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The impact of unconventional monetary policy on euro area public finances

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Unconventional monetary policy measures implemented by the European Central Bank in recent years have helped to reduce interest rates on sovereign debt in the euro area as a whole. In addition to the direct impact on debt servicing payments, monetary policy conduct in the most recent period has had positive macroeconomic effects which have indirectly impacted the cyclical revenue and expenditure items in the government budget. This article approximately quantifies both direct and indirect effects for the main countries in the euro area.

THE IMPACT OF UNCONVENTIONAL MONETARY POLICY ON EURO AREA PUBLIC FINANCES

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Introduction

Against the background of the sovereign debt crisis, which between 2010 and 2012 affected several countries in the euro area, the European Central Bank (ECB) adopted a series of measures which normalised financial conditions in the euro area and restored the proper functioning of monetary policy transmission mechanisms. This was the case, for example, of the Securities Markets Programme (SMP) and the Outright Monetary Transactions Programme (OMT) which allowed the ECB to purchase debt securities on secondary markets in order to prevent tensions from spreading. Although the OMTs were not ultimately activated, their introduction was essential to reduce instability and allay fears about the reversibility of the euro. Subsequently, from June 2014, the ECB began a fresh expansionary phase of monetary policy against a backdrop of excessively moderate inflation.[1] Aside from setting the interest rate on the deposit facility at –0.4%, the ECB stepped up the monetary stimulus by expanding and restructuring its balance sheet. On the one hand it introduced the Targeted Longer-Term Refinancing Operations (TLTROs) to supply the banking system with long-term funding and strengthen the transmission of monetary policy through the credit channel. On the other, at the end of 2014 it took the step of rolling out a large-scale asset purchase programme (APP).

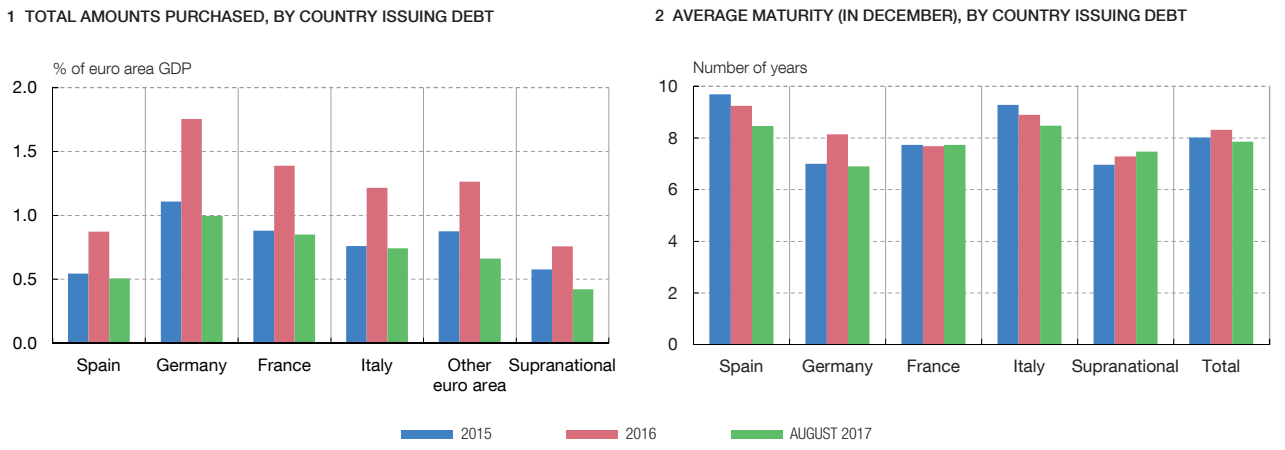
Under the APP it is estimated that the Eurosystem will have purchased assets for an amount of slightly more than 20% of euro area GDP by the end of 2017. The component of this programme aimed at purchasing government debt (PSPP) came into operation in March 2015. Under the umbrella of the PSPP, the Eurosystem has purchased government debt of euro area countries amounting to 4.7%, 7.2% and 4.2% of euro area GDP in 2015, 2016 and the period January-August 2017, respectively (see Chart 1).

