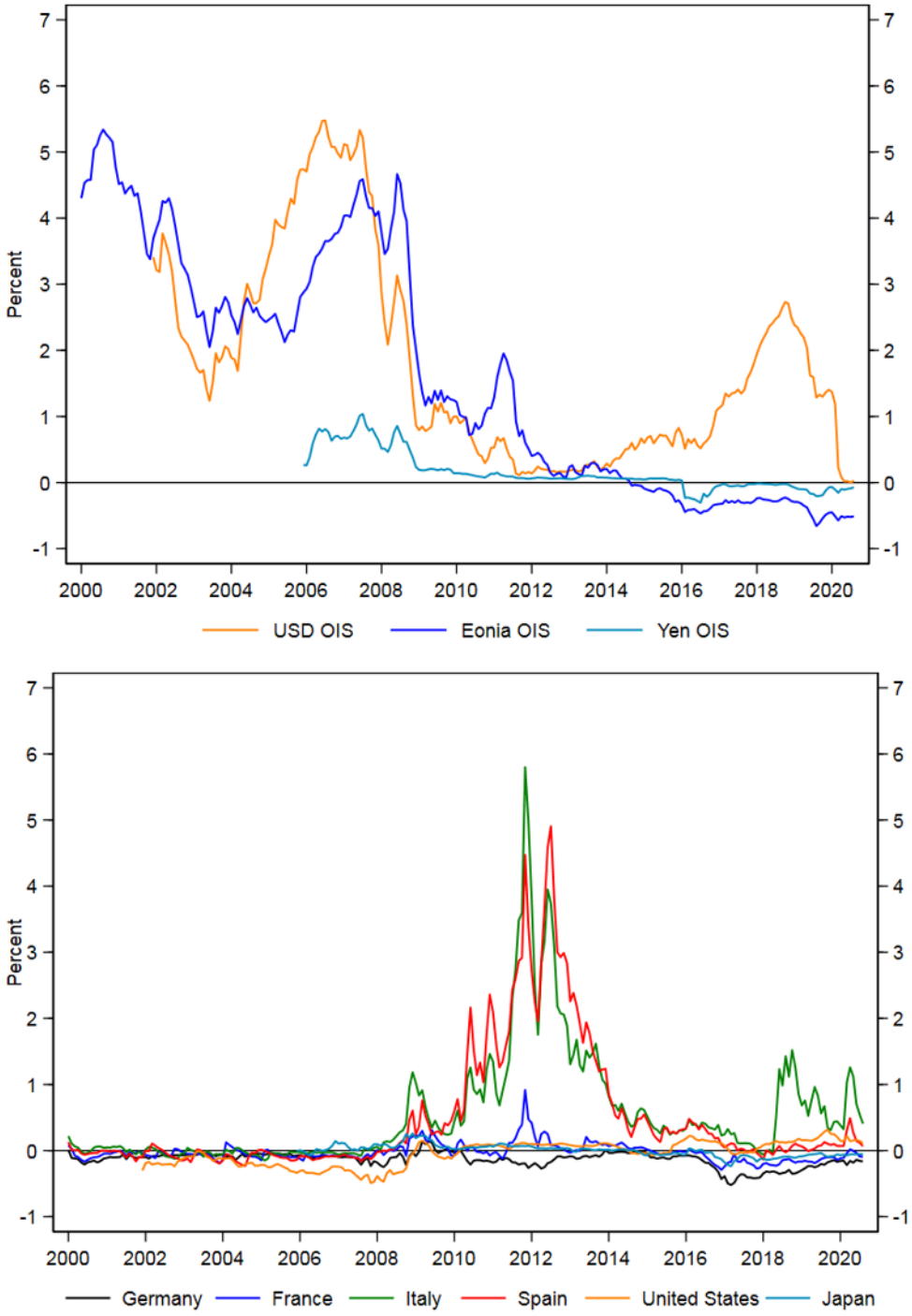
In a similar vein, President Draghi did not locate the origin of what he called the sovereign debt crisis in excessive debt. Instead, he suggested, it reflected the inability of the ECB to act similarly to its peer central banks:

> "[…] since 2010 the euro area has suffered from fiscal policy being less available and effective, especially compared with other large advanced economies. This is not so much a consequence of high initial debt ratios — public debt is in aggregate not higher in the euro area than in the U.S. or Japan. It reflects the fact that the central bank in those countries could act and has acted as a backstop for government funding. This is an important reason why markets spared their fiscal authorities the loss of confidence that constrained many euro area governments' market access." (Draghi, 2014, p. 306)

[12] We use the OIS interest rates. These are rates that are computed from swap contracts where one leg has a certain maturity, and the other leg is the overnight rate. These contracts are considered virtually default-risk free as the margin is settled daily. The spread of some interest rate relative to the OIS is therefore considered to be a good measure of risk.

[13] See, e.g. Calvo (1988), De Grauwe and Yi (2013) and Corsetti and Dedola (2016).

Figure 6: Monetary policy transmission at 2-year horizon



Source: Bloomberg and authors' calculations.

Notes: Top panel shows 2-year OIS rates, bottom panel shows the spreads between 2-year sovereign bond yields and the OIS rate of their respective currency.

Box 1: Debt sustainability and multiple equilibria

Sovereign debt is sustainable when a country's government is able and willing to generate sufficiently large future primary surpluses to service the debt and stabilise its level, relative to the size of the economy.

Let b denote the debt ratio and s the primary surplus ratio (to GDP). The key determinants of debt sustainability can be summarised in the following simplified form of the equation governing debt dynamics (the year-over-year change in the debt ratio):

$$\Delta b = (r - g)b_{-1} - s$$

Here, r is the interest rate the government needs to pay to refinance its debt and g the growth rate of GDP. Since sustainability requires that the debt ratio be declining over time ($\Delta b < 0$) or at least remain stable ($\Delta b = 0$), the equation above determines the minimum surplus required to keep the debt sustainable over time:

$$s = (r - g)b_{-1}$$

In principle, multiple self-fulfilling equilibria may arise in sovereign debt markets, corresponding to different beliefs regarding the ability of the government to service its debt. If investors believe that the debt is safe, the government can service its debt at the safe interest rate, r_S, which may require a very small primary surplus, or no surplus at all if the safe rate is smaller than the growth rate of the economy (as has been the case over the past decade in advanced economies). On the other hand, if investors believe there is a risk the government will not be able to service the debt, they will demand an additional risk premium, $\phi > 0$. The additional risk premium raises the interest rate, $r = r_s + \phi$, and makes the required primary surplus needed to keep the debt sustainable higher. The required primary surplus may be so high that the government may not be able to produce it with certainty, thus confirming the investor beliefs that the debt is risky.

When both a safe and risky equilibria are compatible with the underlying economic fundamentals, the central bank has a critical coordinating role on the equilibrium that will prevail in practice. If debt is sustainable when evaluated at the safe interest rate, the central bank should clearly communicate this and dispel the beliefs that credit risk is appropriate. Without such coordination, markets may well converge to an inferior (from a welfare perspective), self-fulfilling equilibrium that is, nonetheless, implicitly validated by the central bank.

The comparison of the primary balance and debt ratios for Germany, Italy and Japan (Figure 7) provides visual confirmation of President Draghi's acknowledgement that the euro crisis was not caused by high debt. Compared to Japan, Italy's debt ratio has been much lower and rose only modestly when the fiscal positions of advanced economies deteriorated in the aftermath of the GFC. Furthermore, Italy's fiscal policy remained very tight, despite the deep recession it experienced, and in contrast to Japan. In fact, Italy has been running primary surpluses in line with those of Germany. With global interest rates at historically low levels, Italy should have been able to run more expansionary policy and still see a decline of its debt ratio over the past decade. This has not happened. The reason is that unlike Japan, and unlike Germany, Italy has been consistently penalised since the start of the euro crisis with a significantly higher cost of refinancing its debt (Figure 8).

Draghi's statement points to the root of the problem: His statement implicitly acknowledges that if the ECB had acted similarly to peer central banks and diffused market tensions, the euro area would not have been in crisis. The statement also implies that, in his view, the ECB was *unable* to act in this manner.

It does not explain, however, why the ECB was unable to manage the unwarranted spreads that so many Member States had to endure.

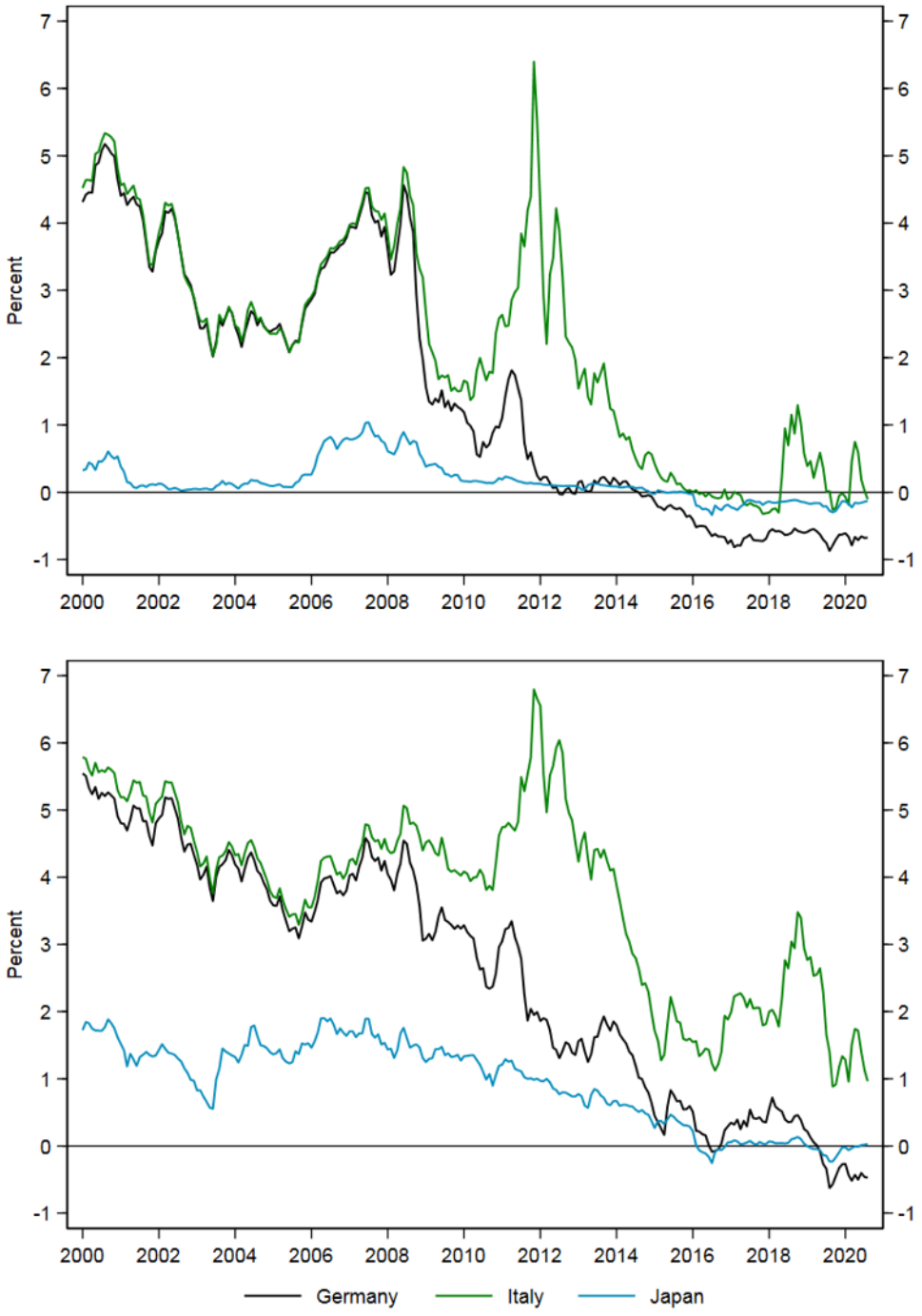
Figure 7: Primary balance and debt: Germany, Italy, Japan

Source: AMECO.

This points to two possibilities: If it is indeed true that the ECB does not have the legal authority to manage spreads to address market stress, especially when it concerns such a central market as the one

for sovereign debt, then this constitutes a serious flaw in the design of the legal framework in which the ECB operates. Such a flaw, if it exists, needs to be addressed urgently to safeguard the continued viability of the euro. If, on the other hand, the ECB *does* have the legal authority to adapt its policy framework in a manner than can address unwarranted market stress in government bond markets and does not do so, this would constitute an abdication of its responsibility.

Figure 8: Government bond yields, 2- and 10-year maturity: Germany, Italy, Japan



Source: Bloomberg.

4. THE ECB'S PRIMARY MANDATE OF PRICE STABILITY

4.1. The ECB's original interpretation of its mandate

At its 13 October 1998 meeting, the ECB Governing Council adopted its original policy strategy. This included a quantitative (though imprecise) definition of price stability, our focus in this section. (We return to other aspects of the strategy later on.) The ECB communicated that price stability would be maintained "over the medium term" properly acknowledging the lags in the monetary policy transmission process and the need for policy to somewhat pre-emptive.

With regard to the interpretation of its mandate and definition or price stability, the ECB announced, specifically:

> "As mandated by the Treaty establishing the European Community, the maintenance of price stability will be the primary objective of the ESCB. Therefore, the ESCB's monetary policy strategy will focus strictly on this objective. In this context, the Governing Council of the ECB has adopted the following definition: "Price stability shall be defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%." (ECB, 1998).

With this interpretation, in particular the statement that the ECB would "strictly focus" on price stability, the ECB inappropriately downplayed its Treaty obligations to contribute to the European Union's multiple objectives, without prejudice to price stability. That said, a strict focus on price stability certainly simplified the decision making process of the young institution and could be seen as facilitating building credibility, which was surely of paramount concern.

It should be noted that minutes or transcripts of this discussion, or detailed information about the briefings and other supporting material that prepared the Governing Council discussion are not available to the public, even more than two decades after the fact. Without this material, which *is* available for the historical policy record of some other central banks, it is not clear what the basis for this questionable interpretation was. The lack of historical information about policy deliberations and supporting material deserves attention in the context of transparency and accountability.

Regarding the definition of price stability, the most notable element of the ECB decision in October 1998 was the avoidance of precision. This proved to be a consequential decision. Lack of clarity diffuses accountability and invites counterproductive discretion. The consequences of this decision are still lingering today so it merits some additional discussion.

The ECB could have adopted a clearer definition of price stability, for example a 2% inflation goal, as some central banks had adopted at the time. That said, in 1998, lack of precision was not uncommon in the interpretations of price stability provided by other central banks.[14]

By defining price stability as a rate of inflation "below 2%", the ECB attempted to provide continuity in two ways, which could help establish credibility. First, it allowed the ECB to claim that the definition was in line with "most current definitions adopted by national central banks in the euro area". Indeed, some NCBs that formed the EMU in 1998 lacked precise definitions of price stability. But a 2% inflation goal could also have been similarly described. Indeed some of the NCBs that were represented in the EMU, had been operating with an explicit 2% inflation target.

[14] The Fed and BOJ being prominent examples. At the Fed, lacking clarity on the policy committee's goal, the staff prepared analysis for policy meetings that routinely presented policymakers with multiple alternative goals, such as 1.5% and 2%. (Orphanides, 2020).

The second way in which the imprecise definition of price stability adopted in 1998 provided continuity was that it allowed the ECB to claim that "[t]he current rate of HICP inflation in the euro area is in line with this objective". By fall 1998, inflation had declined from around the 2% levels it had been in early 1997 to 1%. The decline was transient, associated with global developments that depressed economic activity and prices worldwide, notably the Asian financial crisis of 1997 and the Russian financial crisis of 1998. While adopting a 2% goal would have been more representative of the underlying trend in the data and revealed policy preferences in earlier years, tactical considerations argued for the less precise definition of price stability, a rate of inflation "below 2%". Otmar Issing, a founding member of the ECB Executive Board, later confirmed the importance of this tactical consideration: "In order to demonstrate the seriousness of its intent, the ECB Governing Council chose to define price stability – HICP inflation incidentally stood at 1 per cent in October 1998 – as a rate of price increase of 'below 2 per cent'." (Issing, 2008, p. 103).

4.2. Evolution of ECB's interpretation of its primary mandate

The ambiguity in the original definition of price stability would have a long-lasting effect on ECB policy. The perceived interpretation of the ECB definition of price stability evolved over time.

Examining the long-term inflation expectations in the ECB survey of professional forecasters (SPF) is informative. Figure 9 provides pertinent information from responses of individual professional forecasters regarding inflation 5 years ahead. Since typical cyclical fluctuations do not last that long, expectations of inflation 5-years ahead should reflect perceptions of the central bank's inflation goal. The responses can be aggregated in different ways and the figure reflects three alternatives. First, the mean and median of individual point forecasts. Second, the density mean, which is obtained from the probabilistic forecasts. The bottom panel shows percentiles of the point forecasts, which provides information about the disagreement among forecasters about the ECB's perceived inflation goal.

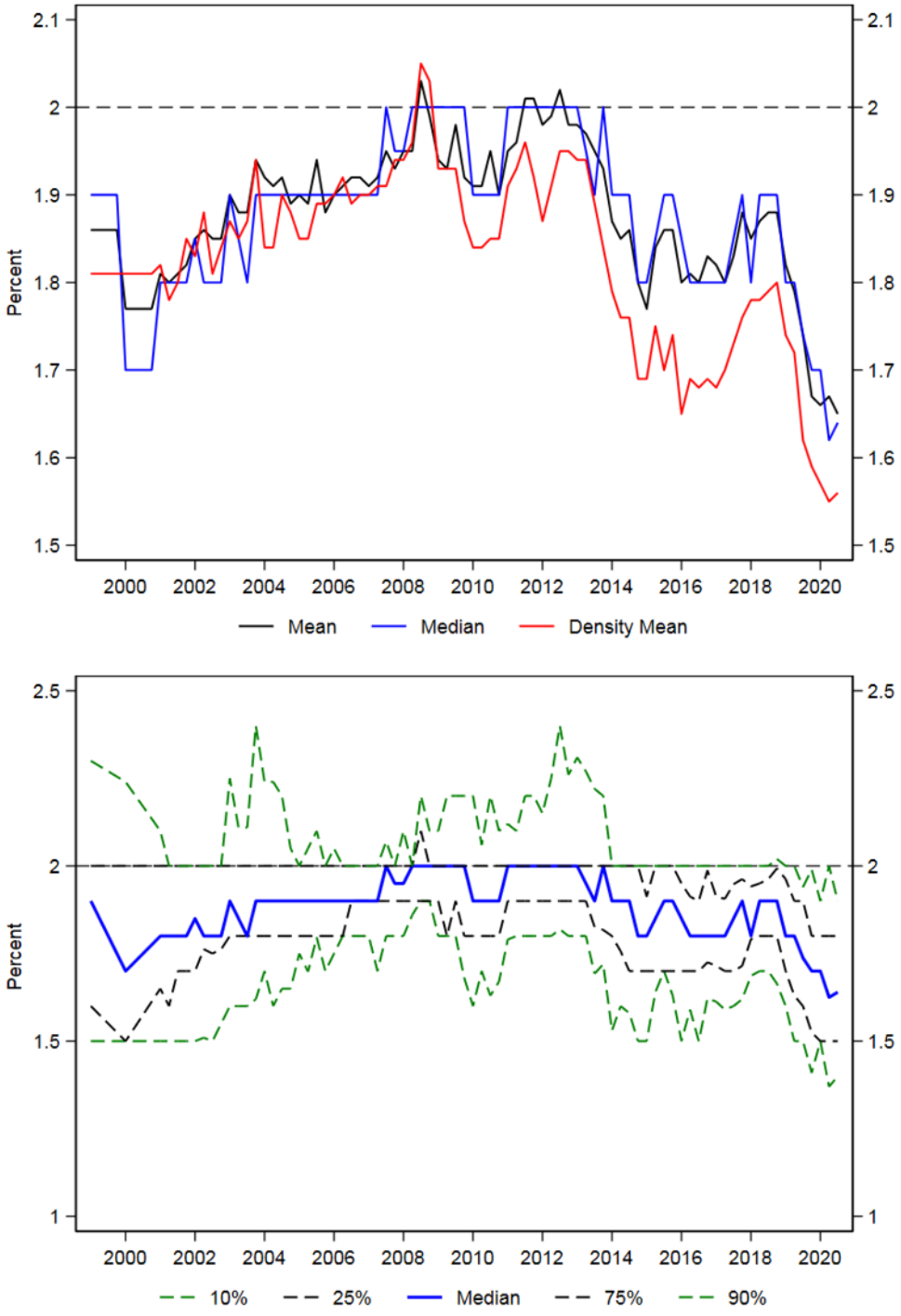
The evolution of these forecasts suggests we could broadly divide the sample into three periods. (i) the first few years from 1999 to 2003 or so, corresponding to the loose definition "below 2%". In this period, inflation expectations were moving around 1.8% but with considerable variation across individuals. (ii) the period from around 2003-2004 to 2011. In this period, which includes the GFC, inflation expectations suggest the ECB's goal was perceived to fall in the much narrower 1.9% to 2% region. (iii) the period from 2012 to the present. In this period, inflation expectations generally drifted downwards and exhibited again more variation, suggesting a similar degree of the unhelpful ambiguity regarding the ECB's interpretation of price stability at the turn of the century.

The evolution in perceptions of the ECB's interpretation of its primary mandate mirror ECB communication and policy. It can inform about better and worse communication and/or policy and as such help improve policy strategy.

An important positive step in the ECB's policy strategy was associated with the policy strategy review that was conducted in early 2003. The results were announced on 8 May 2003. At that meeting, the Governing Council announced the following a "clarification" of its 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%. Price stability is to be maintained over the medium term." Today, the Governing Council confirmed this definition (which it announced in 1998). At the same time, the Governing Council agreed that in the pursuit of price stability it will aim to maintain inflation rates close to 2% over the medium term." (ECB, 2003)

Figure 9: Evolution of long-term inflation expectations



Source: ECB SPF and authors' calculations.

Notes: Density mean (top panel) is the mean of the means of the individual respondents' density forecasts. Mean, median and percentiles (in bottom panel) are computed from the individual respondents' point forecasts.

