THE ECB MONETARY POLICY RESPONSE TO THE COVID-19 CRISIS

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Abstract

The ECB has responded forcefully to the challenges posed by the COVID-19 crisis for the euro area economy. This paper reviews the different monetary policy measures adopted by the ECB since the COVID-19 outbreak and explains their rationale. It also looks at several analyses of the impact of some of the main measures on both the Spanish economy and that of the euro area as a whole.

Keywords: European Central Bank, asset purchases, refinancing operations.

JEL classification: E44, E52, E58.

Resumen

El Banco Central Europeo (BCE) ha desplegado una respuesta enérgica ante los desafíos planteados por la crisis del Covid-19 a la economía del área del euro. Este documento revisa las diferentes medidas de política monetaria adoptadas por el BCE desde la irrupción de la pandemia, y proporciona una explicación de su motivación, así como varios análisis del impacto de algunas de las principales medidas sobre la economía española y sobre el área del euro en su conjunto.

Palabras clave: Banco Central Europeo, compra de activos, operaciones de refinanciación.

Códigos JEL: E44, E52, E58.

Contents

1 Introduction

The COVID-19 outbreak in the euro area has prompted a health and economic crisis that is unprecedented in recent history. In the face of this situation, the economic authorities have responded energetically and forcefully. In particular, the European Central Bank (ECB) has played a most notable role in addressing the initial tightening of financial conditions caused by the pandemic, thus heading off a more severe impact of the crisis on the real economy.

This paper aims to summarise the measures adopted by the ECB, to explain their rationale and to analyse the economic and financial effects of the main measures, both in Spain and in the euro area as a whole. In this connection, the paper first briefly describes the pre-virus euro area monetary policy situation, which is characterised by a low-inflation and low-interest-rate environment. It then details the various measures taken by the ECB since March. Finally, using various quantitative tools, it analyses what the potential economic and financial impact of the main measure adopted in the current pandemic – namely, the pandemic emergency purchase programme (PEPP) – has been. These tools suggest that the PEPP would have positive first-order effects on the euro area's and Spain's GDP and inflation. These findings are probably a conservative estimate of the PEPP's effects, given the difficulty of quantifying the ensuing severity of the financial and economic downturn had this programme not been in place.

2 The pre-pandemic monetary policy situation

In the decade prior to the COVID-19 crisis, the main advanced economies were exposed to disinflationary pressures that opened the way for a period of persistently low inflation (see Chart 1). This led central banks to hold their policy interest rates close to zero or, in some cases, at even negative levels. As the space for further interest rate cuts progressively narrowed, central banks began to use a series of "unconventional" tools. These included forward guidance and various balance sheet-expansion measures (generally known as quantitative easing), and were aimed at achieving a greater degree of monetary expansion[1] (see Chart 2). The unconventional measures proved their effectiveness in responding to situations in which conventional monetary policy saw interest rates drawing closer to their lower bound, and consequently they have now become part of the monetary policy toolbox in what has been dubbed the "new normal" of monetary policy.[2]

In some economies, such as the United Kingdom and the United States, there had been some normalisation of interest rates before the COVID-19 outbreak. In the euro area, however, interest rates were at that time still holding at record lows. Before the pandemic, the prospect of this scenario of persistently low interest rates and inflation rates extending into the future was already posing a significant challenge for monetary policy conduct. The

Chart 1
HEADLINE INFLATION (CPI)
Y-o-y rate
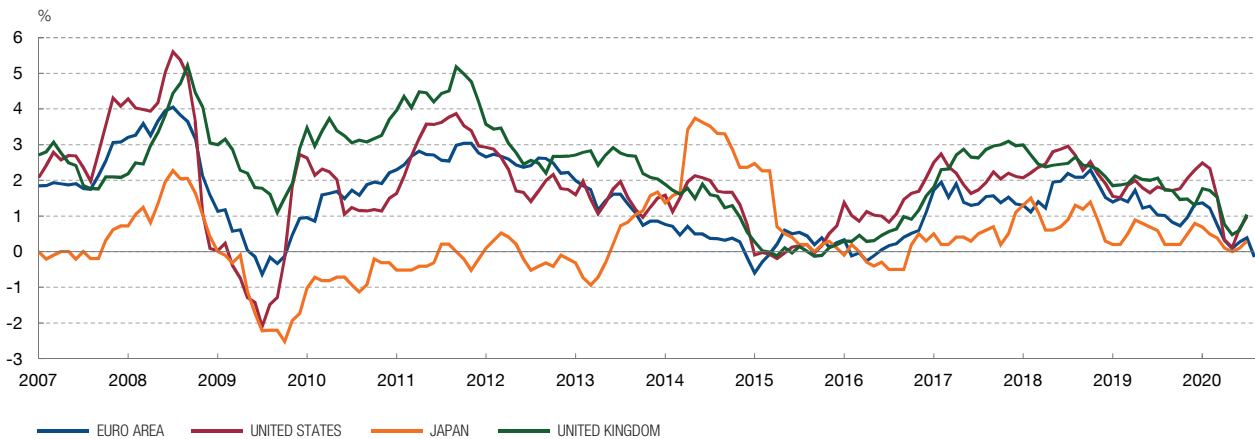
SOURCE: Thomson Reuters Datastream.

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1   For a detailed analysis of the euro area's monetary policy response to disinflationary pressures, see Banco de España (2016).

2   The lower bound of nominal interest rates is a consequence of the fact that economic agents can withdraw their savings in cash if the return thereon is negative enough. This bound is below zero owing to the intrinsic costs and risks associated with banknote storage (security, risk of loss or robbery, etc.). For a detailed analysis of the impact of the unconventional measures in the years prior to the COVID-19 crisis, see Rostagno et al. (2019). Banco de España (2019) discusses in depth the "new normal" of monetary policy and Arce et al. (2019) analyse the role of asset portfolio reinvestment in the context of asset purchase programmes.