The ECB's action has been effective in noticeably easing the financing conditions of the economy.[2] Among other aspects, these measures have improved the financing conditions of general government and its market access, contributing to the significant reduction seen since 2012 in interest rates on sovereign debt, which has directly impacted the associated debt servicing payments of the euro area governments. Likewise, these measures are estimated to have had positive macroeconomic effects and, consequently, also to have indirectly affected cyclical government budget items, by increasing tax revenue, as a result of higher tax bases, and by reducing expenditure of a more cyclical nature such as unemployment benefits, as a result of the upturn in employment.

This article approximately quantifies both types of effects – direct and indirect – on the public finances of the main euro area countries.[3] Specifically, first, following a section which presents descriptive evidence on recent developments in interest rates on sovereign debt for the main euro area countries, estimations are provided of the monetary measures' direct effect on the debt servicing costs of Germany, France, Italy, Spain, the Netherlands

1 See Banco de España (2016 and 2017a) and European Central Bank (2015).
2 For an analysis of the monetary policy measures adopted by the Eurosystem during the crisis and their macroeconomic implications, see Banco de España (2016).
3 This article expands upon certain findings presented in section 2.1 of Chapter 4 of the Banco de España's *2016 Annual Report* [see Banco de España (2017b)].

PROGRAMME OF PURCHASES OF GENERAL GOVERNMENT ASSETS BY THE ECB CHART 1



SOURCE: ECB.
NOTE: Monthly information available on the ECB website, https://www.ecb.europa.eu/mopo/implement/omt/html/index.en.html.
Supranational bodies are institutions formed by two or more national governments. For example, securities were purchased from the European Stability Mechanism (ESM), the European Financial Stability Facility (EFSF) and the European Union.
The projection published in May 2017 by the European Commission was used as the reference for euro area GDP in 2017.

and Belgium and the euro area aggregate for the period 2014-16. Second, the total direct and indirect effect on the government deficit of Spain and of the euro area as a whole is estimated. The complexity of the matter addressed warrants treating the exercises conducted in this article as mere approximations of the orders of magnitude of the effect of such unconventional monetary policies on public finances, which are subject to a high degree of uncertainty.

Recent developments in interest rates on sovereign debt

Interest rates on government debt in euro area countries have fallen significantly since mid-2012 – the height of the sovereign debt crisis – to date (see Chart 2). In particular, since the beginning of the new expansionary phase of unconventional monetary policy in June 2014 up to the end of 2016, the interest rate at issuance of five-year and ten-year debt declined by around 110 and 120 basis points (bp), respectively, in the case of Germany, France and Italy, by close to 150 bp and 160 bp for Spain, and by slightly more than 120 bp and 140 bp for Belgium.