The new definition reduced the unhelpful ambiguity of the 1998 communication "below 2%" to explain that the ECB preferred to steer inflation "close to 2%". It was a significant change. Coupled with monetary policy actions that were consistent with aiming to achieve inflation close to 2% in the

medium term, this change facilitated the anchoring of inflation expectations around 1.9% to 2%, as noted earlier.

The press briefing explained the rationale for the change. The ECB clearly understood the benefits of well anchored inflation expectations for the conduct of monetary policy and the 2003 clarification was a constructive step in that direction. The ECB also explained that by guiding inflation close to 2% it could better defend against the ZLB, protect the economy against deflation, and better accommodate heterogeneity of inflation outcomes across the euro area, so that deflation would be avoided not only in the aggregate but also in the individual Member States (Issing, 2003).

While the change adopted in May 2003 was a positive step, it was also a missed opportunity. The ECB changed its interpretation of price stability to be as close as it could be to a clear 2% goal, without actually taking the step that could have locked in the benefits of better anchoring expectations. The benefits of well anchored expectations were very clearly understood and communicated by the ECB in various occasions, including in speeches, and research contributions. However, the Governing Council apparently could not reach agreement on taking that last step. One possible explanation for this was the concern that adopting a "change" in the definition of price stability could harm ECB credibility whereas adopting a "clarification" of the earlier communication would not. The clarification could be interpreted as an implicit symmetric goal very close to 2%, providing much of the benefit, without the reputational risk. Through influencing the original decision by temporarily depressing inflation in 1998, the Asian and Russian financial crises of the late 1990s would have a surprisingly long lasting effect on ECB policy.

ECB policy under President Trichet, who took over from President Duisenberg a few months after the 2003 policy review, could be characterised as broadly consistent with a 1.9%-2% inflation goal. This proved particularly helpful during the GFC: It helped to keep the underlying inflation trend quite stable, despite the unusually large shocks buffeting the economy at the time. Trichet's celebration of the 1.97% average inflation performance, mentioned earlier, was consistent with and helpful for reinforcing this message.

The interpretation that the ECB was operating with an inflation goal very close to 2% under President Trichet was never explicit but was also supported, indirectly, with publication of the specification of the econometric model the ECB had developed to inform policy. As is well understood by experts following central bank research and communications, operational numerical assumptions are always required for quantitative analysis. The pertinent assumptions are selected to be as useful as possible for the policy process. In the case of the ECB's model, the choice for the operational definition of price stability was an inflation rate equal to 1.9%:

> "[…] the monetary authority's long-run (net) inflation objective … is assumed to equal 1.9 percent at an annualized rate, consistent with the ECB's quantitative definition of price stability of inflation being below, but close to 2 percent." (Christoffel, Coenen and Warne, 2008, p. 38).

Unfortunately, by missing the opportunity to adopt a clear symmetric long-term definition of price stability, the ECB invited discretionary deviations from the systematic pursuit of its price stability goal. Indeed, following the end of President Trichet's term and with the intensification of the euro crisis, the ECB's implied commitment to guide inflation towards 1.9%-2% was neglected. Inflation and inflation expectations drifted lower.

Identifying exactly when other considerations dominated policy away from maintaining well anchored inflation expectations around 1.9%-2% is not straightforward.[15] To be sure, ECB communications continued to suggest the desire to maintain well anchored inflation expectations. But this was not systematically supported by ECB actions. Judging from the evolution of the long term inflation expectations (Figure 9), the disconnect between communication and action became entrenched during 2012, about the same time the ECB embarked on quantitative tightening. Recall that the tightening episode, from summer 2012 to end 2014, reduced the size of the ECB balance sheet by about one third (Figure 3). Actions speak louder than words.

4.3. A comparison with other central banks: the 2% global benchmark

By the time the ECB started its operations in 1998, a consensus was already developing in the global central banking community that the adoption of a policy strategy that helped anchor inflation expectations as much as possible was critical for policy success not only for maintaining price stability but for facilitating better macroeconomic stabilisation performance. This emerging consensus was reflected in a new approach to policy that was espoused in a small but increasing number of central banks: inflation targeting.

In 1998, inflation targeting was still fairly novel, having been first introduced in New Zealand in 1989. However, it was soon introduced elsewhere, with considerable success. Early adopters among developed countries included Canada and Australia. The Bank of Canada adopted inflation targeting in 1991 and has been operating with a 2% target, since 1995. The Reserve Bank of Australia adopted an average inflation target between 2 and 3% over the business cycle, with emphasis on the 2.5% midpoint.[16]

Following the 1992 European Monetary System (EMS) crisis in the European Union, the inflation targeting framework was also adopted by some Member States and the experience with the framework was positive. King (1997) and Heikensten (1999) provide reviews of the early experience for the United Kingdom and Sweden, respectively.

The Bank of England adopted inflation targeting in October 1992, with an explicit numerical definition of price stability expressed as an inflation goal of 2.5% measured in terms of the Retail Price Index. This was subsequently reformulated as a 2% target inflation rate measured in terms of the Consumer Price Index (CPI).

In January 1993, the Riksbank announced that its operational definition of price stability would be a 2% inflation target, measured in terms of the CPI, with a tolerance level of +/- 1 percentage point. While the tolerance band recognised that inflation cannot be perfectly controlled in the short run, the emphasis on the 2% target established a well-defined anchor for inflation expectations.

Among the Member States of the Union that adopted the euro in 1999, Finland and Spain also adopted inflation targeting. In 1998, both operated with a 2% target.

But other central banks of large advanced economies, notably the Fed and Bank of Japan, had not adopted a precise quantitative goal during the 1990s. At the time of the ECB's adoption of its original definition of price stability in 1998, those two central banks formally communicated simply that they aimed to maintain price stability, without an explicit definition. Though ambiguous, the ECB's adoption of a quantitative definition was an improvement relative to the Fed and the BOJ. Even before the May

[15] Lyziak and Paloviita (2017) and Nautz, Pagenhardt and Strohsal (2017) present pertinent statistical analysis.

[16] Bernanke et al (1998) review the international experience with the framework, as available at the time the ECB was discussing its policy strategy.

2003 clarification of its strategy, the ECB's definition of price stability excluded inflation rates of zero or below, which was a concern in Japan around the turn of the century, and above 2%, which was a concern for the United States during the 1990s.

At the Federal Reserve, the Federal Open Market Committee (FOMC) discussed the appropriate definition of inflation on numerous occasions over many years, without managing to reach agreement on a quantitative goal. Policy was seen as credible and effective without an explicit numerical goal, which argued against a change in strategy. And the discussions revealed differences among participants, some favoured lower and some higher operational goals for inflation. But the differences were not very wide. As early as 1996, the FOMC's discussions effectively revealed a consensus for an inflation goal close to 2%, consistent with what the ECB adopted later on. While FOMC deliberations are not made public in real time, the 1996 discussion was revealed with the publication of the FOMC transcripts, which are released with a five year lag. It was public information at the time the ECB adapted its strategy in 2003. Practices, including the operational definition of price stability, were converging. But some ambiguity remained in place during the 2000s.

This changed with the crisis. The experience with the GFC reinforced the importance of anchoring inflation expectations in line with a central bank's objectives, which raised the significance of providing a precise definition of a central bank's inflation goal. In January 2012, the Federal Reserve announced the adoption of a 2% symmetric inflation goal. In January 2013, the Bank of Japan followed with a similar adoption of a 2% inflation goal.[17] Noting these developments, former ECB President Trichet observed in his Mayekawa lecture that 2% inflation has become a "global benchmark" for defining price stability in advanced economies (Trichet, 2019, p. 37).

Among the central banks of the world's largest advanced economies, the ECB currently stands out as the only one that is still operating with an ambiguous definition of the inflation rate corresponding to price stability. By 2013, all others had communicated a 2% goal. In retrospect, it's clear that economic outcomes in the euro area would have been better, had the ECB followed its peer central banks and adopted a 2% inflation goal in 2013, or soon after, instead of pursuing lowflation.

4.4. Assessing the ECB's track record in achieving its primary mandate

As already discussed in Section 3, the overall economic record of the euro area compares unfavourably to that of other advanced economies, such as the United States. But not before the euro crisis. All the difference is due to the notably worse performance of the euro area after the GFC. Since the euro crisis, the ECB appears to have pursued a policy of lowflation, deciding against the provision of accommodation sufficient to raise inflation in line with the pre-crisis performance. This suggests that ECB monetary policy could have done a better job overall by at least providing more policy accommodation since the euro crisis started. The additional accommodation would have kept inflation closer to 2%, consistent both with the ECB's definition of price stability and with the ECB's policies before the euro crisis, while simultaneously supporting the economy overall. However, this assessment depends on a specific interpretation of price stability. An alternative interpretation is that the ECB's lowflation policy successfully achieved the ECB's primary mandate. Given the ambiguity of the definition of price stability, first in the Treaty and subsequently in the ECB's own strategy statements, alternative assessments of the performance are possible. This is not unique to the ECB, or the specific question at hand. It's a generic problem with performance evaluation: Vagueness promotes unaccountability. To improve accountability, a key task of the ECB's policy review must be to provide clarity to the ECB's interpretation of price stability.

[17] Additional detail on the background and rationale of these changes by the Fed and the BOJ is provided in Orphanides (2018, 2020).

An alternative way to assess the ECB's performance with respect to its primary mandate, is by examining cases where information was provided on what inflation outcomes were considered desirable and checking whether policy actions were consistent with delivering these outcomes.

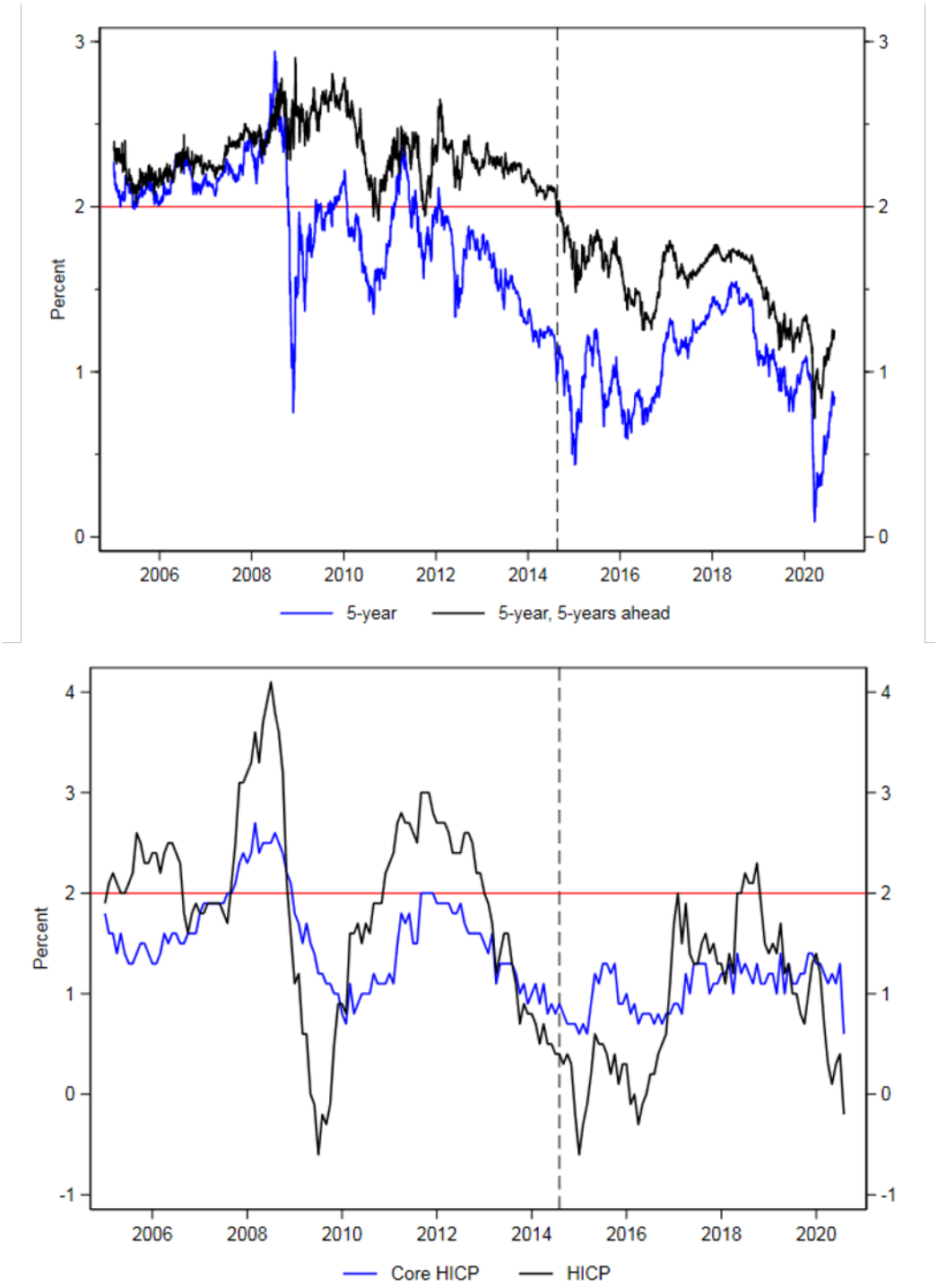
One case relates to President Draghi's 22 August 2014 Jackson Hole speech cited earlier. To set the stage, recall that by spring 2014, it was evident (at least outside Frankfurt) that ECB policy was too tight. In Washington, on 2 April 2014, then IMF Managing Director Christine Lagarde reiterated the view that euro area low flation was harmful, indeed an "obstacle" to short-run growth not only for Europe but for the global economy. Her advice was unequivocal: "More monetary easing, including through unconventional measures, is needed in the Euro Area to raise the prospects of achieving the ECB's price stability objective." (Lagarde, 2014). Unfortunately, the ECB did not heed Lagarde's advice.[18] By August, with additional evidence accumulating, it was increasingly difficult for the ECB to dispute the soundness of this view. President Draghi used the occasion of his keynote in Jackson Hole to address it. He acknowledged that the low inflation in the euro area at the time was of concern. Though the ECB expected the factors that depressed inflation to be temporary, President Draghi included a detailed reference in his remarks, appropriately highlighting the risks and providing explicit guidance for mitigating policy action:

> "I have said in principle most of these effects should in the end wash out because most of them are temporary in nature — though not all of them. But I also said if this period of low inflation were to last for a prolonged period of time the risk to price stability would increase.
>
> Over the month of August, financial markets have indicated that inflation expectations exhibited significant declines at all horizons. The 5 year, 5 year swap rate declined by 15 basis points to just below 2 percent — this is the metric that we usually use for defining medium-term inflation.
>
> But if we go to shorter- and medium-term horizons, the revisions have been even more significant. The real rates on the short and medium term have gone up, on the long term they haven't gone up because we are witnessing a decline in long-term nominal rates, not only in the euro area but everywhere really. The Governing Council will acknowledge these developments and within its mandate will use all the available instruments needed to ensure price stability over the medium term." (Draghi, 2014, p. 306)

Figure 10 (top panel) presents data on the 5-year and the 5-year, 5-years ahead inflation swap rates, the latter corresponding to what President Draghi suggested was the metric used for monitoring medium-term inflation. Inflation swap rates are market based indicators and, as such, subject to noise, but informative nonetheless. (The bottom panel presents monthly HICP and core HICP data for reference.) At the time of his talk in late August 2014, the 5-year, 5-years ahead inflation swap rate had just crossed 2%, as he noted. In subsequent months, the ECB decided to ease policy significantly, as President Draghi suggested. Indeed, by the end of 2014, the ECB ended its quantitative tightening and started expanding its balance sheet (as shown in Figure 3), which represented a very significant change in policy. As would be expected, the inflation outcomes started to gradually improve, together with the inflation swaps. However, the ECB subsequently decided to end the easing cycle prematurely, well before the inflation swap rates returned to the level that had prompted the policy action (Figure 3 and Figure 10). Progress towards raising inflation, in line with the intent that had been communicated in August 2014, stopped. We return to this in Section 6.3.

[18] Instead, the ECB communicated annoyance (Economist, 2014).

Figure 10: Inflation swaps and HICP inflation



Sources: Bloomberg, ECB SDW, and authors' calculations.

Notes: Dashed vertical lines mark 22 August 2014 (top) and August 2014 (bottom) panel.

An assessment of the ECB's performance with respect to its primary mandate also depends on the economic areas examined. Given the divergence in outcomes across Member States, the evaluation could include, in addition to the aggregate performance for the euro area overall, the performance of the individual Member Stares. Whatever the precise interpretation of the ECB's primary objective of

price stability, a smaller divergence in the inflation performance across Member States is preferable to a larger divergence. Of course, the performance of each individual Member State with respect to price stability will also depend on idiosyncratic shocks and economic policies that exert an influence. That said, in pursuing its primary mandate, the ECB should adopt policies that, in addition to maintaining price stability for the euro area as a whole, aim to counteract shocks that lead to divergences in inflation across Member States, and, in particular protect all Member States from deflation. Otmar Issing highlighted this in his briefing following the May 2003 strategy review. He noted that the decision to raise the ECB's implicit inflation goal to "close to 2%" took into account "the need for sufficient safety margin to guard against the risks of deflation … and implications of inflation differentials within euro area." (Issing, 2003, p. 7, emphasis in the original).

Table 1: Inflation statistics, 1999 to 2019

	Mean	Standard deviation	Minimum	Maximum	Mean 1999-2010	Mean 2011-2019
Austria	1.8	0.8	0.4	3.6	1.8	1.9
Belgium	1.9	1.0	0.0	4.5	2.0	1.8
Germany	1.5	0.7	0.2	2.8	1.5	1.5
Spain	2.1	1.4	-0.6	4.1	2.8	1.1
Finland	1.6	1.1	-0.2	3.9	1.8	1.5
France	1.5	0.8	0.1	3.2	1.8	1.2
Greece	2.0	1.8	-1.4	4.7	3.2	0.3
Ireland	1.7	1.9	-1.7	5.3	2.5	0.6
Italy	1.8	1.0	-0.1	3.5	2.2	1.2
Luxemburg	2.2	1.3	0.0	4.1	2.6	1.6
Netherlands	1.9	1.2	0.1	5.1	2.1	1.6
Portugal	1.9	1.4	-0.9	4.4	2.5	1.2
euro area	1.7	0.9	0.2	3.3	2.0	1.2

Source: ECB SDW and authors' calculations.

In this regard, there was scope for the ECB to improve its performance with respect to its primary mandate. The divergence in core inflation measures presented in Section 3 is striking. A simple

comparison of summary statistics for headline HICP inflation, presented in Table 1, provides additional information.

Three observations based on the table are of interest. First, the variability of inflation in some Member States is much larger than in other Member States. Second, while (in annual data) deflation was avoided in the aggregate, half of the Member States did experience deflation in at least one year. These deflation episodes occurred in the post-GFC era, suggesting that even if the ECB's lowflation policies were somehow consistent with its own interpretation of price stability for the euro area as a whole, they failed to protect individual Member States from deflation, as the policy strategy adopted in 2003 intended. Third, based on the statistical properties of aggregation, one would have expected that if the ECB pursued the monetary policy best suited for the euro area as whole, inflation would have been more stable for the euro area as a whole than for any of the individual Member States that comprise the aggregate. The data are not consistent with this simple metric of policy success. This demands additional scrutiny. One might be tempted to ponder whether ECB policy has been inappropriately implemented in a manner that de facto favours some individual Member State(s) over others. However, the small sample (21 annual observations) is not sufficiently informative to support this hypothesis with confidence.

4.5. Alternative approaches

Comparing the experience of the ECB to that of other central banks strongly suggests that the adoption of a clear symmetric inflation goal should be an important part of a revised policy strategy. Clarity on the inflation objective would help policy become more systematic and restore credibility, re-anchor inflation expectations in the euro area and facilitate the ECB's policy response to economic disturbances.[19] The emergence of a 2% goal as a global benchmark has a lot to recommend it.

However, there are many other elements to a monetary policy strategy beyond the selection of a quantitative definition of price stability. In this section we briefly discuss two main families of alternatives relating to the implementation of the selected quantitative definition over time. Numerous variations could be considered within these two families.

The *first family of approaches* relates to inflation targeting. The hallmark of inflation targeting is a clear communication of the goal. Its second key element is the commitment by the central bank to take the necessary policy action to achieve that objective in the medium term, being informed by inflation forecasts and/or expectations that guide policy. Inflation targeting is forecast targeting in this regard. Beyond that, there are numerous variations and choices that influence how robust the strategy can be, accounting for various sources of imperfect knowledge. These variations matter, for example they influence how quickly or slowly inflation returns to its target, when the economy is hit by shocks, what exact factors are taken into account in that decision (e.g. financial stability considerations, or growth and employment considerations etc.) but this is of secondary importance to the commitment to a fixed target.[20] Other variations include whether, in addition to communicating the inflation goal, the central bank communicates a band to reflect the uncertainty of achieving the goal, and the choice of inflation index, e.g. headline inflation or core inflation measures, which also matters for communication.[21]

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[19] See e.g. Levin, Natalucci and Piger (2004), Orphanides and Williams (2005), Gaspar et al (2006), Goodfriend (2007), Gürkaynak, Levin and Swanson (2010), and Gaspar, Smets and Vestin (2010).

[20] See, e.g. Svensson (1997, 2011), Batini and Nelson (2001) and Smets (2003).

[21] Central Banks can communicate forecasts of multiple indices, but need to focus on one index to describe their policy strategy, presumably the one that most accurately measures overall prices over time. Short term noise issues can be dealt with by *also* communicating core inflation projections, as the ECB has been doing over the past few years.

Ultimately, with or without a clear inflation goal, all major central banks in advanced economies are faced with transmission mechanisms and inflation dynamics that demand a forward looking policy approach that is shaped by the outlook of inflation. An explicit goal disciplines policy, which helps to keep policy systematic.