Chart 2
POLICY INTEREST RATES AND CENTRAL BANK BALANCE SHEETS

1 POLICY INTEREST RATES

2 CENTRAL BANK BALANCE SHEETS

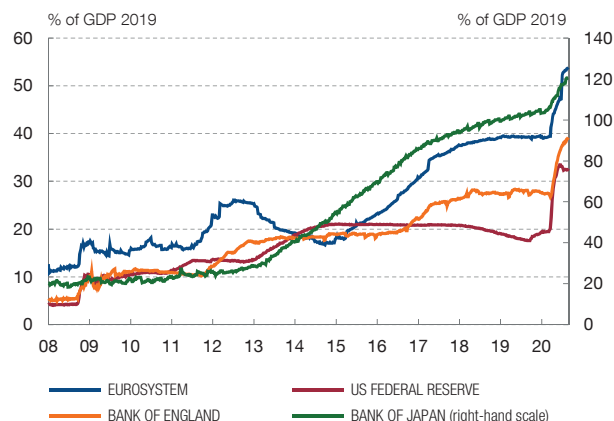EUROSYSTEM — US FEDERAL RESERVE
BANK OF ENGLAND — BANK OF JAPAN

EUROSYSTEM — US FEDERAL RESERVE
BANK OF ENGLAND — BANK OF JAPAN (right-hand scale)
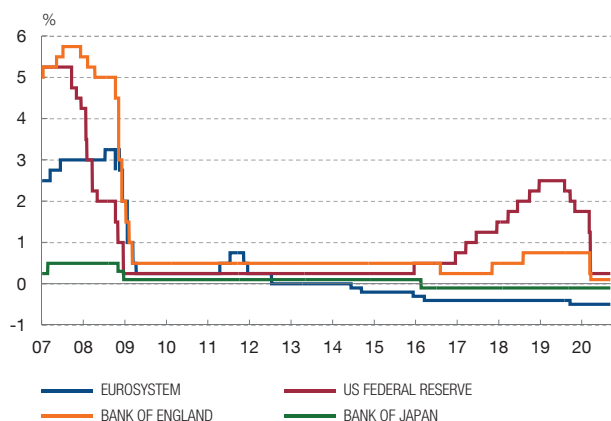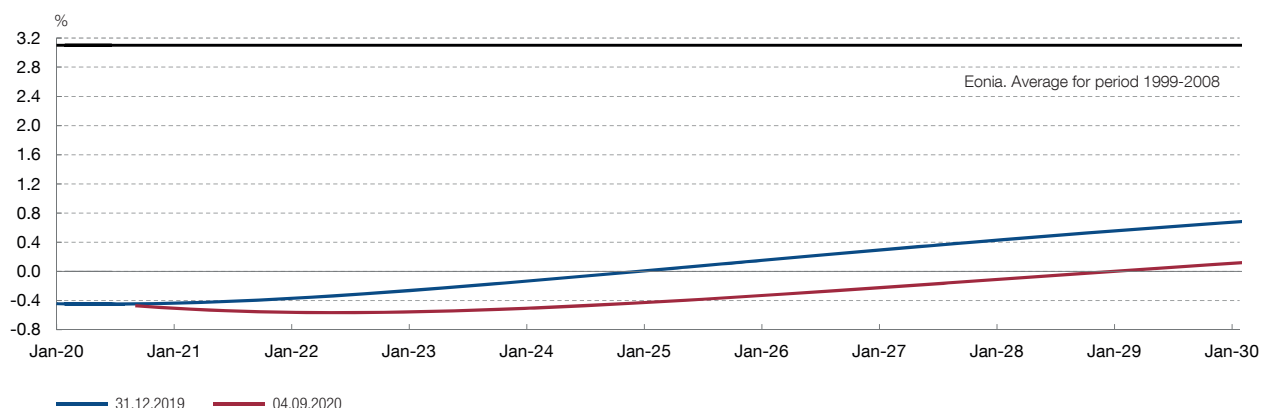
SOURCE: Thomson Reuters Datastream.

information drawn from pre-pandemic yield curves suggested that, according to financial market expectations, short-term interest rates would remain in the coming years at substantially lower levels than their average values prior to the 2008 economic crisis (see Chart 3).

The low-interest-rate environment is related to the decline in the so-called "natural interest rate", defined as the real interest rate consistent with a volume of output equal to the economy's potential level and with stable inflation. Theoretically, proper monetary policy conduct requires central banks to adjust their nominal interest rates so that the real interest rate (i.e. the nominal rate minus expected inflation) approximately follows the natural interest rate path.[3] That helps keep inflation at close-to-target levels. Accordingly, the estimated decline in the natural interest rate in recent years would explain why central banks have, in order to prevent excessively low inflation rates, been obliged to cut their interest rates, drawing them closer to their lower bound.[4] The fall in the natural interest rate in recent years is due to structural factors, such as the decline in productivity growth, progressive population ageing and the relative shortage of safe financial assets, all these being matters over which central banks have little sway. Noting this decline in the natural interest rate, and the subsequent increase in the likelihood of the lower bound of nominal interest rates restricting central banks' future capacity to meet its objectives, prompted monetary policy strategy reviews by some of the leading central banks, such as the Federal Reserve and the ECB, in order to adapt policy to the new reality.[5]

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3 For a detailed analysis of the natural interest rate and its implications for monetary policy, and a description of the relationship between the natural interest rate and inflation under the standard neo-Keynesian model, see Galesi et al. (2017).

4 Holston et al. (2017), for instance, estimate that the natural rate in 2016 was at positive but very-close-to-zero levels in the United States, and at negative levels in the euro area. Fiorentini et al. (2018) find negative values for both the United States and the euro area.

5 In late August this year, the Federal Reserve announced the main findings of its strategic review. See Box 2 of the Banco de España's September 2020 Quarterly Report for a description of this announcement and an assessment of its effects on financial markets.

Chart 3

OIS INSTANTANEOUS FORWARD CURVE (a)

%

Eonia. Average for period 1999-2008

31.12.2019   04.09.2020

SOURCES: Thomson Reuters Datastream and Banco de España.

a The OIS instantaneous forward curve is calculated based on market prices for Overnight Interest Swap (OIS) contracts and indicates the required EONIA interest rate on future dates for those contracts to entail no payment between the parties. The OIS rate curve provides an imperfect estimation of future interest rate expectations since it is also affected by the term premium, which reflects the interest rates borne by financial agents. The EONIA (Euro Overnight Index Average) is an index of overnight interbank interest rates and is often considered the ECB's implicit operational benchmark.

Against this background, the quarters prior to the onset of the pandemic were marked by the persistence of euro area inflation at relatively low levels some distance off their medium-term objective (below but close to 2%). The overall HICP increased by 1.2% on average in 2019, 0.6 pp down on 2018. And core inflation, which excludes food and energy prices, also posted a low rate, averaging 1% in 2019, unchanged on the two previous years.

The ECB's monetary policy reacted to this situation, increasing its expansionary stance over the course of 2019. First, in September 2019, the ECB cut its deposit facility rate (DFR) by 10 basis points, to –0.50%. The main refinancing operations rate and the marginal lending facility rate were held stable at 0% and 0.25%, respectively (see Chart 4).[6] Second, the ECB introduced a new series of targeted longer-term refinancing operations (TLTRO III). This programme provides banks with liquidity at advantageous prices if they meet certain real-economy lending growth targets. This measure sought to preserve favourable lending conditions and to support monetary policy transmission through the banking channel. Third, the ECB decided to resume net public and private asset purchases under the Asset Purchase Programme (APP), at a rate of €20 billion per month, commencing November 2019. The ECB thus sought to improve financing conditions in financial markets, as is explained in the following section in greater detail.[7]

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6 The cut to the DFR involved deepening the policy of negative remuneration of the banking sector's reserves deposited in the ECB. With the aim of preserving monetary policy transmission through banks, the ECB announced the introduction of a tiered reserve remuneration system, whereunder a portion of reserves would be exempt from negative remuneration.

7 Along with these measures, the ECB reformulated its forward guidance arrangements in September 2019. It removed all mention of specific time horizons and made the first rise in rates conditional upon the inflation outlook converging robustly towards a level sufficiently close to (but below) the 2% reference.

Chart 4
ECB POLICY RATES AND EUROSYSTEM BALANCE SHEET

1 ECB POLICY RATES AND EONIA

WEEKLY MROs

MARGINAL LENDING FACILITY

DEPOSIT FACILITY

EONIA

2 EUROSYSTEM BALANCE SHEET

OTHER NET

SECURITIES

LIQUIDITY FACILITIES

RESERVES

CASH
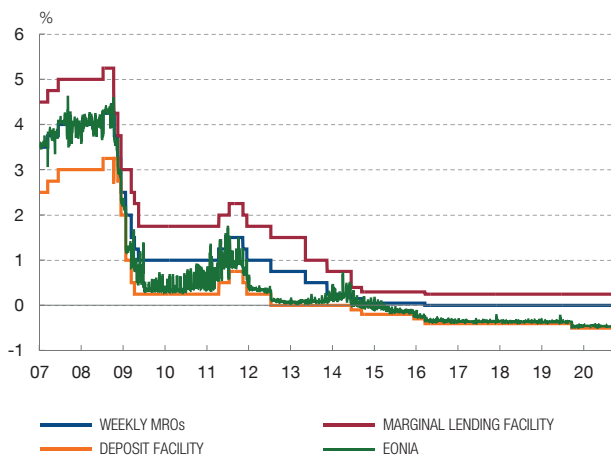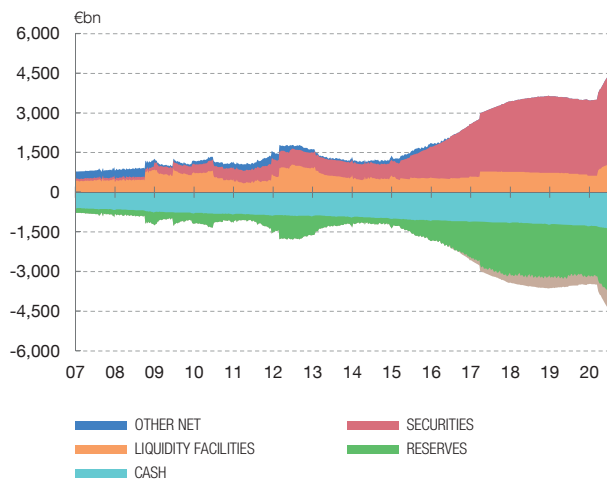
SOURCES: Thomson Reuters Datastream and ECB.