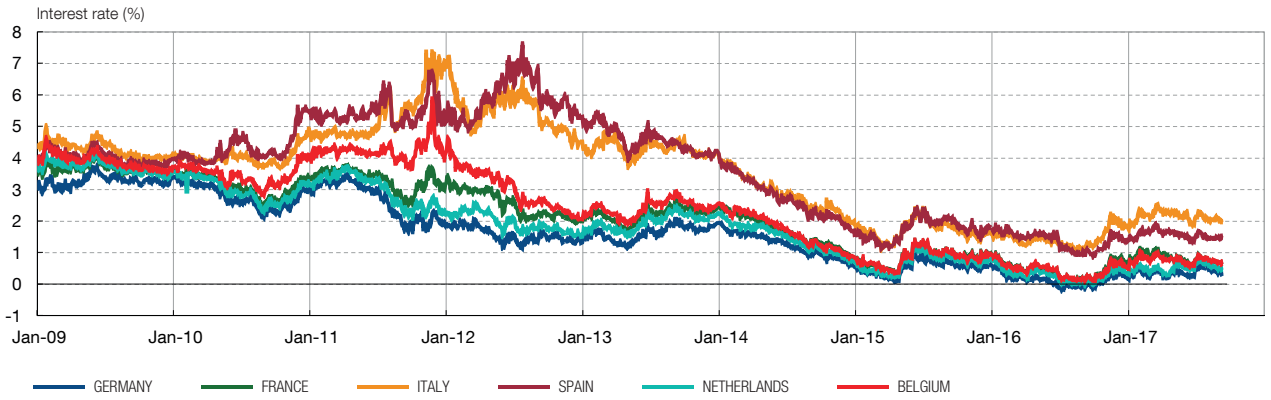
The decline in the interest rate at issuance of government debt across all maturities resulted in a fall in average implicit rates on debt[4] in recent years. Thus, the average implicit rate on the euro area sovereign debt stock in aggregate terms decreased between 2014 and 2016 by slightly more than 15%, falling by more than 17% in Spain. Since in most countries government debt only decreased marginally or continued to rise over those years, the fall observed in the general government interest burden/GDP ratio in the euro area in the period was mainly due to the decline in the interest rate at issuance (see Table 1). Specifically, the interest on government debt/GDP ratio of the euro area aggregate decreased by 0.5 percentage points (pp) between 2014 and 2016, 0.4 pp of which can be attributed to the fall in implicit rates and 0.1 pp to the decline in the debt ratio.

In spring 2014, prior to the series of announcements of the ECB's unconventional measures, no-one anticipated that the subsequent period (2014-16) would be characterised

4 Implicit rates are defined as the ratio between the interest expense of government debt and the outstanding stock of that debt in a specific year.

YIELD ON 10-YEAR GOVERNMENT DEBT

CHART 2



SOURCE: Banco de España.

GOVERNMENT DEBT INTEREST EXPENDITURE DYNAMICS (2014-16)

TABLE 1

	Interest expenditure (% of GDP)		Implicit interest rates (%) (a)		Average life of government debt (years)		Change in interest expenditure (% of GDP)		
	2014	2016	2014	2016	2014	2016	Observed 2014-16	Owing to change in	
								Debt	Rates
Euro area	2.7	2.2	2.9	2.5	7.3	7.9	-0.46	-0.07	-0.40
Germany	1.8	1.4	2.4	2.0	6.2	6.5	-0.40	-0.13	-0.27
France	2.2	1.9	2.3	2.0	7.0	8.0	-0.28	0.03	-0.31
Italy	4.6	4.0	3.5	3.0	6.8	7.3	-0.62	0.02	-0.65
Spain	3.5	2.8	3.5	2.8	6.0	7.0	-0.66	-0.03	-0.63
Netherlands	1.4	1.1	2.1	1.7	6.8	7.0	-0.34	-0.10	-0.24
Belgium	3.3	2.9	3.1	2.7	7.5	8.5	-0.41	-0.02	-0.39

SOURCES: Eurostat and Banco de España.

a The implicit interest rate is calculated by dividing interest payments in year t by debt in year t, and is presented as a percentage.

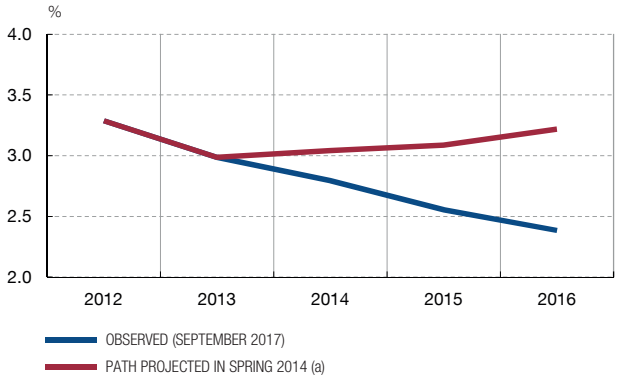
by such favourable government debt cost dynamics as those which were subsequently observed. Thus, in the euro area as a whole and in Spain, the stability programmes published by the various euro area Member State governments in spring 2014 projected that the implicit rate on debt would stabilise at the levels prevalent as of that date, with the result that said rate was expected to stand at around 3.2% in the euro area and at 3.6% in Spain in 2016, whereas the actual rate was 2.4% in the euro area and 2.8% in Spain (see Chart 3.1). This projection was consistent with the profile of the interest rate measured by the implicit forward rates in the yield curve estimated as of those dates (see Chart 3.2).