We can illustrate the benefits of adopting the target versus not with a simple comparison of one common aspect of the policy process at the Fed and the ECB: The inflation projections and their implicit role in communicating policy. Both the Fed and the ECB have been publishing inflation projections every quarter for a number of years. Short term inflation projections are mostly shaped by recent shocks and the underlying inflation trend. But longer-horizon inflation projections provide essential information about the central bank's commitment to price stability and about the central bank's interpretation of price stability. At horizons beyond two years, which is typically long enough for the central bank to respond to temporary shocks, they should be close to the central bank's goal.[22]

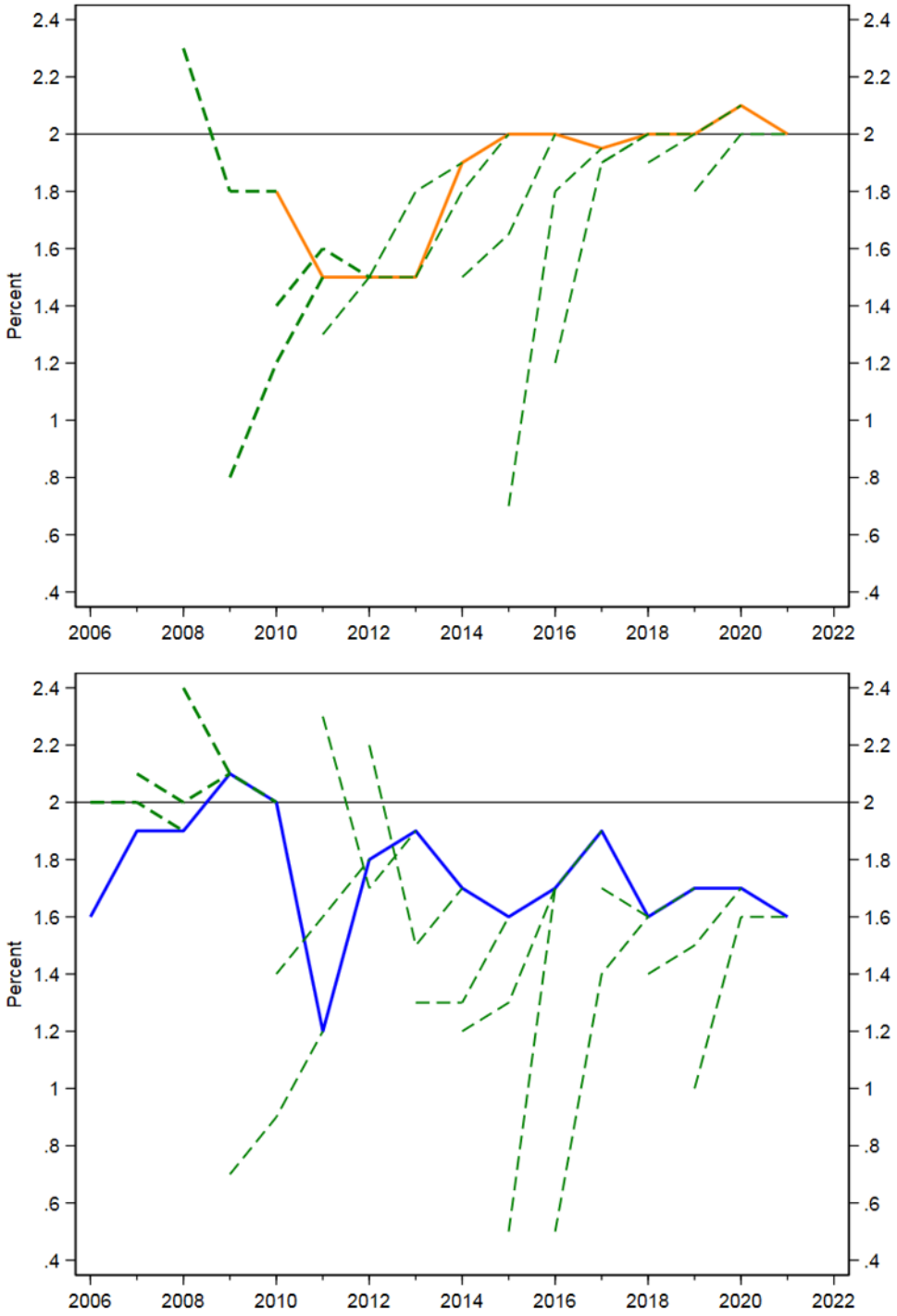
Figure 11 plots the inflation projections paths associated with the 1st quarter of every year from 2006Q1 to 2019Q1 for the ECB and 2008Q1 through 2019Q1 for the Fed.[23] For both central banks, each green line shows the forecast for the path of Q4/Q4 inflation for the current years and subsequent two years. More precisely, these correspond to 3-, 7- and 11-quarter ahead projections. The solid lines (orange for the Fed, blue for the ECB) connect the 11-quarter ahead projection.

As already mentioned, in January 2012, the Fed announced a 2% inflation goal while the ECB has continued to operate with an ambiguous goal. This resulted in notable difference in the inflation projections. In the case of the Fed, given the commitment to guide inflation to 2%, the inflation projections reflected a more systematic convergence of the inflation projection path to the target. This helped anchor expectations (Figure 12) in line with the Fed's target. In the case of the ECB, the lack of a clear goal resulted in projection paths that did not communicate a commitment to any specific inflation rate. The 11-quarter ahead projection, which could have served this role, fluctuated extensively. Inflation expectations, which were better anchored in the euro area than in the United States before the Fed's adoption of an inflation goal, became dis-anchored as well (Figure 9 and Figure 12).

[22] Unusual shocks, such as associated with the GFC and, more recently the pandemic, may well require a longer horizon than 2-3 years.

[23] This excludes the March 2020 projection, which is not available for the Fed. 2020 projections of inflation are discussed in Section 7.

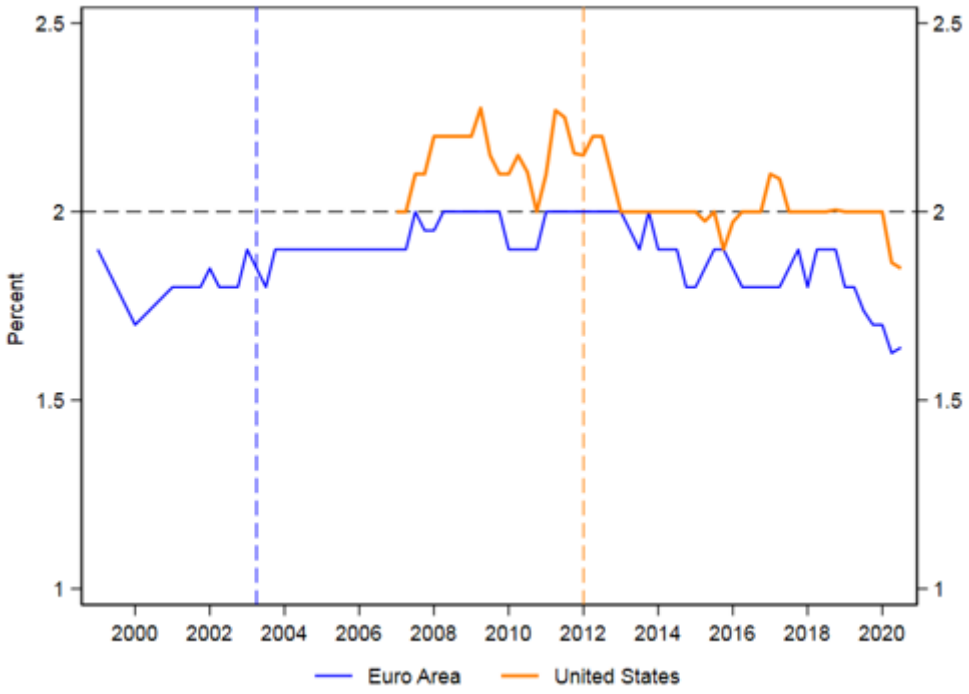
Figure 11: Communicating policy through inflation projections



Source: Fed and ECB.

Notes: Top panel shows FOMC median projections. Bottom panel shows ECB staff projections. Each dashed line connects the 3-, 7-, and 11-quarters ahead projections made in the first quarter of each year. Solid lines connect the 11-quarters ahead projections. Last projection shown corresponds to 2019Q1.

Figure 12: Long-term surveys of inflation projections



Source: ECB SPF and Federal Reserve Bank of Philadelphia SPF.

The *second family of approaches* relates to price level path targeting. This family of approaches differs from the inflation targeting family in that it communicates a commitment to maintain prices over time close to a fixed path. The chosen path would reflect the central bank's inflation goal, e.g. 2%. In the absence of uncertainty, it would be identical to inflation targeting with the same goal. But not so in the presence of shocks that move inflation, albeit temporarily, away for the inflation goal. Under the price level path targeting approach, the central bank commits to make up past errors in the control of inflation. This has the important benefit that it provides more certainty about prices at long-horizons, which can facilitate long-term planning better than the inflation targeting approach. In addition, it may better protect the economy against the ZLB.[24] But it complicates the formation of inflation expectations at shorter horizons, when the policy needs to make up past misses from the inflation target. To illustrate the significance of the promise to make up past misses, Figure 12, top panel, compares the historical price level paths for the US and euro area against a path corresponding to a 2% inflation goal starting in December 1998. The bottom panel plots the gap of the price level from the path suggested by the 2% inflation goal. As can be seen, the price gap is not very large when inflation hovers symmetrically above and below its goal. But when the inflation rate systematically underperforms the inflation goal, a notable gap opens up. Notice that for both the Fed and the ECB, the price level gap was close to zero right after the GFC. Since then, the inflation misses have resulted in a gap of about minus 4 percent for the United States and about minus 8 percent for the euro area. Correcting such negative gaps would require the central bank to tolerate inflation somewhat above 2% for some time, to make up the cumulative miss in the inflation objectives.

[24] Research highlighting the merits of price level path targeting includes Wolman (1998), Svensson (1999), Smets (2003), Eggertson and Woodford (2005), and Gaspar, Smets and Vestin (2007).

Over long horizons, average inflation misses are very small, so the price level targeting approach is closely related to targeting a long-horizon moving average of inflation. Variations of inflation targeting that involve targeting average inflation over horizons that are not very long, fall in between the traditional inflation targeting and traditional price level targeting approaches.[25]

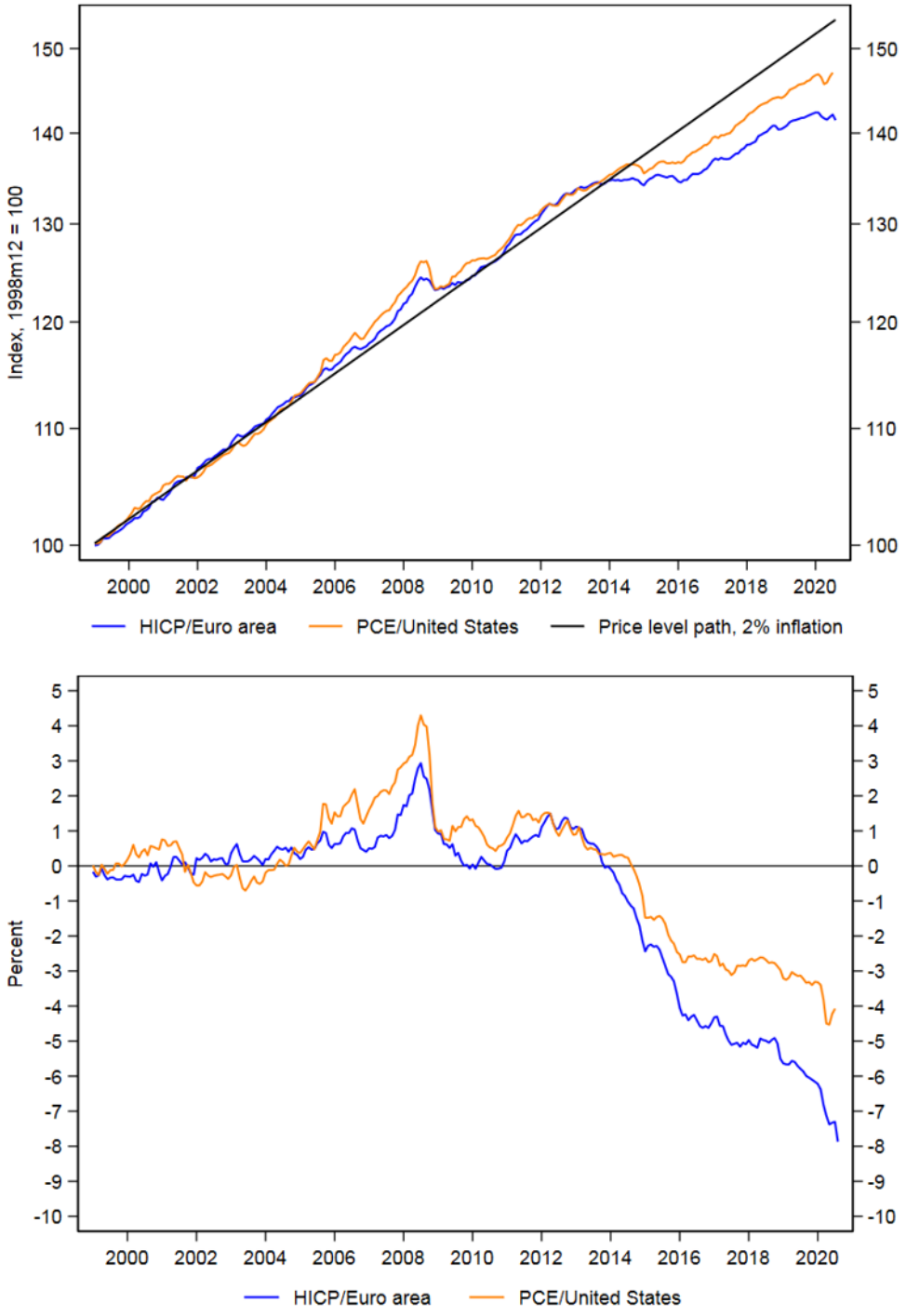
In August 2020, the Fed announced a revision of its policy framework that moves it somewhat away from the traditional inflation targeting approach towards price level targeting. This is intended to make up for some of the price level gap that accumulated since 2012, in light of the Fed's inflation misses since it adopted the inflation goal of 2% that year.

Another consideration that influences the effectiveness of a policy strategy is the communication associated with the policy process and decisions. As already noted, projections of inflation can play a significant role in this regard. But there are variations that make inflation projections more or less informative. For example, the ECB publishes staff projections. By contrast, the BOJ and Fed publish projections of individual policymakers, without disclosing their identities. These are much more informative than staff projections, as they can better incorporate policy intentions and show differences on opinion among committee members regarding the outlook. The BOJ projections also provide useful information on the balance of risks associated with the individual projections.

The communication of the uncertainty associated with projections is another consideration. Uncertainty bands based on historical projection errors, as some central banks use, are of limited value as they cannot usefully convey how the uncertainty changes over time nor the factors that are seen as most likely to result in material changes to the baseline projection. Alternative scenarios are more useful for illustrating the range of outcomes. The ECB has started presenting alternative scenarios this year in the context the ongoing pandemic. It would be useful to consider continuing and expanding their use as part of the strategy review.

[25] In model-based comparisons, the relative merits of inflation targeting, price level path targeting and average inflation targeting are not clear cut and depend on particular modelling assumptions about the economy and the implementation of monetary policy. See e.g. Batini and Yates (2003) and Nessen and Vestin (2005).

Figure 13: Price level path targeting



Source: ECB SDW, FRED, Federal Reserve Bank of St. Louis, and authors' calculations.

5. THE BROADER MANDATE: SUPPORTING THE ECONOMIC POLICIES OF THE UNION

5.1. Comparison with other central banks

Central bank statutory mandates can be classified into two broad categories: Mandates with a lexicographic ordering of objectives, placing price stability above other objectives, and mandates that list multiple objectives without any specific guidance on their relative importance.

The ECB's mandate, described earlier, falls under the first category. So does the Bank of Japan's mandate. According to Article 2 of the Bank of Japan Act:

> "Currency and monetary control by the Bank of Japan shall be aimed at achieving price stability, thereby contributing to the sound development of the national economy."

In contrast, the Fed's mandate belongs in the second group. According to Section 2A of the Federal Reserve Act:

> "The Board of Governors of the Federal Reserve System and the Federal Open Market Committee shall maintain long run growth of the monetary and credit aggregates commensurate with the economy's long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates."

The statutory mandate of a central bank matters for the policy strategy adopted. However, practices tend to be more similar than differences in the legal text might suggest. The reason is simple: Regardless of the wording of the mandate, it is widely recognised that unlike other desirable objectives, price stability is the only one for which the central bank is ultimately solely responsible for.[26] For all other socially desirable objectives, the government and multiple other institutions, potentially including the central bank, share responsibility. For this reason, price stability is recognised to have a special role in central bank mandates, even when it is listed as one of multiple objectives.

With regard to actual practices in recent times, the experience of central banks that have adopted versions of inflation targeting is of interest. For some of these central banks, starting with the Reserve Bank of New Zealand (RBNZ) where the framework started in 1989, the adoption of the framework was facilitated by a change in the law towards a lexicographic ordering, expressing price stability as the central bank's primary mandate. Central bank laws adopted from the 1990s on around the world often reflected similar changes, moving away from multiple goals to defining price stability as the primary mandate. But in other cases, central banks adopted inflation targeting while their legal frameworks specified multiple mandates, and without a change in the law. This includes the Bank of Canada, and since 2012 the Fed. In those cases the central banks reinterpreted their mandate, informed by theoretical advances and policy experience that pointed to the conclusion that maintaining price stability was a prerequisite for promoting sustainable growth and high employment. Depending on the institutional setting, this could be done with formal or informal consultation with the government/parliament.

From a governance perspective, consultation with a central bank's government/parliament is desirable, when feasible. In the case of the ECB, such consultation may need to be less formal than for

[26] This follows from Milton Friedman's dictum that "inflation is always and everywhere a monetary phenomenon" (Nelson, 2020).

other central banks. Nonetheless, some consultation with the European Parliament would be desirable when the ECB contemplates reinterpreting its mandate.

In terms of the governance of the interpretation of the mandate, and process for adjustment, the Bank of Canada provides an excellent example of balancing independence and democratic accountability considerations. The Bank of Canada's inflation targeting framework is defined in a joint agreement with the government that is reviewed every 5 years. While it has maintained the same framework, with minor adjustments since the 1990s, the 5-year review process promotes discussion on possible ways in which the framework could be improved, informed from experience. For example, in the aftermath of the GFC, for the 2016 renewal of its mandate, the Bank examined whether it should increase its inflation target (in light of the encounter with the ZLB), whether to move towards a core measure of inflation and the extent to which financial stability considerations should be taken into account in the conduct of monetary policy (Bank of Canada, 2016).

5.2. Potential conflicts associated with multiple objectives

By maintaining price stability over time, a central bank also promotes sustainable economic growth and full employment over time. Business cycle fluctuations can cause temporary deviations of growth and employment from the sustainable growth and full employment paths but such economic disturbances typically do not create a conflict between price stability and these objectives.

In general, the primary goal of price stability is complimentary with full employment. For example, in economic downturns, easing monetary policy to prevent inflation from declining also supports economic activity and employment.

However, when adverse supply shocks materialise, a temporary conflict between price stability and economic and growth and employment typically arises. In case of such developments, maintaining price stability over the medium term price takes priority. The temporary cost to growth and employment, however, can be minimised with the adoption of a monetary policy strategy that anchors inflation expectations effectively. This is why the adoption of a clear inflation goal is a critical part of the monetary policy strategy.

In the case of the ECB, because its broader mandate is so wide-ranging, a potential conflict among the various desirable goals of the Union arises. In principle, the ECB as any other central bank, has considerable fiscal power that could be mobilised for any of these goals without compromising price stability. Selectively supporting some of these goals over others, however, is a political issue. If the ECB would make such a decision, it would politicise the institution and ultimately jeopardise its independence.

5.3. Sustainable economic growth and full employment

Economic growth and employment is certainly in the interest of the Union. It is therefore part of the broader objectives of the ECB as well. The Union has clearly an interest in all employable and willing people to be able to work, and in maximum growth in order to enhance the welfare of its population.

But beyond that, growth and employment are most important business cycle indicators. Variations in economic activity — recessions and booms — are events that influence the development of the inflation rate with a certain lag. There is, therefore, a second reason why the ECB would want to influence the business cycle. By gauging the business cycle, the ECB ultimately controls inflation. This is the price stability interest in growth and employment.

However, the monetary policy interest in employment and growth is qualitatively different from the overall interest of the Union in maximum growth and employment. The price stability mandate of the

ECB implies that the ECB must be interested not in maximal employment and growth, but in maintaining a level of employment and growth that is in the medium term compatible with price stability. This means that there can be situations in which the ECB wants to curb growth or restrain employment for fear of the inflationary consequences in the future.

In essence, this means that the ECB is bound to pursue maximum employment *subject to price stability*. When the economy is slumping, there is no antinomy between the ECB's prime objective and the interest of the Union to stimulate. In a boom, the interests are less well aligned, and the primary responsibility of the ECB must take precedence for the ECB's actions.

5.4. Cohesion and solidarity among Member States

The ECB is responsible for price stability in the euro area. This does not only mean price stability in the euro area overall but, to the extent possible, price stability in each Member State of the EMU.

More generally, the ECB has an innate interest in promoting economic convergence of all member countries. Diverging economic developments would make the ECB's job increasingly difficult and ultimately put into question the ability of the ECB to achieve its main goal. It would also undermine the political viability of EMU. For this reason, the cohesion of the Union is of utmost importance for the primary goal of the ECB already. Progress towards the Union's objective of promoting cohesion and solidarity among Member States helps the ECB to achieve its primary objective.

Sustained differences in the cost of financing the provision of public goods across Member States are detrimental to economic cohesion. This poses a challenge for the ECB that relates to our discussion regarding the impairment of the monetary policy transmission mechanism. As already discussed, sovereign debt markets can be susceptible to multiple self-fulfilling equilibria. Without a coordinating role by the central bank[27], markets may well converge to an equilibrium with a higher interest rate than what could be otherwise supported. In the euro area, left unchecked, such a development will divert capital flows, raising the interest rates of "more" vulnerable states even more, while depressing the interest rates of "less" vulnerable states. Obviously, such a development would also widen spreads between more and less vulnerable states, even when fundamental factors could correspond to very narrow spreads. How should the ECB be dealing with such situations?

