



DIRECTORATE-GENERAL FOR INTERNAL POLICIES

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How do Low and Negative Interest Rates Affect Banks' Activity and Profitability in the Euro-area?

**Monetary Dialogue
November 2016**

In-Depth Analysis



DIRECTORATE GENERAL FOR INTERNAL POLICIES
POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

How do low and negative interest rates affect banks' activity and profitability in the euro area?

Monetary Dialogue 28 November 2016

COMPILATION OF NOTES

Abstract

Critics of ECB loose monetary policy warn against the risk that this policy squeezes banks' profits, which could ultimately lead to higher lending rates and lower credit supply. This discussion has arisen in the euro area in particular, as banks' profitability is low on average and some banks are burdened by a huge amount of non-performing loans. By extension, it is argued, low or negative interest rates impair the transmission mechanism of monetary policy. At the same time, however, the demand for loans increases at low interest rates, which can lead to larger lending volumes and thus improve earnings. Obviously, there is no unequivocal effect on banks' profitability ability from low/negative interest rates per se. Other problems such as a large proportion of bad loans, high operational/management costs and low productivity may play an important role in explaining the weak profitability of euro area banks. The notes in this compilation provide an assessment of these different effects. The notes have been requested by the Committee on Economic and Monetary Affairs as an input for the November 2016 session of the Monetary Dialogue.

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

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Original: EN

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Manuscript completed in November 2016

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<http://www.europarl.europa.eu/committees/en/econ/monetary-dialogue.html>

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INTRODUCTION

To push inflation up and enhance lending to the real economy (in a low growth environment), the ECB and other central banks have significantly eased monetary conditions and introduced very low or even negative interest rates. A growing number of critics warn against the risk that this policy squeezes banks' profits, which could ultimately lead to higher lending rates and lower credit supply. This discussion has arisen in the euro area in particular, where banks are already burdened with low profitability and, some of them, by a huge amount of non-performing loans. This has a negative effect on banks' capital (as capital is built up also via retained earnings) and on lending. By extension, it is argued, low or negative interest rates impair the transmission mechanism of monetary policy.

Low and negative interest rates affect banks' profitability in different ways, however. To the extent that falling interest rates are not followed by lower funding costs, banks' interest margins are indeed reduced. At the same time, however, the demand for loans increases at low interest rates, which can lead to larger lending volumes and thus improve earnings. In addition, debt securities often increase in value when interest rates fall and this can boost bank's profitability as a result of increased valuation profits. Low interest rates and low lending rates also strengthen the customers' debt servicing ability, which in turn reduces credit losses and/or the need to make provisions for anticipated credit losses. By contrast, however, a protracted period of low interest rates may contribute to the build-up of financial imbalances, ever-greater indebtedness and higher credit risks among households and companies, which have a negative effect on banks' profitability and lending to the economy.

Obviously, there is no unequivocal effect on banks' profitability from low/negative interest rates per se. Other problems such as a large proportion of bad loans, high operational/management costs and low productivity may play an important role in explaining the weak profitability of euro area banks.

The notes in this compilation provide a first assessment of the overall effect of low/negative interest rates on banks' profitability and the monetary policy transmission mechanism in the euro area. The notes have been requested by the Committee on Economic and Monetary Affairs as an input for the November 2016 session of the Monetary Dialogue. The main conclusions and policy options are summarised below.

According to **Daniel Gros** (Centre for European Policy Studies), the impact of low(er) interest rates on bank profits is a priori ambiguous. It depends on the business model of the bank, the strength of the competition and the general economic environment. Most of the more recent empirical studies tend to find a positive relationship between interest rates (or the yield curve) and bank profits. However, this might have been due to the fact that rates used to be high during good times, when loan losses were low and demand for loans was high. Moreover, bank profitability has not declined notably in those countries that were among the first to adopt negative rates (Switzerland, Denmark and Sweden). The overall conclusion is that negative rates and low long-term rates constitute more of a contributing factor than the key underlying reason for the currently low profitability of banks in the euro area. Other broader trends, like the continuing tightening of regulation and the savings surplus of the euro, are likely to be more important.

According to **Christophe Blot et al.**, (Observatoire Français des Conjonctures Économiques), the shift to negative rates (following ECB quantitative easing (QE) policy) amplifies the fall in short-term and long-term market rates and reinforces the incentive for commercial banks to operate reallocation on their asset portfolios. It should lead to an increase in loans to business and households in the euro area. At the end of October 2016,

excess reserves and deposit facilities subject to negative interest rates amounted to 1047 billion euros, representing an annual gross cost of 4.2 billion euros for commercial banks. This cost may be offset by the capital gains realized by selling securities to the ECB. By flattening the yield curve, the negative interest rate policy reduces the net interest margin and thus the profitability of the maturity transformation activity is carried out by the banks. In the short term, a flattening yield curve may be positive since the average maturity of the asset is generally longer than that of the liability. Nevertheless, in the medium term, the net interest margin of the banks should decrease. The impact on banks profitability could be mitigated if commercial banks decided to pass on the cost associated with the negative rates through the levying of additional fees and commissions. Moreover, the decline in interest rates could decrease the risk of default of banks' debtors.

According to **Maria Demertzis** *et al.*, (Bruegel), quantitative easing (QE) affects banks' profitability through three main channels: i) First, as QE drives up bond prices, banks holding such bonds see their balance sheets strengthened; ii) Second, QE reduces the long-term yields and thereby reduces term-spreads. With it, the lending-deposit ratio spread falls, reducing the banks' ability to generate net interest income on new loans; iii) Last, QE improves the economic outlook, which should help banks exposed to the economy to find new lending opportunities and less problems with non-performing loans. The effects of QE on bank profitability is therefore not in one direction. If anything, the immediate effect should be positive.

Banks themselves have been quite negative about the impact of QE on their net interest income but they have also acknowledged its positive impact on capital gains (ECB Bank Lending Survey). The authors show that lending-deposit spreads for new lending have fallen significantly. Looking at actual bank profits, net interest income has been stable. Moreover, bank profitability has been increasing mostly due to efforts to clean balance sheets of impaired assets (at least until the end of 2015). This is consistent with a reduction in non-performing loans (NPLs), particularly in countries where the NPLs levels were abnormally high. The paper also documents that that bank profitability in some countries is a concern for many years now, starting well before the QE programme. The main drivers of bad profitability have been non-performing loans, legal risks and other problems unrelated to net interest income that has remained fairly stable. The overall conclusion is that there is not any major bank profitability issue arising out of the ECB's QE programme.

NOTES

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POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

Low rates = low bank profits?

Daniel GROS

IN-DEPTH ANALYSIS

Abstract

The impact of low(er) interest rates on bank profits is a priori ambiguous. It depends on the business model of the bank, the strength of the competition and the general economic environment. Most of the more recent empirical studies tend to find a positive relationship between interest rates (or the yield curve) and bank profits. However, this might have been due to the fact that rates used to be high during good times, when loan losses were low and demand for loans was high. Moreover, bank profitability has not declined notably in those countries that were among the first to adopt negative rates (Switzerland, Denmark and Sweden). The overall conclusion is that negative rates and low long-term rates constitute more of a contributing factor than the key underlying reason for the currently low profitability of banks in the euro area. Other broader trends, like the continuing tightening of regulation and the savings surplus of the euro, are likely to be more important.

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EXECUTIVE SUMMARY

- Interest rates have strongly declined in the past few years. Short-term rates have been firmly in negative territory since the European Central Bank (ECB) pushed its deposit rate below zero, and long-term rates are still hovering around zero if one looks only at risk-free rates, such as German government bonds or swap rates (which do not contain risk on the principal).
- At the same time, bank profitability has declined (and the stock market value of banks has declined, in particular in the first half of this year). Moreover, a number of academic studies have tended to find that higher interest rates are, on average, associated with higher profits.
- It is thus tempting to see a causal link between lower rates and lower bank profits.
- But the recent empirical evidence is not clear-cut. The interest margins of banks have somewhat declined, but it is difficult to say whether this was due to lower rates. Bank profitability does not seem to have been adversely affected in those countries that adopted negative rates before the ECB followed suit (Switzerland, Denmark and Sweden).
- Low/negative interest rates might be associated with low bank profitability because the same factors that induce central banks to push their policy rates negative, namely a weak economy, are typically present when the economy is weak. This overall weakness of the economy then leads to lower credit demand and also to lower bank profits. The banks in countries with negative rates, but stronger growth (like Denmark and Sweden, mentioned above) might thus continue to make profits in spite of negative rates.
- Another contributing factor in the euro area might be the recent emergence of a large overall savings surplus reflected in the large current account surplus. This overall savings surplus, mostly due to lower investment, requires a different business model for banks, as credit demand from the non-financial corporate sector might be permanently lower and a part of household savings will have to be intermediated abroad.

1. INTRODUCTION

There is a strong presumption among market participants and policymakers that negative rates have an adverse impact on bank profits (and thus potentially on bank stability). The key reason, often adduced, is that banks are reluctant to charge their clients negative rates on deposits even when the rate at which they can deposit funds at the central bank becomes negative. However, competition might force banks to lower their lending rates, thus compressing the interest margin, which represents still their most important source of income.

It is thus possible that lowering (policy) rates further into negative territory could after a certain point have a negative impact on bank lending. Brunnermeier and Sannikov (2016) have called this the “reversal rate”.

Whether negative rates represent a special case can be debated. Negative rates could also just be considered one step further in lowering rates below zero. The question at hand should thus not be so much whether negative rates have a negative impact on bank profits, but whether lower rates in general lead to lower bank profits.

This contribution will focus on what one can learn from the voluminous empirical literature on the link between interest rates and bank profitability.

The next section begins by illustrating the recent developments in the interest margin (and finds little movement). This is then followed by a brief survey of the empirical, academic literature. The following section then discusses whether another factor, namely concentration, which is often associated with low competition, might protect bank profits. Section 4 concludes.

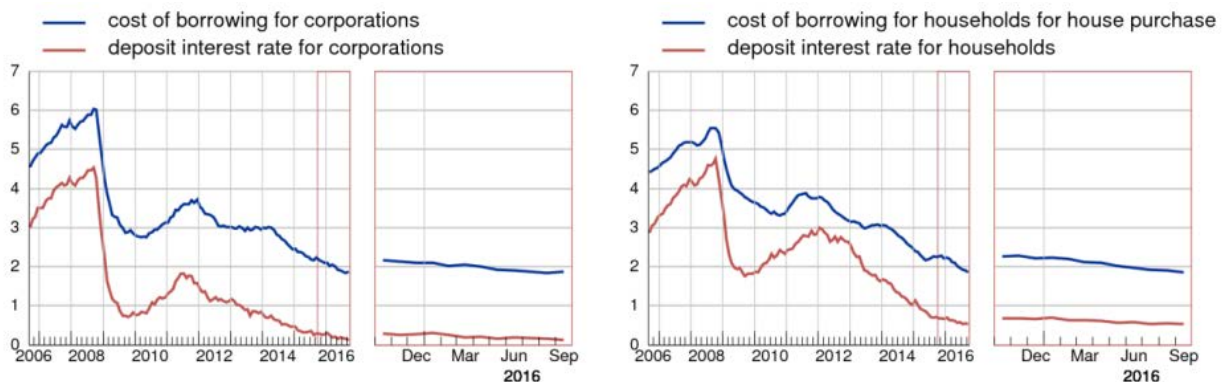
2. INTEREST RATES AND BOOK MARGINS: THE EYEBALL VIEW

The presumption that ultra-low interest rates have a negative impact on bank profitability has arisen most strongly in the context of negative (short-term) rates. The very short-term rates in the money market are a direct consequence of the negative deposit rate adopted by the European Central Bank (ECB).

The argument made about negative rates is that banks are hesitant to charge clients, especially those they wish to retain, a negative rate on deposits, but interest income on their lending is limited because competition forces them to lower lending rates as short-term are falling in general (see Jobst and Lin, 2016 and Coéré, 2016).

However, a first look at the data does not confirm this presumption. Figure 1 below shows the interest rates banks pay on their deposits and the rates they charge to borrowers. The right-hand panel reports the data for households, showing both the evolution over the last decade and over the last year. It is apparent that both deposit rates and the cost of borrowing of households have continued to decline, albeit slowly. There is thus no clear evidence that the net interest margin (NIM) has declined for household-related borrowing and lending as a result of low or negative rates. On the contrary, it seems that the NIM is slightly higher today than it was in 2008 or 2011. The data on corporate lending and the deposits of the corporate sector, on the left-hand side panel of Figure 1, show a similar evolution: deposit and lending rates both decline and the difference between the two has actually somewhat widened relative to the pre-crisis period and shows little change over the last year.

Figure 1: Evolution of deposit and lending rates, 2006 - present



Source: European Central Bank (2016b).

Coéré (2016) arrives at a somewhat different conclusion by looking only at the interest rates charged on new loans. However, most of the drop in the NIM that he observes had already occurred in 2014, whereas the major cuts in the deposit rate into negative territory occurred in 2015 and 2016.

The net interest margin constitutes of course the main source of bank profits, but it cannot determine overall profitability on its own. One key factor of course is the rate at which loans are not paid back. Write-downs on loans that are not serviced on time (so-called non-performing loans) have been a major driver of reduced profitability in recent years.

There are of course other channels through which interest rates can affect bank profits. For example, many banks hold considerable amounts of longer-term government (and other) bonds on their balance sheet. As long-term interest rates decline, the value of these

securities goes up, providing the banks with a capital gain (which they can realise by selling the sovereign bonds to the eurosystem).

Riksbank (2016) provides a useful illustrative summary table reproduced below:

Table 1: Effect of low and negative interest rates on banks' earnings

Income item	Effect
Net interest income	
Interest margin	Varies
Deposit margin	-
Increased volumes	+ (depends on assumed effectiveness of negative rates in stimulating demand)
Net commission income	+
Net results from item at fair value	+
Costs*	-
Loan losses	+ (depends on assumed effectiveness of negative rates in stimulating demand)
Overall (=Profit)	Varies

*The costs are specific to negative interest rates and do not apply to low rates in general.

Source: Riksbank (2016).

It is thus difficult to say with certainty that the problems of the euro area's banking sector are due to a falling interest rate margin caused by negative interest rates. Other elements might either have compensated for this effect or reinforced it. Looking only at the data for one year, one cannot establish any systematic, let alone causal, link. It is thus necessary to look at the overall evidence on the link between interest rates and bank profitability.

2.1. Interest rates and bank profitability: a short review of the literature

The existing academic literature does not offer a consensus regarding the effect of interest rates on bank profitability. In large part, this is due to the fact that different studies used different measures of bank profitability (net interest margin or return on assets) and interest rates (3-month interest rate versus 10-year government bond yield, loan rate versus deposit rate). However, a broad reading suggests that the relationship might have changed with the onset of the period of low and stable inflation rates. The studies covering this so-called Great Moderation period tend to show a positive correlation between interest rates and bank profits. The underlying reason for this tendency might be simply that higher (nominal) rates were generally associated with good economic conditions, and thus low loss rates.

Early studies include Flannery (1980), who finds that banks' profits are not very responsive to the level of interest rates, and Hancock (1985) who concludes that the correlation for the US is negative. Importantly, Hancock (1985) differentiates between loan and deposit rates and shows that the change in banks' profitability generated by changes in loan rates is greater than the change generated by deposit rates. Therefore, there is larger profit elasticity with respect to loans rather than deposits.

Demirguc-Kunt and Huizinga (1999) find that high real interest rates are associated with higher net interest margins and profitability, especially in developing countries. Saunders and Schumacher (2000) highlight the importance of interest rate volatility and report a positive relationship between banks' net interest margins and interest rate volatility. They

document that this was indeed the case for the EU and the US during the period 1988-1995 and report that a 1% increase in volatility increases bank net interest margins by 0.2%. More recently, Mirzaei *et al.* (2013) support the view that higher interest rate spreads increase profitability. The effect, however, is stronger in banks operating in emerging economies, indicating that these banks tend to adjust more interest rates in order to raise profits.

A negative impact of the real long-term interest rate on bank profitability was found by Beckmann (2007). This finding, which is also consistent with the results of Arpa *et al.* (2001), further strengthens the procyclical profitability pattern. In another study, however, Albertazzi and Gambacorta (2009) conclude that while money market rates have a negative impact on both measures of profitability employed (profit before taxes and return on equity), long-term rates show a positive correlation.