In sum, the outbreak of COVID-19 in the euro area was against a backdrop of low inflation and extensive monetary stimulus, with policy interest rates at record lows, new net asset purchases under the APP and a set calendar for long-term liquidity tenders under the TLTRO III programme.

3 Measures taken by the ECB in response to the pandemic

The ECB has reacted swiftly and resolutely to the COVID-19 crisis.[8] The main measures taken by the ECB between early March and the date of this paper going to press are detailed below. They have focused on its asset purchase programmes (APP and PEPP) and on its longer-term refinancing operations (LTRO, TLTRO III and PELTRO) with a triple aim: (i) ensuring that the overall stance of its monetary policy was sufficiently accommodative; (ii) underpinning the stabilisation of the financial markets to safeguard the monetary policy transmission mechanism; and (iii) providing ample liquidity, especially to keep bank lending flowing. Table 1 summarises the measures adopted.

In response to the course of the COVID-19 health crisis during the latter stages of 2020 Q1, on 12 March the ECB adopted an initial raft of expansionary measures. First, the ECB resolved to apply considerably more favourable conditions to all TLTRO III operations between June 2020 and June 2021.[9] The ECB thus intended to encourage lending to the agents hardest hit by the spread of COVID-19, in particular small and medium-sized enterprises (SMEs) and the self-employed, which are more reliant on bank lending as they experience greater difficulties in raising market-based financing. In light of the gradual worsening of the economic situation, the terms and conditions of TLTRO III were further improved at the ECB meeting on 30 April.[10]

€1.3 trillion, an all-time high in ECB refinancing operations, were allotted to euro area banks in the June TLTRO III tender operation. The available information suggests that European banks appear to be using the bulk of this liquidity to lend to the real economy. This was reflected in the euro area Bank Lending Survey (BLS) of April 2020, where 74% of the banks surveyed indicated that they expected to use the liquidity provided by TLTRO III to grant loans to households and firms over the next six months. At present, in both the euro area and, particularly, Spain interest rates on bank loans have held at levels close to their record lows and the volume of new bank loans to firms has grown very briskly since March, far exceeding the pre-pandemic credit growth rate.[11]

Second, the ECB decided to conduct longer-term refinancing operations (LTROs). The aim of these operations, maturing on 24 June 2020, was to provide bridge financing to

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8 See Banco de España (2020) for more details on the measures taken by the ECB and other central banks in response to the pandemic.

9 TLTRO stands for targeted longer-term refinancing operations. They are so named because the interest rate payable by participating banks to the ECB is linked to attainment of certain goals in terms of lending to firms and households. The greater the bank's lending activity during the reference period, the lower the interest rate on its TLTRO borrowing will be. TLTRO III refers to the third series of such operations implemented by the ECB.

10 Following this recalibration, the maximum rate applicable from June 2020 to June 2021 is 50 bp below the average rate on the main refinancing operations (MRO), currently at 0%. For institutions maintaining their levels of lending to the real economy, the interest rate will be 50 bp below the average deposit facility rate (DFR). The DFR is currently –0.5%. Accordingly, those institutions that maintain their levels of lending would pay an interest rate of –1% between June 2020 and June 2021 (provided the DFR does not increase over that period).

11 The public guarantee facilities backing bank loans launched in several euro area countries, including Spain, have also played a key role in preserving the supply of bank credit. See Alves et al. (2020) for further details on the developments in financing granted to firms and households in the context of the COVID-19 crisis.

Table 1

MONETARY POLICY MEASURES ADOPTED BY THE ECB TO COMBAT THE IMPACT OF THE CORONAVIRUS

Measures	12 March	18 March	7 April	22 April	30 April	4 June
Support for credit	– TLTRO III more favourable conditions (-25 bp) – LTRO: 12 additional operations to bridge liquidity needs, maturing in June 2020 (average deposit facility rate)	– 15 March: weekly USD operations with 84-day maturity – 20 March: weekly operations: frequency increased to daily			– TLTRO III: improved conditions during the crisis period (–50 bp) – PELTRO: 7 additional operations maturing in 2021 Q3 (–25 bp)	
Collateral easing measures		Adjusted collateral standards announced	– 20% reduction of collateral valuation haircuts – Enlarged scope of eligible assets under ACC framework	– Marketable assets meeting requirements on 7 April will remain eligible as long as their rating remains at or above BB (CQS5 on the Eurosystem scale and CQS4 for ABS)		
Asset purchases	– APP: additional net asset purchases of €120 bn until end-2020	PEPP: extraordinary asset purchase programme with envelope of €750 bn until end-2020				– PEPP: additional increase of €600 bn (overall envelope €1.35 tn) and extension to end-2021 Reinvestments until at least end-2022

SOURCE: Banco de España.

commercial banks up to that date, on which the aforementioned June TLTRO III tender would be held.[12] Anticipating that these financing operations, whose conditions are not linked to lending goals, would be necessary for some banks beyond June, the ECB launched new pandemic emergency longer-term refinancing operations (PELTROs) on 30 April. The cost of these operations is higher than the LTROs and TLTRO III, since they were only designed to be used in exceptional circumstances, with TLTRO III being the main instrument for transmitting the ECB's monetary stimulus to banks.[13]

Third, the ECB undertook that net purchases under the APP would continue at the monthly pace of €20 billion approved in September 2019, together with the purchases under the additional €120 billion temporary envelope until the end of 2020. The aim of this

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[12] The rate on these new LTROs would be fixed at the average of the DFR (currently –0.50%) over the life of the respective operation and they would be conducted with full allotment.

[13] Specifically, seven operations will be carried out, commencing in May, with staggered maturities in 2021 Q3. These operations will be conducted as fixed rate tender procedures with full allotment. The interest rate will be 25 bp below the average MRO rate over the life of each PELTRO.

measure was to improve financing conditions on financial markets by reducing the interest rates applicable to government and corporate bonds.

The main mechanism whereby asset purchases lower interest rates is the absorption by the central bank of a portion of duration risk on the market. Duration risk is due to the change in the market price of medium and long-term bonds over their term to maturity. When the central bank buys bonds from investors, it frees up the latter's capacity to absorb new risks. This reduces the risk's price on the market and, therefore, the implied term premium in bond yields (i.e. the remuneration required by investors to assume duration risk).[14] This effect is reinforced in situations like that of the first half of March where, in addition to duration risk, asset prices were affected by heightened default risk. The expansion of the APP increased the extraction of these risks in a setting of a sharp rise in the volume of debt issuance (see Chart 5 in the case of government debt).