On the one hand, one could argue, that the ECB is "not here to close spreads" between government bonds of Member States, because doing so would effectively reduce the financing cost of states the markets judge risky while, in the process, raising it for the states that markets identify as deserving a safe haven subsidy. Such an uneven hand in facilitating fiscal conditions can be interpreted as inappropriate for an apolitical monetary authority. On the other hand, tolerating wide spreads, when "markets" could also support narrower spreads with the same fundamentals would imply that the ECB is ineffective in providing the monetary conditions in a uniform way.

The double dimension of monetary and fiscal consequences of spreads poses a dilemma. Although ECB policies are not the only determinant of interest rates in individual Member States, ECB policies are the most important determinant of spreads between the interest rates in Member States. And although there may be uncomfortable fiscal implications associated with narrower spreads, it is critical for the ECB to coordinate markets towards the equilibrium with narrower spreads over equilibria with wider spreads, when both can be supported by the same fundamentals. From a monetary policy perspective, the narrower the spreads the easier it is for the ECB to ensure that the single monetary policy is effectively transmitted in all Member States and the easier it is to fulfil its mandate.

[27] Or, as a result of flaws in the central bank's monetary policy implementation framework, e.g. as discussed in Section 6.

5.5. Environmental sustainability

Environmental sustainability is not an orthodox application of monetary policy. Monetary policy has for the most part only short- or medium-term effects on the economy, whereas the structural environmental challenges manifest over a long horizon. A case in point is climate change. It is unclear how setting an interest rate, which is the conventional monetary policy instrument, could have an effect on CO2 emissions in any meaningful way, in particular since anthropomorphic climate change is a relatively slow moving process (at least compared to business cycle frequencies).

On the other hand, it is true that climate change does potentially have drastic effects on potential output, and can therefore not be ignored by any central bank. The ECB should attempt to integrate climate change effects into its long term macroeconomic models and forecasts. That argument does not imply, however, that the ECB should try to fight climate change *for price stability reasons*. It only implies that the ECB should adapt to it by measuring and managing inflation correctly.

To make an analogy: Article 3(3) of the Treaty states that "[the Union] shall promote scientific and technological advance", and, in fact, scientific progress is the basis of potential growth. This means that the ECB should be mindful of scientific progress when assessing long term projections. It does not imply that the ECB itself should try to advance scientific progress and, for instance, institute a science foundation *for price stability reasons*.

Contributing to environmental sustainability is certainly part of the broader mandate of the ECB. So is the promotion of scientific and technological advance. Does the ECB have the democratic legitimacy to use its discretionary authority to mobilise its resources to support one over the other? We think not.

The ECB has incredible discretionary authority that can be employed to support various desirable goals: For example, environmental sustainability. The ECB commandeers a very substantial portfolio. It is one of the largest institutional investors. It can ensure that it invests in an environmentally mindful fashion. Private investors and investment funds are widely using environmental, social, and governance (ESG) criteria to inform their investment decisions. In the context of climate change, the focus for the ECB could be put on environmental criteria, or even more focused, on a measure of CO2 emissions to guide the ECB's activities on the financial market. The idea here is that the ECB's leverage to influence and "distort" asset prices could be beneficial in fostering environmentally friendly activities and make CO2 intensive activities more expensive to finance.

In the case of private investment funds, ESG policies commonly result in the exclusion of certain shares or possibly even whole businesses from being included into a fund or into the investable universe of an investor. In the case or the ECB, the situation is more complicated. The ECB's balance sheet contains largely bonds from member governments and from corporations, and it has already a very significant focus on green bonds.[28]

The ECB could apply a CO2 criterion not only to the assets it purchases, but also to the collateral framework, excluding bonds from companies that do not meet its CO2 standards as acceptable collateral in refinancing operations. This would make such bonds significantly less attractive and increase the financing cost of such corporations.

In principle, the ECB could go even further and apply such a criterion also to government debt. For example, it could allocate its purchases of sovereign debt not just on the basis of the capital key of each Member State but on the basis of a capital-and-ecological key. It could also raise haircuts on sovereign

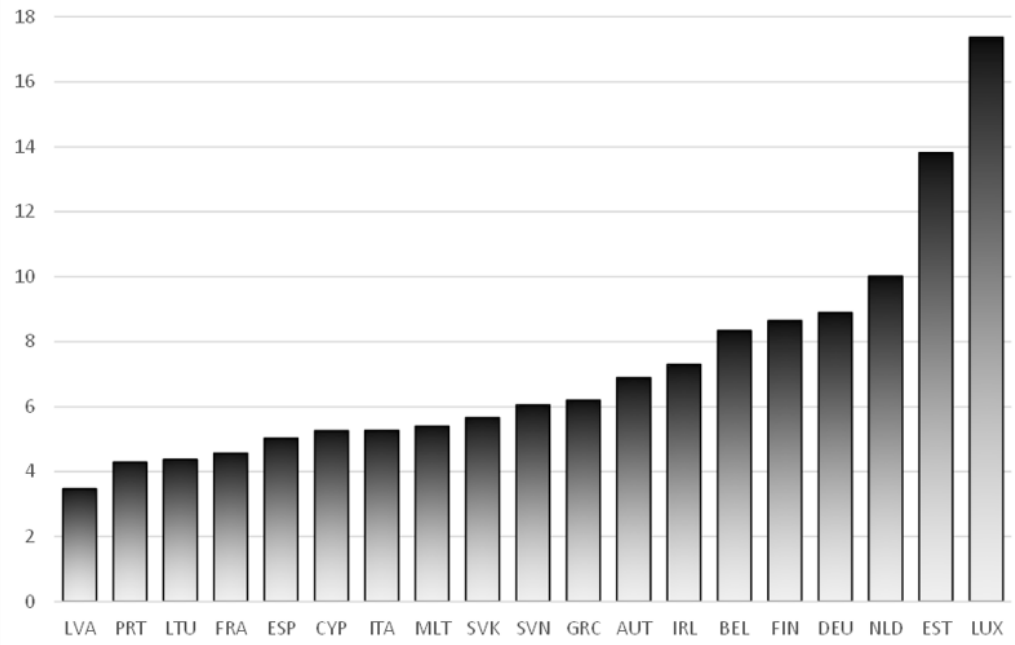
[28] As part of its corporate sector purchase programme, the ECB has been purchasing green bonds in line with their share in the eligible universe, around 20% (ECB, 2018).

debt of Member States with high CO2 emissions. This would ease financial conditions in countries that are the best in terms of CO2 emissions, and worsen it for countries that are particularly harmful in this respect. The heterogeneity of the carbon footprint of member countries of the euro area is considerable, as can be seen from Figure 14.

Such a policy could provide an incentive for Member States to improve their carbon footprint. It is also quite obvious that the ECB could easily be accused of overstepping its mandate by doing this, that it would be *ultra vires*.

Moreover, even if such a policy would support the Union's desire to combat climate change, it would run counter to the goal of cohesion and convergence of the member countries, as the monetary conditions between Member States would diverge based on an ecological measure. One should therefore carefully weigh the effect and side-effects of using climate considerations in the disbursal of monetary policy.

Figure 14: Carbon footprint of EMU Member States



Source: The World Bank Group. (https://data.worldbank.org/indicator/EN.ATM.CO2E.PC).

Note: 2014 is the last year that covers all euro area members in the database.

In our view, this is a question of weighing two goals that are secondary to the ECB against each other, and therefore require the decision of a political institution, that is, the European Parliament. It is not the ECB Governing Council's role to decide such matters. The large distributional effects of greening monetary policy, in particular with respect to outright purchases and collateral admissibility, makes this view even more pertinent.

More generally, it must be recognised that, while the ECB has significant spending power, care is needed to use this power in accordance with the principles of democratic legitimacy. The ECB's spending power is more visible at the ZLB, when asset purchases become a critical aspect of monetary policy operations. But who is to choose what kind of assets to purchase? This choice has potentially large effects on market prices and financing costs. The decision on what to purchase will unavoidably

disproportionately support specific industries to the disadvantage of other industries; it will unavoidably help some Member States more than others. In taking such decisions, the ECB favours some secondary objectives over other secondary objectives. In our view, it is not the call of the ECB to make such a judgement. In the concrete example, the decision to focus on environmental sustainability and not on research and technological advance (or any other goal of the Union) falls outside the ECB's mandate. From this perspective, a better alternative for the ECB, when it needs to expand its balance sheet through asset purchases, is to purchase *exclusively* government debt. By doing so, the ECB would be providing additional fiscal resources that the Member States can mobilise to advance the Union's goals according to the priorities of the Union's democratically elected political bodies.

5.6. Assessing the ECB's track record in achieving its broader mandate

Could the ECB have done more to "support the general economic policies in the Union" in order to advance the goals of listed in Article 3 of the Treaty, "without prejudice to the objective of price stability"? Since the euro crisis started, our answer is yes.

First, had monetary policy aimed consistently towards a 2% inflation goal, policy would have been significantly more accommodative in the euro area over the past decade. At the very least, this would have supported higher economic growth and employment and thus the Union's goal of "aiming at full employment" as demanded in the Treaty. Supporting economic growth and employment would likely also have had beneficial effects on related objectives, such as social progress.

Second, in light of the divergence of outcomes within the euro area (described in Section 3), the more accommodative monetary policy that was available to the ECB, without compromising price stability, would have greatly contributed towards the promotion of economic cohesion and solidarity among Member States.

Third, by supporting greater growth, as was feasible without compromising price stability, the ECB would have helped lessen the strains on fiscal policy in the EMU over the past decade. With higher GDP growth, debt ratios would have been lower and the euro area would have been in a stronger position to face additional challenges, such as those materialising this year.

These conclusions follow from straightforward consideration of counterfactual economic outcomes associated with more accommodative monetary policy in traditional macroeconomic analysis. Importantly, they do not consider whether the ECB correctly interpreted its authority to address issues relating to the impairment of the monetary policy transmission mechanism in the euro area. If the ECB could have acted similarly to its peer central banks in that regard, economic outcomes in the euro area over the past decade would have been vastly different.

However, mitigating factors ought to be considered as well. The mismanagement reflected in decisions by governments during the crisis put the ECB in an impossible position. Traditional macroeconomic analysis cannot capture the complex political dynamics that gave rise to the mismanagement observed during the crisis. Alternative ECB policies could have led to different decisions by the governments resulting in better or worse outcomes than what traditional macroeconomic analysis can capture.

6. IMPLEMENTATION AND EFFECTIVENESS OF POLICY

6.1. Original framework

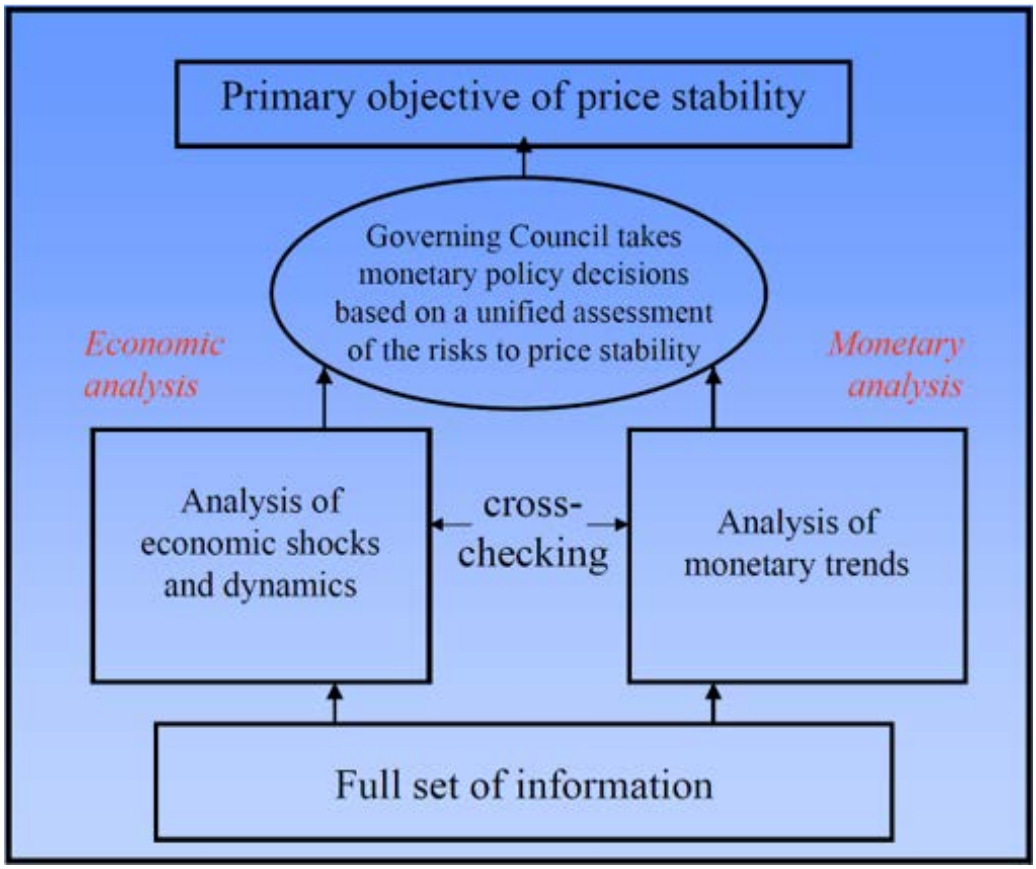
As discussed in Section 4, in the context of the ECB's original interpretation of its mandate, the ECB Governing Council announced the policy strategy of the newly established central bank on 13 October 1998. The strategy reflected the outcome of careful preparation over several years, following the ratification of the Maastricht Treaty in 1992. The European Monetary Institute, established in January 1994, helped prepare the ground.

In light of the unique nature of the EMU, the best strategy was not obvious. In a thoughtful description of the challenges, Otmar Issing described the start of the monetary union as "terra incognita" (Issing, 1996, p. 201). An important consideration was how to ensure credibility. This could greatly benefit from the success of the Bundesbank, the most influential among the central banks of the newly established Eurosystem. At the time, the Bundesbank preferred a strategy based on monetary targeting, along the lines of its own successful application in previous decades. In the 1980s and 1990s, monetary targeting helped a number of central banks, including the Fed, to reestablish price stability, following the policy mistakes that led to the Great Inflation in most advanced economies. During the Great Inflation, central banks that relied on monetary targeting, such as the Bundesbank and the Swiss National Bank proved more successful than central banks that did not. As inflation returned to low and more stable levels, however, the information value of monetary and credit aggregates diminished and monetary targeting lost some of its appeal. Greater attention was given to projections based on economic analysis, typically with input from structural macroeconometric models.

The ECB's original strategy combined the two: It distinguished two strands of analysis, "economic analysis," and "monetary analysis". The prominent role to money provided continuity with the successful strategy of the Bundesbank, which helped establish credibility, while the "economic analysis" incorporated the evolving best practices associated with short- and medium-term projections of the economy. An advantage of the two-pillar strategy, is that it allowed cross-checking of policy recommendations from the two approaches. This made the strategy more robust than either approach would be separately. A graphical representation of the strategy is provided in Figure 15, reproduced from Issing (2003).

Interestingly, the ECB's money pillar was also consistent with the language in the Fed's mandate. As noted earlier, the Federal Reserve Act stipulates that in pursuit of its objectives, the Fed "shall maintain long run growth of the monetary and credit aggregates commensurate with the economy's long run potential". This language was introduced in the legislation in 1977. In principle, monetary policy could be conducted simply on the basis of monetary analysis. This is especially useful when inflation is high and volatile and inflation expectations difficult to gauge — as was the case in several economies around the world during the Great Inflation. Indeed, this is what led to the change in the Fed's mandate in 1977, and the adoption of monetary and credit aggregates as an intermediate policy objective. However, as monetary policy succeeded in taming inflation, the usefulness of monetary and credit aggregates waned. In a low and stable inflation environment, the money pillar becomes less useful as a guide to monetary policy relative to its usefulness in a high and volatile inflation environment.

Figure 15: The ECB's two-pillar strategy



Source: Issing (2003).

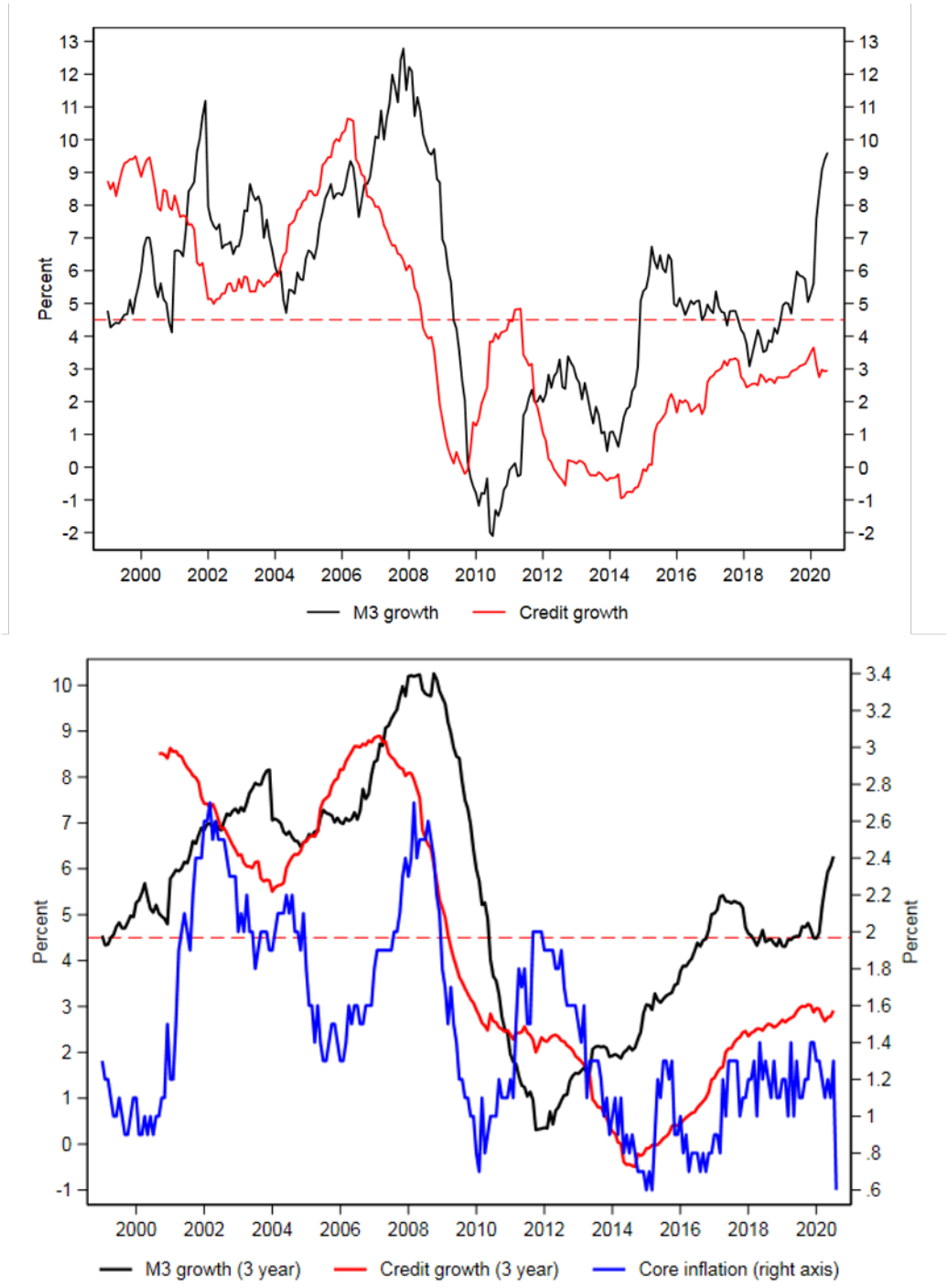
Following the 2003 policy strategy review, the role of the money pillar diminished somewhat, but the two-pillar strategy was retained and has remained prominent in ECB policy communications. The introductory statements at press conferences following policy meetings have continued to refer to "economic analysis" and "monetary analysis" separately all along. However, it is unclear whether the monetary pillar is still employed in the manner described in 1998 and 2003. The evidence suggests otherwise.

A comparison of the annual growth rates of money and credit to the ECB's reference value that served as a guide for the money pillar is informative. The reference value corresponded to a 4.5% annual growth rate for money. It was consistent with nominal income growth rising in line with the natural growth rate of the economy under price stability—that is, the sum of real potential GDP and the ECB's implicit inflation goal. Money and credit growth persistently higher than the reference value provided a signal that nominal income was growing too fast, suggesting tighter policy was needed to maintain price stability. Conversely, money and credit growth below the reference value provided a signal that easier policy would be needed to support nominal income in line with price stability.

The top panel of Figure 16 compares the annual growth rates of money and credit with the reference value. In light of the volatility of money and credit, examining the underlying trend in these growth rates can me more informative. To that end, the bottom panel plots the corresponding 3-year average growth rates, as these better reflect the underlying trends in money and credit growth. Focusing on the period after the GFC, raises question about the use of the money pillar. For a number of years, money and credit growth were consistently significantly below the reference value. The money pillar

persistently suggested that monetary policy needed to be eased by more than the actual accommodation the ECB provided. Was this information utilised along the lines described in 1998 or 2003? Apparently not. Core inflation (also plotted in the bottom panel) fell during this period. The decline in inflation coincided with the period when the money pillar was pointing to the need for additional policy accommodation.

Figure 16: Money and credit



Source: ECB SDW and authors'calculations.

The disconnect between continued communication of monetary policy in terms a two-pillar strategy, with the apparent silent demotion of the monetary pillar deserves attention in the context of the ECB's monetary policy strategy review. If the monetary pillar is no longer used, the communication of the policy strategy should be adjusted accordingly. As a rule, it is unhelpful to keep communicating one thing, while doing something else.

However, it would also be worthwhile to reassess whether the monetary pillar can no longer serve a useful cross-checking role to economic analysis. The evidence does not appear to support this conclusion. A weakness of relying solely on economic analysis is that it draws on macroeconometric models and the projections associated with them. Shifts in the economy that are not adequately understood in real time tend to result in biases in projections. This can mislead policymakers relying on them. Since the global financial crisis, the relationship between inflation and economic activity that is typically at the center of the macroeconometric models used for economic analysis (the Phillips curve) has shifted in a manner that has resulted in a systematic bias of inflation forecasts. In the case of the ECB, the staff projections systematically over-predicted core inflation (Lambrias and Page, 2019). An implication of this bias is that the ECB's economic pillar was prescribing more restrictive policy in this period, relative to what would be prescribed with unbiased projections. Had the ECB placed more emphasis on the money pillar after the GFC, it would have eased policy more, counterbalancing the bias in the economic analysis, and helping avert lowflation.