Evidence for the United States (Genay and Podjasek, 2014) finds that higher short-term interest rates are associated with higher net interest margins. Moreover, all else being equal, the estimated effects are greater for smaller institutions. The estimated effect of the spread in the terms is also similar. However, when return on assets (ROA) is used as a measure of banks' profitability, the results are more mixed. For small banks, higher short-term rates and a steeper yield curve (reflecting a large difference between short- and long-term rates) have little effect on ROA. On the other hand, both are associated with a higher ROA for large banks.

The analysis for Germany (Busch and Memmer, 2015) suggests that higher rates, expressed as the yield on the outstanding government bonds ('Umlaufrendite'), have an unambiguously positive effect on the net interest margin in the long-run, while in the short run an increase in short-term rates will depress banks' income. For the UK, Alessandri and Nelson (2015) show that both the short-term rates and the yield curve slope contribute positively to banks' net interest margin. In particular, the model suggests that as short-term rates fall, banks reduce their loan rates and expand credit provision, putting downward pressure on the NIM as their balance sheets expand.

Recently, Borio *et al.* (2015) provide evidence that monetary policy tightening that brings short-term interest rates from 0% to 1% raises the ROA by 0.4 percentage points over one year. Moreover, an increase in the slope of the yield curve from -2 percentage points to -1 percentage point raises the ROA by 1.2 percentage points over one year, while the effect is 0.6 percentage points if the slope goes from 1 percentage point to 2 percentage points. Along the same line, Claessens *et al.* (2016) provide evidence for a positive relationship between short-term interest rates and net interest margins, with the adverse effect on profitability being particularly significant in a low interest rate environment. They document that a 1% decrease in the short-term interest rate is associated with a 0.09pp decrease in the net interest margin in the high-rate environment versus a 0.17pp decrease in the net interest margin in the low-rate environment.

A different view is provided by a survey published by the ECB (2016c) (based on the Bank Lending Survey), which suggests that negative interest rates hurt banks' profitability. More than 80% of the participating banks stated that the negative deposit rate, as well as the asset purchase programmes, reduced net interest margins and profitability, despite improving capital gains.

However, the data for the period between 2010 and 2015 for the countries that introduced negative interest rates even earlier than the euro area, namely Denmark, Sweden and Switzerland (Scheiber *et al.*, 2016), suggests that negative interest rates have not resulted in a significant reduction of bank profitability, and particularly of net interest income.

Furthermore, the literature has found that the relationship between interest rates and banks' profitability depends, among other factors, on the source of bank funding and the degree of downward stickiness of retail deposit rates. In particular, Bernanke (2016) argues that if banks depend primarily on wholesale funding, large depositors and foreign depositors, negative short-term rates should not be expected to have large effects on bank profitability. On the other hand, banks that rely primarily on retail deposits (which exhibit limited interest rate pass-through from negative interest rate policy) would likely suffer larger margin compression compared to banks that rely mainly on wholesale funding.

3. BANK CONCENTRATION AND BANK PROFITABILITY

Another reason why bank profitability has been alleged to be low is that excessive competition is destroying their margins. Banks in markets with a high concentration might not be able to pass lower rates to their customers. But this does not seem to be a general rule.

The relationship between banking market structure and performance in terms of profitability is not a new topic. Many studies in the banking literature and more generally in the industry find a positive relationship between profitability and measures of market structure – defined either in terms of concentration or market share.

The theoretical literature provides two opposing hypotheses regarding the effect of market concentration on bank profitability: the structure-conduct-performance (SCP) paradigm and the efficient-structure hypothesis. The first postulates that market structure (i.e. concentration) influences the conduct (i.e. competition) and this in turn influences performance (i.e. profitability). For example, higher concentration leads to lower competition which leads to higher market power and higher profitability (Short, 1979; Bourke, 1989; Molyneux *et al.* 1994). The latter asserts that the performance of a bank is not caused by market structure, but rather by the fact that more efficient banks gain market share at the expense of less efficient banks, thus making the market more concentrated (Demsetz, 1973; Evanoff and Fortier, 1988).¹

The main criticism of the SCP paradigm, however, is the *a priori* negative relationship between concentration and competition. The contestability theory of Baumol (1982) states that highly concentrated markets can also lead to more competition.² This has been shown empirically by Claessens and Laeven (2004) who, using a sample of banks from 50 countries for the years 1994-2001, find that competition and concentration are positively related to each other.

Even though the relationship between market concentration and bank profitability has received significant attention over the years, the existing literature shows contradictory results. Gilbert (1984) surveys different empirical studies to find a significant influence of market structure on the performance of banks (32 out of 44 studies). Berger and Humphrey (1997) and Rhoades (2000) show that more concentrated markets (through mergers and acquisitions) in the US have positive effects on profitability and efficiency of banks. For European banking markets (Germany, France, UK, Italy and Spain), Maudos and Fernandez de Guevara (2004) found a statistically significant positive correlation between concentration and bank interest margins for the period 1993–2000. More recently, Tregenna (2009) shows that for the US, concentration has a positive and highly significant effect on profitability, and in particular return on assets (ROA) and return on equity (ROE).

Conversely, Smirlock (1985) reports that concentration does not explain bank profitability for 2,700 banks operating at the state level in the US. For Europe, Goldberg and Rai (1996) also fail to find a positive relationship between concentration and profitability for a sample of banks across 11 European countries over the period, 1988–1991. Using bank level data for 77 countries, Demirguc-Kunt *et al.* (2004) find that bank concentration has a negative

¹ For an extensive review of empirical work see Rhoades (1977).

² In the definition of Baumol (1982), "... a contestable market is one into which entry is absolutely free, and exit is absolutely costless. ...the entrant suffers no disadvantage in terms of production technique or perceived quality relative to the incumbent, and that potential entrants find it appropriate to evaluate the profitability of entry in terms of the incumbent firms' pre-entry prices."

and significant effect on the efficiency³ of the banking system, except in rich countries with well-developed financial systems and more economic freedom.⁴

Moreover, Beckmann (2007), using annual country and banking group data over the period 1979-2003 for 16 Western European countries, found that the industry concentration in national banking markets does not affect bank profitability. In a study based on 1929 banks in 40 countries during 1998-2008, Mirzaei *et al.* (2013) show that greater market concentration is negatively correlated with bank profitability. But this is true only for emerging economies.⁵

³ In this paper, bank efficiency is measured by the net interest margin.

⁴ However, in another study (Demirguc-Kunt and Huizinga, 1999), using bank-level data in 80 industrial and developing countries for the period 1988 to 1995, the authors find a significant and positive impact of bank concentration, measured as the ratio of the assets of the three largest banks to total banking assets in a given year.

⁵ The Mirzaei et al. (2013) exercise reveals that in advanced economies market share seems to dominate market concentration.

4. CONCLUSIONS

This contribution has focused on a longer-term survey of empirical literature. The only clear conclusion reached is: "it depends". The impact of both long- and short-term (risk-free) interest rates on bank profits could go either way, depending on a variety of factors. There is some evidence that profits remain higher in concentrated banking markets, but this is a general tendency, not a close relationship.

The present environment of negative short-term (policy) rates and low long-term rates is without precedent. It is thus difficult to say whether the existing empirical literature is still relevant.

There could be one single underlying cause for both low bank profits and a monetary policy transmission mechanism, which does not seem to work well. This is the large savings surplus of the euro area. This savings surplus has two broad, longer-term implications.

First of all, the business model of banks will be affected. The primary task of banks used to be to channel household savings to investments by the corporate sector, especially SMEs. However, the (non-financial) corporate sector has also become a net saver. This implies that increasingly banks are just recycling savings between households, mostly through mortgages. The advantage of relationship banking used to be that the bank knew the enterprises, especially the SMEs, it was providing credit to. The importance of this close relationship between banks and their customers is being eroded as the need for bank credit falls.⁶ The current account surplus corresponds to a large extent to this reduction in the need for investment finance. But banks do not have a strong advantage in recycling excess euro area savings abroad.

A second implication of the external surplus is that the transmission mechanism of monetary policy is affected as the euro area accumulates external assets. Lower interest rates benefit debtors at the expense of creditors. In a closed economy these opposite effects should neutralise each other. But in an economy that has accumulated large net external assets this is no longer the case. As argued elsewhere (Gros, 2016), this would imply that the ability of lower rates to stimulate demand will be diminished to the extent that the euro area becomes a net creditor and thus loses income from its foreign assets when interest rates go down.

The concern that low rates depress bank profits might thus be misplaced. In an economy with a large savings surplus like the euro area, rates are likely to remain low, the business model of banks might have to change and the effectiveness of monetary policy might be reduced, regardless of the stance of monetary policy.

⁶ There is evidence (ECB, 2016a) that since the crisis many EU banks have sought to maintain or improve profitability by diversifying their income sources, as well as better managing their cost base. The significant drop in the share of non-interest income observed between 2006 and 2008 (largely owing to trading losses) has gradually increased, bringing it back close to pre-crisis. In the same period, the composition of non-interest income has shifted from more volatile trading income towards fee and commission income. A number of banks have also implemented restructuring plans (branch network rationalisation and headcount reductions) since the crisis, aiming to reduce operational costs.

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ANNEX

Tabular presentation of survey of literature

Study	Years	Countries	Profitability	Interest Rate	Relationship
Flannery (1980)	1961-1978	US	Bank revenue	3M Tbill	Neither
Hancock (1985)		US		Loan and deposit rate	Negative
Demirguc-Kunt and Huizinga (1999)	1988-1995	80 countries	Net interest margin; before-tax profits	3M Tbill	Positive
Saunders and Schumacher (2000)	1988-1995	6 European + US	Net interest margin	Interest rate volatility	Positive
Beckmann (2007)	1979-2003	16 Western European	Return on assets	Long term interest rate (nominal long-term minus contemporary inflation)	Negative
Arpa (2001)	1991-1999	Austria	Net interest income	Short term and long term	Negative
Albertazzi and Gambacorta (2009)	1981-2003	10 OECD	Profit before taxes and Return on equity	Short term and Long term	Negative Positive
Mirzaei <i>et al.</i> (2013)	1999-2008	40 emerging and advanced	Return on average assets	Spread (lending minus deposit)	Positive
Genay and Podjasek (2014)	2003-2013	US	Net interest margin	Short term and term spread	Positive
Busch and Mammer (2015)	1968-2013	Germany	Net interest margin	Short term and long term	Positive
Alessandri and Nelson (2015)	1992-2009	UK	Net interest margin	Short rate and yield curve	Positive
Borio <i>et al.</i> (2015)	1995-2012	14 advanced countries	Return on assets	Short term and yield curve	Positive
Claessens <i>et al.</i> (2016)	2005-2013	47 countries	Net interest margin	Short term	Positive
ECB (2016) - BLS	2016: Q3	Euro area	Net interest margin	Deposit rate	Positive
Scheiber <i>et al.</i> (2016)	2010-2015	Denmark, Sweden, Switzerland	Net interest income	Deposit rate	Neither

NOTES

DIRECTORATE GENERAL FOR INTERNAL POLICIES
POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

Negative interest rates: incentive or hindrance for the banking system?

Christophe BLOT, Paul HUBERT

IN-DEPTH ANALYSIS

Abstract

Since 2014, the ECB has applied a negative interest rate on the excess reserves (and deposit facilities) of commercial banks. This policy is complementary to Quantitative Easing (QE), a program whereby the ECB purchases securities on financial markets. Indeed, the QE provides liquidity to the banks and negative interest rates encourage them to reallocate this liquidity. The negative reserve rate amplifies the fall in short-term and long-term market rates and reinforces the incentive for commercial banks to operate reallocation on their portfolios towards riskier assets. The total amount of liquidity subject to a negative interest rate is 1047 billion euros. Negative interest rates should reduce interest rate margins but the impact on profitability is mitigated by the capital gains banks realise when selling securities to the ECB under QE, by the possibility banks have to finance themselves at negative rates, by a decrease in the risk of default and by the possibility to raise non-interest income.

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EXECUTIVE SUMMARY

- Since 2014, the ECB has applied a negative rate on the excess reserves (and deposit facilities) of commercial banks. This policy aims to amplify the expansionary character of monetary policy. It is complementary to Quantitative Easing (QE), a program whereby the ECB purchases securities on the markets. Indeed, the QE provides liquidity to the banks and encourages them to reallocate this liquidity.
- Whereas the constraint of the zero lower bound (ZLB) was hit, the blurred notion of effective constraint on the interest rate (ELB for effective lower bound) now seems more relevant. The ECB is neither the only nor the first central bank to have dropped a key rate below the 0% mark.
- This shift to negative rates has contributed to lower interbank and market interest rates. Beyond the interest rates set by central banks, some rates on interbank markets and the return on certain assets have also become negative.
- The negative reserve rate amplifies the fall in short-term and long-term market rates and reinforces the incentive for commercial banks to operate reallocation on their asset portfolios. It should lead to an increase in loans to business and households in the euro area.
- At the end of October 2016, excess reserves and deposit facilities subject to negative interest rates amounted to 1047 billion euros, representing an annual gross cost of 4.2 billion euros for commercial banks. This cost may be offset by the capital gains realized by selling securities to the ECB.
- By flattening the yield curve, the negative interest rate policy reduces the net interest margin and thus the profitability of the maturity transformation activity is carried out by the banks. In the short term, a flattening yield curve may be positive since the average maturity of the asset is generally longer than that of the liability. Nevertheless, in the medium term, the net interest margin of the banks should decrease.
- The impact on banks profitability could be mitigated if commercial banks decided to pass on the cost associated with the negative rates through the levying of additional fees and commissions. Moreover, the decline in interest rates could decrease the risk of default of banks' debtors.

1. INTRODUCTION

Since 2008, central banks have deeply changed the operational framework of their monetary policy with the implementation of so-called unconventional measures. By deciding to set a negative nominal interest rate on deposit facilities in June 2014, the ECB has taken a further step in the unconventional dimension of its monetary policy. Whereas the constraint of the zero lower bound (ZLB) was hit, the blurred notion of effective constraint on the interest rate (ELB for effective lower bound) now seems more relevant. The ECB is neither the only nor the first central bank to have dropped a key rate below the 0% mark. In July 2009, the central bank of Sweden - the Riksbank - reduced the deposit rate to -0.25%.

This shift to negative rates as a new unconventional monetary policy tool raises many questions about its impact on the economy and the ability of central banks to achieve their objectives. Beyond the interest rates set by central banks, some rates on interbank markets and the return on certain assets have also become negative.

In this policy brief, we attempt to analyse consequences of this situation on the banking system of the euro area. Commercial banks play an important role in the financing of the euro area economies and are directly affected by the effect of negative rates due to their lending and deposits activity.