On 18 March, the outlook for the euro area economy deteriorated significantly after the announcement of lockdowns in several countries – among them Spain – and a sharp increase in sovereign (see Chart 6.1) and corporate debt interest rates. This increase was uneven across jurisdictions. It was much sharper in those countries, such as Italy or Spain, hardest hit by the pandemic whose fiscal situation was less comfortable at the onset of the crisis. It is important to note that, in the euro area, sovereign yields in each Member State play a pivotal role in the transmission of monetary policy to the real economy. Specifically, sovereign yields are not only important to government financing costs, but are also a key benchmark when determining financing costs on capital markets for firms and financial institutions. In the case of the latter, since the costs of bank lending are linked to the costs of the financing raised by the banks themselves, sovereign yields ultimately affect indirectly the interest rate applicable to bank lending on which, as stated above, SMEs, the self-employed and households are highly dependent.

In light of this situation, at the extraordinary Governing Council meeting of 18 March, the ECB announced the PEPP. The same classes of public and corporate sector assets will be purchased under this temporary program as under the APP. The key difference between the APP and the PEPP is that under the latter purchases will be conducted in a flexible manner and fluctuations in their distribution will be allowed over time, among jurisdictions and across asset classes.[15] The ECB thus attempted to avoid financial fragmentation that would impede or hinder the transmission of its monetary policy to the financial conditions in some euro area countries.

The PEPP was implemented with an initial envelope of €750 billion until the end of 2020. Subsequently, on 4 June 2020, it was increased to €1.35 trillion until at least

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14 The yield on a debt security is the sum of an expectation component, which reflects the projected future performance of short-term interest rates, and a term premium, which reflects the risk absorbed by the investors. See Vayanos and Vila (2009) and Eser et al. (2019).

15 However, the allocation of public sector bond purchases across jurisdictions will continue to be guided by the capital key in the long run, without prejudice to the aforementioned flexible application of the programme in the short term.

Chart 5
ILLUSTRATIVE ESTIMATION OF DURATION RISK: PORTFOLIO AND BONDS WEIGHTED BY MATURITY (PSPP + PEPP-GOV)

OUTSTANDING SOVEREIGN BONDS (BIG-4, SEVERE SCENARIO)
PEPP (BIG-4)
PSPP (BIG-4)
PROPORTION OF STOCK OF BIG-4 DEBT SECURITIES IN THE PSPP-PEPP PORTFOLIO (right-hand scale)
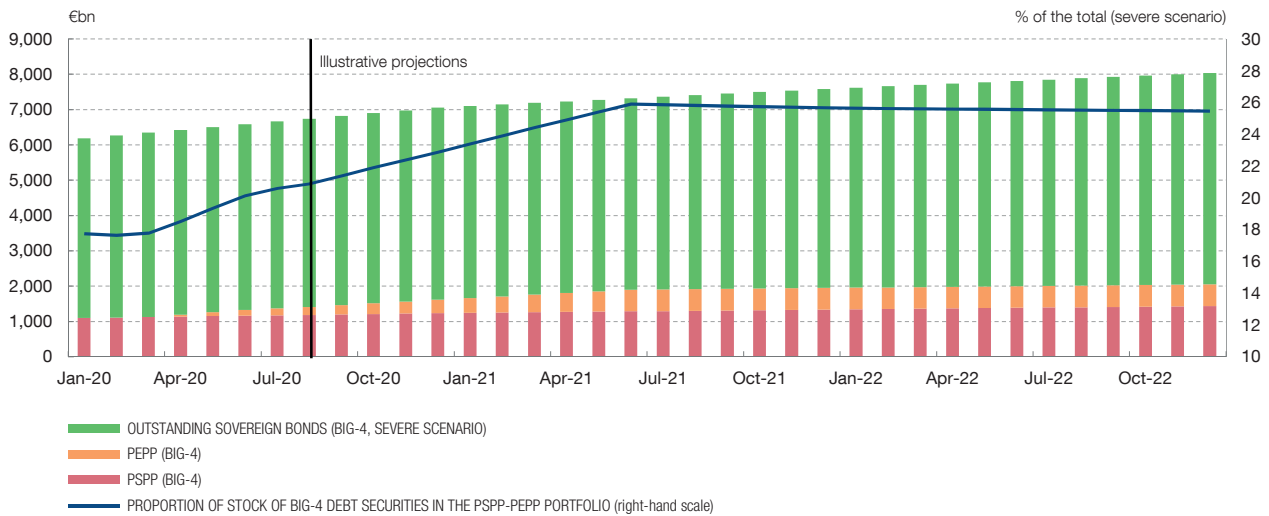
SOURCE: ECB. Latest data: August 2020.
NOTE: The chart depicts an illustrative projection of the portfolio of public sector bonds of Germany, France, Italy and Spain (Big-4) under the ECB's asset purchase programmes, distinguishing between the holdings under the PSPP (the APP public sector purchase sub-programme) and the PEPP (PEPP-GOV). The projected net monthly purchases under the PSPP as of August 2020 (latest information available when this paper was prepared are calculated at 80% (current weight of the public sector bonds in the APP portfolio) of the sum of €20 billion over the projection horizon (in line with the assumptions of the ECB Survey of Monetary Analysts) and €120 billion until the end of 2020. An additional weight of 72% is applied to this value to reflect the portfolio of the Big-4 as a percentage of the PSPP stock. The portion corresponding to additional PEPP purchases (€1.35 trillion) is also included, for which a linear distribution of the purchases over the projection horizon is assumed (for illustrative purposes). Public sector securities purchases under the PEPP accounting for 90% of its total envelope (corresponding approximately to its current weight) and the same 72% weighting for the Big-4 are assumed. The chart also projects the stock of sovereign debt corresponding to the Big-4. All the amounts are shown in terms equivalent to ten-year bonds, the metric typically used to reflect the volume of duration risk in a set of bonds with different maturities. To do so, the weighted average maturity (WAM) of the respective government debt portfolios was used. The WAM of the PEPP-GOV and PSPP portfolios for the Big-4 is 7 and 7.21 years, respectively, while the WAMs (in 2019) of the stocks of sovereign debt were 7.27 (DE), 8 (FR), 7.3 (IT) and 8 (ES) years. Annual to monthly linear interpolation of the projections of the stock of sovereign debt corresponding to the Big-4. Lastly, it is important to stress that the projections shown in this chart are illustrative and should not be interpreted as projections as such.

