

# FEATURES

## ADAPTING LENDING POLICIES WHEN NEGATIVE INTEREST RATES HIT BANKS' PROFITS

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*We study the impact of negative interest rates on banks' lending and risk-taking using a large sample of euro banks and their individual answers to the Bank Lending Survey (BLS). We find that banks whose net interest income is adversely affected by negative rates are concurrently lowly capitalized, take less risk and adjust loan terms and conditions to shore up their risk weighted assets and capital ratios. These banks also increase non-interest charges more. But, importantly, we find no differences in banks' credit supply neither in the Euro area nor in Spain. These findings suggest that negative interest rates, while they may erode banks' unit lending margins, do not necessarily lead to lower volume of supplied credit.*

### Introduction

Following the meeting of the Governing Council on June 5, 2014, the ECB announced the reduction of the deposit facility rate (DFR) to -0.10%. This rate cut, together with other measures, aimed to stimulate the sustained recovery of the euro area inflation rate towards levels compatible with the mandate of price stability of this institution, which corresponds to a medium-term inflation rate close to but below 2%. Since then the DFR has experienced further reductions until -0.4% in March 2016, the level at which it currently stays. The reduction in the DFR has transmitted to other reference rates for bank lending such as Eonia and Euribor, (see Chart 1) and, consequently, it has been argued that low interest rates maintained for an extended period may reduce banks' unit lending margins.

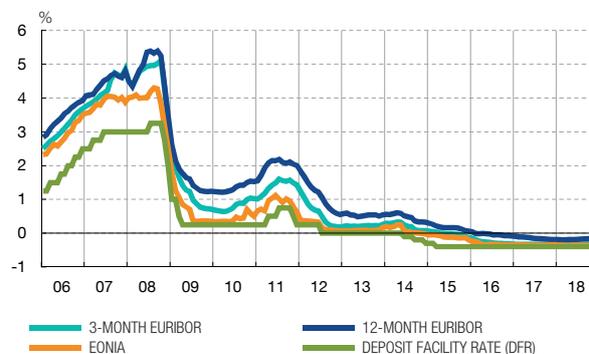
The recent empirical literature has explored a wide array of channels through which negative rates may harm banks' lending margins. A first channel relates to the degree of the banks' reliance on retail deposit funding, on which they typically find difficult to charge negative interest rates (Heider *et al.*, 2017; Schelling and Towbin, 2018). Secondly, banks maintaining excess liquidity may face a negative return on reserves (Demiralp *et al.*,

### EVOLUTION OF INTEREST RATES

CHART 1

The chart shows the evolution of the deposit facility rate (DFR), EONIA and 3-month and 9-month Euribor for the period between the 1st of January 2006 and mid-September 2018.

#### OFFICIAL INTEREST RATES AND REFERENCE INTEREST RATES



SOURCE: European Central Bank.

2017; Basten and Mariathan, 2018). Finally, a low net worth may lead to binding capital constraints and limit banks' risk taking ability, hence restraining their capacity to raise lending margins by charging higher spreads to riskier borrowers (Brunnermeier and Koby, 2017).

In this paper we first offer new empirical evidence on the relevance of the various channels through which negative interest rates affect banks' net lending margins in the context of the recent experience of the Euro area. Then, we study the effect of the negative interest rates on banks' credit supply, loan terms and conditions and ultimately, on banks' risk-taking. To this aim, we exploit the non-anonymised answers to the Bank Lending Survey (iBLS) and the individual balance-sheet data (IBSI database) of a sample of 122 Euro area banks from 13 countries during the period between 2014Q2 and 2017Q3. This survey contains a question that deals explicitly with this issue. More specifically, banks are asked whether the ECB's negative deposit facility rate (DFR) contributed to a decrease or an increase in their net interest income. It allows to disentangle the effects of the negative DFR from other simultaneous monetary policy measures.