2. NEGATIVE INTEREST RATES: A NEW UNCONVENTIONAL MEASURE

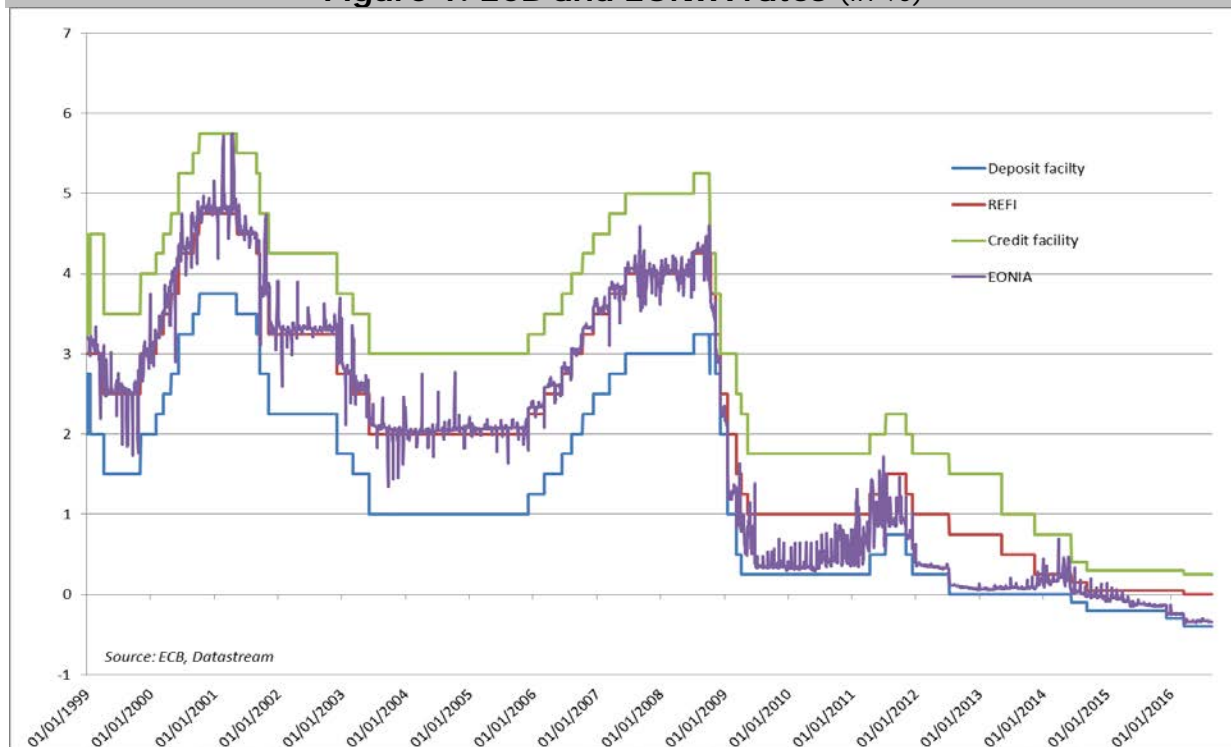
2.1. The Negative Interest Rate Policy

Central banks' actions are most often based on the setting of several interest rates allowing them to influence bank and market interest rates and more generally all financing conditions of non-financial agents. The central bank rates are generally threefold: a central rate that acts as a signal on the direction of monetary policy and can also serve as a reference in the conduct of monetary policy operations and two rates (floor and ceiling) framing it.

In the case of the ECB, the central rate (referred to as the REFI rate) is a minimum rate applied to refinancing operations for credit institutions in the euro area. The rate of refinancing operations allows the ECB to influence the rate charged by credit institutions for inter-bank loans (EONIA for Euro overnight index average), and then the overall bank rates and market interest rates. To better control EONIA fluctuations, the ECB offers two facilities available to banks: lending facilities by which banks in the euro area may borrow from the ECB for a period of 24 hours and deposit facilities at the ECB for a period of 24 hours. These two devices constitute upper and lower bounds for the EONIA and it is the lower bound that is negative today (Figure 1).

Within the euro area, banks obtain liquidity via main or long-term refinancing operations at a zero rate since March 2016. However, the ECB has also opened up the possibility for targeted refinancing operations (TLTRO II for Targeted Long Term Refinancing Operations II) with the interest rate to be set at the level of the deposit facility rate, that is, negative. In other words, the ECB will pay banks that meet some criteria for granting credit to consumers and non-financial corporations to lend in turn.

Figure 1. ECB and EONIA rates (in %)

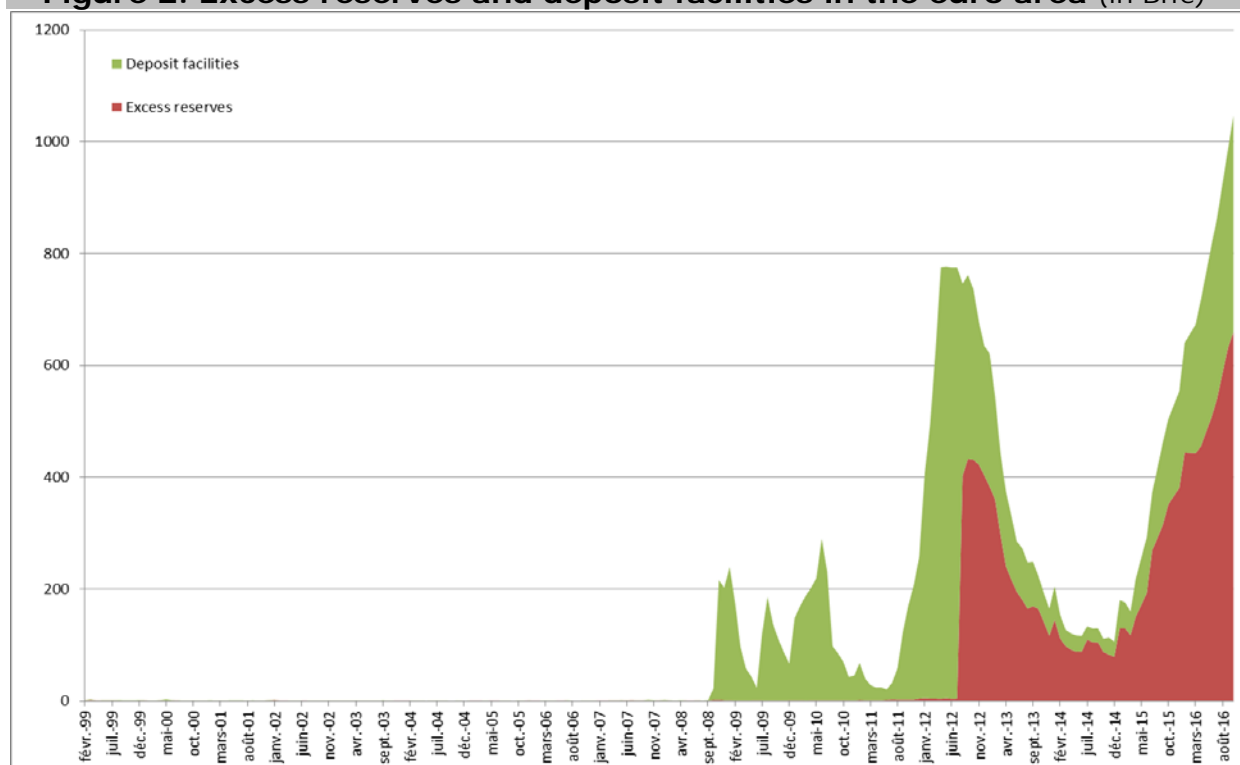


These negative rates are made possible because commercial banks use the central bank as their bank. The funds they hold at the central bank account are called reserves. Commercial

banks must first hold a minimum amount of reserves (reserve requirements) set by the central bank for regulatory and liquidity control matters. Reserves held by commercial banks above this regulatory amount are said to be excess reserves and can only be held by institutions that have a deposit account at the central bank. Commercial banks also use these reserves to manage transactions between them through the banking system. These excess reserves evolve in an (almost) closed circuit between the central bank and commercial banks that lend and borrow these reserves between them. Excess reserves - electronic - can be exchanged for banknotes. Besides, commercial banks by granting credits or purchasing securities to non-financial agents will create deposits on behalf of these non-financial agents, deposits that will substitute required reserves for excess reserves. The possibility for getting rid of excess reserves then depends on the credit multiplier and credit demand.

In normal times, commercial banks only have the required reserves. The ECB deposit facility account and excess reserves, subject to negative rates, had virtually no outstanding amounts until the end of 2008 (Figure 2), with commercial banks going through the interbank market to refinance. During the crisis, central banks created huge volumes of liquidity and de facto replaced the interbank market. While commercial banks did not want to lend to each other, the ECB allowed commercial banks to borrow directly from the ECB itself while commercial banks with liquidity preferred to leave them on deposit at the central bank. When a commercial bank borrows from the central bank, the central bank credits the account of the commercial bank: more reserves are created. In addition, the purchase of bonds through quantitative easing programmes also contributed to an increase in excess reserves. Each time the central bank buys a bond, it credits the reserve account of the bank whose customer was the seller. It should be noted, however, that banks are not at any time forced to sell their securities to the ECB.

Figure 2. Excess reserves and deposit facilities in the euro area (in Bn€)



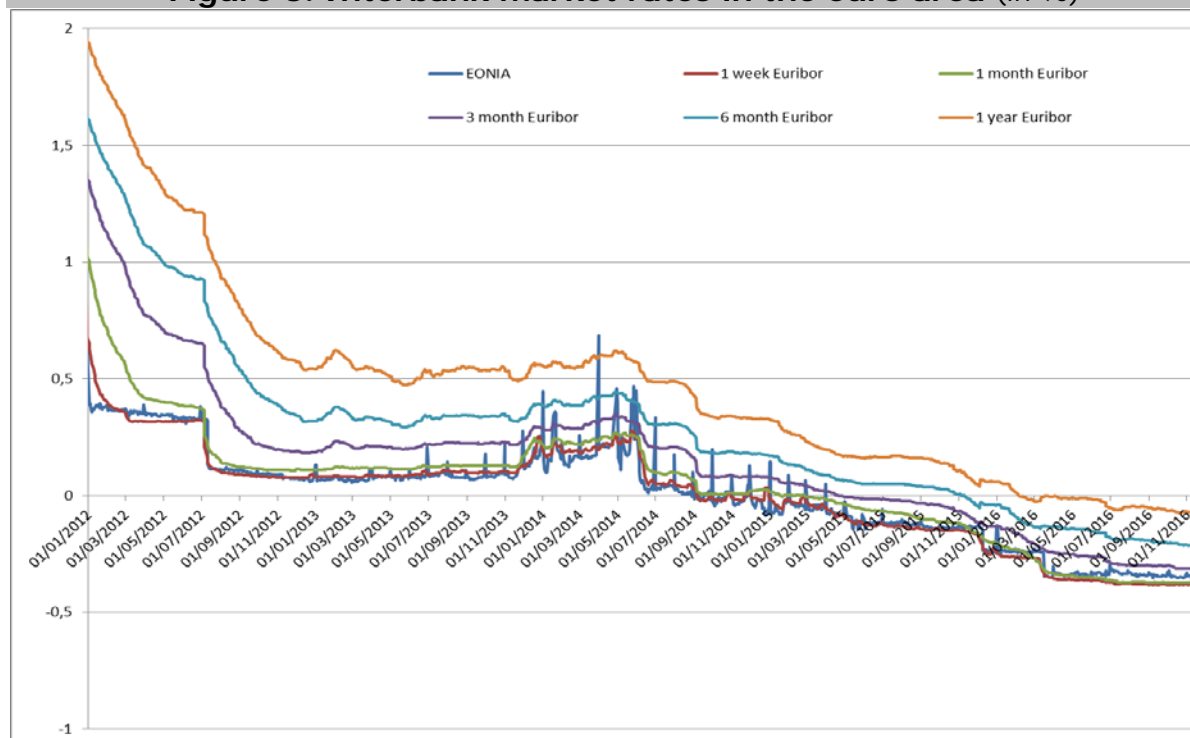
Source: ECB.

2.2. Negative interest rate: beyond monetary policy rates

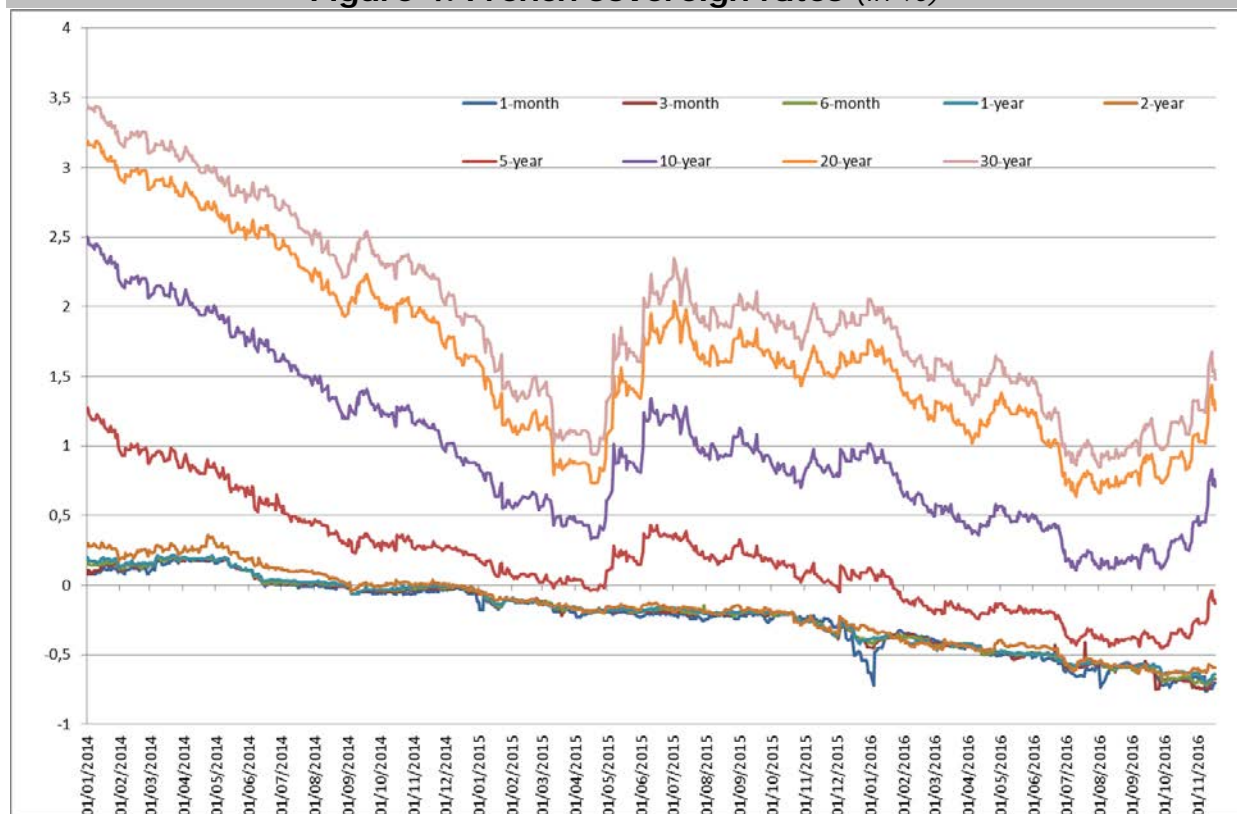
The emergence of negative nominal interest rates is not the preserve of exogenous decisions taken by central banks to satisfy internal or external objectives. Some interest rates in the interbank or bond markets are also negative today. In this case, the negative interest rate results from the transmission mechanism of monetary policy decisions.

This is primarily the case of the EONIA rate. With the abundant liquidity provided by the ECB, commercial banks are trying to lend excess reserves to other banks (liquidity supply is higher than demand). This competition pushes the interbank interest rate on a day-to-day basis down until it is close to the ECB deposit rate (Figure 1), at a negative level today. Through its refinancing operations at various maturities - 1 week for MROs, 3 months normally, and for LTROs with extensions of 6 months to 3 years during the crisis - of commercial banks in the euro area, lower interest rates have been transmitted to interbank market rates, which are negative for all maturities from 1 week to 1 year (Figure 3).

The fall in interest rates has been transmitted to the entire money market, but also to longer maturities, as evidenced by changes in yields on French sovereign bonds (Figure 4). The influence of monetary policy on market rates results from both the transmission of interest rate changes and the other measures taken by the ECB. Under the expectations hypothesis theory of the term structure of interest rates (as opposed to the preferred habitat theory), the interest rate at a given maturity - for example, 5 years - is determined by the interest rate on a lower maturity - for example 1 year - and expectations of future rates, for example 1 year in 1, 2, 3 and 4 years. Falling interest rates on longer maturities is also stimulated by the quantitative easing programme implemented by the ECB, which conducts securities purchases on different segments of the bond markets. In the case of France, this downward pressure on the entire term structure of rates leads to negative rates for all maturities of less than 5 years, the 5-year interest rate being also negative. In the case of Germany, the 7-year rates were also negative at -0.46% at the end of August 2016. These interest rates in turn influence interest rates granted to businesses and consumers. The average interest rate on a mortgage over 5 years in the euro area is thus falling. According to the ECB, it was 3.28% the month before the change to a negative deposit rate, and it is now 2.71%.