Other aspects of the ECB's policy strategy served the euro area well in the ECB's first few years. To be sure, before the encounter with the ZLB, policy was simpler—raising or lowering the overnight interest rate was enough to exercise monetary control. But there was more to that. Interest rate policy was conducted in a systematic fashion: Interest rates would be raised and lowered responding to the evolution of the short-term outlook for inflation and economic growth, which represents a robust approach to maintain inflation close to the central bank's goal, while dampening the business cycle. Interest rate policy was not communicated in terms of a simple policy rule: Nonetheless, it could be captured quite well with a robust rule responding to two inputs: Deviations of incipient inflation from the ECB's implicit inflation goal; and deviations of incipient real GDP growth from estimates of the growth of real potential GDP.[29]

The operational aspects of policy worked relatively smoothly as well, an extremely important aspect of policy strategy that is often overlooked outside central banking circles, and sometime even inside central banks. In its early years, the ECB exercised its discretionary authority under Article 18 of the Statute satisfactorily. The ECB's collateral framework was broad and flexible. This accommodated well the fragmented financial system of the euro area and ensured that the transmission of monetary policy was effective in all Member States. This represented a major achievement for the young institution, and for Europe and its citizens.

Unfortunately, not all aspects of the ECB's strategy relating to the implementation of monetary policy continued to work as effectively after the GFC. The encounter with the ZLB and the euro crisis exposed a number of challenges not all of which have been satisfactorily addressed.

6.2. The challenge of a low interest rate environment

One of key the lessons from the GFC is that countercyclical monetary policy is more challenging when interest rates are so low that policy cannot rely solely on interest rate cuts to provide the policy

[29] Gaspar and Issing (2011) and Hartmann and Smets (2018) provide details. In algebraic terms, the simple rule can be expressed as follows: $\Delta i = 0.5(\pi - \pi^*) + 0.5(\Delta q - \Delta q^*)$, where Δi is the quarterly change in the interest rates, $(\pi - \pi^*)$ the difference in the short-term inflation projection from the goal, and $(\Delta q - \Delta q^*)$ the difference of the short-term real GDP projection from potential output growth.

accommodation necessary to counteract the disinflationary impetus of a severe recession. A secular decline in interest rates, already evident before the GFC, has continued over the past decade.[30] This has important implications for the design of monetary policy.

The room to ease monetary policy with interest rate cuts is constrained by the natural rate of interest. In equilibrium, the natural nominal rate of interest is the sum of the central bank's inflation goal, π^*, and the real natural rate, r^*. With a 2% inflation goal, if r^* is high, say 3%, the nominal natural rate of interest is 5%. This would also be the available buffer for conventional policy accommodation. In a recession, starting from normal conditions, the central bank can cut rates by five percentage points before encountering the ZLB. With the same 2% inflation goal, if r^* is as low as zero, the central bank can only cut rates by two percentage points before encountering the ZLB. If more easing is needed, and the central bank does not provide it, a costly deflation will ensue.

The ZLB challenge is asymmetric. If the central bank adopted a policy strategy that were symmetric in its response to upside and downside shocks to the economy, the ZLB would induce a negative bias to inflation: On average, inflation would be below the central bank's goal.[31] One way to counteract this bias, is with a commitment to be more accommodative and for a longer period, than otherwise, but only when inflation is persistently low. This implies that when the ZLB constraints policy and keeps inflation persistently below the 2% goal, the central bank commits to overshoot the 2% goal in the future. This is similar to temporarily raising the inflation goal somewhat above 2%, in order to ensure that the average rate of inflation over long horizons equals 2% and is not biased below that goal. The revised policy strategy announced by the Fed in August 2020, introduces exactly this form of asymmetry to achieve its 2% inflation goal, on average:

> "The Committee 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." (Board of Governors of the Federal Reserve System, 2020)

The challenge arising from the ZLB is not new. In the context of modern macroeconomics, it was encountered as early as 1930, motivated by the slump associated with the 1929 crash. In his *Treatise on Money*, John Maynard Keynes proposed the purchase of long-term government debt—quantitative easing—as a solution. His advice, directed to the Fed and the Bank of England, was to oversupply reserves not only to push short-term rates to zero but also to purchase "long-dated securities" (Keynes, 1930, p. 386). By doing so, the central banks could depress longer-term interest rates as needed. His advice was not heeded. The consequence was the Great Depression of the 1930s. Keynes had anticipated that "the mentality and ideas" of policymakers themselves might pose an impediment to adoption of the necessary policy action. An important aspect of a robust monetary policy strategy is to help policymakers prepare for uncomfortable contingencies and avoid such errors.

By 1936, in his *General Theory*, Keynes, suggested that fiscal policy could be a very powerful tool for tackling the depressed economy. He also noted the theoretical possibility of the "liquidity trap": Monetary policy alone might not be potent enough to provide sufficient accommodation, if a bound

[30] See Brand, Bielecki and Penalver (2018), Lopez-Salido et al. (2020) and references therein for pertinent discussions of the decline and estimates of the extent of the decline.

[31] See Coenen et al (2004) and Mertens and Williams (2019) for discussions of this bias.

existed on nominal long-term interest rates. So, already in Keynes's writings from the 1930s, we can identify proposals on how monetary and fiscal policies can mitigate the challenge of a low interest rate environment. Inevitably, this points to the need to address, as part of a monetary policy strategy review, the effective coordination of fiscal and monetary policies.

6.3. Addressing the challenge

Providing additional monetary accommodation, once the short-term nominal interest rate is brought to zero, is possible in two ways: First, through quantitative easing policies. Second, by taking the extraordinary step of reducing the short-term interest rate somewhat below zero. We examine each in turn.

Quantitative easing policies constitute an effective way to mitigate the ZLB but are more challenging for central banks than merely adjusting the short-term interest rate for several reasons. They introduce more visible distortions to asset prices; they have more pronounced fiscal and distributional consequences; they can have adverse financial stability side-effects; they introduce greater risk on the central bank's balance sheet; and their potency is more uncertain.

QE can take many forms, all associated with oversupplying reserves to the monetary system, thereby expanding the central bank's balance sheet. The reserves may be used in different ways and ease monetary conditions through different channels despite an unchanged overnight interest rate. The canonical form of QE involves purchases of long-term government debt. Such purchases depress term premia and reduce implied real interest rates. Purchases of corporate debt or purchases of equity reduce the cost of financing for corporations. Purchases of foreign assets, weaken the exchange rate. QE can also be implemented through lending programs. The central bank can issue reserves and lend them to financial institutions that can in turn use the reserves to purchase assets or to extend loans.

Ultimately, through such operations, the central bank can materially reduce the cost of financing for governments, businesses, and households and provide accommodation even without changing the short-term nominal interest rate. In a sense, QE distorts prices from what would have prevailed in the economy if the central bank conducted policy solely through the short-term interest rate. This is an unavoidable feature of QE, but one that attracts attention and criticism.

Since the GFC, numerous central banks in advanced economies have resorted to quantitative easing to provide additional accommodation, beyond what interest rate cuts can deliver. Comparisons across central banks are not straightforward, as the normal size of a central bank's balance sheet may differ from one economy to another. Nonetheless, the significance of the scale of these operations can be easily seen. Figure 17 compares the balance sheets of the Fed, the ECB, the BOJ and the SNB in two different ways. In the top panel, the size of the balance sheet of each central is normalised to equal 100 in August 2008, the month before the GFC started. In the bottom panel, the balance sheet of each central bank is shown relative to the GDP of the respective economy. Both views confirm that all these central banks have expanded their balance sheets massively since the GFC, and again, in response to the 2020 pandemic.

The figure also suggests that the ECB's balance sheet expansion has not been particularly exceptional, compared to the other central banks. Compared to its pre-GFC size, the ECB's expansion has been the smallest of the four (top panel). Compared relative to each economy's GDP, the ECB's balance sheet size is the second smallest among the four.

The size of a central bank's balance sheet can be arbitrarily large, since there is no specific limit to the amount of reserves a central bank can issue. Ultimately, since the balance sheet is expanded to provide monetary accommodation, the "correct" size must be gauged by the accommodation needed to meet

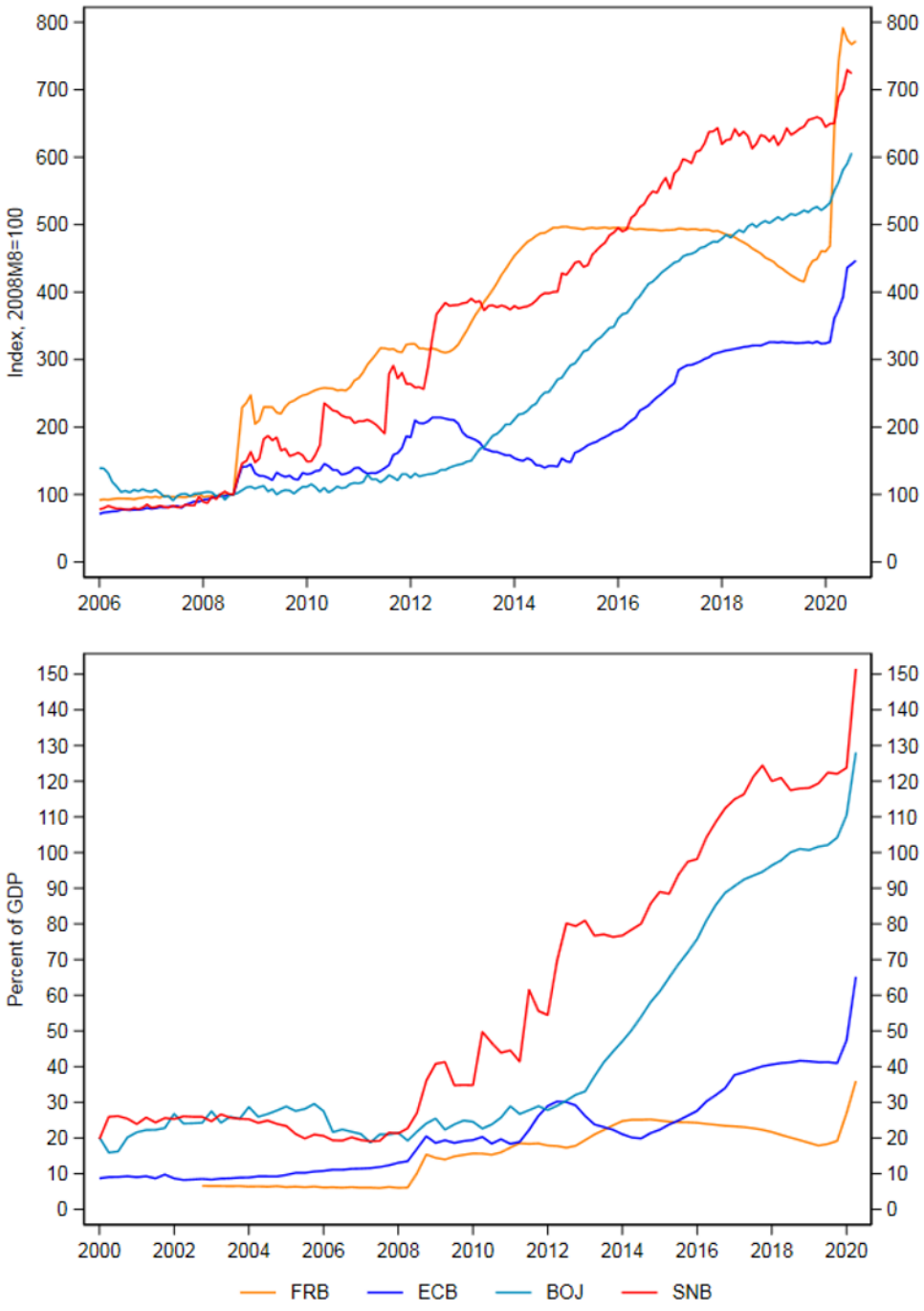
the central bank's goals. All four central banks shown in the figure, have experienced rather low inflation over the past decade. By this metric, none has expanded their balance sheet excessively.

In the case of the euro area, a more decisive expansion of the ECB's balance sheet since the GFC would have been beneficial. As discussed earlier, the ECB's decision to shrink its balance sheet by one third from mid-2012 to end-2014 was a major policy error. But the ECB's balance sheet policies raise questions even after 2015. Judging from the performance of the euro area economy, the path of inflation, inflation projections and inflation expectations, as discussed earlier, the ECB's balance sheet expansion continued to be miscalibrated after 2015. What could explain the ECB's reluctance to expand its balance sheet appropriately to raise inflation towards 2%? Understanding the possible causes is important for assessing how the ECB's policy strategy could be improved to avoid similar policy miscalibrations in the future.

An important factor is associated with the unique problems arising from the incomplete nature of the EMU. Recall that the canonical form of quantitative easing entails the purchase of long-term government debt. But in the case of the ECB, there is no single government counterpart. One implication is that this form of QE must be implemented through purchases of sovereign debt of the Member States. In principle, the ECB could have simply proceeded with such purchases, roughly in proportion to the size of each Member State. This would have replicated, in the context of the euro area, the canonical form of QE at other major central banks, such as the Fed and the BOJ. The prospect of such purchases, however, became a source of controversy and attracted political attacks and legal challenges directed against the ECB.

The controversy had a material role in limiting ECB purchases of sovereign debt. For example, the ECB adopted "limits" by putting an upper bound on bond purchases in its public sector purchase programme (PSPP), even though there was no way of knowing the quantity of purchases that would be needed to raise inflation towards 2%. The justification provided for these self-imposed limits was "to ensure compliance with the monetary financing prohibition laid down in the Treaty" (ECB, 2015, p. 8). In the event, the ECB ended its PSPP, as its self-imposed restrictions were being tested well before sufficient progress towards raising inflation had been made.

Figure 17: Central bank balance sheets



Source: ECB SDW, BOJ, SNB and FRED, Federal Reserve Bank of St. Louis.

In addition, the ECB decided to implement QE *not* as a common policy implemented on the common balance sheet but rather as a set of separate operations undertaken by each individual NCB on its own balance sheet. Thus, each NCB would make purchases of sovereign debt of its own Member State, on its own balance sheet. In the accounts of the meeting in which this decision was taken, the ECB

acknowledged that this was not the best way to implement QE in the euro area[32]: "On the one hand, arguments were made in favour of full risk sharing so as to counter perceptions of a lack of unity. Full risk sharing would also underline the singleness of monetary policy" (ECB, 2015, p. 15). Nonetheless, this was rejected: "On the other hand, in view of concerns about moral hazard it was argued that a regime of partial loss sharing would be more commensurate with the current architecture of Economic and Monetary Union and the Treaties under which the ECB operates" (ECB, 2015, p.15). In effect, the ECB decided to deviate from implementing QE in the manner best suited for the euro area, from a monetary policy perspective, in order to avoid moral hazard on the part of Member States' governments. Although this justification did not explicitly cite Articles 123 and 125 TFEU, it is suggestive of the source of concern.

The ECB also expanded its balance sheet through a number of lending programs—refinancing operations. In these programs, the ECB lends liquidity to financial institutions for extended periods, up to 3-4 years, upon presentation of eligible collateral. The financial institutions can then use the liquidity to purchase assets or make loans. Similar to canonical QE, these programs are also effective in supporting aggregate demand.

The evidence based on the ECB's experience with QE, suggests that it has been effective in boosting aggregate demand, and containing the decline in inflation expectations and lowflation.[33] Thus, the ECB's reluctance to expand its balance sheet as aggressively as was needed to raise inflation close to 2% was not a reflection of misconceived concerns of ineffectiveness.

Whatever the cause, the ECB's reluctance to fully embrace the canonical form of QE—outright purchases of sovereign debt—had another adverse side effect: In the aftermath of the GFC, it unduly constrained fiscal policy. Recall that one of the direct consequences of purchases of government debt is the reduction in the real cost of refinancing government debt. Through more aggressive purchases of sovereign debt, the ECB could have created additional fiscal space for EMU governments that could have been utilised to implement more expansionary fiscal policy. This, in turn, would have boosted GDP and helped raise inflation towards 2%, without a deterioration of Member States' debt ratios. The proper calibration of balance sheet policies, accounting for fiscal-monetary interactions is especially important for monetary policy in a low interest rate environment.[34]

Starting in 2014, the ECB partially compensated for the timidity of its balance sheet policy by introducing negative interest rates. Reducing the short-term interest below zero has similar accommodative effects through the term structure of interest rates and through the exchange rate as reducing the interest rate from a higher positive value to a lower positive value. And, in this sense, it is an effective tool. However, reducing interest rates on reserves to below zero, while simultaneously providing zero-interest currency, has some side-effects that are not concerning when rates are positive.

Banks have been reluctant to charge negative rates to their retail customers. It appears that banks expect a significant elasticity of deposit supply at 0% from retail customers, especially if one bank would start charging rates to customers in isolation, when other banks still offer a zero rate. This, together with switching costs, provides an incentive to banks to do "depositor hoarding", even if holding on to these depositors at 0% cost is relatively expensive.

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[32] The accounts described the decision in terms of risk sharing, referring to the distribution of profits and losses from the operations: "full" sharing corresponded to purchases government debt using the common balance sheet; "partial" sharing to each NCB purchasing separately bonds on its balance sheet.

[33] Pertinent research includes Andrade et al (2016), Coenen and Schmidt (2016), Mouabbi and Sahuc (2019), and De Santis (2020).

[34] See Sims (2016) and Orphanides (2018) for discussions of fiscal-monetary interactions. Recent work based on the ECB's New Area Wide Model suggests important benefits from well-coordinated fiscal and monetary policies to successfully tackle the low interest rate challenge. (Coenen, Montes-Galdon and Smets, 2020).

It is clear that a negative policy rate, coupled with a deposit rate that does not go negative, imposes either a very flat or possibly even inverted effective yield curve on banks. This implies that the maturity transformation — a key component in the traditional business model of banks — is not working anymore. It is possible that banks try to find alternative sources of revenue in such circumstances. Indeed, Demiralp et al (2019) find that negative rates correlate with a higher level of risk in banks' loan portfolio. This is akin to "search for yield" on the part of banks, and can be interpreted as banks trying to make up for the dwindling term premium by loading more default premium into the asset mix.

Moreover, it is even conceivable that banks might charge higher rates on their loan business as a reaction to deteriorating returns on cash assets. This is captured by the idea that they may be a reversal rate where the effect of a more negative rate becomes more contractionary rather than expansionary (Brunnermeier and Koby, 2018).

The ECB, and other central banks that have implemented negative interest rates have been mindful of this adverse effect on banks. To partially compensate for it, they provide generous exemptions on the amount of reserves that are subject to a negative interest rate. This has permitted reducing rates somewhat more below zero.

On balance, accounting for side-effects, the experience of the ECB with negative interest rates appears to be positive (Schnabel, 2020). But the uncertainty associated with side-effects from further reductions argues for caution and constrains significant further cuts.

One way to get around this constraint is to move towards the abolition of physical cash through the introduction of central bank digital currency (Bordo and Levin, 2017). Since the current low interest rate environment is anticipated to persist for some time, in considering monetary policy strategy for the future, the ECB and other central banks could benefit from cooperating with each other to expedite the necessary innovation that might make it practical to implement negative interest rates without the side effects evident at present.

6.4. Systematic policy in a low interest rate environment

Monetary policy is more effective when it is systematic and guided by an explicit or implicit rule. The systematic nature of policy can be easily explained when a policy rule describes reasonably well how the central bank's policy instrument responds to changes in inflation and economic activity. In Section 6.1, we discussed how the ECB's successful policy before the GFC could be described in terms of a simple rule with a short-term interest rate instrument.

One of the difficulties associated with the ZLB is that policy can no longer be well described in terms of a short-term interest rate instrument. However, the principle that policy is more effective when it is systematic still applies. One of the challenges in a low interest rate environment is to communicate the systematic nature of monetary policy even when this cannot be reflected in short-term interest rate changes.

The first necessary element of systematic policy is to be clear about the inflation goal, whose importance was discussed in Section 4. A description of systematic policy, however, is more than just stating a goal. A rule also describes how a policy instrument is adjusted to achieve the goal.

One way to do this in the context of QE is to treat the size of the central bank's balance sheet as the policy instrument and describe how it is to be adjusted as the outlook and inflation and economic growth evolve. For example, the ECB could commit to a rate of balance sheet expansion that is commensurate with the shortfall of inflation or projected inflation from the inflation target.

Communicated in this fashion, the ECB would also clarify the purpose of balance sheet expansions. The purpose of balance sheet expansion, which does involve the purchase of government debt, has nothing to do with monetary financing. Instead, the purpose is to achieve the primary mandate and depends on the development of inflation alone.

Alternatively, the ECB could consider relying more directly on longer term interest rates as policy instruments. The effectiveness of QE is derived from its influence on longer term real interest rates. Interest rates, in particular the ones with medium or long maturity, are key variables that determine aggregate demand. The traditional transmission mechanism therefore runs through those interest rates. In an environment that is not bound below, the mechanism is that the central bank influences short term rates, which then trickles down to longer maturity yields, which affects aggregate demand, and ultimately inflation dynamics. In a low interest environment, controlling longer term rates through short term rates is no longer possible. At the ZLB, QE serves as a substitute to the role short-term interest rate adjustment has in influencing long term rates. But an even more direct approach would be to use longer term interest rates directly as policy instruments.

This is how yield curve control (YCC) works. YCC has been implemented by the Bank of Japan since 2016, as a refinement of canonical QE. In particular, the BOJ has combined a slightly negative short term interest rates with a target of 0% at 10-year maturity, and committed to a pace of bond purchases calibrated to keep the 10-year government bond yield close to 0% as long as inflation remains below its 2% goal. A concern with YCC is that it may require large and unpredictable changes in the size of the central bank's balance sheet. A lesson from the BOJ experience is that by communicating a credible target for long term yields, the BOJ has been able to control the whole yield curve at exceptionally low levels, without unusually large purchases of government debt. In this sense, QE with YCC appears to be more efficient than QE without YCC.