Direct effects on interest rates and interest payments on sovereign debt

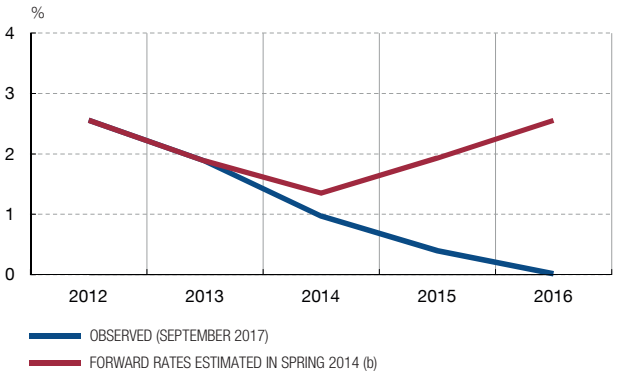
In general, fluctuations in interest rates, and, especially, in long-term rates at issuance are due to different types of factors. Consequently, the recent decline observed in long-term interest rates in the euro area cannot be attributed solely to monetary policy. In particular, these rates may also have fallen for other reasons, such as revisions in the outlook for economic growth and inflation, changing conditions in the external environment, economic policy measures adopted nationally in various spheres, such as structural reforms, as well as the fiscal consolidation implemented throughout most of the euro area.

PATH OF INTEREST RATES OF GOVERNMENT DEBT CHART 3

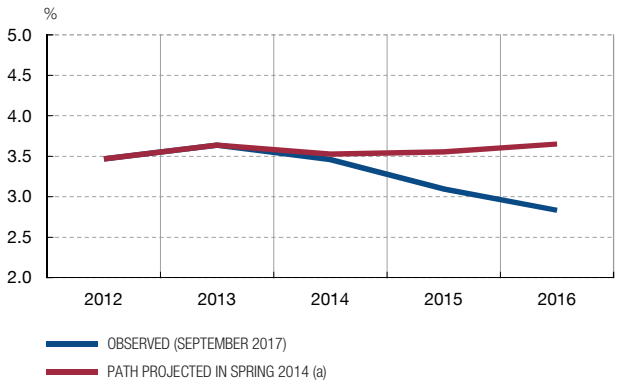
1 IMPLICIT RATE OF GOVERNMENT DEBT: EURO AREA (a)



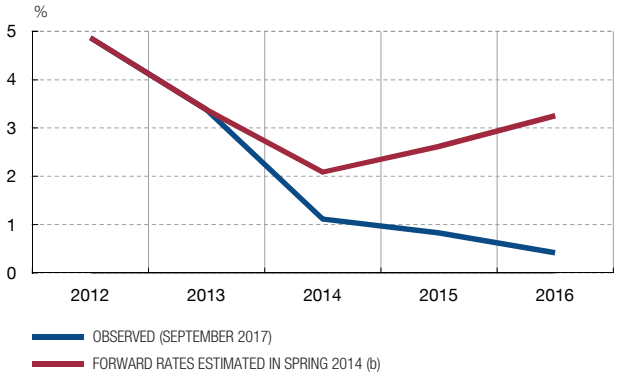
2 INTEREST RATE AT ISSUANCE OF 5-YEAR GOVERNMENT DEBT: EURO AREA



3 IMPLICIT RATE OF GOVERNMENT DEBT: SPAIN



4 INTEREST RATE AT ISSUANCE OF 5-YEAR GOVERNMENT DEBT: SPAIN



SOURCES: Banco de España and European Commission (Country Stability Programmes, 2014).

a Using the aggregate rate of six countries (Germany, France, Italy, Spain, the Netherlands and Belgium) taken from the 2014 stability programmes and the rate observed for the same six countries. The 2014 Stability Programme is used for Spain.
b The forward rate is the implicit interest rate in the rate curve estimated in May 2014 for the maturities indicated. In this case it refers to the euro area as a whole.