Figure 3. Interbank market rates in the euro area (in %)

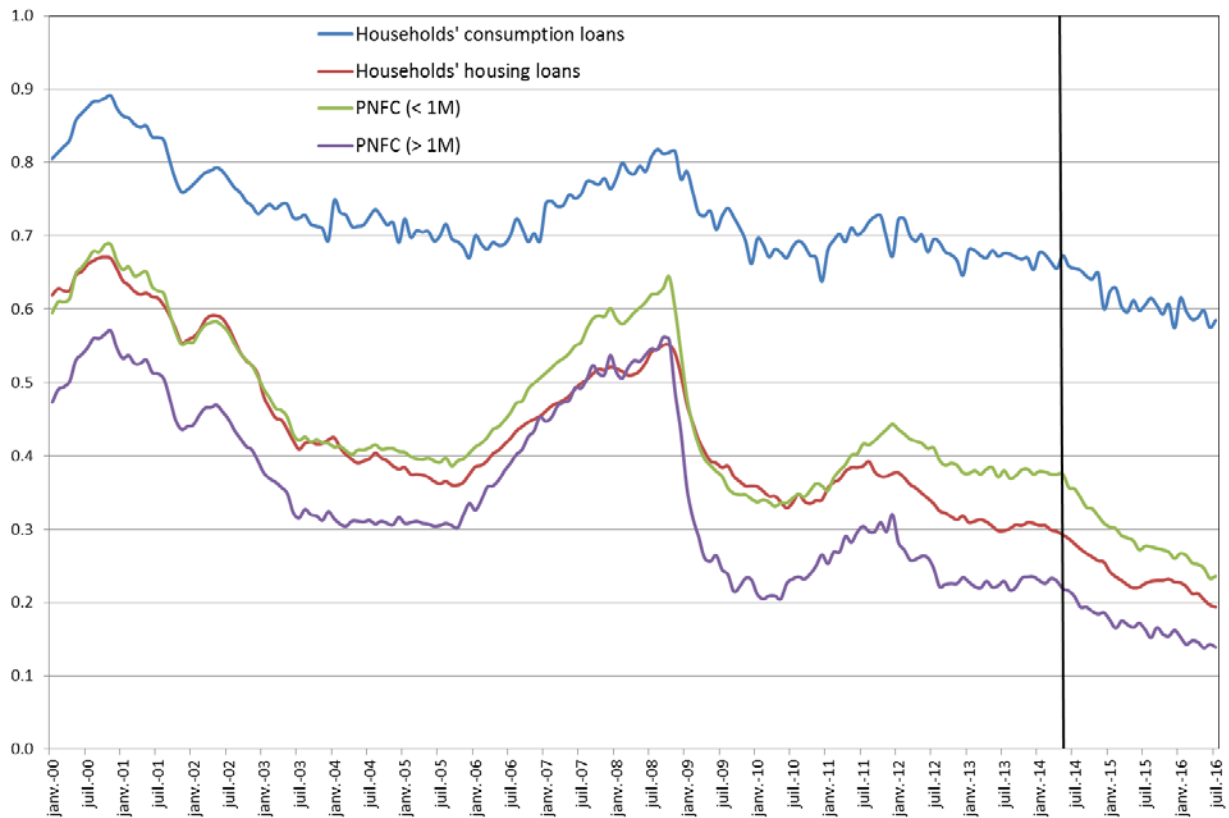
Source: Datastream.

Figure 4. French sovereign rates (in %)

Source: Datastream.

Negative rates appear to have contributed to lower borrowing costs for firms and households (Figure 6). However, it is difficult to determine what proportion of the decline is attributable to negative rates, and how much is due to developments in the economy or to other ECB programmes, such as its long-term targeted refinancing operations (TLTROs) and Public Securities Purchase Programme (PSPP). Blot and Hubert (2016) estimate the degree of pass-through from policy rates to banking rates and suggest that the decline in the retail banking interest rates has been accentuated since the EONIA rate became negative.

Figure 6. Interest rates to non-financial firms and households in the euro area (in %)



Source: ECB. Interest rates on new loans granted.

3. THE ECONOMIC IMPACT OF NEGATIVE INTEREST RATES

With this measure, the objective of the ECB is to strengthen the expansionary nature of its monetary policy. By sending the signal of an additional cut in interest rates, the central bank wants to relax the financing conditions and support inflation as well as inflation expectations. To the extent that negative rates impose a financial cost, their impact on the economy may also reduce the profitability of credit institutions and hence the effectiveness of the measure.

3.1. A direct cost for banks to put into perspective

The existence of a negative rate on deposits implies that the depositor incurs a cost. In the euro area, banks are required to have an account at the ECB and deposit reserve requirements in proportion to the deposits they receive from their customers. However, the negative rate does not apply to all reserves but to the deposit facilities as well as to the average reserves exceeding reserve requirements and other deposits at the Eurosystem. Before the crisis, the average stock of excess reserves and deposit facilities was barely 1 billion euros. It has increased quite substantially since October 2008 (Figure 1) as a result of the interbank market paralysis and measures implemented by the ECB. At the end of October 2016, total reserves held by euro area credit institutions with the ECB amounted to 777.4 billion euros, of which 117.8 billion were required reserves and 659.6 were surplus reserves. Deposit facilities amounted to 387 billion euros. The total amount of liquidity subject to a negative rate is 1047 billion euros, representing an annual gross direct cost of 4.2 billion euros for commercial banks. This figure must be put into perspective and be compared with the balance sheet size of euro area banks is 31,700 billion euros, including 11,900 billion loans to non-financial agents. Beyond this direct cost, negative rates modify all rates, which can affect the profitability of financial institutions whose activity relies on the transformation of maturities and an asset / liability management that depends on interest rates.

It is noteworthy that the counterpart of the Public Securities Purchase Programme (PSPP) is the quasi-mechanical increase in excess reserves, and that with the capital structure of the PSPP, negative rates have differential effects on commercial banks within the euro area. Given that the PSPP program is highly concentrated in core countries of the euro area and the majority of purchases of bonds are from specialized brokerage banks, the distribution of excess reserves is not homogeneous between banks and reinforces the concentration of excess reserves in the banks of the least vulnerable countries of the euro area. The cost attributable to the negative rate is therefore not the same between the countries of the euro area.

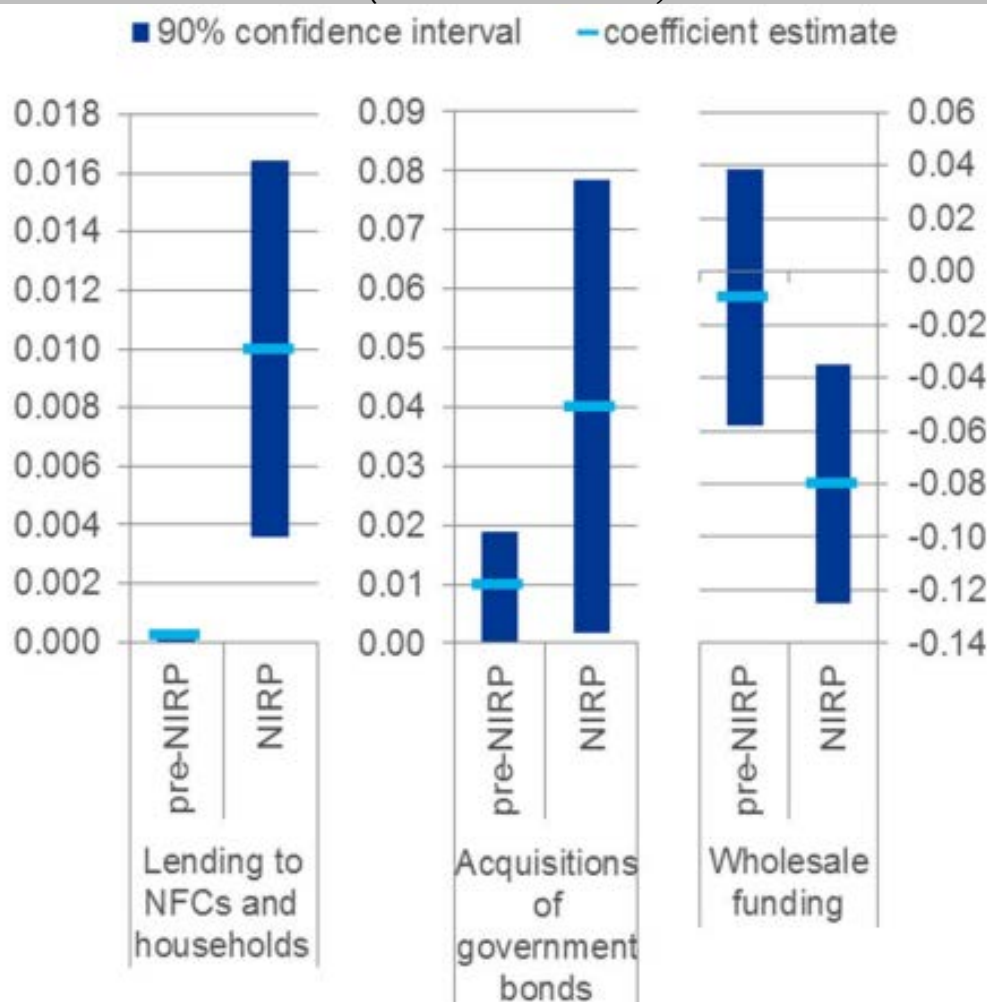
Finally, it is important to understand why commercial banks agree to sell securities to the ECB and thus to see their excess reserves increase. Since the quantitative easing programme increases the demand and thus the price of bonds, commercial banks will agree to sell their securities when the capital gain realized offsets the loss of yield incurred (i.e. the difference in yield between the transferred security and the excess reserves paid at a negative rate). The argument that negative rates have a detrimental effect on the profitability of commercial banks thus appears, at least in part, misleading. Moreover, because yields of securities targeted by central bank purchases decrease with QE programmes, the difference between the interest rate on securities and the interest rate on excess reserves decreases, and thus the cost of negative rates also decreases.

3.2. Negative rates and the allocation of credit/securities

According to the ECB's Bank Lending Survey (2016b), negative rates appear to have led to an increase in loans to businesses and households in the euro area, and the impact is expected to continue. To assess the extent to which banks are likely to convert their excess liquidity (excess reserves that are subject to the negative rate) into loans or purchases of securities, Demiralp et al. (2016) use panel banking data and estimate the response of a given bank's loans to non-financial corporations and households (as a percentage of core assets) to the excess liquidity of the same bank and excess liquidity multiplied by a dummy variable "negative rates". They also include several controls, such as loans from the previous month to non-financial corporations and households, and bank and time fixed effects. Their objective is to assess whether the coefficient associated with excess liquidity during the period at negative rate has increased, suggesting that negative rates make banks more inclined to convert excess liquidity into loans.

According to their analysis, a one percentage point increase in a bank's excess liquidity (as a percentage of its assets) leads to a 0.01 percentage point increase (Figure 7) in its loans to households and non-financial corporations (as a percentage of its assets), which represents an economically significant increase corresponding to about 20% of the average monthly flow of new loans to households and non-financial corporations by banks in the euro area. It is also significantly higher than the estimated response in the period prior to the introduction of negative rates. Similarly, the holding of excess liquidity leads to a slight increase in purchases of sovereign bonds.

Figure 7. Responses of banks to the holding of excess liquidity
(estimated coefficient)



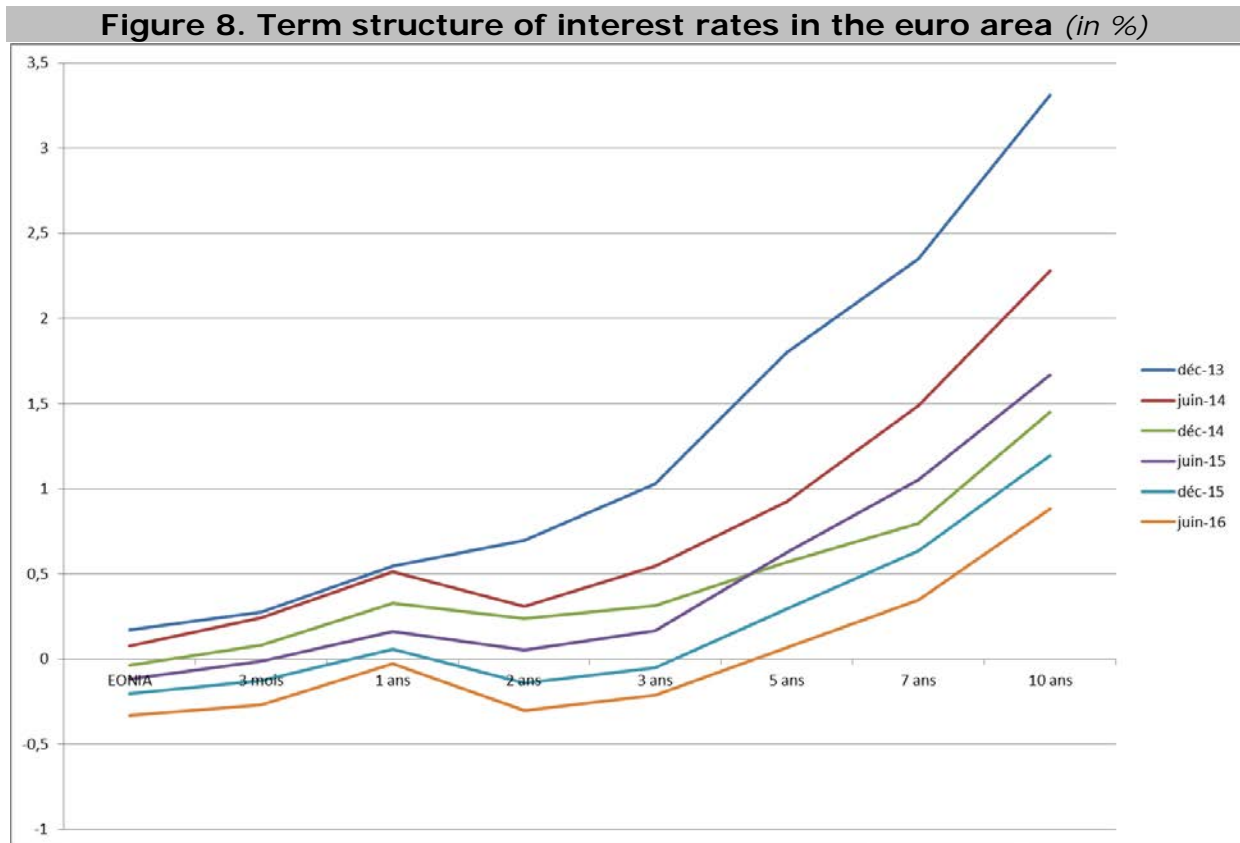
Source: Demiralp, S., J. Eisenschmidt and T. Vlassopoulos, (2016)
[figure 4 and annex III, figure A4].

3.3. Bank Profitability

Due to their deposit-taking and lending activities, the profitability of banks depends to a large extent on the intermediation margin, i.e. the difference between the interest rate applied to loans and the interest rate applied to deposits. The banks' balance sheet structure means that they have short-term resources - deposits - while their assets have a longer maturity. By flattening the yield curve (Figure 8), the negative interest rate policy reduces the net interest margin and thus the profitability of the maturity transformation activity carried out by the banks.

Beyond the negative effect for banks of the flattening of the yield curve, a second negative effect for banks with low or negative rates comes from the difference in sensitivity of the returns of the bank's assets and its financing costs. Since the remuneration of household and business deposits cannot be negative by choice (the bank does not want to lose customers) or by constraint (legal), commercial banks see their margins reduce. This argument, however, needs to be put into perspective, as the TLTRO II programme allows banks to finance themselves at negative rates from the central bank. This depends on the type of activities carried out by the banks. Deposit banks with a larger credit activity will

benefit more from refinancing at negative rates via TLTRO II than investment banks. The negative rates will therefore have redistributive effects within the banking sector.