In the case of the ECB, there is no common sovereign yield curve that could be used to implement YCC. Instead, the ECB could target a GDP-weighted sovereign yield curve.

6.5. Assessing debt sustainability and sovereign credit risk

The assessment of the sustainability of government debt has become a serious issue for the ECB since the safe asset status of government debt was compromised during the crisis. Debt sustainability analysis (DSA) can be employed to determine whether a Member State's debt has become unsustainable, in which case it would be problematic for the ECB to allow its use in monetary policy operations. For example, consider quantitative easing. Purchasing government debt of dubious quality can be interpreted as monetary financing, which the ECB is not allowed to do. Alternatively, consider the ECB's collateralised credit operations. Should government debt of a Member State with unsustainable debt dynamics be considered eligible collateral?

As the central bank of a monetary union, the ECB faces a unique challenge. The manner in which it treats Member States is also unique. Peer central banks accept debt of the sovereign of their own country in their own currency for monetary policy operations without reservation. This is why, in advanced economies, government debt enjoys the status of a liquid asset. Whether it is also a safe asset depends on the fiscal sustainability of the government finance, but even if this is doubtful, there will always be demand for such an asset because it provides unfettered access to central bank liquidity.

This is not so in the euro area. Since Deauville, the status of government debt has fundamentally changed. A change in the ECB's views regarding debt sustainability can determine whether the debt is included or excluded from its monetary policy operations.

The methodology employed for debt sustainability thus becomes an important aspect of monetary policy strategy. Debt sustainability analysis critically depends on assumptions regarding the interest rate at which a government can refinance its debt in the future. A question that arises in practice is whether it is appropriate to always rely on market interest rates for such analysis. For private entities, which have no material influence on interest rates, this is a sensible benchmark. For a central bank, that can have a material influence on interest rates, however, the answer is different. Market information can be procyclical and the central bank should account for that in its own analysis. During times of market stress, in particular, market information may be misleading. Indeed, the ECB has recognised this problem and expressed the view that *automatic* reliance on market information should be avoided:

> "[…] the Eurosystem is cautious against any automatic reliance of regulation on market based variables. Market-based information may be excessively volatile and significantly misleading, for instance, during times of market dislocation. In these situations, market information can be procyclical; reflecting over- and under-reactions which result in mispricing over longer time periods." (ECB, 2011, p. 2)

At the same time, the ECB has adopted a methodology for debt sustainability analysis that embodies exactly such an *automatic* reliance on market information.[35] This represents a glaring inconsistency.

In sovereign debt markets, multiple self-fulfilling equilibria can coexist with the same fiscal fundamentals (see Box 1 in Section 3.5). The operational procedures and assumptions employed for evaluating debt sustainability by the central bank provide information on whether the central bank aims to coordinate beliefs on the safe equilibrium or promotes one of the risky equilibria. A central bank that decides to rely on market interest rates as an assumption for debt sustainability effectively chooses to validate whatever equilibrium is reflected in market rates. This may well include an unwarranted credit risk and be far worse, from a welfare perspective, than the safe equilibrium that the central bank could have chosen to validate instead.

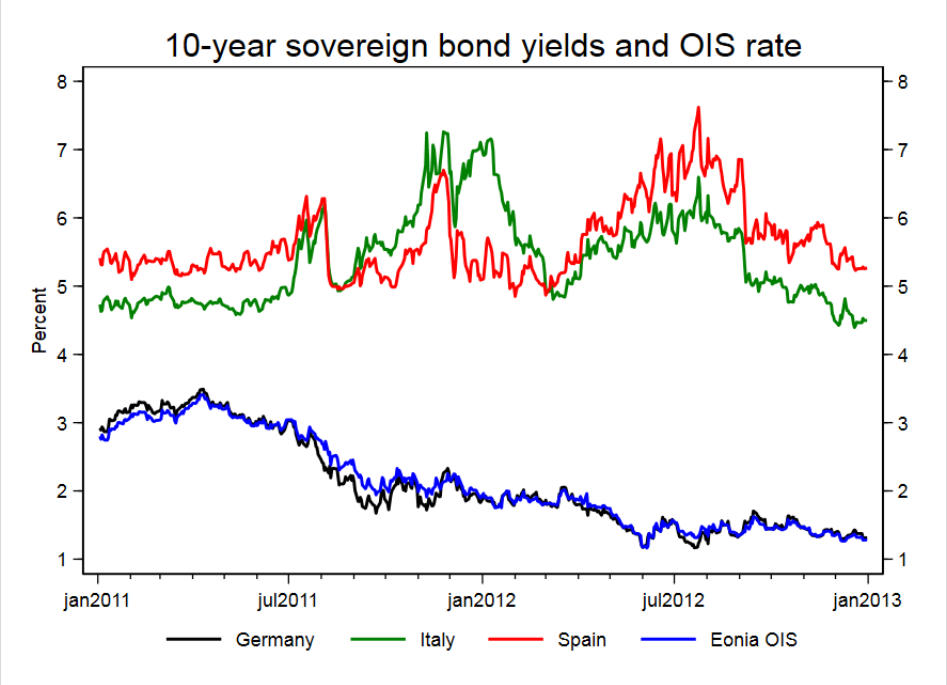
The automatic reliance of the ECB on market interest rates for debt sustainability analysis induces unnecessary and undesirable vulnerabilities in the euro area.

[35] The ECB DSA methodology is detailed in Bouabdallah et al (2017). Box 2 examines an episode that illustrates the consequences of using incorrect interest rate assumptions.

Box 2: The interest rate assumption in DSA: Italy and Spain in summer 2012

In recognition of the heightened tensions in euro area sovereign debt markets that prevailed in summer 2012, the September 2012 Monthly Bulletin (ECB, 2012) included debt sustainability analyses for Spain and Italy. The point of the exercise was to demonstrate that debt dynamics in the two states were sustainable, thereby suggesting that, in the ECB's view, the prevailing market perceptions of credit risk were unwarranted.

A critical assumption necessary for the analysis was the interest rate at which Spain and Italy would be able to refinance their government debt in the future. At the time, risk-free rates at 10-year maturities were just above 1% (see figure below). Instead, the ECB decided to adopt an assumption that was about in line with the prevailing market rates for Spain and Italy, inclusive of the unwarranted credit risk that the exercise was meant to dispel: "It is assumed that nominal market interest rates at ten-year maturities will converge from their present levels to 5% by 2015." (ECB, 2012, p. 89).



Source: Bloomberg.

Because of this interest rate assumption, which included a 3-4 percentage point premium over the safe rate, debt dynamics for Spain and Italy appeared unsustainable, absent large future primary surpluses. (Box 3 illustrates the large effect of the interest assumption on the DSA result.) In the baseline scenario, sustainability was indeed attained with large primary surpluses—reaching as high as 3.3 and 5.7 percentage points of GDP, respectively, for Spain and Italy. Instead, had an assumption closer to the prevailing risk-free interest rates been adopted, as could have been easily supported by the ECB, the exercise would have demonstrated that no primary surpluses were needed to assure debt sustainability.

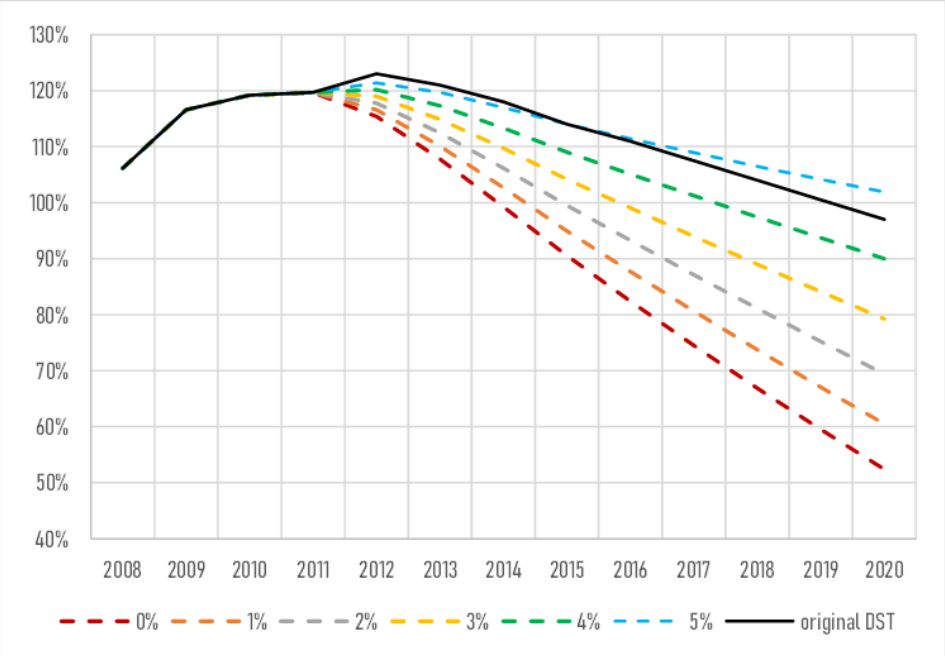
By embracing market interest rates the ECB muddled the message of the exercise and made debt sustainability in Spain and Italy appear more tenuous than it actually was.

Box 3: Compound interest and the sensitivity of DSA

As discussed in Box 1, the sustainability of debt is determined by the ability of a government to achieve sufficient primary surpluses (or not too large primary deficits), and the cost of financing (captured by the interest rate it has to pay on the stock of accumulated debt) versus the growth rate of the tax base (which we equate with GDP growth). It is often underappreciated how strong the effect of the interest rate is in this equation. In fact, due to the effect of compounding interest, small changes of the interest rate have an immense impact on debt sustainability.

In Box 2, it was explained that the ECB chose to use projected interest rates that were close to market rates in their DSA of Italy and Spain. The assumption was that yields would converge to 5%, whereas the safe rate was close to 1%. Since the ECB argued that the debts of these two countries were sustainable, it would have been consistent to use the safe rate instead of the market rate that included perceived worries of default.

The chart below depicts the implied trajectories of debt to GDP for Italy, while keeping the assumptions about primary balance and GDP growth unaltered from the ones used in the ECB analysis (ECB, 2012, p. 89). The comparison should provide a sense of how sensitive debt sustainability is with respect to assumptions about the prevailing interest rate.



Source: ECB (2012) and authors' calculations.

It should be noted that this analysis underestimates the effect of the interest rate. If the ECB had clearly communicated that the Italian debt was safe, and guided markets accordingly, the interest rate would have fallen towards the safe level, which would have eased the fiscal restrictions imposed on the Spanish and Italian governments. As a consequence, a more expansionary fiscal policy would have become feasible and GDP would have grown faster, which would have improved debt dynamics even more.

6.6. Collateral framework

Monetary policy can be implemented in different ways. Today, the most common mechanism is to use repurchase agreements (repos), in which the central bank provides liquidity to a bank in return for borrowing some well-defined assets. A repo can be understood as a joint contract consisting of a first leg, in which the bank sells the asset to the central bank, and a second leg, in which the central bank sells the asset back to the bank at a future point in time at a predetermined price. For the time span between these legs, the bank has access to the liquidity from the central bank. By rolling such repo contracts, the central bank can finely regulate the amount of liquidity that is outstanding, and tightly control the money market rate.

The collateral framework of a central bank is of utmost importance to the implementation of monetary policy. It determines which assets are eligible at what conditions for such repo operations. An asset that is part of the basket of collateralisable assets is particularly valuable for banks, because it provides access to much needed liquidity from the central bank. Such assets therefore trade at a higher price, implying that they enjoy a lower yield. The difference can be interpreted as a convenience or liquidity spread. By specifying the collateral framework, the central bank is deliberately distorting the financial market prices.

The main purpose of a central bank's collateral framework is to ensure sufficient availability of collateral to allow a smooth implementation of monetary policy. Through its collateralised credit operations, a central bank can also determine who has access to its balance sheet and at what terms. Some central banks have very limited discretionary authority in this regard. In the case of the ECB, Article 18 of the Statute entrusts the institution with incredibly broad discretionary authority.

In the context of the EMU, this discretionary authority proved to be a poisoned chalice: The realisation that the ECB could declare government debt ineligible for its monetary policy operations suggested that the ECB's collateral framework could also serve as an effective disciplining device for governments, which entangled the ECB in the politics of the euro crisis.[36] Well-behaved government finances are helpful for achieving price stability. One could therefore argue that the ECB should use its operations to discipline Member States to behave fiscally responsibly, in the interest of its primary mandate. Doing so, however, would clearly be overstepping the authority of the ECB, and it would politicise the institution in a way that would be harmful to its functioning.

In general, a central bank will specify the collateral framework in such a way as to safeguard its own balance sheet from default risk. One should note, however, that the default risk of the central bank is small, since the second leg of the repo transaction guarantees the central bank that the commercial bank will purchase the asset back. In fact, the default of an asset that is used as collateral will ultimately affect the bank, not the central bank. The central bank will suffer a loss only if the bank defaults during the horizon of the repo.

The heterogeneity of collateral frameworks used by different central banks is surprisingly large (see BIS, 2013). Some central banks (most notably the Federal Reserve) have a very narrow set of instruments eligible as collateral for monetary policy operations. Others accept a wider set of assets. The ECB is most extreme in that regard. It allows a wide variety of assets ranging from government bonds, to uncovered bank bonds, asset-backed securities and credit claims. Some have argued that the fact that the ECB accepts assets of less than perfect quality undermines market discipline (Nyborg, 2017).

Risk management considerations are also reflected in the ECB's collateral framework. The ECB requires a minimum credit rating to consider an asset as eligible collateral. Government debt is no exception in

[36] See Orphanides (2020) and references therein.

this respect. In the aftermath of the GFC, a consensus has emerged that linking regulation in an automatic fashion to rating agencies' verdicts is to be avoided (FSB, 2010). Despite this, the ECB relies on ratings from four rating agencies to gauge the solvency of government debt. This is highly problematic for several reasons.

1. The financing conditions of Member States can be harshly affected depending on the assessment of external rating agencies.[37]
2. This goes beyond the direct effect of default-risk spreads. Instead, as the ECB links collateral eligibility to credit ratings, a downgrading can also destroy the liquidity premium of a member's bonds and thus greatly affect the financial position of a Member State's government.
3. The rating determines the haircut that the ECB uses when accepting collateral, or whether it accepts the collateral at all. A haircut is applied on top of the market valuation. Thus, if a bond is already trading at a relatively low value (high yield), a haircut is applied on top of that, which further reduces the attractiveness of the bond. This is prone to spiral out of control.

This last point is particularly important. The ECB uses market prices to measure the objective value of an asset, including a government bond. A high yield of a bond often goes hand in hand with a less favourable rating. On top of the depressed price, the central bank then imposes a haircut or rejects the bond altogether on the basis of a low credit rating. However, market prices and credit ratings are endogenous: They depend sensitively on central bank policies. If the central bank would accept a bond with no haircut, the financial condition of the particular corporate entity or state would improve, raising bond prices and improving credit ratings.

Put differently, a harsh treatment of a government bond by the central bank can depress the market value and the rating, which then justifies the harsh treatment. This might, in an extreme scenario, even provoke a default. Alternatively, a more favourable treatment by the central bank may ease the financing conditions so much that a high rating ensues and no default occurs.

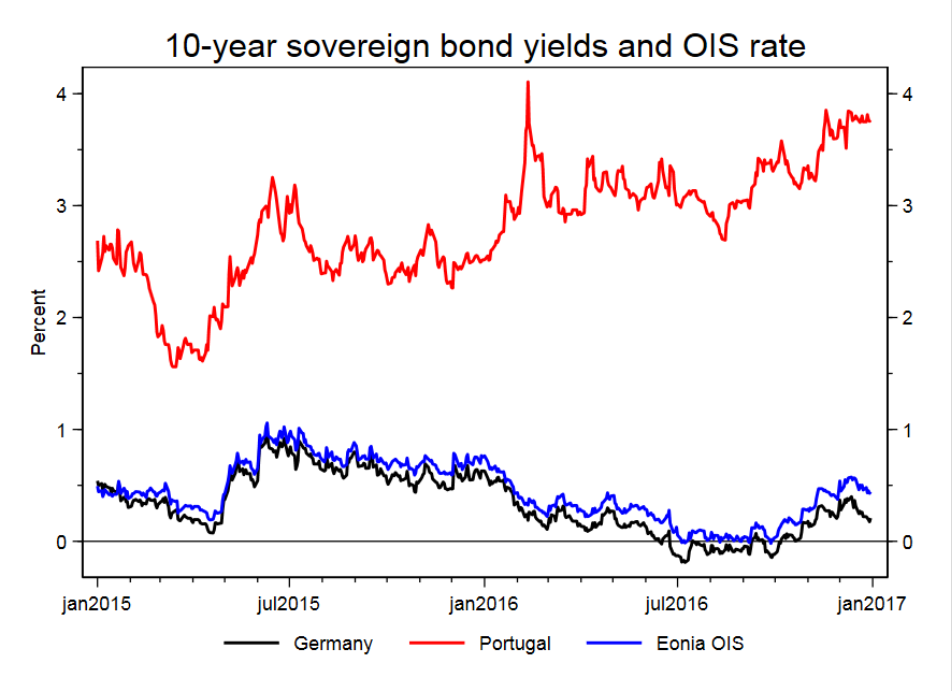
By relying on credit ratings to determine collateral eligibility of government debt, the ECB inadvertently created a highly destabilising cliff effect. For Member States near the ratings cliff, mere rumours about possible downgrades tighten monetary conditions and induce the possibility of a roll-over crisis. Fear that downgrades would trigger the loss of eligibility creates an adverse self-fulfilling dynamic and the perception that the fate of Member States is in the hands of private rating agencies (see Box 4). Since Deauville, investors must protect against capital losses in the event of roll-over crisis, even if the sovereign is sustainable and default is unnecessary. As a result, the elevated propensity of roll-over crises due to the cliff effect creates an additional credit premium in government bonds of most Member States.

In general, using market prices as gauge for quality is fundamentally problematic, when this assessment by the ECB is one of the main sources for the determination of the market price. This is a situation with potentially multiple equilibria, and in such a situation, a unique objective measure of the "true value" does not exist independently of the ECB's assessment.

[37] Vernazza and Nielsen (2015) document substantial "damaging bias" in assessments for the 5 Member States identified as more vulnerable in Section 3.

Box 4: The cliff effect in Portugal

In 2015-2016, Portugal's recovery from the peak of the euro crisis was hampered by uncertainty relating to the cliff effect embedded in the ECB's collateral framework. Despite the ECB's quantitative easing programme, monetary policy conditions tightened in Portugal, as summarised by the 10-year yield on sovereign debt (see figure).



Source: Bloomberg.

Portugal was at the edge of the ratings cliff: Of the four private credit rating agencies entrusted by the ECB to determine the eligibility of sovereign debt for its monetary policy operations, only one, DBRS, rated Portugal above the ECB's threshold. In accordance with the ECB's framework, a decision by DBRS to downgrade Portugal by a just one notch would automatically exclude Portuguese government debt from the ECB's quantitative easing program and render the securities ineligible as collateral. Since a downgrade would result in an automatic tightening of monetary conditions in Portugal and threaten a debt roll-over crisis, hints and rumours relating to DBRS became a key driver of monetary conditions in Portugal.

Sensitivity to a possible downgrade increased in August 2016, following remarks by a DBRS official expressing concerns about the country. In anticipation to the subsequent rating decision, the *Economist* reported: "Markets are waiting anxiously for October 21st, when DBRS will update its rating of Portuguese sovereign debt. Hints from DBRS have been playing havoc with the ten-year bond yield." (Economist, 2016)

In the event, DBRS decided not to downgrade Portugal on 21 October. Escaping the downgrade, however, did not resolve the underlying uncertainty caused by cliff effect embedded in the ECB's collateral framework. As the *Financial Times* reminded its readers on 24 October, "the rating is not forever. In April, DBRS will revisit its rating, so for the next six months, Portugal's fate will again depend on a little-known credit agency based in Toronto". (Moore, 2016)

Vitor Constâncio outlined this problem clearly in his fare-well address:

> "The issue stems from the fact that the demotion of national public debt to debt with default risk opens the door, as in any other asset market, to episodes of acute liquidity stress with investors panicking or speculating, leading prices and yields to levels not justified by changes in fundamentals. Without a response, such events create contagion in a monetary Union and self-fulfilling crisis with redenomination risks that may put into question the whole monetary Union. […] In 2011, after the Deauville episode and the early talk about the Greek debt private sector involvement, financial markets attacked Italian and Spanish sovereign bonds without any change in their fundamentals, showing the outcome of a domino effect that threatened to ultimately reach some core countries as a result of widespread contagion." (Constâncio, 2018)

The heart of the problem is the multiplicity of equilibria: Given a collateral policy that ties the eligibility of bonds to market prices (or ratings) can easily be compatible with a good and a bad equilibrium.[38] If the dog chooses to chase its tail, he will spin out of control. But he might just as well not chase his own tail, and this will be a much less volatile equilibrium. This fragility can be broken by removing the dog's tail, which in the context of the ECB means a commitment of the ECB not to use market prices for quality assessment, but some more fundamental and longer term analysis.

It should be noted that when the ECB started its operations, its collateral framework did not include a cliff effect for government debt. Though it relied on credit rating agencies to determine collateral eligibility for private debt, it did not threaten to declare government debt ineligible on the basis of credit ratings. Consistent with global central banking practice, it accepted the government debt of its own governments without minimum credit rating thresholds. This was changed in 2005, following the decision by governments to weaken the Stability and Growth Pact, subsequent to its violation by Germany and France in 2003-2004. The following rationale supported the change: By introducing credit rating criteria in the eligibility of government debt, the collateral eligibility of government debt would become a disciplining device, which, in turn, would encourage market discipline.

At the time, the legitimacy of using the ECB's collateral framework as a disciplining device for Member States' government was questioned:

> "It has been recently argued that the ECB should use its collateral policy as a sanction to exert fiscal discipline […]. Although superficially appealing, this suggestion would be misguided. […] [I]it is clear that the design of the Stability and Growth Pact and its implementation are governmental responsibilities, to be controlled by parliaments. […]
>
> [I]t is not and cannot be the ECB's role to enforce fiscal discipline and to correct shortcomings in the implementation of the Stability and Growth Pact. Attempting to do so would politicise the ECB's operations and ultimately threaten its independence […]". (Issing, 2005)

Nonetheless, the ECB went ahead with the change in its collateral framework, thereby elevating the role of credit rating agencies in government bond markets.