A commonly used approach to attempt to identify the effect of monetary policy measures on financial asset prices is the "event study", which in this case analyses how government debt yields in the euro area vary when announcements of monetary policy measures are made by the ECB. For this purpose it is assumed that in a very small window of time around these announcements (for example, one or two days), financial assets will only respond to these monetary policy announcements.

According to this methodology,[5] from June 2014 to the end of 2016 around 75% of the fall observed in five-year interest rates in the euro area aggregate could be attributed to monetary policy, with significant cross-country heterogeneity (see Table 2, columns three to six).[6] Similarly, the effect of this policy on the interest rate at issuance of debt at relevant maturities can be calculated in order to determine interest expenditure.

5 This estimation is an update, using data until early 2017, of the event study prepared by the Banco de España (2016). In particular, 60 events are considered, 20 of which refer to ECB press conferences, 13 to the publication of discussions of the Governing Council and the remainder to public speeches by members of the Governing Council of the ECB.
6 Applying this methodology, however, is not without practical difficulties, such as the selection of the size of the time window during which the change in prices is measured or the fact that financial markets usually factor in the effects of possible subsequent official announcements.

ESTIMATED DIRECT EFFECT OF THE ECB'S UNCONVENTIONAL MONETARY POLICY ON INTEREST PAYMENTS OF GENERAL GOVERNMENT IN THE MAIN EURO AREA COUNTRIES

TABLE 2

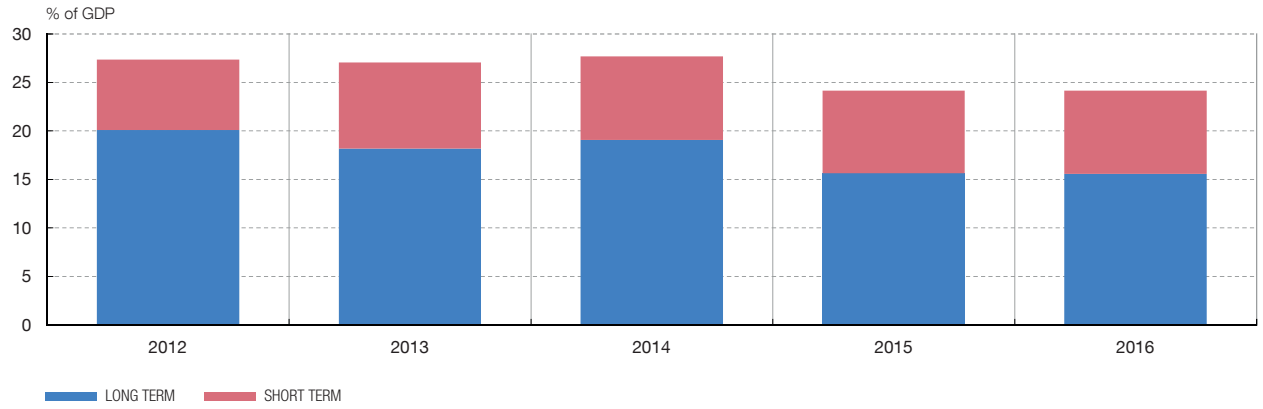
	Change in interest rate on government debt								Counterfactual exercise (a)
	Observed (bp)		Owing to unconventional monetary policy (b)				Expected in May 2014 (bp)		Saving in interest expenditure (% of GDP)
			Percentage		Change				
	1-year	5-year	1-year	5-year	1-year	5-year	1-year	5-year	
Euro area	-34	-108	75	74	-25	-80	90	96	0.5
Germany	-83	-95	8	18	-6	-18	55	81	0.1
France	-67	-92	0	54	0	-50	79	94	0.3
Italy	-88	-106	98	127	-87	-135	137	118	1.3
Spain	-88	-139	23	84	-20	-117	157	127	0.9
Netherlands	-78	-89	19	41	-15	-36	73	80	0.1
Belgium	-64	-104	11	26	-7	-28	70	92	0.2