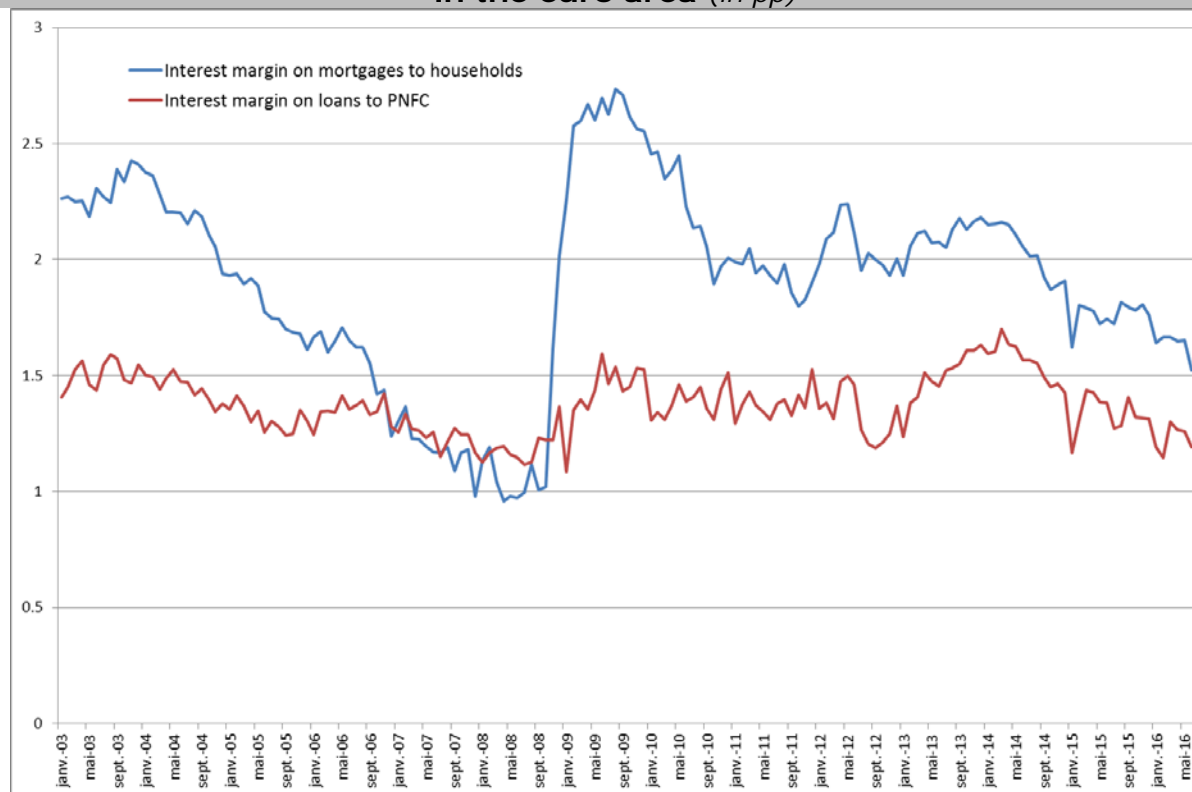
Source: Datastream.

The impact of the flattening of the yield curve on the profitability of banks is not immediate and depends both on the balance sheet structure of the banks and on the speed of diffusion of the fall in monetary policy rates to bank rates. The effect may even be positive in the short term since the average maturity of the asset is generally longer than that of the liability. As a result, while banks will continue to raise revenues at higher rates on previously granted loans, they will benefit from lower costs on deposits whose average maturity is generally shorter than that of loans. This positive effect decreases with the share of variable rate loans since, in this case, the fall in interest rates is more rapidly reflected in interest income. In June 2016, the share of property loans at variable rates was 12% in Germany, 2% in France, 41% in Italy and 48% in Spain.

In fact, there has been an improvement in the profits of banks in 2015, partly in relation to net interest income (ECB, 2016a). While interest margins on housing loans and loans to non-financial corporations have declined in the euro area over the past few months, they do not appear to be significantly lower than those observed before the crisis (Figure 9). Nevertheless, in the medium term, the net interest margin of the banks should decrease. The impact on banks profitability could be mitigated if commercial banks decided to pass on the cost associated with the negative rates through the levying of additional fees and commissions. Indeed, if there are legal or economic constraints - banks fearing losing customers who would be tempted to keep their cash in the form of banknotes - preventing banks from setting a negative rate on deposits, banks have the possibility to raise account-keeping fees. Such a choice would replace the profit resulting from the net interest margin by fees and commissions. On the other hand, as noted above, if banks incur a cost in holding

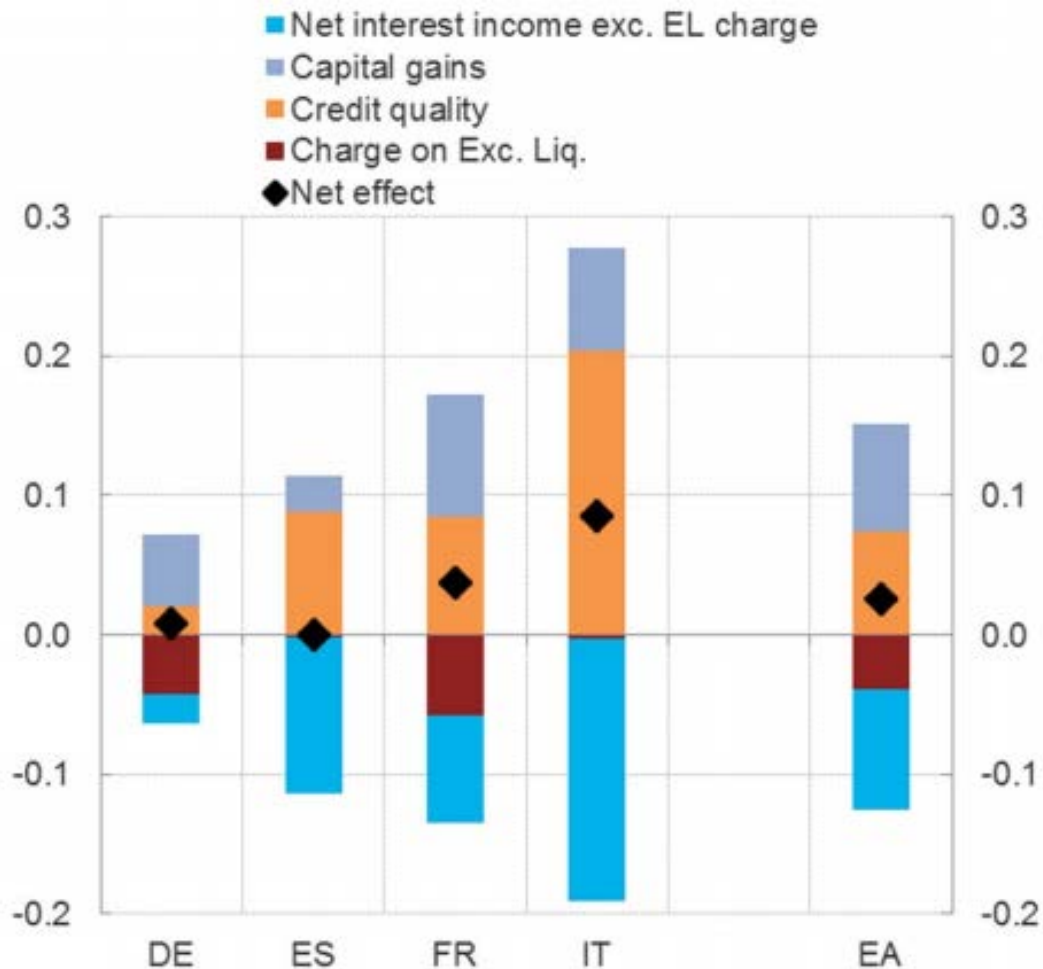
surplus reserves, they have also benefited from capital gains (unfortunately very complicated to quantify) via the revaluation of their holdings and the capital gains from the sales of securities to the ECB as part of the quantitative easing programme.

Figure 9. Interest margin on mortgages to households and PNFCs in the euro area (in pp)



Source: ECB. Authors' calculations. The average margin on loans in the euro area is calculated on the basis of margins for the 5 largest euro area countries weighted by the weight of credits granted by MFIs to non-financial agents. PNFC stands for Private non-financial corporations.

Moreover, the decline in net interest margins could also be mitigated by a decrease in the risk of default of their debtors. Indeed, the fall in interest rates should increase the solvency of non-financial agents, thus reducing non-performing loans. A recent analysis by Claessens et al. (2016) confirms, however, that the net interest margin falls when interest rates fall, especially when banks operate in a low-interest environment. Demilrap et al. (2016) argue that, contrary to the expectations of many experts, bank profitability has not been affected by negative rates, although they have reduced net intermediation margins (interest earned on assets less interest paid on deposits). They suggest that the cost of negative rates is offset by the improvement in the creditworthiness of their borrowers and the increased value of their assets (bonds, equities, etc.) that negative rates - as well as all ECB measures - have helped to generate.

Figure 10. Banks profitability*(in pp, contribution to the ROA between 2014 and 2016)*

Source: EBA and ECB estimates. ROA: Return on Assets. Rostagno *et al.* (2016), « Breaking through the zero line, The ECB's Negative Interest Rate Policy », Conference « Negative interest rates: Lessons learned...so far », Brookings Institution, Washington DC, 6 June 2016.

A higher aggregate demand and a lower probability of default are expected to increase investment income, reduce financing costs and provisions charges, thereby mitigating the negative impact on bank profitability in the euro area and suggest that the floor linked to negative rates could be much lower than the ZLB. However, these benefits appear to be lower in countries where the transmission of policy rates to other rates in the economy is stronger and where low credit demand limits the extent to which banks can increase their loan supply to offset the impact of negative rates. According to Jobst and Lin (2016), the profitability of banks has recently declined and is expected to remain affected. Credit growth is currently insufficient to compensate for the impact of lower interest margins and the positive correlation between credit growth rates and interest margins over the last few years suggests that it is unlikely that the volume of loans would go upwards in these conditions.

3.4. Will the banking sector become riskier?

Finally, the question of the risks associated with this policy of negative rates arises. By encouraging banks¹ to substitute safe assets for negative returns by riskier assets and by facilitating the granting of credit to ex-ante non-solvent agents, the central bank potentially increases the level of risk taken by the banking sector. This could eventually create problems of financial instability. These risks, however, reflect the very channels of transmission of the policy of negative rates and its ability to bring about such effects. It should also be stressed that they are not specific to negative rates but more generally concern the expansionary monetary policy implemented by the central bank. Thus, if these risks cannot be overlooked, they must be considered in terms of their expected gains (return of inflation towards its target). There is therefore a trade-off between financial stability and macroeconomic stabilization, and central banks seem to consider that the potential cost of negative rates and, more generally, of all unconventional measures is less than their positive effects. In addition, the macro-prudential tools set up since the financial crisis aimed at framing these risks could also be mobilized.²

¹ This question also arises for other financial actors such as monetary and bond funds.

² See Coupey-Soubeyran and Dehmej (2014) on the topic of the policy-mix, monetary policy and macro-prudential policy.

CONCLUSIONS

The adoption of a negative interest rate by some central banks has provoked many reactions and raises many questions about the conduct of monetary policy. If the existence of negative *real* rates is common, it is less so for a nominal rate. Beyond the psychological factor, this decision mainly marks the desire of central banks to increase the expansionary character of their monetary policy, or for the central banks of small open economies in the euro area, the desire to reduce capital inflows. In the case of the ECB, this decision complements the range of measures already taken, in particular to increase its effectiveness. While the asset purchase programme allows the ECB to bring in a large amount of liquidity in order to push down interest rates, the negative reserve on excess reserves and deposit facilities should reinforce this decline in interest rates and encourage banks to make portfolio reallocations in favour of loans in order to mitigate the cost of holding reserves. In doing so, some argue that the negative effect on bank profitability may be counterproductive. However, analyses carried out so far suggest that this risk should not be overestimated. In the short term, lower interest rates could improve the profitability of banks. Their margins should be reduced and banks in the euro area will in future be more sensitive to monetary policy normalization which, if neither announced nor even envisaged, should occur in the medium term.

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DIRECTORATE GENERAL FOR INTERNAL POLICIES
POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

What is the impact of the ECB's quantitative easing policy on banks' profitability?

Maria DEMERTZIS, Guntram B. WOLFF

IN-DEPTH ANALYSIS

Abstract

Quantitative easing (QE) can impact bank profitability through a number of channels, most importantly through falling interest margins and through higher asset prices and falling non-performing loans. Lending-deposit spreads have fallen significantly for new lending. Looking at actual bank results, net interest income has been stable and, bank profitability has been increasing mostly due to efforts to clean balance sheets of impaired assets (at least until the end of 2015). Bank profitability in some countries is a concern for many years now, starting well before the QE programme. The main drivers of bad profitability have been non-performing loans, legal risks and other problems unrelated to net interest income that has remained fairly stable. Overall, we cannot yet see any major bank profitability issue arising out of the ECB's QE programme

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EXECUTIVE SUMMARY

- Quantitative easing (QE) affects banks' profitability through three main channels.
 1. First, as QE drives up bond prices, banks holding such bonds see their balance sheets strengthened.
 2. Second, QE reduces the long-term yields and thereby reduces term-spreads. With it, the lending-deposit ratio spread falls, reducing the banks' ability to generate net interest income on new loans.
 3. Last, QE improves the economic outlook, which should help banks exposed to the economy to find new lending opportunities and less problems with non-performing loans. The effects of QE on bank profitability is therefore not in one direction. If anything, the immediate effect should be positive.
- Banks themselves have been quite negative about the impact of QE on their net interest income but they have also acknowledged its positive impact on capital gains (ECB Bank Lending Survey).
- We show that lending-deposit spreads for new lending have fallen significantly. Looking at actual bank profits, net interest income has been stable. Moreover, bank profitability has been increasing mostly due to efforts to clean balance sheets of impaired assets (at least until the end of 2015). This is consistent with a reduction in non-performing loans (NPLs), particularly in countries where the NPLs levels were abnormally high.
- Moreover, we show that bank profitability in some countries is a concern for many years now, starting well before the QE programme. The main drivers of bad profitability have been non-performing loans, legal risks and other problems unrelated to net interest income that has remained fairly stable.
- Overall, we cannot yet see any major bank profitability issue arising out of the ECB's QE programme.

1. INTRODUCTION

ECB policy is and remains controversial. Since the start of the crisis, the ECB's balance sheet has increased three-fold. The recent quantitative easing (QE) program increased the size of the ECB's balance sheet to 117% of GDP.¹ Beyond the possible risks arising from sovereign bond holdings, the debate on QE centres on roughly **four** aspects. The first concerns the question as to whether the program actually contributes to inflation. The second concerns the question as to when is the right moment to end it, irrespective of whether it actually works. Third, there is also an important debate whether it unduly "expropriates" savers. Finally, the fourth aspect is whether it should not be ended earlier because of its impact on financial stability and in particular the profitability of banks and insurances. Depending on the weight put on these four different aspects and how they are assessed, different actors draw different conclusions as regards the ECB policy. This paper focuses on the fourth aspect and in particular the impact on banks.² In the introduction, we briefly review a few arguments on the first three aspects.

There is a surprising large consensus regarding the effectiveness of the ECB's QE program. Papers do not only document the positive impact on prices of assets and the reduction and flattening of yield curves, but also cautiously endorse a positive impact on investment and consumption (German Council of Economic Advisors 2016, Praet 2016, Draghi 2016, Demertzis and Wolff 2016).³ And indeed, since the announcement and start of QE, growth has picked up with the main contributors being gross capital formation and household expenditure (see charts in the annex).

There is less consensus on the right moment to exit the program. The German Council of Economic Advisors (2016) argues that the ECB should taper their APP and that the current monetary policy stand is no longer appropriate for economic conditions. Inflation measures such as the HICP would provide a wrong picture due to volatile energy prices and, moreover, financial stability risks are high. By contrast, the latest CMF⁴ results show that 77% of macroeconomists asked disagreed or strongly disagreed with the view that the "...exceptionally loose monetary policy by the European Central Bank is no longer appropriate...". Looking at Figure 1 below, we concur with the majority of economists that HICP as well as core inflation remain very low compared to the ECB's inflation goal, so that further monetary support is warranted.