During the GFC, the destabilising role of using credit ratings was recognised and efforts were made to improve practices. The European Commission proposed limiting the role of credit ratings and consulted with the ECB accordingly. In 2011, the ECB acknowledged the problem and supported the

[38] We have recently developed a theoretical model describing precisely this mechanism, see Lengwiler and Orphanides (2020).

Commission's efforts to remove the vulnerability associated with credit ratings from European regulations:

> "The Eurosystem supports the Commission's efforts to reduce the reliance of financial markets and the official sector on CRAs' ratings and to diminish the impact of "cliff effects" on financial institutions and markets. The crisis has shown that the overreliance on ratings, as they are embedded in many regulations and private contracts through ratings downgrades (and their spill-over effects) can destabilise financial markets." (ECB, 2011)

However, despite acknowledging the destabilising role of the "cliff effects" generated by credit ratings, the ECB continued to rely on them for its own operations.

Has the ECB employed the discretionary authority delegated to it under Article 18 of the Statute as effectively as it should to fulfil its mandate? Our answer is no. As we have learned from the euro crisis, the ECB's decision to delegate collateral eligibility of government debt to rating agencies, and associated cliff effect, had catastrophic consequences for multiple Member States.

Indeed, among all other weaknesses in the ECB's monetary policy strategy, *this flaw may be the single most important for the continuing fragility of the EMU*. The cliff effect in the ECB's collateral framework has been the proximate cause of episodes of severe market stress and debt rollover crises that afflicted several Member States since the start of the euro crisis.

Given the critical role of the ECB collateral framework for diffusing unwarranted market stress in government bond market, much would be gained if the ECB re-examined and corrected this aspect of its collateral framework as part of its monetary policy strategy review.

7. THE RESPONSE TO THE PANDEMIC

7.1. The challenge

At the onset of the pandemic, the euro area was not in a particularly good position. The unresolved effects of the euro crisis were still lingering in the form of substantial spreads between government bonds of various Member States. Brexit, and its associated risks, remained unresolved. As a result of the ECB's policy decisions in earlier years, average inflation in the EMU was uncomfortably low, and the policy rate was negative, which did not leave the ECB much room to deploy conventional easing measures.

The pandemic has sizeable effects in the EMU. The ECB/Eurosystem staff projections of GDP growth for 2020 declined from +1.1% in December 2019 to +0.8% in March, -8.7% in June, and -8.0% in September. Not surprisingly, the outlook for inflation has also been marked down (Table 2). This deepened the lowflation problem in place before the crisis, pointing to the need for a more forceful monetary stimulus. The pandemic had a similar adverse effect on the US economy and the FOMC also marked down its inflation forecasts (Table 2).

Table 2: Recent inflation projections

	ECB			Fed			
	2020	2021	2022	2020	2021	2022	2023
December 2019	1.2	1.5	1.7	1.9	2.0	2.0	NA
March 2020	1.1	1.5	1.6	NA	NA	NA	NA
June 2020	0.0	1.0	1.4	0.8	1.6	1.7	NA
September 2020	-0.2	1.5	1.4	1.2	1.7	1.8	2.0

Source: ECB and Fed.

Notes: Q4/Q4 inflation projections. For the ECB, these are ECB/Eurosystem quarterly staff projections for HICP inflation. For the Fed, these are the median FOMC projections for PCE inflation.

Both central banks responded forcefully. With interest rates already low, monetary easing was implemented through a balance sheet expansion. In conjunction with important fiscal easing this contained the depth of the recession. Comparing the two central banks, however, suggests two differences that make the ECB's task more challenging.

First, having already adopted a clear inflation goal in 2012, and having pursued policies that successfully anchored inflation expectations at 2%, the Fed faces an easier task in supporting the economy and maintaining price stability than the ECB. A crucial benefit of a commitment to a 2% inflation goal is that it diminishes the risk that the recessionary shock will guide inflation expectations lower, which would raise real-interest rates and reduce the effectiveness of the policy easing. Still, some risk remains. To reduce this risk further, the Fed took an additional important step. In August 2020, it adjusted its monetary policy strategy aiming specifically to strengthen its commitment to deliver 2%

inflation over time. The result is evident in the FOMC projections, shown in Table 2. By September, the Fed communicated through its projections that it will provide sufficient accommodation to the economy to bring back inflation to 2% over the next 3 years. The Fed even communicated that it aims at overshooting the 2% target for some time to make up for past undershooting of the goal. This should help protecting against a downshifting of inflation expectations.

By contrast, the ECB's projections in June and September suggest the ECB continues to tolerate lowflation and its adverse effects on inflation expectations, which make its easing policy less effective: With its current policy strategy, real interest rates are higher than they could have been, had the ECB shown greater commitment to guiding inflation towards 2%.

Had the ECB adopted a clear 2% inflation goal before the pandemic, as all other major central banks in advanced economies had done years ago, the ECB would have been in a better position to protect the euro area economy from the pandemic shock. More importantly, the ECB can still reap the benefits of better anchoring inflation expectations if it adopts a clear 2% inflation goal the soonest. While many other aspects of the ECB's policy strategy review might require further deliberation, the adoption of a clear inflation goal should not be further delayed.

The second challenge the ECB faces relates to the lingering problems of the euro crisis. We turn to that next.

7.2. Three episodes in the ECB's response

The mishap: 12 March 2020. The ECB's response to the pandemic had a rocky start. A potentially dangerous communication mishap at the press conference of 12 March 2020, in which President Lagarde stated the ECB was "not here to close spreads", made yields of vulnerable countries' debt spiralling out of control. Figure 18 visualises this event clearly.

But President Lagarde deserves respect for acknowledging and attempting to correct the mishap quickly. The following footnote was added to the published transcript of the press conference:

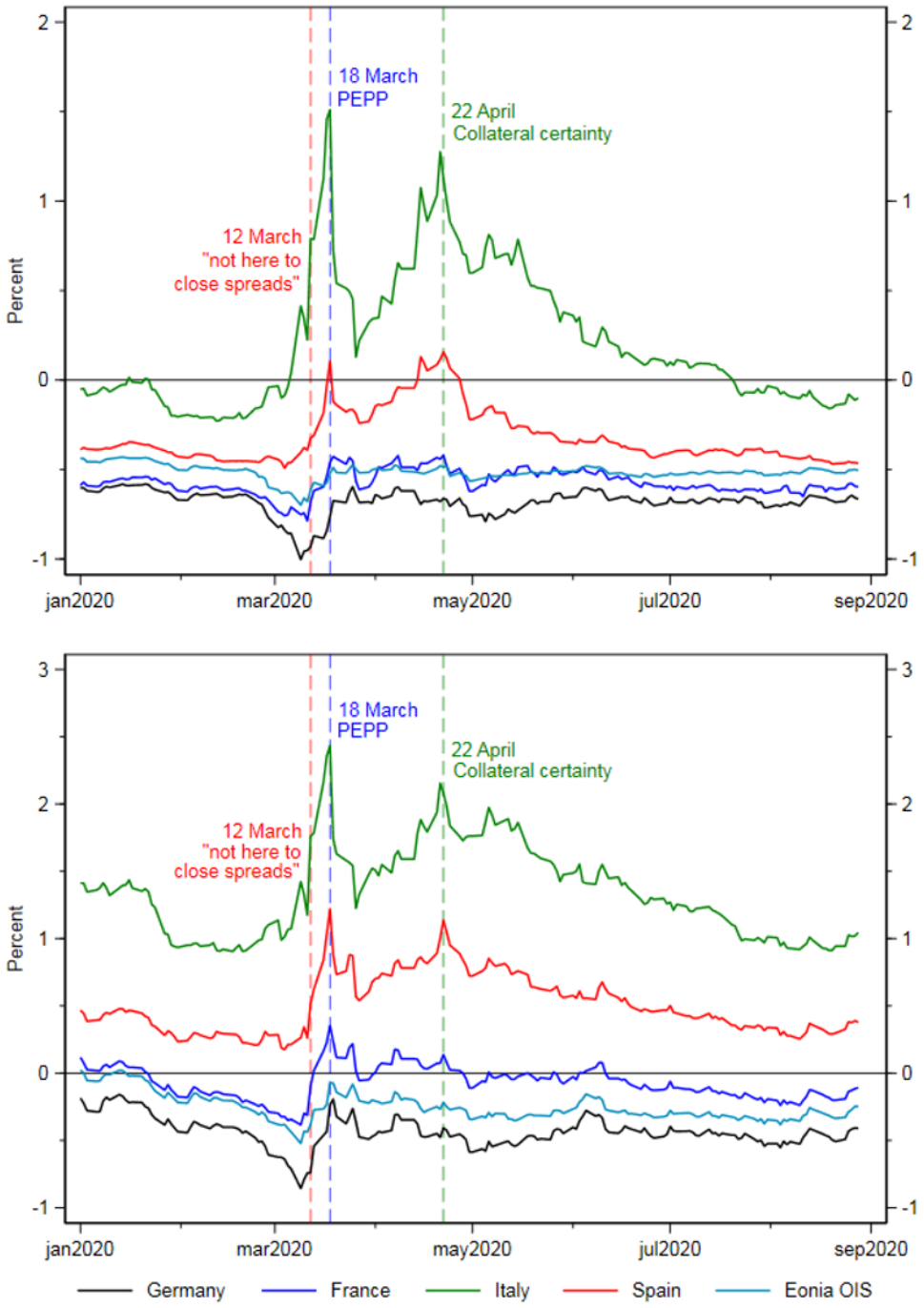
> "I am fully committed to avoid any fragmentation in a difficult moment for the euro area. High spreads due to the coronavirus impair the transmission of monetary policy. We will use the flexibility embedded in the asset purchase programme, including within the public sector purchase programme. The package approved today can be used flexibly to avoid dislocations in bond markets, and we are ready to use the necessary determination and strength." (ECB, 2020b)

This was followed by a set of measures designed to swiftly address the key issues. We focus on two.

The pandemic emergency purchasing program (PEPP): 18 March 2020. A program to purchase up to EUR 750 billion private and public securities until December 2020 (ECB, 2020c). The rationale provided for this was to "counter the serious risks to the monetary policy transmission mechanism". The distribution of the purchases is more flexible with respect to asset classes and jurisdictions, which is important in order to be able to deploy the measures where they are most needed. The statement also mentions that the risk parameters of the collateral framework were eased, but it was not explained at the time what that meant exactly.

Figure 18 demonstrates that the PEPP was initially stabilising the market. Yet, this was only of short duration. Only a few days later, spreads started to rapidly increase again.

Figure 18: Sovereign bond yields and OIS rates during pandemic



Source: Bloomberg.

Notes: 2-, and 10-year maturities, in top and bottom panels, respectively.

Certainty of collateral availability: 22 April 2020. The larger issue that continued to roil markets was whether the ECB would repeat its actions during the euro crisis and allow the flaws in its collateral framework to induce roll-over crises in sovereign debt markets. A first step towards addressing this issue was taken by the Governing Council on 7 April (ECB, 2020d). The ECB's risk tolerance in credit operations was temporarily increased by reducing the haircuts by 20% across the board. Yet, the

measures announced that day did not provide certainty on collateral eligibility and had no visible effect on the spreads. On 22 April, the Governing Council took a more decisive decision, finally addressing the problem. It announced that it would grandfather eligibility of assets used as collateral in credit operations until September 2021. Any asset that was eligible on 7 April, would remain eligible, regardless of decisions by private credit rating agencies upon which the ECB had been relying to determine eligibility. As can be seen in Figure 18, this decision reduced the stress in the market, supporting the view that the looming cliff effects were a key factor of the market turmoil.

7.3. Issues well addressed … and a glaring shortcoming

Cliff-effect. By grandfathering collateral eligibility, the ECB effectively defused the cliff effect in its collateral framework and asset purchase programs (see Section 6.6 and Box 4). This had a material effect in reducing the roll-over risk induced by the cliff effect and the associated market tensions.

Monetary transmission mechanism and credit conditions. Financing condition for sovereigns and private enterprises are closely linked. By easing the conditions for sovereign debt, credit becomes cheaper also for private enterprises and households. Large spreads in some countries prevent the expansionary monetary policy to be transmitted to those countries. They experience high interest rates even though OIS rates are low. A monetary union with no currency risk naturally experiences a very large amount of substitutability between assets, so that small differences can lead to acute shifts and serious imbalances. This was clearly explained by ECB Executive Board Member Philip Lane,

> "[…] there is an additional market stabilisation role for the common central bank in a multi-country monetary union. In the absence of the stabilising presence of the central bank, a crisis environment can give rise to self-fulfilling flight-to-safety dynamics and illiquidity in individual sovereign bond markets, on account of the high substitutability across sovereign bond markets in the absence of currency risk. Such non-fundamental volatility in spreads impairs the smooth transmission of monetary policy across countries and it is a basic task for the central bank to counter such destabilising forces." (Lane, 2020)

Effectively, this is the same issue highlighted several years earlier by Draghi (2014),

> "[…] fiscal policy was constrained by concerns over debt sustainability and the lack of a common backstop, especially as discussions related to sovereign debt restructuring began […] Sovereign pressures also interrupted the homogenous transmission of monetary policy across the euro area. Despite very low policy rates, the cost of capital actually rose in stressed countries in this period, meaning monetary and fiscal policy effectively tightened in tandem." (Draghi, 2014, pp. 296ff)

Fiscal room to manoeuvre. The measures are important because they effectively reduce the financial stress of the more vulnerable countries of the EMU at an instant where fiscal flexibility is key. As we have discussed, these countries are faced with a low inflation combined with high output gaps and unemployment. Such a situation requires an expansionary monetary and fiscal policy. Without support from the monetary policy and with fiscal policy constrained by high interest rates, such a macroeconomic situation is unmanageable. The partial relief given to these economies is therefore absolutely necessary.

Relating back to the euro crisis, it appears that the ECB has now found a way to tame spreads, which is vital for addressing the aftermath of the pandemic. In the euro crisis, the ECB felt that it could not satisfactorily address the widening spreads, as discussed in Section 3.5. It is uplifting to see that the ECB has found a way to tackle this key issue in the current situation.

The shortcoming. The obvious shortcoming is that all these measures are temporary. The removal of the cliff effect from the ECB's collateral framework is scheduled to expire in September 2021. This implies, first, that longer term debt issued today is still subject the same uncertainty as before the measures were taken. Second, as things currently stand, the cliff effect will return in full force. The fragility of the sovereign debt market that arises from the pre-existing flaw in the ECB's operational framework has not been addressed in a lasting fashion. The pandemic response is an effective short term patch, but not more. In our view, it is urgent to find a permanent solution to this flaw.

8. RECOMMENDATIONS

1. Adoption of a symmetric 2% inflation goal

A clearly communicated inflation goal anchors inflation expectations and improves the effectiveness and efficiency of monetary policy. In addition, it improves accountability and thereby protects against political pressures. Among the central banks of the world's largest advanced economies, the ECB currently stands out as the only one that has not yet adopted a clear inflation goal. 2% has emerged as a global standard.

2. Implementation of the 2% inflation goal

In implementing a 2% goal, the ECB should consider a policy strategy that accounts for persistent downside misses of the goal. The lower bound on interest rates introduces an asymmetry in the risks relating to the achievement of price stability. To counterbalance this asymmetry, the ECB could tolerate temporary overshoots to its 2% target after episodes of downside misses to ensure that inflation over the long term is consistent with the 2% goal. Such a policy reduces long-term uncertainty about the price level, which reinforces the institution's commitment to price stability over the long term.

3. Economic cohesion

The ECB's monetary policy strategy should support economic cohesion of the Union more strongly than in the past. Economic cohesion of the Union is part of its overarching goals as defined in the Treaty, and therefore part of the broader mandate of the ECB. More directly, however, cohesion is essential for protecting price stability in individual Member States, and thus part of the ECB's primary mandate. Furthermore, lack of cohesion as reflected in divergences of macroeconomic developments across Member States hinders the effective deployment of monetary policy in an even fashion within the EMU, which poses an unworkable challenge to monetary policy.

4. Other objectives

The ECB's broader mandate contains several other objectives, as stated in Article 3 of the Treaty, that are less directly related to monetary policy. For instance, scientific and technological advance, and environmental sustainability, both are important objectives of the Union and demand attention. With respect to economic sustainability, the ECB can and should address it directly by being ecologically mindful and avoiding waste. However, this issue is only vaguely related to the primary mandate and core central banking functions. The ECB should abstain from prioritizing some of the Union's objectives that are only vaguely related to price stability over other objectives. Doing so would be a distraction from the ECB's legitimate tasks, risk its politicisation, and compromise its independence.

5. Impairment of the monetary transmission mechanism

Since the euro crisis, the ECB has repeatedly experienced challenges associated with the effective transmission of its monetary policy across Member States. The temporary measures that have been adopted in the ECB's forceful response to the pandemic have demonstrated that this issue can be addressed better than in the past. We recommend that the ECB draw lessons from this experience to ameliorate *on a permanent basis* the structural weakness that manifested in the euro crisis.

6. Cliff effects in the collateral framework

The ECB's reliance on private CRAs in the determination of collateral eligibility for credit operations produces dangerous cliff effects, and is contrary to best practice as advocated by the FSB. The ECB has

the authority to establish the principles used to evaluate the adequacy of collateral, based on Article 18 of the Statute. Given the prime role of government debt in the monetary transmission mechanism, we recommend that the ECB remove reliance on ratings for sovereign debt.

7. Overreliance on market prices

In evaluating debt sustainability of Member States, the ECB should strictly rely on fundamental factors, instead of the ECB's current practice of relying on market-based interest rate projections. Market prices can be excessively volatile and misleading in times of stress, and relying on them is procyclical. In addition, using market rates for debt sustainability analysis invites the possibility of multiple self-fulfilling equilibria. By relying on market interest rates as an assumption for debt sustainability, the ECB effectively chooses to validate whatever equilibrium is reflected in market rates. This can inhibit the safe equilibrium that the central bank could have chosen to validate instead.

8. Communication of policymaker projections

Policy communication could benefit from publishing ECB Governing Council projections, especially about inflation. While staff projections are very useful for understanding the state of the economy, they are less informative than the views of the Governing Council as these can better incorporate policy intentions and show differences of opinion among committee members regarding the outlook. To improve transparency and guidance, we recommend that the ECB publish the Governing Council's projections.

9. Instrument for systematic policy

The ECB could consider communicating the systematic nature of its policy calibration with a benchmark policy rule, similar to the implicit rule that described ECB monetary policy before the GFC. Since the overnight interest rate instrument cannot serve this role well in the current low interest rate environment, the ECB could replace it with a longer-term interest rate or the size of its balance sheet. A rule could explain how the ECB intends to adjust the size of its balance sheet, or its longer-term interest rate instrument, in response to changes in the outlook of inflation. Such a rule would buttress the ECB's commitment to pursue its primary mandate in a systematic fashion. It would also reinforce that the purpose of public sector purchases and lower long term interest rates is the pursuit of the primary mandate alone, and is not to be misunderstood as monetary financing.

10. Protect against politicisation

In designing its monetary policy strategy, the ECB should avoid the appearance that it is willing to deploy its monetary policy instruments to enforce fiscal discipline. Doing so would obviously be outside of the purview of the ECB. Since the euro crisis, the ECB has allowed this appearance to take root. This appearance alone threatens the independence of the ECB and its effectiveness in fulfilling its mandate. We recommend that the ECB reaffirm that "[…] it is not and cannot be the ECB's role to enforce fiscal discipline and to correct shortcomings in the implementation of the Stability and Growth Pact" (Issing, 2005).

11. Historical policy records

The ECB is overly secretive regarding its policy deliberations. Unlike other major central banks, it does not make available to the public detailed minutes or transcripts of meetings, and the staff documents associated with the discussion. This hinders transparency and accountability, and it obstructs historical

policy evaluation that would benefit the ECB's policy assessment process. We recommend that the ECB make historical policy records available, in lightly redacted form, with a 5-10 year delay.

12. Periodic policy strategy review

Periodic strategy reviews are an integral component of transparency, accountability, and the democratic legitimacy of the ECB. The ECB's strategy review in 2003, about five years after the adoption of its original strategy, was constructive and improved policy. We recommend that the ECB embraces the practice of regular strategic reviews in reasonable intervals.

9. CONCLUSION

In his analysis of changes in the policy strategy of the Federal Reserve during its first 100 years, Julio Rotemberg identified a positive role for penitence: "The tendency of the Fed to alter its methods and its objectives drastically when critics successfully argue that `bad outcomes' are a product of Fed `mistakes'." (Rotemberg, 2013, p. 67) As all human institutions, central banks are imperfect. A hallmark of success for any independent institution is the capacity to learn from past mistakes. Regular reviews of policy strategy are a critical part of this learning process.

Compared to its peers, the ECB is a young central bank, operating in a more challenging institutional environment, hampered by the incomplete nature of the Economic and Monetary Union. After a good start that surpassed expectations in the first few years of its operations, it experienced an existential crisis and faced challenges it proved unable to address fully and satisfactorily. The ECB's second decade revealed deficiencies in the monetary policy strategy it had adopted before the GFC that impaired its ability to fulfil its mandate in the best possible manner. These deficiencies interacted with unfortunate political decisions leading to an existential crisis for the euro.

Unwittingly, the ECB was caught up in the politics of the euro. The ECB acted decisively to avert the collapse of the euro, but in a manner that contributed to divergences in the performance of different Member States that are inconsistent with the goals of the European Union and incompatible with the long-term viability of the euro. In effect, during the 2010s, monetary policy was transmitted unevenly to Member States, with important distributional consequences. In addition, while the common monetary policy stance appeared broadly appropriate for some Member States, it proved improperly calibrated for the euro area as a whole, leading to "lowflation". Policies guided by a better monetary policy strategy could have delivered higher growth and higher employment overall, as well as smaller divergences across Member States, thereby better fulfilling the ECB's mandate, without compromising the primary goal of price stability.