## CHARACTERISTICS OF AFFECTED AND NON-AFFECTED BANKS (a)

TABLE 1

Affected banks are those that report, in their answers to the BLS, an adverse effect of the negative deposit facility rate on their net interest income. Non-affected banks report a neutral or positive effect. The sample comprises 122 banks from 13 euro area countries between 2014Q2-2017Q3.

Variable	Average of affected	Average of non-affected	Difference between averages	Significance (b)
Size (c)	10.69	10.67	0.02	
Capital ratio (d)	10.34	11.51	-1.17	***
Liquidity ratio (e)	8.75	6.92	1.83	***
Loan-to-deposit ratio (f)	0.27	0.69	-0.42	***
Deposit ratio (g)	42.67	37.05	5.62	***
Borrowing from the Eurosystem (h)	1.16	0.66	0.50	***
Excess liquidity (i)	2.63	1.68	0.96	***
Market share (j)	6.52	4.64	1.87	***

SOURCE: European Central Bank and Banco de España.

a Based on "Adapting lending policies when negative interest rates hit banks' profits" (O. Arce, M. García-Posada, S. Mayordomo and S. Ongena), Banco de España Working Paper 1832.

b \*\*\* significant at 1%, \*\* significant at 5%, \* significant at 10%.

c Logarithm of total assets.

d Capital and reserves over total assets, in %.

e Cash, sovereign debt and deposits with the Eurosystem over total assets, in %.

f Loans to households and non-financial corporations over deposits by households and non-financial corporations, in logs.

g Deposits by households and non-financial corporations over total assets, in %.

h Total borrowing from the Eurosystem over total assets, in %.

i Excess liquidity (deposit facility + current account - minimum reserve requirements) over total assets, in %.

j Ratio between a bank's total assets and the total assets of the country's banking sector, in %.

Thus, we separate banks in two groups according to their responses: those that report a negative effect of the negative interest rates on their net interest income (henceforth, *affected banks*) and those that report a neutral or positive effect (henceforth, *non-affected banks*).

### Relationship between negative interest rates and bank capital

Table 1 shows the average characteristics of *affected* and *non-affected* banks, as well as the difference between the averages of the two groups. Affected banks have lower capital ratios than non-affected ones (10.3% and 11.5%, respectively). A possible explanation is that, following a drop in the interest rate, the negative effect of lower unit lending margins on a bank's profit could be partially offset by raising the supply of loans or by adapting loan terms and conditions to take more risks. However, low bank capital may hinder the expansion of credit supply or greater risk taking because of its loss-absorbing capacity (Brunnermeier and Koby, 2017). Moreover, during the post crisis period low net worth banks were under particularly intense regulatory scrutiny about their lending policies and risk-taking behaviour. In addition, affected banks also have a higher share of deposits than non-affected ones (42.7% vs.

37.1%), and hold a higher fraction of excess liquidity (2.6% of total assets) than non-affected ones (1.7%).

### Negative interest rates and credit supply

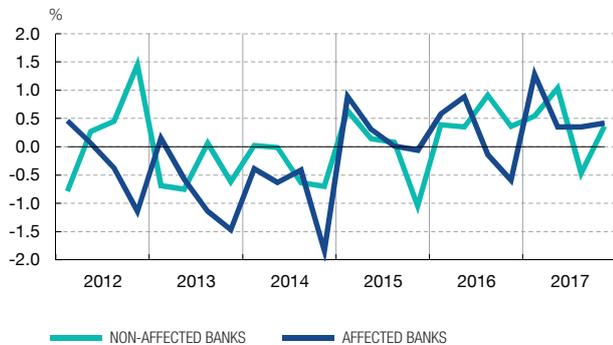
The next question to address is whether negative interest rates have a significant impact on banks' credit supply. In view of Chart 2, which shows the average growth rates of loans to non-financial corporations in these two groups of banks, one might conclude that there are not significant differences in terms of the total amount of credit supplied by affected banks and non-affected ones. In fact, several analyses based on multiple regressions corroborate the previous statement, independently on whether we measure credit supply by means of credit growth or credit standards.