the end of June 2021 and it was announced that the maturing principal payments from securities purchased under the PEPP would be reinvested at least until the end of 2022. The PEPP, together with the new purchases under the APP, will increase the portfolio of the Eurosystem's securities purchase programmes to around €4.4 trillion in June 2021 (see Chart 6.2). In early September 2020, net purchases of public and corporate sector assets under the PEPP had already reached €497 billion since its launch at the end of March, i.e. 37% of the total projected amount. Specifically, purchases of Spanish public sector bonds to date have accounted for around 12.9% (€46 billion) of total public sector bond purchases from the various euro area countries, slightly above the corresponding capital key (11.92%), according to the ECB's preliminary data at end-July. The announcement of the PEPP considerably eased financial conditions in the euro area. Sovereign debt yields declined significantly following the PEPP's announcement (see Chart 6.1). Section 4 provides a detailed assessment of the immediate impact of the PEPP's announcement on a wide range of financial indicators using an event study approach.
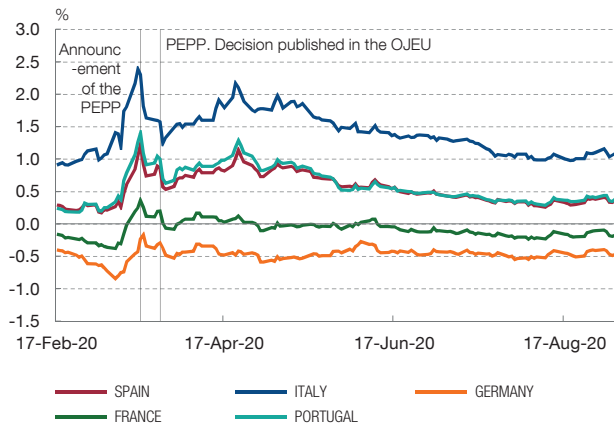
The extraordinary Governing Council meeting of 18 March also resolved to include non-financial commercial paper in the range of eligible assets under the corporate sector
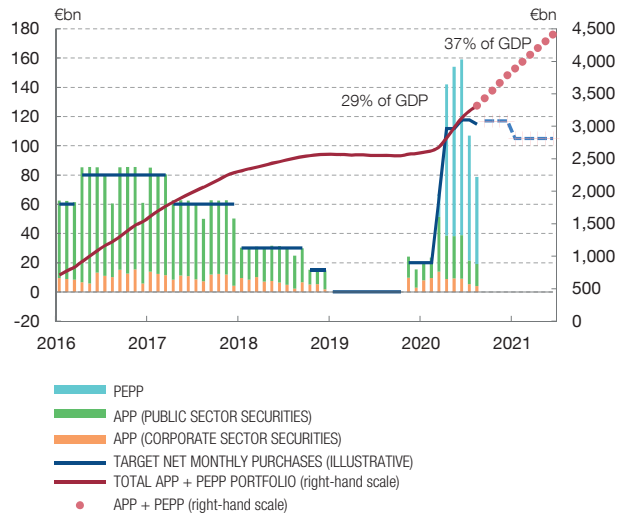
Chart 6

TEN-YEAR SOVEREIGN BOND YIELDS AND THE ECB'S ASSET PURCHASE PROGRAMMES (APP + PEPP)

1 TEN-YEAR SOVEREIGN BOND YIELDS

2 ASSET PURCHASE PROGRAMMES (APP + PEPP)

SPAIN   ITALY   GERMANY
FRANCE   PORTUGAL

PEPP
APP (PUBLIC SECTOR SECURITIES)
APP (CORPORATE SECTOR SECURITIES)
TARGET NET MONTHLY PURCHASES (ILLUSTRATIVE)
TOTAL APP + PEPP PORTFOLIO (right-hand scale)
APP + PEPP (right-hand scale)

SOURCES: ECB and Thomson Reuters Datastream.

a The target net monthly purchases from September 2020 (broken blue line) include the monthly €20 billion approved in 2019 and the monthly amount corresponding to additional net monthly purchases of €120 billion under the APP (approved on 12 March) and €1.35 trillion corresponding to the PEPP (approved on 18 March and increased on 4 June) that will be conducted until end-June 2021, based on the illustrative assumption of a uniform distribution of those purchases until end-June 2021 (in practice, purchases under the PEPP can be distributed flexibly over time). On the basis of the total purchases announced, the volume of APP and PEPP assets on the Eurosystem's balance sheet as at June 2021 would equal 37% of euro area GDP in 2019.

purchase programme (CSPP). Commercial paper is a short-term debt security commonly used by firms. The aim of this measure was to ease tensions in the money market.

Lastly, in April the ECB adopted a package of temporary collateral easing measures for Eurosystem refinancing operations.[16] The principal aim of these measures was to increase banks' ability to request funds in Eurosystem refinancing operations (MRO, LTRO, TLTRO III and PELTRO), thereby supporting lending by banks to firms and households. First, the ECB reduced collateral valuation haircuts by a fixed factor of 20%. This allows banks to obtain a greater level of funding for a set amount of collateral. Second, the scope of acceptable credit assessment systems used in the ACC frameworks was enlarged.[17] This made loans to firms and the self-employed benefiting from public guarantee schemes adopted as a response to the pandemic eligible as collateral. Third, the Governing Council decided that all investment grade (BBB- or higher) marketable assets that were therefore eligible as collateral on 7 April would remain so as long as their rating was not downgraded below a certain level (BB). The aim of the latter measure was to mitigate the impact on collateral volumes of possible downgrades to ratings resulting from this crisis.

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16 See Box 3.2 of the Banco de España's *Annual Report 2019*.

17 These frameworks afford Eurosystem NCBs the possibility of enlarging the scope of eligible collateral in their jurisdictions by including bank loans that comply with certain requirements.

To conclude this section, it bears repeating that although at the date of this paper going to press the ECB has not changed its key policy rates since September 2019, these are low by historical standards. The negative DFR together with the forward guidance on interest rates have helped to maintain at highly accommodative levels the short, medium and long-term risk-free interest rates.[18] This is a necessary but not sufficient condition for ensuring an appropriate monetary policy stance: it is essential that changes in the risk-free yield curve are transmitted to firms' and governments' financing costs on debt markets and to the cost of bank lending. The latter was the main goal of the asset purchase programmes and the refinancing operations implemented by the ECB since the onset of the COVID-19 crisis. The combination of the two arrangements has helped preserve accommodative financing conditions for households, firms and governments throughout the euro area.

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18 The ECB's current forward guidance establishes that its Governing Council expects its interest rates "to remain at their present or lower levels until it has seen the inflation outlook robustly converge to a level sufficiently close to, but below, 2% within its projection horizon, and such convergence has been consistently reflected in underlying inflation dynamics". This therefore ties the future timing of when the institution expects to start raising its interest rates to both observed and projected euro area inflation dynamics.

4 The impact of the PEPP

The aim of this section is to provide a quantitative approximation of the impact of the PEPP on the financial markets and macroeconomics of the euro area and, more particularly, Spain.

4.1 Impact on financial markets

First, an event study approach is employed to identify the immediate impact of the PEPP announcements on financial markets.[19] The effect that such announcements have on capital markets is one of the main transmission channels of the asset purchase programmes. It is called the "stock effect" in the economic literature, since it includes investors' expectations of future developments in the stock of financial assets acquired by the central bank under the framework of these programmes. As a note of caution, this approach only partially assesses the PEPP's effects on financial markets given that it does not capture other effects of programmes of this type, such as those produced by the flow of asset purchases when the latter are conducted ("flow effects"). Consequently, in principle, this approach may undervalue the total impact of this programme.
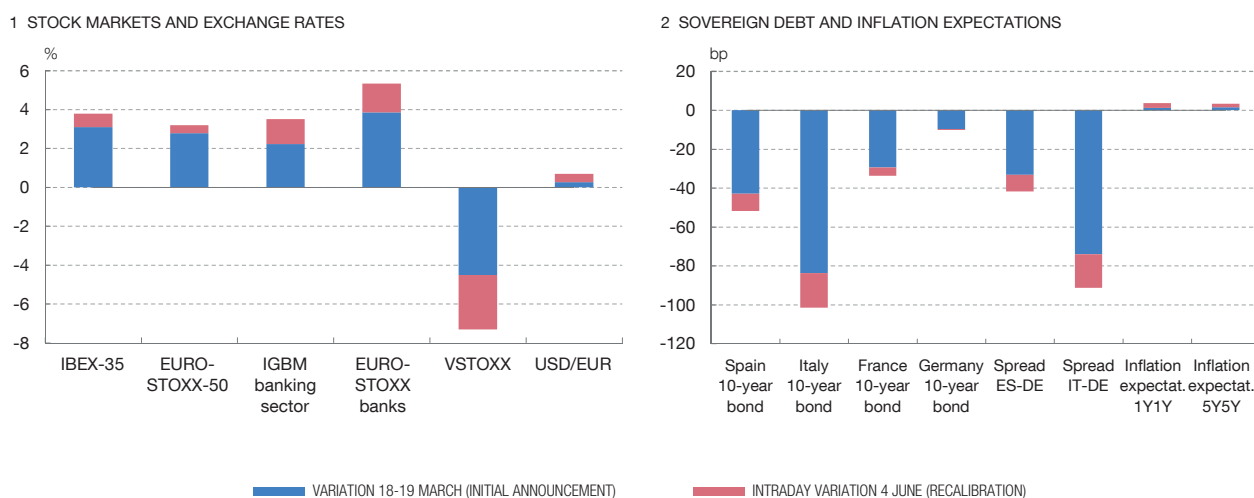
Charts 7.1 and 7.2 show the effect of the initial PEPP announcement of 18 March (blue bars) and the subsequent announcement of its increase on 4 June (red bars) on various stock market indicators, the euro/dollar exchange rate, ten-year sovereign bond yields and spreads and inflation expectations obtained from inflation swaps. The results indicate that both the initial announcement of the PEPP and, to a lesser degree, of a subsequent increase in the programme, had a positive effect on the main stock market indices in the euro area and in Spain, along with the banking sector sub-indices. They also lessened stock market volatility (see Chart 7.1). Additionally, both announcements prompted sharp falls in sovereign debt yields, especially those of Italy and Spain, and in their spreads over the German Bund (see Chart 7.2). As shown in the charts, in general, the increase in the PEPP on 4 June had a smaller impact than that triggered when it was initially announced. This may be due to two factors. First, unlike the initial announcement, which was largely unexpected, the increase announced on 4 June was partially priced in by investors, although the additional volume finally approved was somewhat higher than expected.[20] Second, the PEPP was increased in June against a background of lower financial market tension than that observed in mid-