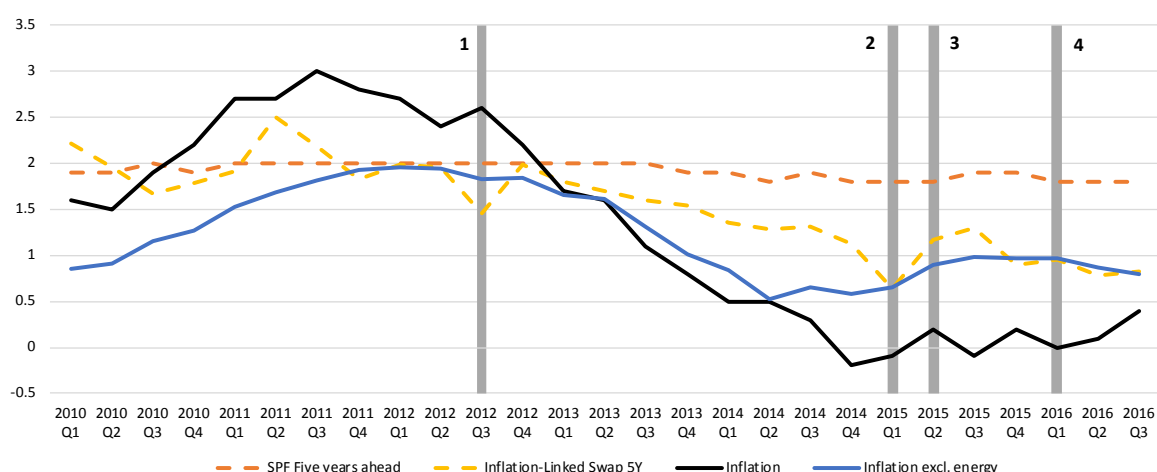
¹ See figure A.1 in annex. The APP/PSPP (Asset Purchase Program, Public Sector Purchase Program) share in the balance sheet amounts to about 35 percentage points. The Corporate Sector Purchase Program (CSPP) amounts to very little by comparison (see insert, yellow strip). Nevertheless, the Corporate sector has responded to the program, as the issuance of corporate bonds did indeed pick up following the demand by the ECB.

² The European Parliament requested the study to focus on the impact on banks.

³ See Marx et al (2016) for a comprehensive summary of latest available attempts to quantify the effects. Efforts to quantify the impact show that effects are not immaterial. Andrade et al (2016) estimate a maximum effect on inflation of 0.35% and 0.6 % on the level of GDP (original APP program only i.e. early PSPP). Cova et al (2015) are more optimistic with the effects being 0.8 % and 1.4% on inflation and the level of GDP respectively. Praet (2016) and Draghi (2016) evaluate all QE till now to have an impact of 0.5% on average annual inflation for the period between 2015 and 2018. The cumulative effect on GDP for the same period is 1.6%. See also Claeys and Leandro (2016) for an early assessment.

⁴ The latest thinking of European macroeconomists [German Council of Economic Experts' view of ECB policy Monday, November 7, 2016](#)

Figure 1: Inflation and inflation expectations (%)



Source: European Central Bank and Bloomberg. Measures of expectations: Survey of Professional Forecasters and 5-year Inflation Linked Swap rates

Note: 1) "Whatever it takes"⁵ 2) Announcement of PSPP 3) Start of PSPP 4) CSPP and expansion of PSPP

As regards the "expropriation of savers", there is less of an academic debate as this is a mostly politically driven issue. By its very nature, monetary policy action will impact the relative wealth of savers and investors. An unexpected decrease in the interest rate is an effective policy tool for the ECB because it does make savings less attractive and investments most attractive. This question therefore ultimately becomes a question of why nominal yields are relatively low and whether the ECB has reacted to that low yield environment or is the primary driver of it. The recent increase in long-term yields and the corresponding bust in the bond markets is one sign that political decisions, the amount of public investments and the expectations of market actors confirm our previous arguments that to ultimately increase long-term yields, more public investments and better and more structural reforms are needed (Wolff 2015, Claeys 2016)⁶.

As regards the impact of monetary policy on bank profitability and the balance sheets of banks, there is an increasing literature both on the channels at work as well as the empirical evidence.⁷ Three theoretical channels can be identified. The first one concerns the impact of monetary policy on the net interest income, the second on the non-interest income and finally the impact on loan loss provisions. There are good arguments to say that both the level and the shape of the yield curve can have a major impact on interest margins. In addition, QE has an immediate effect on the level of bond prices, supporting banks that hold sovereign bonds. Finally, there are various macroeconomic feedback channels as QE should support the economy thereby improving NPL rates and reducing the need for provisioning. It would go beyond the scope of this briefing to discuss all the channels in detail but a summary of different channels is provided in the annex.

⁵ Refers to the speech given by Mario Draghi on the willingness of the ECB to act, now known as the "whatever it takes" speech.

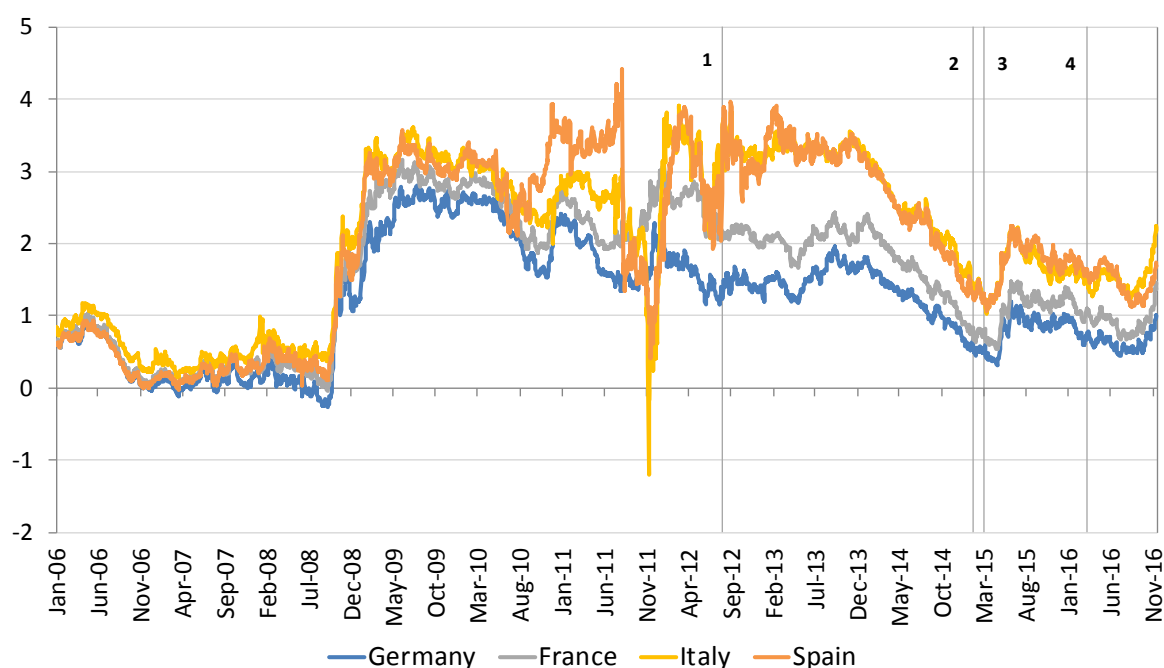
⁶ <http://bruegel.org/2015/11/schriftliche-stellungnahme-bundestagsanhörung-niedrigzinspolitik-der-ezb/>
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⁷ See for example, Agur and Demertzis (2015) and a summary of the literature. Alessandrini and Nelson (2012) for the overall effect of the yield curve on bank profitability. Borio et al (2015) also provide a detailed discussion of various channels.

2. ASSESSING THE EFFECTS OF MONETARY POLICY ON BANK PROFITABILITY IN THE EURO AREA

The spread between long- and short-term bond yields is important for bank profitability as banks engage in maturity transformation. This spread should have declined following the start of the QE (PSPP) but it should be acknowledged that it is also influenced by other factors, namely forward guidance and expectations on conventional monetary policy. As shown on Figure 2 term spreads fell from very high levels in the periphery countries during 2013 and 2014, but it have actually increased since the announcement and start of QE.⁸ Since the ECB announcement of the expansion of the PSPP and also the decision to include corporate bonds in March 2016 term spreads have been on a declining path, albeit volatile. However, in recent months the term spreads have been increasing again. Broadly speaking, they are currently at the same level as at the start of the QE. It is difficult therefore to discern a strong and lasting effect of the QE on the term spread.

Figure 2: Government bond term spreads
(10 year yields – 1 year yields) (%)



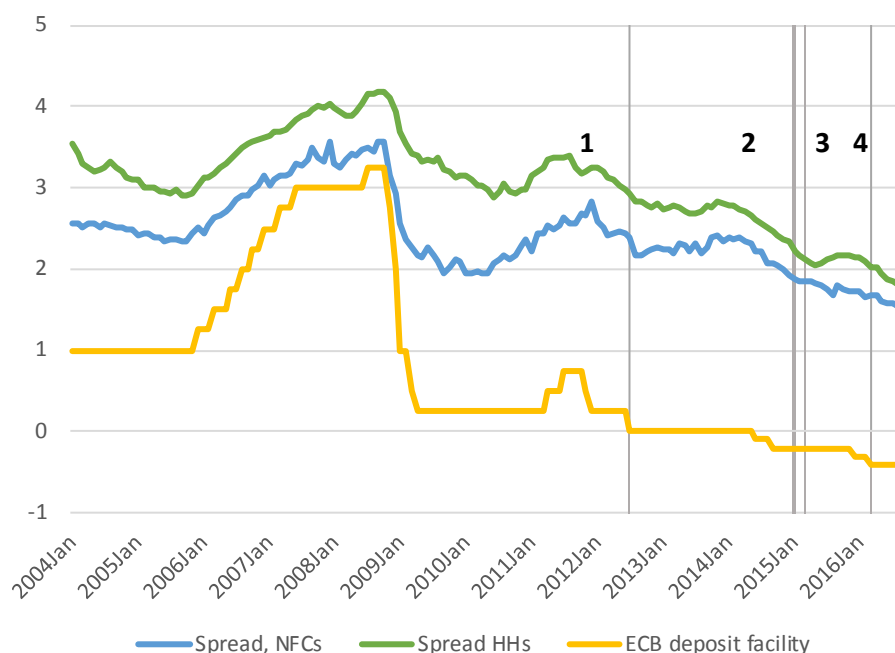
Source: Bloomberg

Note: 1) "Whatever it takes" 2) PSPP Announcement 3) Start of PSPP 4) CSPP and expansion of PSPP

Profits are affected when the lending- deposit rate spread reduces, as banks borrow short term (typically through deposits) to invest in long-term assets. We observe that the lending-deposit rate, and therefore the margin for banks to make profits continues to decline. For the euro area, as a whole, Figure 3, shows that this reduction in the lending-deposit rate is visible for new lending to the households and non-financial corporate sector. With regards to new lending, the lending deposit spread in September 2016 amounted to 1.77% for the household sector and 1.55% for non-financial corporations.

⁸ The uncertainty relating to negotiations with Greece in the summer of 2015 may be the explanation for that.

Figure 3: Lending-deposit rate spread on new credit - euro area by sector (%)



Source: European Central Bank

Note: 1) "Whatever it takes" 2) PSPP Announcement 3) Start of PSPP 4) CSPP and expansion of PSPP. **Spread NFCs:** Loans other than revolving loans and overdrafts, convenience and extended credit card debt, Total initial rate fixation, Total amount, New business coverage, Non-Financial corporations (S.11) sector, denominated in Euro; - Overnight deposits, Total original maturity, New business coverage, Non-Financial corporations (S.11) sector, denominated in Euro. **Spread HHs:** Lending for house purchase excluding revolving loans and overdrafts, convenience and extended credit card debt, Total initial rate fixation, New business coverage, Households and non-profit institutions serving households (S.14 and S.15) sector, denominated in Euro; Overnight deposits, Total original maturity, New business coverage, Households and non-profit institutions serving households (S.14 and S.15) sector, denominated in Euro.

Nevertheless, the impact on total profitability depends also on the number of loans issued, and as Figure A. 4 in the appendix shows, loans to households continue to grow at a rate of two per cent and is just turning positive for NFCs.

Quantitative easing also affects asset prices through what is known as the "portfolio balance" channel. As banks sell these assets to the central bank, they reallocate cash obtained to the riskier assets to generate greater profits. But the immediate effect on bank profitability arises what is dubbed the "scarcity effect" (Montecino and Epstein 2014). As securities of different maturities are imperfect substitutes, the Central Bank's increase in demand of long term securities should decrease their availability in the market and therefore also increase their price (all things being equal). This effect is possible as the Central Bank is a large player who aims to shift bank incentives through QE. Montecino and Epstein (2014) compare the level of profitability of banks in the US who sold directly to the Fed as part of the *Large-Scale Asset Purchases* (LSAP) program.⁹ They indeed find that by comparison to banks that were not part of LSAP, their profitability went up by 0.35 of a percentage point. This is economically a significant number in an era where profitability hovers around zero.

⁹ Data shows that the ECB did not buy these assets from domestic banks with the exception of Spain (Hüttl and Merler 2016).

3. BANK PROFITABILITY: PERCEPTIONS AND FACTS

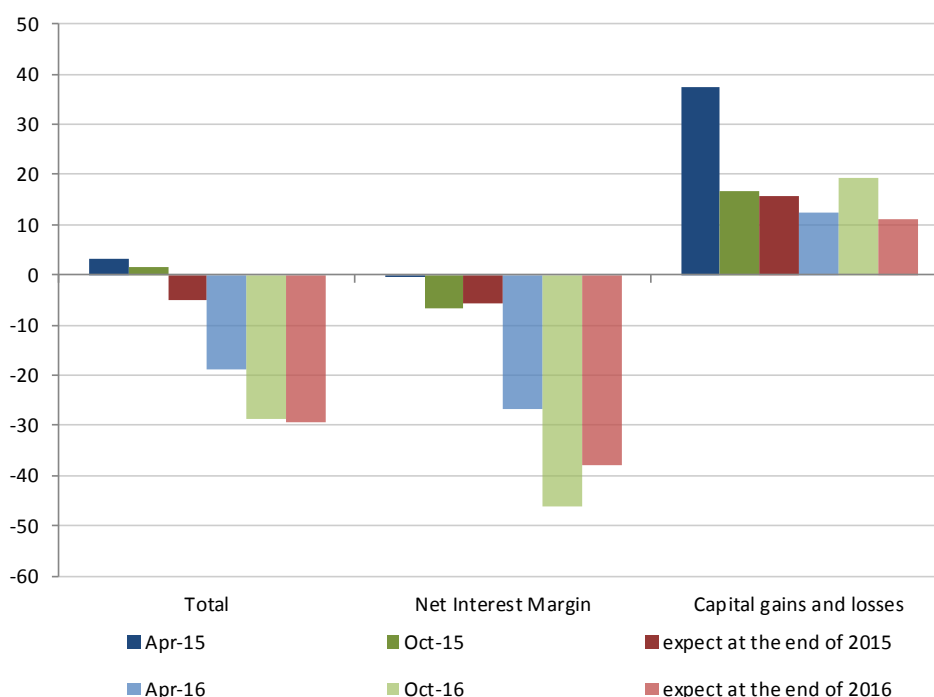
The arguments so far imply that the total effect of QE on bank profitability consists of three elements:

- Positive effect: scarcity effect through an increase in capital gains
- Negative effect: lowering and flattening of the yield curve leads to lower opportunities for profits arising from the lending – deposit rate spread
- Finally, an improvement arising from an improvement in macro conditions that improve the demand for credit and quality of credit.

But what do the data on bank profitability actually show and how do banks perceive the current situation?

In its regular Bank Lending Survey, the ECB asks banks how they perceive the impact of QE on their profitability. Figure 4 below shows that since the end of 2015 banks in the euro area have on average been increasingly negative about their ability to generate profits because of QE.

Figure 4: Impact of the expanded APP on euro area banks' profitability



Source: Bank Lending survey, ECB (results for surveys on April and October, 2015, 2016)

Notes: The y-axis shows the difference between the share of "increase/improve considerable/somewhat" responses and "decrease/deteriorate considerably/somewhat" responses.¹⁰ Answer to the question 130: "Over the past six months, has the ECB's expanded asset purchase program led to a change in your bank's assets or affected (either directly or indirectly) your bank profitability? Is it likely to have an impact here over the next six months?" In the next section, we explore whether this perception is already visible in the actual data on bank profitability.