SOURCES: Eurostat and Banco de España.

a Differences with respect to the counterfactual exercise comprising the assumption that in the absence of unconventional monetary policy, interest rates would have performed in line with the projections in May 2014 (market forward rates).
b Event study for the period June 2014 - December 2016, considering the change in a two-day window around 36 dates on which the Governing Council of the ECB announced measures, accounts of its meetings were published or speeches were made by key members of the Council which signalled the possibility of action being adopted shortly.

SHORT AND LONG-TERM GOVERNMENT BORROWING REQUIREMENT IN SPAIN (a)

CHART 4



SOURCE: Banco de España.

a In-house estimation based on the outstanding stock of government debt (securities and loans) and their average life (at different maturities).

The structure of government debt at different maturities determines annual maturities and the government borrowing requirement (see Chart 4 for the borrowing requirement in the case of Spain) and, therefore, the pass-through of changes in interest rates at issuance to the average implicit rate and the direct impact on the interest burden of government debt. One way of quantifying this impact is to compare the changes observed in the interest burden with those that would have occurred in a hypothetical scenario where the interest rates at issuance of short-term (one-year) and long-term (five-year) debt would have held at the levels envisaged at the time prior to the new expansionary phase of unconventional monetary policy,[7] assuming that the budget situation would not have varied with regard to the situation projected at that time.[8]

7 In line with the approach followed in the Eurosystem projection exercises, the rate projections are obtained from the forward yield curve [see ECB (2016)]. Note that the numbers obtained include, in addition to expectations of future rate developments, a term premium which could introduce upward bias in the estimations.
8 In particular, relating to changes in the primary budget balance, the deficit-debt adjustment and the average duration of government debt.

The findings of an exercise of these characteristics show that, between 2014 and 2016, the general governments of Spain and Italy would have made savings on debt interest payments of around 1 pp of GDP in cumulative terms during this period as a result of the implementation of unconventional monetary policies (see Table 2, last column). In other countries such as Germany and France, where the impact of these measures on sovereign yields has been lower, this estimated saving would have been between 0.1 pp and 0.3 pp of GDP.

Direct and indirect effects on euro area public finances

This section gives an approximate estimate of the total effects (direct and indirect) of unconventional monetary policy on public finances for Spain and for the euro area as a whole. These effects arise from the direct impact of monetary policy on interest rates at different maturities, presented in the previous section, and from the impact of the improvement brought about by that monetary policy on macroeconomic variables. Unconventional monetary policy measures have pushed up economic growth and inflation and have, therefore, had an additionally beneficial impact on public finances, as a result of higher tax revenues and lower public spending on unemployment benefits [see Banco de España (2016)].

The estimated macroeconomic effects of unconventional monetary policy are obtained from simulations produced using standard macroeconometric models used by the Eurosystem national central banks to prepare the aggregate projections for the euro area as a whole and for each of the euro area countries. In the case of the Spanish economy, the model used is the Banco de España's Quarterly Model (MTBE, by its Spanish initials) [see Hurtado *et al.* (2011)].[9] The effect on the government deficit was then calculated as follows. First, the direct cumulative impact on the interest burden in the period 2014-16, arising from the effects on government debt yields at different maturities, was recorded (see Table 2). Second, the indirect impact was calculated, applying the elasticity of the government deficit to GDP growth estimated in the previous stage.[10]