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19 The event study approach calculates the variation in relevant financial indicators in a narrow window of time around a specific event, to isolate the impacts of that event from other potential factors such as economic or, in the current context, epidemiological developments. In this case, the ECB announced the PEPP in a press release published at 23:45 on 18 March after European capital markets had closed. Consequently, the variation is calculated in each indicator between the closing value on 18 March (for example, at 17:30 in the case of stock market indices) and the first 30 minutes of the session on 19 March (09:30 for the stock markets). The exception is the foreign exchange market which operates via a computerised trading system. In this case the exchange rate variation is calculated between 30 minutes before and after the announcement was made, namely between 23:15 on 18 March and 00:15 on 19 March. On 4 June the increase in the PEPP was announced in the usual fashion, via a press release published at 13:45 and, therefore, the window between 13:30 and 14:15 is used so that it ends, once more, 30 minutes after the event. This analysis of the impact of the PEPP on financial markets is discussed in detail in Box 3.3 of the Banco de España's *Annual Report 2019.*

20 For example, a survey by Reuters between 11 and 14 May showed that almost half of the respondents expected an increase in the PEPP in June, with the median increase being €375 billion, lower than the €600 billion which were finally announced.

Chart 7

IMPACT OF THE PEPP ANNOUNCEMENTS ANALYSED USING AN EVENT STUDY

1 STOCK MARKETS AND EXCHANGE RATES

%

(chart: IBEX-35, EURO-STOXX-50, IGBM banking sector, EURO-STOXX banks, VSTOXX, USD/EUR)

2 SOVEREIGN DEBT AND INFLATION EXPECTATIONS

bp

(chart: Spain 10-year bond, Italy 10-year bond, France 10-year bond, Germany 10-year bond, Spread ES-DE, Spread IT-DE, Inflation expectat. 1Y1Y, Inflation expectat. 5Y5Y)

■ VARIATION 18-19 MARCH (INITIAL ANNOUNCEMENT)   ■ INTRADAY VARIATION 4 JUNE (RECALIBRATION)

SOURCE: Thomson Reuters Datastream.

March, which could also mean a lower impact on financial conditions.

4.2 Macroeconomic impact

Once the impact of the PEPP on financial markets has been assessed, macroeconometric models are subsequently used to estimate its effect on the main macroeconomic variables of the euro area and the Spanish economy, focusing especially on inflation and GDP. In particular, a dynamic stochastic general equilibrium (DSGE) model and a structural vector autoregression (SVAR) model were employed. DSGE models are particularly suitable for simulating asset purchase programmes because of their rigorous microeconomic fundamentals and the fact that they include the effects of such programmes on economic agents' expectations. However, these models impose a relatively rigid structure on the relationships between the model's different variables; consequently, as a robustness exercise, an alternative counterfactual simulation exercise was performed using the SVAR model. This type of model permits more flexible relationships between variables than DSGE models, but it lacks their microeconomic fundamentals and does not include the role of expectations when determining the effects of economic measures. The SVAR model exercise simulates, from April 2020 onwards, the future path of asset purchases under the PEPP in line with those projected in the general equilibrium model, comparing them with an unconditioned scenario, i.e. with no exceptional intervention by the ECB in the form of the PEPP.

The DSGE model used is the Joint Spain Euro-Area (JoSE).[21] This model has been developed by the Banco de España as a macroeconomic and monetary policy analysis tool. The model consists of a monetary union with two regions (respectively representing Spain

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21 See Aguilar et al. (2020).

and the rest of the euro area) and incorporates the various nominal, real and financial frictions commonly included in the literature on large DSGE models used by central banks.[22] The model's parameters are estimated using Bayesian econometric techniques, with observed macroeconomic series for both economies. There are various types of economic agents in each region of the monetary union: households, firms and a fiscal authority. The households and firms are subject to borrowing constraints in the form of a limit proportional to the value of their collateral (housing in the case of households and capital for firms).

In order to assess the impact of the asset purchase programmes, the JoSE model includes a series of additional financial frictions to reflect the effect of these programmes on the yields of the purchased assets and, in turn, how this impacts the real economy.[23] The model is calibrated to replicate the estimated elasticity (based on event studies and a yield curve model) of the ten-year sovereign bond yield with respect to the ECB's asset purchases.[24] The elasticity observed in the data, and therefore calibrated in the model, is higher for Spain than for the rest of the euro area. Further, two alternative calibrations are considered: the first based on the reaction of sovereign bond yields to the initial announcement of the PEPP, characterised by relatively high elasticity, and the second based on experience with the PSPP – the APP public sector purchase sub-programme active since 2015 – which has generally been characterised by lower yield elasticity for those bonds.

The effects of two sequential announcements approximating the ECB's PEPP announcements are simulated using the model. The first one, in line with the initial PEPP announcement of 18 March, is for purchases of net assets amounting to €750 billion over nine months (from April to December 2020) with no reinvestment. The second, in line with the recalibration of the PEPP of 4 June, announces an increase to the net purchase programme amounting to €600 billion until the end of June 2021, bringing the total to €1.35 trillion, along with a commitment from the central bank to reinvest until at least the end of 2022 the maturing principal payments from that portfolio following discontinuation of the net purchases.[25] The simulation takes into account the sequence of the announcements: initially only the first announcement is simulated, while the second announcement is subsequently included in Q2 of the initial simulation. This distinction is particularly important in rational expectations models, such as JoSE, in which agents anticipate the future effects of the measures at the time of their announcement.

Chart 8 sets out the overall effect (relative to a counterfactual scenario of no PEPP) of both PEPP announcements on the main variables of interest in the DSGE model. The effects are shown both for Spain and the euro area as a whole in the scenario of low elasticity for

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22 See Smets and Wouters (2007).

23 Specifically, following Harrison (2017), adjustment costs are introduced for the composition of short and long-term bonds in investors' portfolios, whereby purchases made by the monetary authority prompt changes in the portfolios' average yields and generate effects on aggregate demand and inflation.