Moreover, we also merge the answers to the BLS by the 10 Spanish banks participating in the survey with loan-level data from the Spanish credit register and banks' balance sheets collected for supervisory purposes. Consistently with the previous finding for the whole Euro area sample, the analysis based on detailed information at the loan level for Spain reveals that there are no significant differences in the variation of lending by those banks whose net interest income was affected by negative interest rates as compared to those that

## EVOLUTION OF CREDIT TO NFCs IN AFFECTED AND NON-AFFECTED BANKS CHART 2

The chart shows the evolution of the deposit facility rate (DFR), EONIA and 3-month and 9-month Euribor for the period between the 1st of January 2006 and mid-September 2018.

QUARTERLY GROWTH RATE OF CREDIT TO NON-FINANCIAL CORPORATIONS



SOURCE: European Central Bank and Banco de España.

were not affected. Interestingly, following the inception of a negative DFR in June 2014 affected banks cut their supply of credit to riskier firms by more than unaffected banks.

### Negative interest rates, bank capital and risk taking

In line with the previous evidence, it is worth analysing whether those banks affected by negative interest rates adjust their credit portfolio by granting safer loans, i.e., loans with shorter maturity and higher collateral requirements, in order to improve their risk-weighted assets and, in turn, their regulatory capital. The results based on the European sample reveal that affected banks tighten the terms and conditions of their loans by reducing their average maturity and increasing commissions and fees more than non-affected banks. In addition, affected banks exhibit a lower risk tolerance, as reported to the BLS. The results obtained with the subsample of Spanish banks are consistent with those obtained with the European sample, and they also provide evidence on higher collateral requirements by affected banks.

Intuitively, negative interest rates may limit the accumulation of capital organically, through retained earnings, by some banks. This implies that negative interest rates have an adverse effect on the net worth of those banks. Thus, a reduction of banks' net worth that places some banks close to the regulatory requirements will limit their capacity to take new risks in order to make higher profits. This will normally lead to a lower level of risk-weighted assets. Given that, as explained before, the optimisation of regulatory

capital ratios is not carried out through a reduction in credit supply, the adjustment of loan terms and conditions is the main channel through which risk-weighted assets are optimised. A regression analysis for the period 2012-2017 for the same sample of European banks corroborates this hypothesis and shows that, following the introduction of negative interest rates, the average ratio of risk-weighted assets to total assets of affected banks fell by 2.7 pp more than that of non-affected banks. This is a sizeable effect, as this reduction accounts for a 5.2% of the average ratio of risk-weighted assets over total assets in that period.

### Conclusion

This paper offers new empirical evidence on the impact of negative interest rates on banks' credit policies and risk taking in the context of the recent experience of the Euro area. We find that banks whose net interest income is adversely affected by negative rates are concurrently lowly capitalized, take less risk and adjust loan terms and conditions to shore up their risk weighted assets and capital ratios. Importantly, there are no significant differences in terms of the supply of credit by those banks whose net lending margins are affected by negative interest rates and those that are not, which can be interpreted in favour of the hypothesis that the policy rates in the Euro area are above the so-called reversal rate, below which a further reduction of the rate may trigger a contraction of the total supply of loans (see Brunnermeier and Koby, 2017).

The Capital Requirements Directive (CRD IV) and the Capital Requirements Regulation (CRR), in place since January 2014, envisage several capital-based measures to enhance the resilience of the European financial system and limit the build-up of vulnerabilities. Besides macroprudential capital buffers that should be fully implemented as of January 2022, regulators might also require additional buffers to individual financial institutions under Pillar 2 based on either a macro- or micro-prudential perspective.<sup>1</sup> Thus, the results of this paper should not be interpreted based solely on the risk-taking channel of monetary policy but on the interaction of monetary and prudential policies.

<sup>1</sup> In addition to those capital requirements, banks could opt to have capital ratios well above the required ones either for signaling purposes, shock absorption, or their proper functioning in periods of stress.

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