Table 3 presents the effect of unconventional monetary policy on the government deficit of the euro area and of Spain thus estimated (third section of the table), along with the assumptions used in the calculation. The first section shows the effects on several financial variables: one and five-year sovereign bond yields and the euro/US dollar exchange rate. The second section of the table records the estimated effects of the purchase programme on real and nominal GDP. According to these estimates, the cumulative effects of the purchase programme on real GDP growth between 2014 and 2016 amount to 1.3 pp for the euro area as a whole and to 1.7 pp for Spain. Lastly, it is estimated that, owing to these measures, since mid-2014 the Spanish government deficit has fallen by 0.9 pp of GDP as a result of the direct effects on the interest burden, and by a further 0.9 pp as a result of the indirect macroeconomic effect, i.e. an overall drop of 1.9 pp. In the case of the euro area the figures are somewhat lower, with the direct effects described in the previous section standing at 0.5 pp of GDP and the additional indirect effect deriving from the resulting improvement in economic activity at 0.8 pp.[11] [12]

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9 The estimates were obtained following the methodology described in Box 1.2 of the *2016 Annual Report* [see Banco de España (2017a)].

10 This calculation does not take into account the effect of inflation on the government deficit, which depends on a broad set of factors, especially the degree of indexation of the expenditure items, and is therefore subject to considerable uncertainty.

11 In a recent Banco de España article using an alternative methodology, the total effects of the APP on the aggregate euro area government deficit are estimated as 0.7 pp of GDP. This method is an extension of the model developed by Burriel and Galesi (2016), used in Banco de España (2016) to estimate the macroeconomic effects of unconventional monetary policies, which includes the government deficit among the national variables.

12 It should also be noted that as a result of the PSPP, government debt holdings by Eurosystem national central banks have risen very significantly, affecting their profits and also government revenue, given that those profits are distributed mainly to the respective Treasuries. There are several channels through which this situation may

IMPACT OF THE ECB'S UNCONVENTIONAL MONETARY POLICY ON A SET OF FINANCIAL AND MACROECONOMIC VARIABLES AND THE GOVERNMENT DEFICIT IN SPAIN AND THE EURO AREA

TABLE 3

	Euro area				Spain			
	2014	2015	2016	Cumulative	2014	2015	2016	Cumulative
Effect on financial variables (a)								
1-year interest rates on sovereign debt (bp)	-18	-20	13	-25	-4	-9	-7	-20
5-year interest rates on sovereign debt (bp)	-54	-10	-23	-87	-63	-16	-43	-122
Euro/dollar exchange rates (%)	-7	-6	-1	-13	-7	-6	-1	-13
Effect on macroeconomic variables (pp of change) (b)								
Real GDP	0.0	0.6	0.9	1.5	0.1	0.9	0.7	1.7
Inflation (consumption deflator)	0.0	0.3	0.7	1.0	0.0	0.4	0.5	1.0
Effect on government deficit (% of GDP)								
Owing to interest burden (c)	0.0	0.1	0.3	0.5	0.0	0.3	0.6	0.9
Owing to economic growth	0.0	0.3	0.5	0.8	0.1	0.5	0.4	0.9
TOTAL	0.0	0.5	0.7	1.3	0.1	0.8	1.0	1.9

SOURCE: Banco de España.

a Estimations made using the event study methodology employed in Chapter 3 of Banco de España (2016).
b Estimations made according to methodology employed in Box 1.2 of Chapter 1 of Banco de España (2016).
c In the case of the euro area, the effect on the interest burden is obtained by adding together the effects of Germany, France, Italy, Spain, the Netherlands and Belgium.

It is important to note that the estimates presented here are subject to a high level of uncertainty and should, therefore, be treated with the necessary caution. Among other factors, the estimates are based on an alternative counterfactual (hypothetical) scenario that is very difficult to address analytically. As indicated in the introduction, the complexity of the matter addressed warrants treating the exercises conducted in this article as mere approximations of the orders of magnitude of the effect of unconventional monetary policies on the public finances of euro area countries.

14.9.2017.

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pass through to central bank profits. First, interest received will rise as a result of the yield provided by the government debt purchased. Second, as the debt securities are purchased directly from financial institutions, the balancing entry on the central bank's balance sheet is a positive entry in the institution's reserve account, providing it operates in the country. Lastly, the increase in central banks' debt holdings entails higher balance sheet risk, which is covered by means of provisions.