24 See Eser et al. (2019).

25 Although the PEPP announcements did not specify the distribution of net purchases by asset type (public sector vs. corporate sector), in this exercise it is assumed that 90% of the total purchases announced are earmarked for public sector assets, in line (roughly speaking) with the actual percentage of public sector assets purchased under the PEPP to date. Moreover, for simplicity the purchases are linearly distributed over the established horizon. However, as has been noted, in practice the PEPP purchases may be distributed flexibly over time.
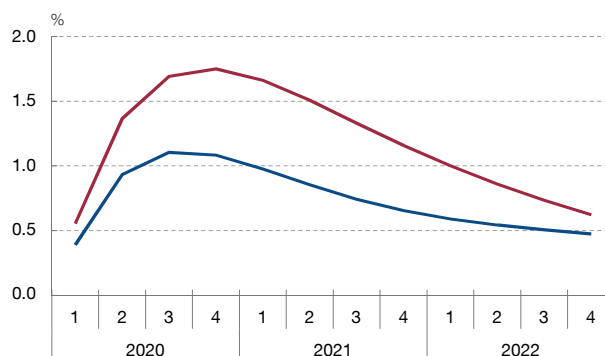
Chart 8
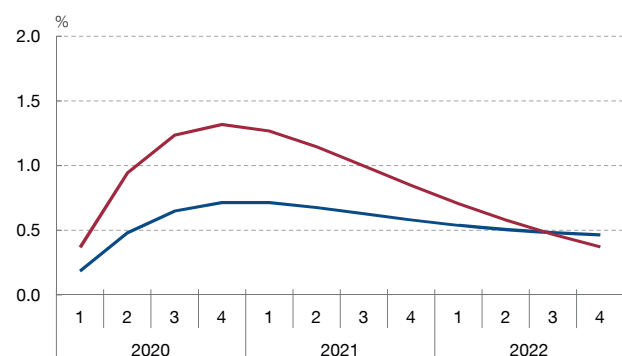**DYNAMIC EFFECTS OF THE PEPP IN THE DSGE MODEL**
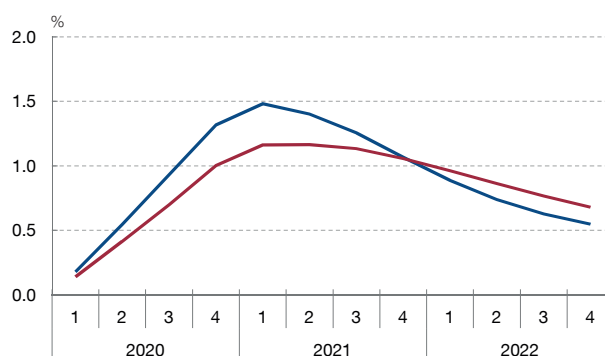
1 LONG-TERM BOND YIELDS
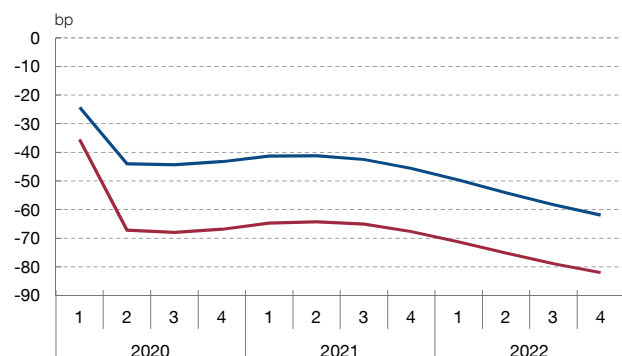
2 GDP LEVEL

3 EMPLOYMENT LEVEL

4 INFLATION

EURO AREA   SPAIN

SOURCE: Banco de España.

sovereign debt yields. In JoSE, once the announcement of bond purchases lowers long-term interest rates, and therefore the average yield of investment portfolios, household savings decline and their spending level increases, while firms step up investment and employment. These effects are amplified by the favourable impact of the purchase programme on the value of the collateral used by households and firms when applying for credit, allowing them to incur more debt and finance higher levels of consumption and investment. The increase in aggregate demand leads to rising GDP and employment. The greater activity generates higher costs for firms, exerting upward pressure on inflation. In general, the effects identified are larger for Spain than for the euro area as a whole, owing primarily to the greater elasticity of Spanish bond yields to the monetary authority's asset purchases.[26]

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26 The differences in the two economies' other parameters also help to explain the larger impact on the Spanish economy in terms of GDP and employment identified in these simulations. The opposite is true for inflation: owing to the lower estimated nominal rigidities for the rest of the euro area, inflation reacts more in the euro area as a whole than in Spain.

In the SVAR model, which has a monthly frequency, a broad spectrum of financial asset prices interact with the macroeconomic conditions of the euro area 19 for the 2007-2019 period.[27] The model, which is global in nature, exploits variation among the variables of all euro area economies and explicitly takes into account cross-country interdependencies. It is important to note that the model includes an identification strategy capable of distinguishing the macroeconomic effects of unconventional monetary policy measures through innovations to the size of certain components of the Eurosystem balance sheet.[28] To estimate the impact of the PEPP, the forecasts of the model conditioned by changes in the Eurosystem balance sheet and including the PEPP are compared with the counterfactual scenario of no PEPP.[29]

As has been noted, the SVAR model is useful here because it provides an alternative assessment of the effects of the PEPP to that of the DSGE model, with fewer structural assumptions and therefore greater flexibility when replicating the relationships between variables. Chart 9 summarises the results of the different models (and the different scenarios in each model) as to the average annual impact of the PEPP on GDP and inflation in the period 2020-2022, both in Spain and the euro area as a whole. The median of the model simulations indicates that the PEPP would have a maximum impact on the real GDP of the euro area of around 1.3%. This would be reached in 2021. Meanwhile, the maximum impact on euro area inflation would be 1.3 pp, likewise reached in 2021. The maximum impact on Spanish GDP would be somewhat larger (1.4%), in line with the PEPP's greater estimated effects on Spanish sovereign bond yields. According to the DSGE model the average annual employment gains would likewise be greater in Spain than in the rest of the euro area: the maximum effect would occur in 2021, when employment would grow by between 0.6% and 1% in the euro area and by between 1.1% and 1.7% in Spain, depending on which calibration is used.[30] Accordingly, the results of the macroeconomic models suggest that the PEPP could have a first-order effect on economic activity, employment and inflation in the euro area and in Spain.

However, it is important to note the degree of uncertainty in these estimates, particularly for Spain. The estimates shown are probably a conservative quantification of the PEPP's effectiveness. In particular, the tools used in these calculations are not designed to

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27 The SVAR model exploits interdependencies between country-specific variables (real GDP growth, HICP, new credit operations to non-financial corporations, cost of credit, stock market prices and effective exchange rates) and common variables weighted based on their share in GDP and trade, such as the ECB's total assets, the MRO rate, the EONIA-MRO spread, the CISS index (which measures systemic stress risk), inflation swaps and shadow interest rates (which are able to capture the monetary policy stance when policy rates reach the zero lower bound). For more details, see Burriel and Galesi (2018).

28 There are different approaches to identifying unconventional monetary policy shocks in the context of SVAR models. One of the most popular is to use innovations to the balance sheet of the central bank (size, components, etc.), in line with Boeckx et al. (2017) and Gambetti and Musso (2017). In particular, since an expansionary conventional monetary policy shock may have the same effects on the ECB balance sheet as a separate unconventional monetary shock, a combination of zero and sign restrictions is typically imposed on the policy rate. This is true in our case and that of Gambacorta et al. (2014).

29 On the basis of the country-specific results, the aggregate for the euro area is constructed weighting the countries by their relative shares in GDP. Similar simulation exercises can be found in Altavilla et al. (2019), Rostagno et al. (2019) and Mandler and Scharnagl (2020).