¹⁰ The data used to compute the differences are weighted average frequency of 5 responses based on the share of each country in the total loan outstanding amounts of the area aggregate and of each bank in the total loan outstanding amount of the BLS banks sample. The sample group comprises around 140 banks from all euro area countries and takes into account the characteristics of each country's national banking system.

The banks also acknowledge that capital gains are positive (the first effect) but consider a negative effect on net interest margins which dominates (hence total is negative in figure 5). It would be important to see whether these perceptions match reality.

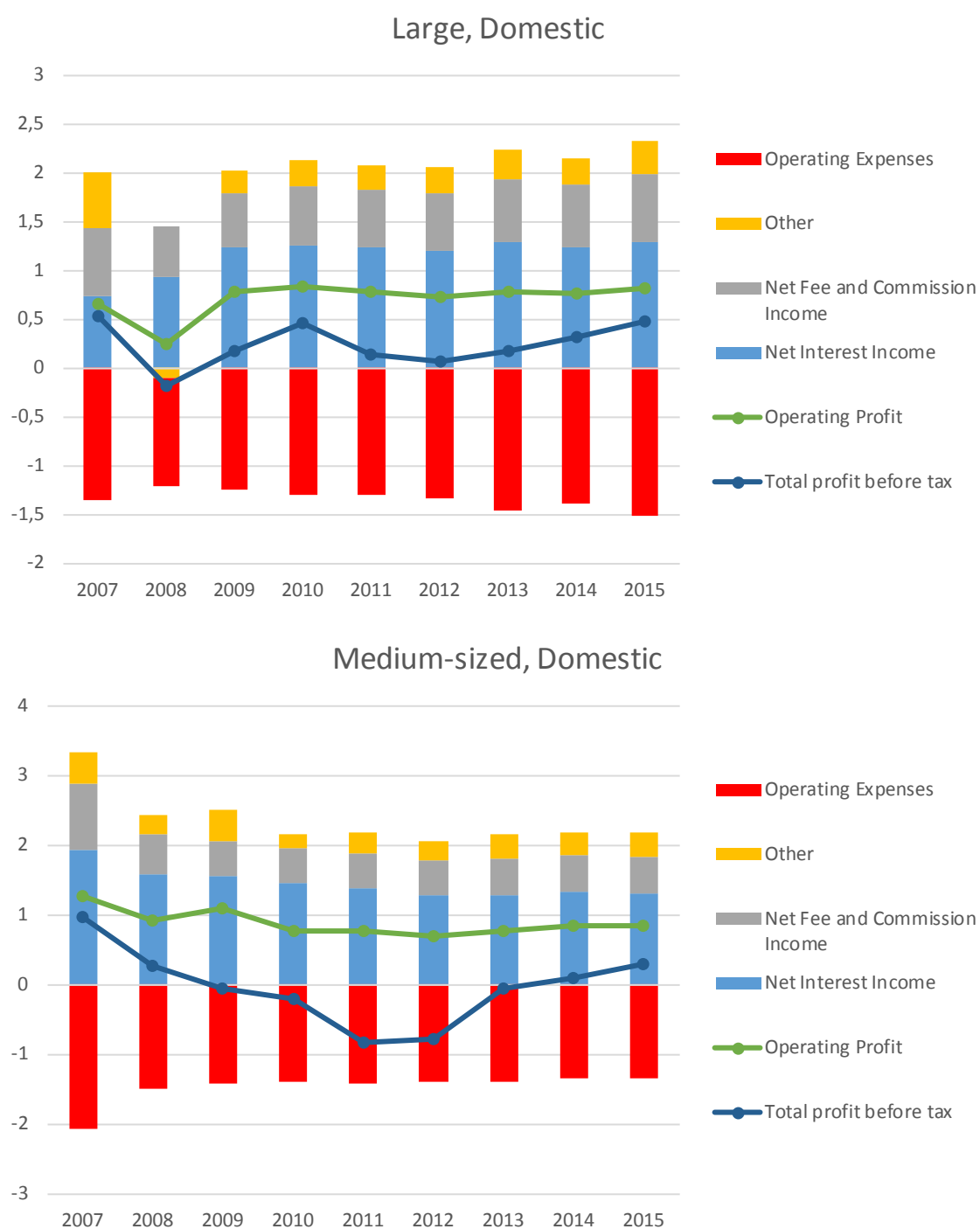
3.1. Bank profitability: a closer look

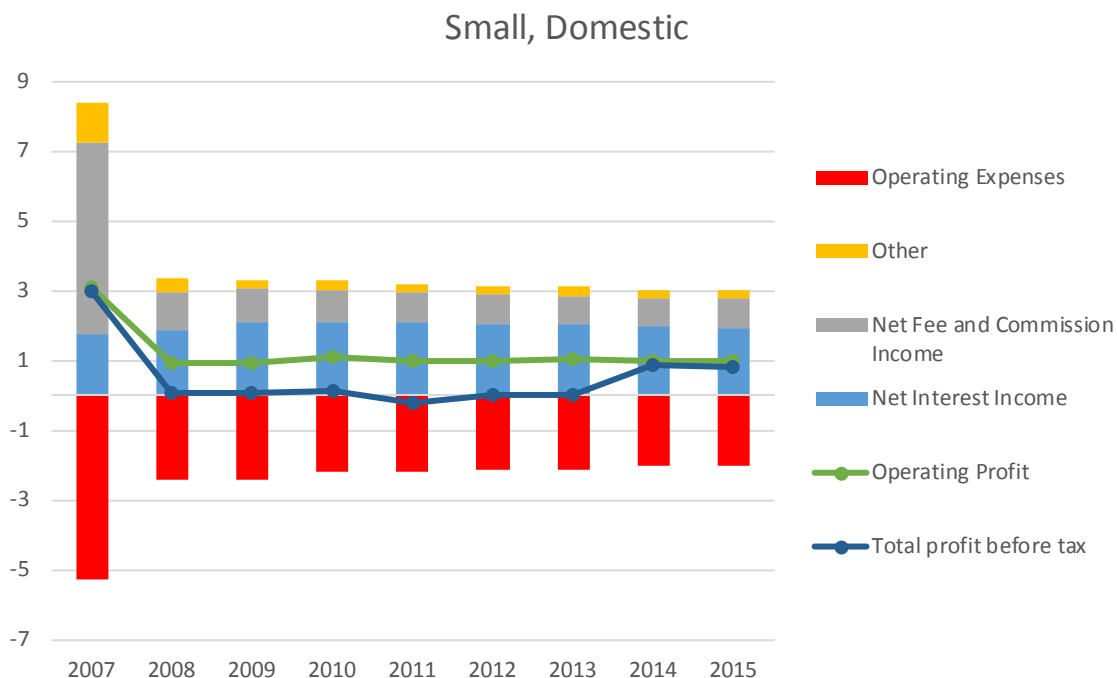
On average, banks fund their loans with deposits. Since deposits are short-term whereas loans mature at the long-term, banks rely on the term structure to generate profits. As we have shown, the term structure has fallen and so has the loan to deposit spread. Accordingly, we would expect lower profits arising from standard bank lending.

The ECB publishes aggregate, consolidated data on banks' profitability, balance, sheets, asset quality, liquidity and solvency. Banks' total profits, as well as those relating to operations and strictly interest income-generating business are the most relevant statistics. We consider two main profit indicators: i) total profit before tax and ii) operating profit. The difference between the two indicators is that the former includes credit loss expenses and impairment losses on financial investment, in addition to operating profit. Furthermore, we break down operating profit to its contributors (bars in the graphs that follow), specifically net interest income, the main item relating to the lending – deposit spread, and of other categories, namely, net commission and fee income, operating expenses and a residual. The difference between operating profits and total profits (allowances/provisions for credit losses arising from bad debts, i.e. an estimate of the debt that is unlikely to be recovered) is indicative of the deteriorating quality of credit that affected bank balance sheet during the crisis.

The data in Figure 5 show that net interest income and operating profits have been fairly stable. Net interest income is the variable that should be directly affected by the documented decline in the term spreads. The fact that in the aggregate data, nothing is visible is surprising. We can think of two main reasons: One is that a falling term spread (and loan-deposit spread) only applies to new loans. Since loan growth is weak, this would mostly affect the rolling-over of existing loans. The low spread therefore only gradually feeds into net interest income. Moreover, it is possible that banks increasingly manage to compensate for the falling spread with a rise of fees (loan origination fees, net of loan origination costs, are recognized as interest). The latter possibility would suggest that banks can successfully adjust their ability to generate profits to the QE environment.

Nevertheless, total profits have been volatile and at times negative. Medium-sized banks appear to have been hit the hardest in this respect. The main drivers of this volatility and the losses have been losses arising from provisioning for non-performing loans. Following the definitions mentioned above, to the extent that operating profits are stable and the difference between total and operating profit is credit loss expenses and impairment, it is that difference that accounts for the volatility. Legal costs go into the operating expense item and are therefore part of the operating profit. Figure 5 shows that euro area banks irrespective of size have made progress in reducing the burden arising from loss provisioning. In the case of small banks, this gap is even eliminated.

Figure 5: Bank profitability: euro area (% of total assets)

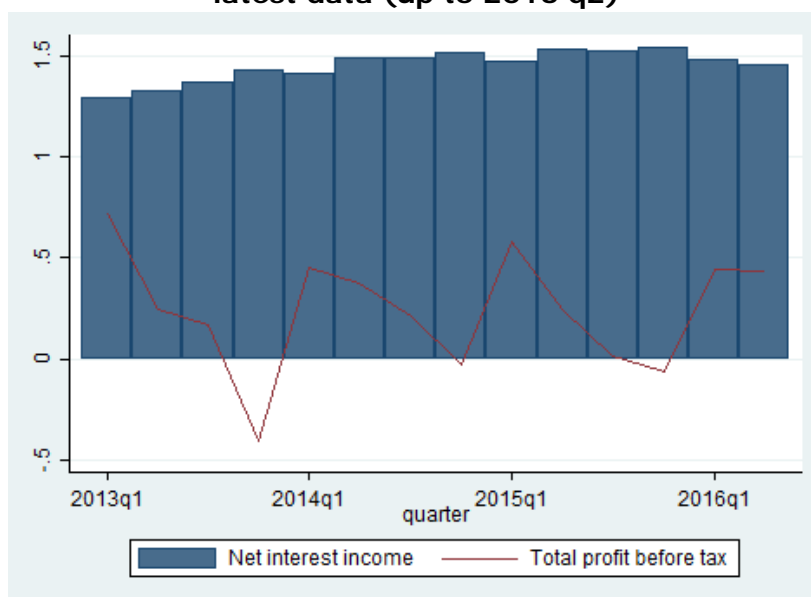


Source: European Central Bank, consolidated banking data

Note: Definition of Bank size based on assets as a percentage of total consolidated assets of EU banks – Large (Greater than 0.5%), Medium-sized (Between 0.5% and 0.005%), Small (Less than 0.005%).

The latest quarterly available information on bank profitability¹¹ that brings the data up to the second quarter of 2016 confirms that net interest income remains stable and total profits even recovered (Figure 6).

Figure 6: Bank profitability: euro area (% of total assets) quarterly profile with latest data (up to 2016 q2)

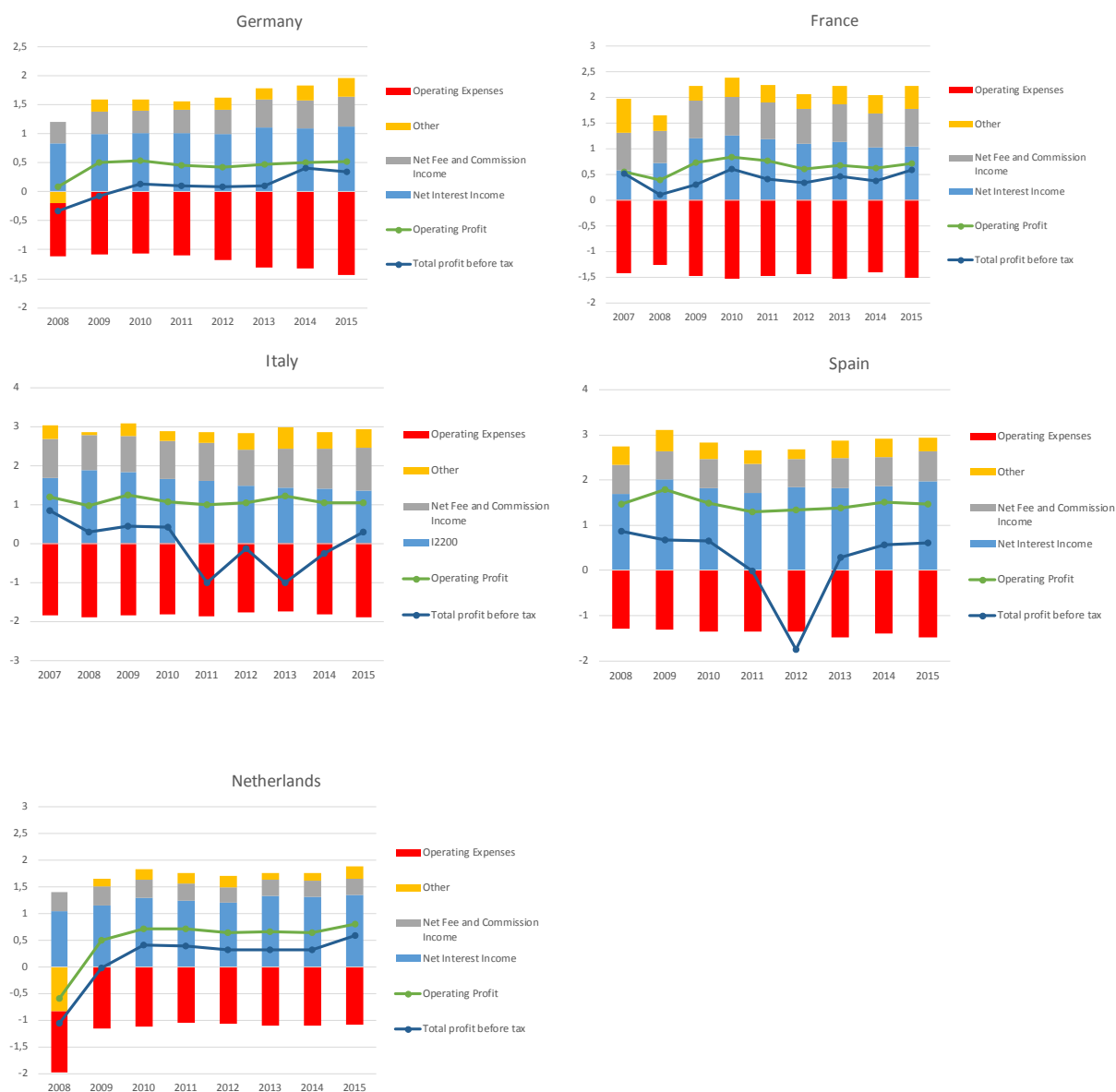


Source: SNL Financial, Bruegel calculations

¹¹ 36 banks of the 129 supervised by the ECB which represents 32% of consolidated euro area banking assets in 2015. We look at a group of stable composition, even if incomplete, to ensure comparability.

A closer look at different countries reveals some country divergences in terms of total profits before taxes (Figure 7). In particular, the data confirm that profitability is in particular low in Germany (0.34% of total assets in 2015) and Italy (0.29%). However, as already said, net interest income (and operating profits) has remained very stable over time in all countries. What did change is total profits over tax which reflect the quality of credit in banks' balance sheets. We see that Italy and Spain, the two countries amongst those five reported with the greatest number of non-performing loans (see Figure A.5 in the appendix), have seen negative profitability.