The ongoing pandemic hit the euro area economy while the adverse consequences of the euro crisis of the 2010s were still lingering. So far, the ECB responded more aggressively to the challenges posed by the pandemic, with important temporary deviations from its underlying policy strategy. In particular, and undoubtedly reflecting lessons from the mishaps during the 2010s, the ECB has shown greater sensitivity to the impairment of the monetary policy transmission in different Member States that can be manifested during panics in financial markets. These temporary corrections should lead to permanent adjustments to the ECB's monetary policy strategy.

The ECB's monetary policy strategy review presents a unique opportunity for the ECB to examine how to best employ its immense power, in accordance with its mandate, to serve the people of Europe.

REFERENCES

- Andrade, Philippe, Johannes Breckenfelder, Fiorella De Fiore, Peter Karadi, and Oreste Tristani (2016). The ECB's Asset Purchase Programme: An Early Assessment. ECB Working Paper 1956. Frankfurt, Germany: European Central Bank. https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1956.en.pdf
- Baldwin, Richard, Thorsten Beck, Agnès Bénassy-Quéré, Olivier Blanchard, Giancarlo Corsetti, Paul De Grauwe, Wouter den Haan, Francesco Giavazzi, Daniel Gros, Sebnem Kalemli-Ozcan, Stefano Micossi, Elias Papaioannou, Paolo Pesenti, Christopher Pissarides , Guido Tabellini, and Beatrice Weder di Mauro (2015). Rebooting the Eurozone: Step 1 – Agreeing a Crisis narrative. CEPR Policy Insight 85, November. https://voxeu.org/sites/default/files/file/Policy%20Insight%2085.pdf
- Bank of Canada (2016). Renewal of the Inflation Control Target. https://www.bankofcanada.ca/wp-content/uploads/2016/10/background_nov11.pdf
- Bank for International Settlements (2013). Central Bank Collateral Frameworks and Practices. Study Group of the Markets Committee, March. https://www.bis.org/publ/mktc06.htm
- Batini, Nicoletta, and Edward Nelson (2001). Optimal horizons for inflation targeting. Journal of Economic Dynamics and Control 25 (6-7), 891-910.
- Batini, Nicoletta and Anthony Yates (2003). Hybrid Inflation and Price-Level Targeting. Journal of Money, Credit and Banking, 35(3), 283-300.
- Bernanke, Ben, Thomas Laubach, Frederic Mishkin and Adam Posen (1998). Inflation Targeting: Lessons from the International Experience. Princeton: Princeton University Press.
- Bini-Smaghi, Lorenzo (2013). Austerity: European democracies against the wall. CEPS, Brussels. https://www.ceps.eu/ceps-publications/austerity-european-democracies-against-wall/
- Board of Governors of the Federal Reserve System (2020). Statement on Longer-Run Goals and Monetary Policy Strategy. 27 August. https://www.federalreserve.gov/monetarypolicy/review-of-monetary-policy-strategy-tools-and-communications-statement-on-longer-run-goals-monetary-policy-strategy.htm
- Bordo, Michael D. and Andrew T. Levin (2017). Central Bank Digital Currency and the Future of Monetary Policy. NBER Working Paper No. 23711.
- Bouabdallah, Othman, Cristina Checherita-Westphal, Thomas Warmedinger, Roberta de Stefani, Francesco Drudi, Ralph Setzer and Andreas Westphal (2017). Debt sustainability analysis for euro area sovereigns: a methodological framework, European Central Bank, Occasional Paper Series, No 185, April. https://www.ecb.europa.eu/pub/pdf/scpops/ecbop185.en.pdf
- Brand, Claus, Marcin Bielecki, and Adrian Penalver (2018). The natural rate of interest: Estimates, drivers, and challenges to monetary policy. European Central Bank, Occasional Paper Series No. 217. https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op217.en.pdf
- Brunnermeier, Markus, Harold James and Jean-Pierre Landau (2016). The Euro and the Battle of Ideas. Princeton University Press.
- Brunnermeier, Markus and Yann Koby (2018). The Reversal Interest Rate, NBER Working Papers 25406.
- Calvo, Guillermo (1988). Servicing the Public Debt: The Role of Expectations. American Economic Review 78(4): 647-661.

- Christoffel, Kai, Günter Coenen and Anders Warne (2008). The New Area-Wide Model of the Euro Area: A Micro-Founded Open-Economy Model for Forecasting and Policy Analysis. ECB Working Paper 944, October. http://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp944.pdf
- Coenen , Günter , Athanasios Orphanides and Volker Wieland (2004). Price Stability and Monetary Policy Effectiveness when Nominal Interest Rates are Bounded at Zero. The B.E. Journal of Macroeconomics, Volume 4: Issue 1. https://doi.org/10.2202/1534-6013.1187
- Coenen, Günter and Sebastian Schmidt (2016). The role of the ECB's asset purchases in preventing a potential de-anchoring of longer-term inflation expectations. ECB Research Bulletin No. 25, July. https://www.ecb.europa.eu/pub/economic-research/resbull/2016/html/rb160725.en.html
- Coenen, Günter, Carlos Montes-Galdon and Frank Smets (2020). Effects of state-dependent forward guidance, large-scale asset purchases and fiscal stimulus in a low-interest-rate environment. ECB Working Paper No 2352, January. https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2352~369d1f217c.en.pdf
- Constâncio, Vitor (2018). Completing the Odyssean journey of the European monetary union. Speech at the ECB Colloquium on The Future of Central Banking, Frankfurt, 17 May. https://www.ecb.europa.eu/press/key/date/2018/html/ecb.sp180517.en.html
- Corsetti, Giancaro and Luca Dedola (2016). The Mystery of the Printing Press: Monetary Policy and Self-fulfilling Debt Crises. Journal of European Economic Association, 14(6): 1329-1371, December.
- De Grauwe, Paul and Juemei Yi (2013). Self-fulfilling crises in the Eurozone: An empirical test. Journal of International Money and Finance, 34, 15–36, April.
- Demiralp, Selva, Jens Eisenschmidt, and Thomas Vlassopoulos (2019). Negative interest rates, excess liquidity and bank business models: Banks' reaction to unconventional monetary policy in the euro area. ECB Working Paper no. 2283.
- De Santis, Roberto (2020). Impact of the Asset Purchase Programme on euro area government bond yields using market news. Economic Modelling, 86, March 2020, p. 192-209.
- Dornbusch, Rudi (1996). Euro Fantasies: Common Currency as Panacea. Foreign Affairs 75(5), September/October 1996, p. 110-124. https://www.foreignaffairs.com/articles/europe/1996-09-01/euro-fantasies-common-currency-panacea
- Draghi, Mario (2014). Unemployment in the Euro Area. In Re-Evaluating Labor Market Dynamics. Jackson Hole Economic Policy Symposium, August 21-23, 2014. Kansas City: Federal Reserve Bank of Kansas City, p. 295-312. https://www.kansascityfed.org/~/media/files/publicat/sympos/2014/2014draghi.pdf
- Economist (2014). Euro-zone lowflation: Getting the message. 3 April. https://www.economist.com/free-exchange/2014/04/03/getting-the-message
- Economist (2016). Portugal's economy: Adventure tourism. 16 October. https://www.economist.com/finance-and-economics/2016/10/13/adventure-tourism
- Eggertson, Gauti and Michael Woodford (2003). The zero bound on interest rates and optimal monetary policy. Brookings Papers on Economic Activity 1, 139-211. https://www.brookings.edu/bpea-articles/the-zero-bound-on-interest-rates-and-optimal-monetary-policy/

- Euro Area Business Cycle Committee (2015). Euro Area Out of Recession, in Unusually Weak Expansion, 1 October. https://cepr.org/Data/Dating/Dating-Committee-Findings-01-Oct-2015.pdf
- European Central Bank (1998). A stability-oriented monetary policy strategy for the ESCB. Press Release, 13 October. https://www.ecb.europa.eu/press/pr/date/1998/html/pr981013_1.en.html
- European Central Bank (2003). The ECB's monetary policy strategy. Press Release, 8 May. https://www.ecb.europa.eu/press/pr/date/2003/html/pr030508_2.en.html
- European Central Bank (2011). European Commission's public consultation on credit rating agencies: Eurosystem reply. February. https://www.ecb.europa.eu/pub/pdf/other/ecpublicconsultationcreditratingagencieseurosystemreplyen.pdf
- European Central Bank (2012). The sustainability of government debt in Spain and Italy. Box 8, ECB Monthly Bulletin, September, p. 89-92. https://www.ecb.europa.eu/pub/pdf/mobu/mb201209en.pdf
- European Central Bank (2015). Account of the monetary policy meeting of the Governing Council of the European Central Bank, held at 21-22 January 2015. https://www.ecb.europa.eu/press/accounts/2015/html/mg150219.en.pdf
- European Central Bank (2018). Purchases of green bonds under the Eurosystem's asset purchase programme. Box in Economic Bulletin, November. https://www.ecb.europa.eu/pub/economic-bulletin/focus/2018/html/ecb.ebbox201807_01.en.html
- European Central Bank (2020). ECB launches review of its monetary policy strategy. Press Release, 23 January. https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200123~3b8d9fc08d.en.html
- European Central Bank (2020b). Introductory Statement. Press Conference, 12 March. https://www.ecb.europa.eu/press/pressconf/2020/html/ecb.is200312~f857a21b6c.en.html
- European Central Bank (2020c). ECB announces €750 billion Pandemic Emergency Purchase Programme (PEPP). Press Release, 18 March. https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200318_1~3949d6f266.en.html
- European Central Bank (2020d). ECB announces package of temporary collateral easing measures. Press Release, 7 April. https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200407~2472a8ccda.en.html
- European Central Bank (2020e). ECB takes steps to mitigate impact of possible rating downgrades on collateral availability. Press Release, 22 April. https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200422_1~95e0f62a2b.en.html
- Financial Stability Board (2010). Principles for Reducing Reliance on CRA Ratings. October. https://www.fsb.org/wp-content/uploads/r_101027.pdf
- Gaspar, Vitor and Otmar Issing (2011). European Central Bank and Monetary Policy in the Euro Area. In The New Palgrave Dictionary of Economics, Palgrave Macmillan. https://doi.org/10.1057/978-1-349-95121-5_2989-1
- Gaspar, Vitor, Otmar Issing, Oreste Tristani and David Vestin (2006). Imperfect Knowledge and Monetary Policy. Cambridge University Press.

- Gaspar, Vitor, Frank Smets and David Vestin (2007). Is Time Ripe for Price Level Path Stability? ECB Working paper 818, October. https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp818.pdf
- Gaspar, Vitor, Frank Smets and David Vestin (2010). Inflation Expectations, Adaptive Learning and Optimal Monetary Policy. In Handbook of Monetary Economics, Volume 3.
- German Federal Constitutional Court (2020). ECB decisions on the Public Sector Purchase Programme exceed EU competences. 5 May. https://www.bundesverfassungsgericht.de/SharedDocs/Pressemitteilungen/EN/2020/bvg20-032.html
- Goodfriend, Marvin (2007). How the World Achieved Consensus on Monetary Policy. Journal of Economic Perspectives, 21(4), Fall, 47–68. https://www.aeaweb.org/articles?id=10.1257/jep.21.4.47
- Gürkaynak, Refet, Andrew Levin and Eric Swanson (2010). Does Inflation Targeting Anchor Long-Run Inflation Expectations? Evidence from the U.S., UK, and Sweden. Journal of the European Economic Association, 8(6), December, 1208–1242.
- Hartmann, Philipp and Smets, Frank (2018). The first 20 years of the European Central Bank: Monetary policy. Brookings Papers on Economic Activity, Fall. https://www.brookings.edu/bpea-articles/the-first-20-years-of-the-european-central-bank-monetary-policy/
- Heikensten, Lars (1999). The Riksbank's inflation target – clarification and evaluation. Riksbank Quarterly Review, 1999:1, 5-17. http://archive.riksbank.se/Upload/Dokument_riksbank/Kat_publicerat/Artiklar_PV/qr99_1_artikel1.pdf
- Honohan, Patrick (2018). Real and Imagined Constraints on Euro Area Monetary Policy. PIIE Working Paper 18-8, August. https://www.piie.com/system/files/documents/wp18-8.pdf
- Issing, Otmar (1996). Monetary Policy Strategies: Theoretical Basis, Empirical Findings, Practical Implementation." In Deutsche Bundesbank, ed. Monetary Policy Strategies in Europe. Munchen: Verlag Franz Vahlen, 197-20/2.
- Issing, Otmar (2003). Evaluation of the ECB's monetary policy strategy. Press seminar slide presentation, 8 May. https://www.ecb.europa.eu/press/pressconf/2003/html/is030508_1.en.html
- Issing, Otmar (2005). One size fits all! A single monetary policy for the euro area. Speech at the International Research Forum, Frankfurt, May 20. https://www.ecb.europa.eu/press/key/date/2005/html/sp050520.en.html
- Issing, Otmar (2008). The Birth of the Euro, Cambridge University Press.
- Keynes, John M. (1930). Treatise on money (Vol. 2). London: MacMillan.
- Keynes, John M. (1936). The General Theory of Employment, Interest, and Money.
- King, Mervyn (1997). The Inflation Target five years on. 29 October. https://www.bankofengland.co.uk/-/media/boe/files/speech/1997/the-inflation-target-five-years-on.pdf
- Lagarde, Christine (2014). The Road to Sustainable Global Growth—the Policy Agenda. Speech, 2 April. https://www.imf.org/en/News/Articles/2015/09/28/04/53/sp040214

- Lambrias, Kyriacos and Adrian Page (2019). The performance of the Eurosystem/ECB staff macroeconomic projections since the financial crisis. ECB Economic Bulletin, Issue 8/2019. https://www.ecb.europa.eu/pub/economic-bulletin/articles/2019/html/ecb.ebart201908_03~15a92cfec1.en.html#toc1
- Lane, Philip (2020). The monetary policy response to the pandemic emergency. The ECB Blog, 1 May. https://www.ecb.europa.eu/press/blog/date/2020/html/ecb.blog200501~a2d8f514a0.en.html
- Lengwiler, Yvan and Athanasios Orphanides (2020). Collateral Framework: Liquidity Premia and Multiple Equilibria, Working Paper, 2020.
- Levin, Andrew, Fabio Natalucci, and Jeremy Piger (2004). The Macroeconomic Effects of Inflation Targeting. Federal Reserve Bank of St Louis Review, 86(4), July/August. https://research.stlouisfed.org/publications/review/2004/07/01/the-macroeconomic-effects-of-inflation-targeting
- Lopez-Salido, David, Gerardo Sanz-Maldonado, Carly Schippits, and Min Wei (2020). Measuring the Natural Rate of Interest: The Role of Inflation Expectations. FEDS Notes 2020-06-19. Board of Governors of the Federal Reserve System. https://www.federalreserve.gov/econres/notes/feds-notes/measuring-the-natural-rate-of-interest-the-role-of-inflation-expectations-20200619.htm
- Lyziak, Tomasz and Marritta Paloviita (2017). Anchoring of inflation expectations in the euro area: recent evidence based on survey data. European Journal of Political Economy, Volume 46, January, 52-73. https://doi.org/10.1016/j.ejpoleco.2016.11.001
- Mertens, Thomas and John Williams (2019). Tying down the anchor: Monetary policy rules and the lower bound on interest rates. Federal Reserve Bank of San Francisco Working Paper 2019-14. https://www.frbsf.org/economic-research/publications/working-papers/2019/01/
- Mouabbi, Sarah and Jean-Guillame Sahuc (2019). Evaluating the macroeconomic effects of the ECB's unconventional monetary policies. Journal of Money Credit and Banking, 51, 831–58. https://doi.org/10.1111/jmcb.12628
- Moore, Elaine (2016). Portugal escapes junk rating from DBRS, but what now? Financial Times, 24 October. https://www.ft.com/content/121a446a-97b4-11e6-a80e-bcd69f323a8b
- Nessen, Marianne, and David Vestin (2005). Average Inflation Targeting. Journal of Money, Credit and Banking, 37(5), October, 837-863. https://muse.jhu.edu/article/186547/pdf
- Nautz, Dieter, Laura Pagenhardt and Till Strohsal (2017). The (de-)anchoring of inflation expectations: new evidence from the euro area. The North American Journal of Economics and Finance, 40, p. 103–15. https://doi.org/10.1016/j.najef.2017.02.002
- Nelson, Edward (2020). Milton Friedman and Economic Debate in the United States, 1932–1972. Volumes 1 & 2. Chicago, University of Chicago Press.
- Nyborg, Kjell (2017). Collateral Frameworks: The Open Secret of Central Banks. Cambridge, Cambridge University Press.
- Orphanides, Athanasios (2018). The Boundaries of Central Bank Independence: Lessons from Unconventional Times. Monetary and Economic Studies, 36, November, p. 35-55. https://www.imes.boj.or.jp/research/papers/english/me36-4.pdf

- Orphanides, Athanasios (2019). Monetary Policy Strategy and its Communication. In Challenges for Monetary Policy, Jackson Hole Economic Policy Symposium, August 22-24, 2019. Kansas City: Federal Reserve Bank of Kansas City, p. 211-260. https://www.kansascityfed.org/~/media/files/publicat/sympos/2019/2019orphanedies.pdf
- Orphanides, Athanasios (2020). The Fiscal-Monetary Policy Mix in the Euro Area: Challenges at the Zero Lower Bound. Economic Policy. https://doi.org/10.1093/epolic/eiaa017
- Orphanides, Athanasios and John Williams (2002). Robust Monetary Policy Rules with Unknown Natural Rates. Brookings Papers on Economic Activity, (2), p. 63-118. https://www.brookings.edu/bpea-articles/robust-monetary-policy-rules-with-unknown-natural-rates/
- Orphanides, Athanasios and John Williams (2005). Imperfect Knowledge, Inflation Expectations and Monetary Policy. In The Inflation Targeting Debate, edited by Ben Bernanke and Michael Woodford, p. 201-234. Chicago: University of Chicago Press. https://www.nber.org/chapters/c9559.pdf
- Praet, Peter (2013). The crisis response in the euro area. Speech, 17 April. https://www.ecb.europa.eu/press/key/date/2013/html/sp130417.en.html
- Rostagno, Massimo, Carlo Altavilla, Giacomo Carboni, Wolfgang Lemke, Roberto Motto, Arthur Saint Guilhem and Jonathan Yiangou (2019). A Tale of Two Decades: The ECB's Monetary Policy at 20. ECB WP 2346, December. https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2346~dd78042370.en.pdf
- Rotemberg, Julio (2013). Shifts in US Federal Reserve Goals and Tactics for Monetary Policy: A Role for Penitence? Journal of Economic Perspectives, 27 (4), p. 65-86. https://www.aeaweb.org/articles?id=10.1257/jep.27.4.65
- Schnabel, Isabel (2020). Going negative: the ECB's experience, Speech at the 35th Congress of the EEA, 26 August 2020. https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp200826~77ce66626c.en.html
- Sims, Christopher (2017). Fiscal Policy, Monetary Policy and Central Bank Independence. In Designing Resilient Monetary Policy Frameworks for the Future. 2016 Jackson Hole Economic Policy Symposium, Federal Reserve Bank of Kansas City. https://www.kansascityfed.org/~/media/files/publicat/sympos/2016/luncheon-discussion.pdf?la=en
- Smets, Frank (2003). Maintaining price stability: How long is the medium term? Journal of Monetary Economics 50: 1293-1309.
- Svensson, Lars (1997). Inflation Forecast Targeting: Implementing and Monitoring Inflation Targets. European Economic Review, vol. 41 (June), p. 1111–46.
- Svensson, Lars (1999). Price-Level Targeting versus Inflation Targeting: A Free Lunch? Journal of Money, Credit and Banking, 31(3), Part 1, August, p. 277-295. https://www.jstor.org/stable/2601112
- Svensson, Lars (2011). Inflation Targeting. In Handbook of Monetary Economics, Vol. 3B, ed. B. M. Friedman and M. Woodford, 1237–1302 (chapter 22). Elsevier. https://larseosvensson.se/files/papers/HandbookIT.pdf

- Svensson, Lars (2020). Monetary Policy Strategies for the Federal Reserve. International Journal of Central Banking, 16, February, 133-193. https://www.ijcb.org/journal/ijcb2002_3.pdf
- Trichet, Jean-Claude (2011). Two continents compared. Speech, 10 June. https://www.ecb.europa.eu/press/key/date/2011/html/sp110610.en.html
- Trichet, Jean-Claude (2019). The Mayekawa Lecture: The Euro Area Economic, Fiscal and Financial Governance: Difficulties and Successes in the Past–Present Challenges–Future Steps. Bank of Japan Monetary and Economic Studies, 37, November, p. 23-40. https://www.imes.boj.or.jp/research/papers/english/me37-3.pdf
- Tucker, Paul (2018). Unelected Power: The Quest for Legitimacy in Central Banking and the Regulatory State. Princeton: Princeton University Press.
- Vernazza, Daniel and Erik Nielsen (2015). The Damaging Bias of Sovereign Ratings. Economic Notes by Banca Monte dei Paschi di Siena, 44(2) 361-407.
- Wolf, Martin (2014). The Shifts and the Shocks: What We've Learned-and Have Still to Learn from the Financial Crisis. Penguin Press.
- Wolman, Alexander (1998). Staggered Price Setting and the Zero Bound on Nominal Interest Rates. Federal Reserve Bank of Richmond Economic Quarterly Volume 84/4 Fall, p. 1-24. https://www.richmondfed.org/~/media/richmondfedorg/publications/research/economic_quarterly/1998/fall/pdf/wolman.pdf
- Wyplosz, Charles (2014). The Eurozone crisis: A near-perfect case of mismanagement. Economia Marche Journal of Applied Economics, XXXIII(1): 1-13. http://economiamarche.univpm.it/index.php/em/article/view/38/35
- Wyplosz, Charles (2016). The six flaws of the Eurozone. Economic Policy. p. 561-598. https://doi.org/10.1093/epolic/eiw008

The ECB is the most important institution for the success of the EMU. It started successfully but the crisis revealed weaknesses related to the incomplete nature of the EMU. The ECB was too timid in using its power, which deepened the euro crisis and led to divergences that threaten the viability of the EMU. With suitable modifications of its monetary policy strategy, and better use of the authority delegated to it, the ECB could greatly improve its success in fulfilling its mandate.

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