30 Employment is not included as a variable in the SVAR model.

Chart 9
SIMULATED EFFECTS OF THE PEPP UNDER THE DSGE AND SVAR MODELS

1 GDP LEVEL

2 INFLATION

RANGE BETWEEN MODELS (a)   ◆ MEDIAN
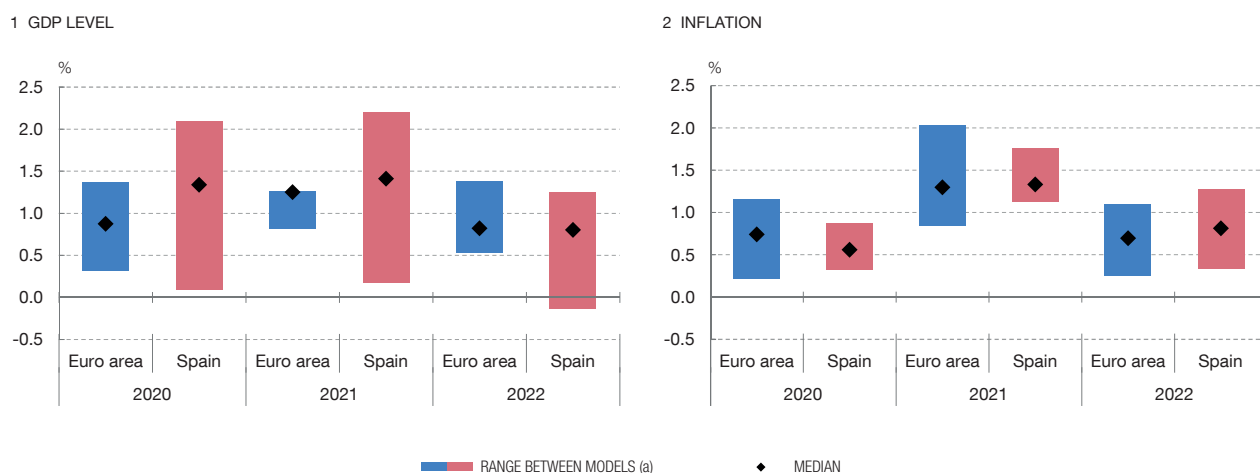
SOURCE: Banco de España.

a Median and results ranges for the effects on the level of GDP and inflation in Spain and the euro area.

capture the benefit of preventing adverse non-linear dynamics – prompted by a sharper tightening of financial conditions in the absence of resolute action by the monetary authority – which would translate into potentially far greater contractionary scenarios.

5 Final considerations

The monetary policy measures adopted by the ECB in response to the COVID-19 crisis have had a stabilising effect on financial markets in the euro area and Spanish economies. The ECB's actions have, in particular, contributed decisively to softening financial conditions in all euro area countries and, in this way, to heading off the emergence of adverse feedback loops between the financial markets and the real economy. This has helped shore up economic agents' confidence, with the subsequent beneficial effects on economic activity and employment, and on the inflation outlook. The analysis set out in this paper provides evidence along these lines.

Despite the support the ECB's measures have provided to the economic recovery, the medium-term inflation outlook nevertheless remains clearly below target. In this respect, the Governing Council has repeatedly stated that it stands ready to adjust all its instruments appropriately to ensure that inflation moves in a sustained fashion towards its objective. Looking ahead, the high uncertainty over the course of the pandemic or over the possible persistence of the initial economic impact on the productive system means that monetary policy must remain vigilant and, if necessary, act again with the same resolve shown to date.

References

Aguilar, P., G. Almeida, S. Hurtado and O. Rachedi (2020). "JoSE: Joint Spain-Euro Area Model", Occasional Papers, Banco de España, forthcoming.

Altavilla C., L. Burlon, M. Giannetti and S. Holton (2019). "Is there a zero lower bound? The real effects of negative interest rates", ECB Working Paper No. 2289, European Central Bank.

Alves, P., R. Blanco, S. Mayordomo, F. Arrizabalaga, J. Delgado, G. Jiménez, E. Pérez Asenjo, C. Pérez Montes and C. Trucharte (2020). "Recent developments in financing and bank lending to the non-financial private sector". Analytical Articles, *Economic Bulletin,* 4/2020, Banco de España.

Arce, Ó., G. Nuño and C. Thomas (2019). "The Eurosystem's monetary policy following the end of net asset purchases", Analytical Articles, *Economic Bulletin,* 1/2019, Banco de España.

Banco de España (2016). "The effect of the ECB's monetary policies in the recent period", Chapter 3, *Annual Report 2015.*

Banco de España (2019). "Monetary policy design in the medium and long term", Chapter 3, *Annual Report 2018.*

Banco de España (2020). "The role of economic policies internationally in the face of the pandemic", Chapter 3, *Annual Report 2019.*

Boeckx, J., M. Dossche and G. Peersman (2017). "Effectiveness and transmission of the ECB's balance sheet policies", *International Journal of Central Banking,* 13(1), 297- 333.

Brunnermeier, M. K., and Y. Koby (2018). "The Reversal Interest Rate", NBER Working Paper No. 25406.

Burriel, P., and A. Galesi (2018). "Uncovering the heterogeneous effects of ECB unconventional monetary policies across euro area countries", *European Economic Review,* Vol. 101, pp. 210-229.

Eggertsson, G., and M. Woodford (2003). "The Zero Bound on Interest Rates and Optimal Monetary Policy", *Brookings Papers on Economic Activity,* 34(1), pp. 139-235.

Eser, F., W. Lemke, K. Nyholm, S. Radde and A. Vladu (2019). "Tracing the Impact of the ECB's Asset Purchase Programme on the Yield Curve", ECB Working Paper No 2293, European Central Bank.

Fiorentini, G., A. Galesi, G. Pérez-Quirós and E. Sentana (2018). *"The rise and fall of the natural interest rate"*, Working Paper No 1822, Banco de España.

Galesi, A., G. Nuño and C. Thomas (2017). "The natural interest rate: concept, determinants and implications for monetary policy", Analytical Articles, *Economic Bulletin,* 1/2017, Banco de España.

Gambacorta, L., B. Hofmann, and G. Peersman (2014). "The effectiveness of unconventional monetary policy at the zero lower bound: A cross-country analysis", *Journal of Money, Credit and Banking,* 46(4), pp. 615-642.

Gambetti, L., and A. Musso (2017). "The macroeconomic impact of the ECB's expanded asset purchase programme (APP)", ECB Working Paper No. 2075, European Central Bank.

Harrison, R. (2017). "Optimal Quantitative Easing", Working Paper No. 678, Bank of England.

Holston, K., T. Laubach and J. Williams (2017). "Measuring the natural rate of interest: international trends and determinants", *Journal of International Economics,* no. 108, pp. 59-75.

Mandler, M., and M. Scharnagl (2020). "Estimating the effects of the Eurosystem's asset purchase programme at the country level", Deutsche Bundesbank Discussion Paper, no. 29/2020.

Rostagno, M., C. Altavilla, G. Carboni, W. Lemke, R. Motto, A. Saint Guilhem and J. Yiangou (2019). "A tale of two decades: the ECB's monetary policy at 20", ECB Working Paper No. 2346, European Central Bank.

Smets, F., and R. Wouters (2007). "Shocks and Frictions in US Business Cycles: A Bayesian DSGE Approach", *American Economic Review,* American Economic Association, 97(3), pp. 586-606.

Summers, L. (2014). "US economic prospects: secular stagnation, hysteresis, and the zero lower bound", Business Economics, no. 49, pp. 65-73.

Vayanos, D. and J. Vila (2009). "A preferred-habitat model of the term structure of interest rates". *NBER Working Paper Series,* No 15487.

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