Figure 7: Bank profitability (selected countries) (% of total assets)



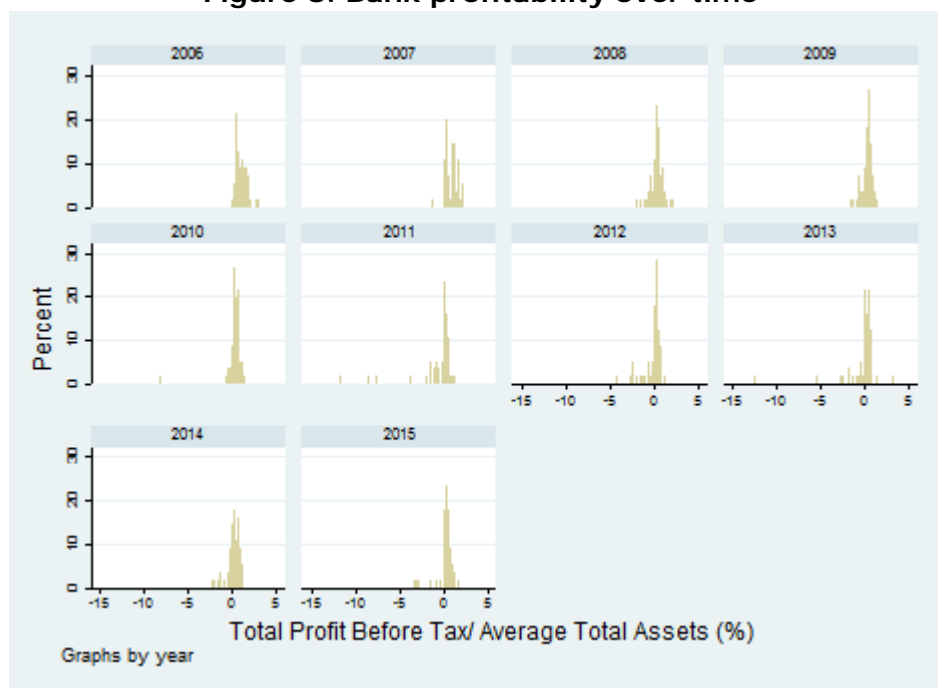
Source: European Central Bank, consolidated banking data

The aggregate macroeconomic pictures could give a distorted picture as they do not capture bank specific developments. In Figure 8, we therefore examine the distribution of profitability of banks since prior to the financial crisis.¹² We observe that during the years

¹² 56 banks of the 129 supervised by the ECB which represents 70 % of consolidated euro area banking assets in 2015. We look at a group of stable composition, even if incomplete, to ensure comparability.

of the crisis the distribution of profits has expanded with an increasing number of banks reporting negative profits. This trend however is starting to reverse as the variability of profits is now decreasing and profits appear more concentrated again. There does not appear any sizeable shift of average profits over time.

Figure 8: Bank profitability over time



Source: SNL Financial, Bruegel calculations

CONCLUSIONS

- ECB's policy is heavily criticized from different angles. One of the most heard criticisms is that its policy is undermining the profitability of banks. As a consequence, so the critique goes, the ECB policy itself would become less effective as weak banks will shy away from lending and will not engage in new lending if deposit to lending spreads are low.
- The lending-deposit spread has fallen significantly on new lending and is now as low as 1.55% and 1.77% for new lending to companies and to households. This corresponds to the replies given by banks to the ECB's bank lending survey that they consider that the APP is negatively affecting the bank's net interest margin. However, there are also differences across countries.
- A look at the aggregate figures of bank profitability, however, shows that net interest income of banks has been extraordinarily stable and has not (yet) fallen as a result of the QE policy. Total profits show significant differences across countries. Such differences are mostly explained by provisioning for non-performing loans. Anecdotal evidence suggests that banks also can manage to compensate for falling interest margins by raising fees.
- Finally, QE has overall positive macroeconomic effects and its announcement has lowered long-term yields and correspondingly increased sovereign bond prices. Both effects support the balance sheets of banks by providing for a better than otherwise economic outlook.
- Overall, in our assessment, the effects of the ECB's QE programme on banks' profitability are not yet at a stage at which the effects are distortionary to banks' operations. In the future, the ECB may want to consider steps comparable to the Bank of Japan that has aimed to increase the steepness of the yield curve to support long-term yields (above 10 and in particular 15 years and more). It would have to evaluate the extent to which such higher long-term yields would deter current investment and benefit banks and insurances – a task that goes beyond the scope of this briefing.

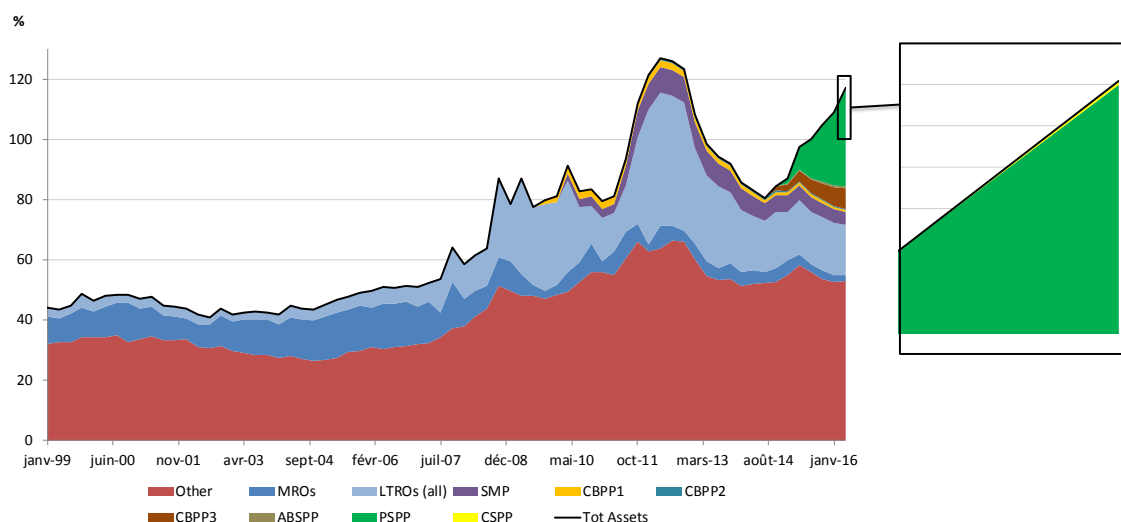
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APPENDIX A: QE AND ITS EFFECTS ON MACROECONOMY

Figure A.1 shows the evolution of the ECB's balance sheet since its inception. The green shaded area shows the effects of QE on the total amount held. It corresponds to about a third of the current total.

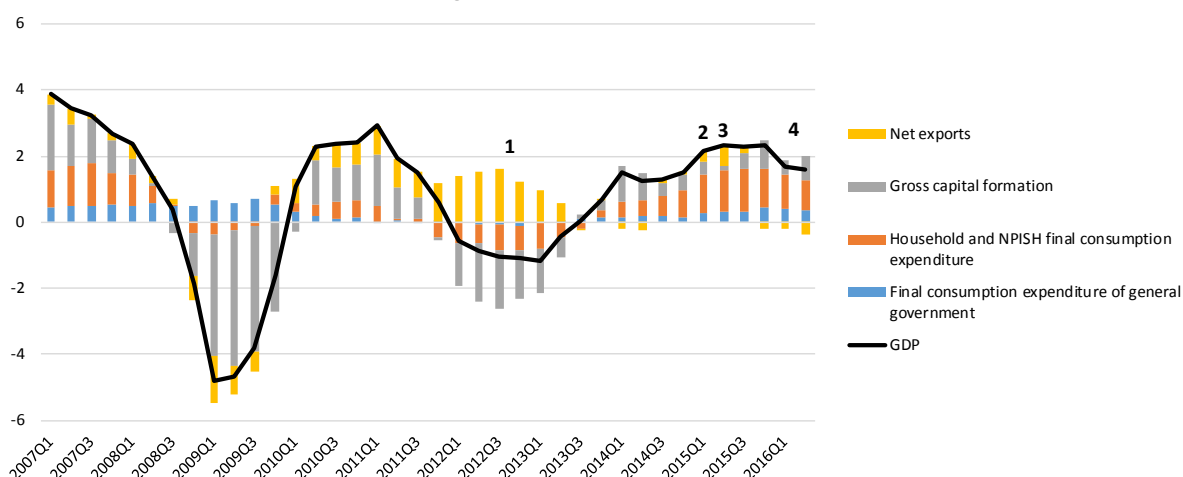
Figure A.1: ECB's balance sheet as percentage of euro area GDP



Source: Eurostat, ECB (insert shows how little in size CSPP amounts to till October 2016)

Figure A.2 below shows an updated graph for GDP growth in the euro area and its contributors. Gross fixed capital formation and household consumption remain the two main drivers of current growth.

Figure A.2 : Contributions to real Gross Domestic Product growth
(growth contribution, %)



Source: Eurostat

Note: 1) "Whatever it takes" 2) Announcement of PPP 3) Start of PSPP 4) CSPP and expansion of PSPP

Indeed, we see in Figure A.3 and A.4 below that both gross fixed capital formation and lending have been consistently improving since the start of QE. More specifically, lending to non-financial corporations has been falling steadily since 2012, only to stabilise in the second half of 2015 following the start of the PSPP. Lending to households has held more robustly,

and has indeed increased since the announcement of the PSPP: from a yearly growth of around 0% to one of 2%. This credit took mostly the form of mortgages which was helped by the stabilisation or even increase in house prices. Credit, therefore, has been important in reversing and sustaining the contributions of consumption and investment to growth.

Figure A.3: Euro area Gross Fixed Capital Formation
(real year-on-year growth, %)

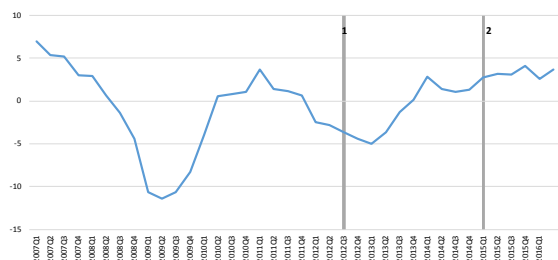
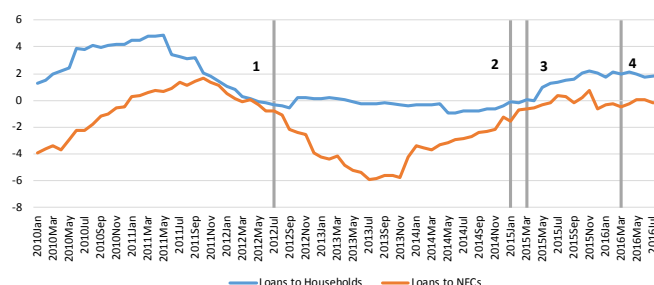


Figure A.4: Loans to households and non-financial corporations
(year-on-year growth, %)

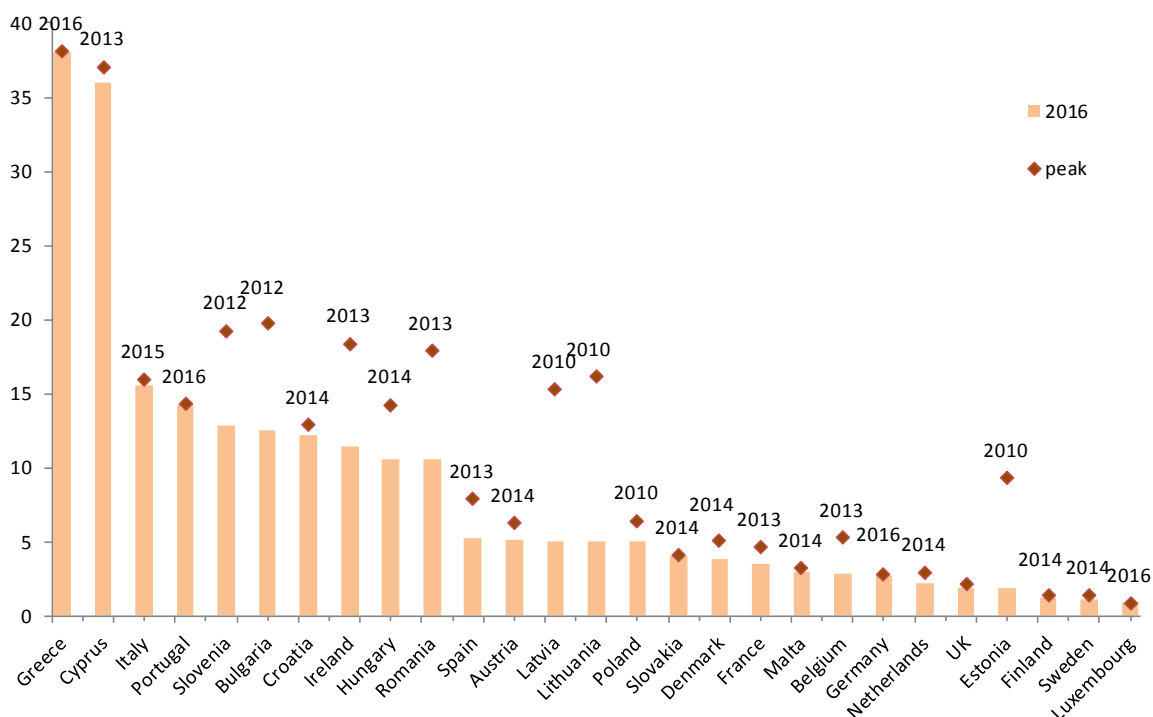


Source: Eurostat and European Central Bank

Note: 1) "Whatever it takes" 2) PSPP Announcement 3) Start of PSPP 4) CSPP and expansion of PSPP

Figure A.5 below shows the progress made in terms of dealing with impaired assets at the EU level. We observe that Spain had both a lower level of NPLs and has managed to implement the reforms made. Italy has a much larger amount of impaired assets and has been slow to implement successfully these reforms. The other three countries, (Germany, France and the Netherlands) have not had levels of NPLs that affected their profitability.

Figure A.5: Gross non-performing debt instruments, % of total gross debt instruments



Source: European Central Bank

Note: peak year to 2016Q1

APPENDIX B: THE CHANNELS THROUGH WHICH QE AFFECTS THE ECONOMY

Krishnamurthy and Vissing-Jorgensen (2011) have outlined the different channels through which Quantitative Easing (QE) may affect medium and long-term interest rates. The seven theoretical channels are summarized below.

- The **signalling channel** concerns expectations on future actions of the Central Bank. It predicts that long-term bond yields will reduce should unconventional monetary policy be perceived as a credible commitment. A large purchase of long-term assets may signal that commitment, as a future raise in interest rates would imply losses for the central bank. This impact is expected to be larger on intermediate-maturity rates.
- Quantitative easing can reduce the duration risk, causing a decrease in long-maturity bond yields relative to short-maturity yields. The **duration risk channel** anticipates that QE will decrease the yield on all long-term nominal assets, with larger effects on longer-duration assets.
- By trading less liquid long-term securities for more liquid reserve balances, QE increases liquidity for investors, reducing the liquidity premium. The **liquidity channel** thus predicts that QE increases yields on the most liquid assets relative to other less liquid assets.
- The **safety channel** suggests that QE policies involving Treasury and agency bonds lower the yields on safe assets relative to less safe assets, such as lower-grade corporate bonds or MBSs. By increasing the supply of safe assets, *clienteles* demands for this type of assets are met, thus reducing their safety premium.
- A specific channel is related to the purchase of Mortgage Backed Securities (MBS) solely. The **prepayment risk premium channel** implies that QE policy through MBS purchases lowers Mortgage Backed Securities yields relative to other bond market yields. This channel is more relevant for the US than the euro area.
- The **default risk channel** addresses the reduction of default risk and default risk premium motivated by the spurring effects of unconventional monetary policy in economic activity. Under these conditions, it is expected that default risk of companies will decrease, leading to a decrease in rates. A reduction in investor risk aversion is also expectable, with a negative impact on default risk premium.
- Finally, Quantitative Easing may impact the real economy *via* the **inflation channel**, as the possible expansionary effects of QE can increase inflation expectations.

The authors note that, as a given interest rate may be affected through a variety of channels, one cannot infer the overall effect of QE from examining a specific asset type.

CAT: QA-01-17-173-EN-C (paper)
CAT: QA-01-17-173-EN-N (pdf)

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ISBN 978-92-846-0726-6 (paper)
ISBN 978-92-846-0727-3 (pdf)

doi: 10.2861/68312 (paper)
doi: 10.2861/832794 (pdf)

