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Bank lending under negative policy rates

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This article shows how the pass-through of negative policy rates via bank lending depends on a bank's funding structure. When policy rates enter negative territory, high-deposit banks increase risk-taking but reduce lending in the syndicated loan market relative to low-deposit banks. The increase in risk-taking reduces financial constraints for higher risk firms.

On 5 June 2014, the ECB Governing Council lowered the Main Refinancing Operation rate to 0.15% and the Deposit Facility (DF) rate to -0.10%. Because banks held significant amounts of excess liquidity during this period, short-term market rates closely tracked the DF rate, effectively making the DF rate the main policy rate. With this decision, the ECB ventured into negative territory for the first time in its history. The unusual nature of negative rates raises several questions. How does standard monetary policy function in such non-standard territory? Is the transmission of negative rates any different than the transmission of low, but positive rates? What are the potential benefits and costs? This Research Bulletin article sheds light on these questions by drawing on the results of a recent study by Heider, Saidi and Schepens (2017). In particular, this Bulletin describes how negative policy rates impact bank lending behaviour in the syndicated loan market.

How policy rates impact bank risk-taking and lending: mechanisms at work

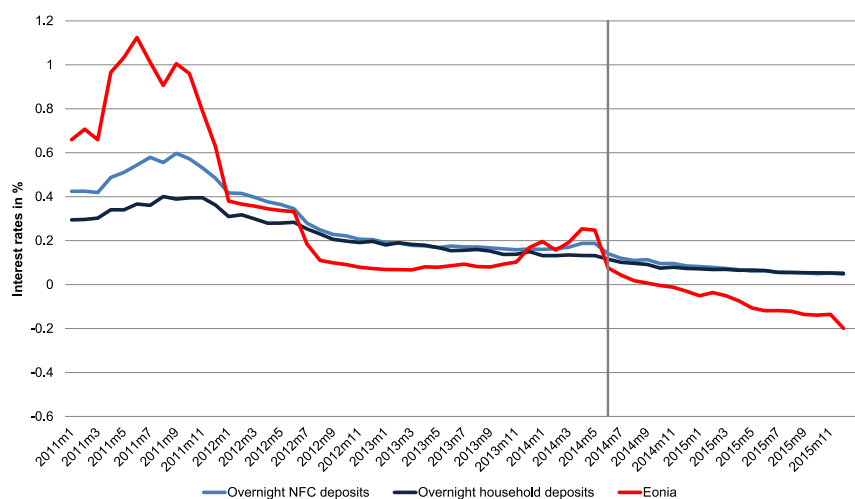
The starting point for the transmission of monetary policy through banks is the existence of an external-finance premium for banks (see Bernanke and Gertler, 1995). Raising external funds is costly because external providers of funds know less about the quality of bank assets (adverse selection) and the quality of management's decision making (moral hazard). When a bank's net worth is high, insiders such as a bank's management or shareholders have more to lose if a project fails. Higher net worth therefore implies that banks should reduce their risk-taking. It also implies a reduction of the moral hazard and adverse selection problems, and so of the external finance premium, which allows banks to borrow more cheaply and lend more.

When rates are positive, a reduction in the monetary policy rate is accommodative because it increases a bank's net worth. Banks typically have short-term liabilities and long-term assets, and rate changes

transmit more immediately to short-term rates than to long-term rates (because of risk and term premia). As a result, the liability side effect will dominate. This leads to an increase in net worth.^[2]

However, when the policy rate becomes negative, deposit rates face a hard zero lower bound, as banks are reluctant to charge negative deposit rates to their customers. This reluctance results in a negative shock to the net worth of banks with a lot of deposit funding relative to banks with little deposit funding. This is because the negative policy rate leads to cheaper market-based (non-deposit) funding, but not to cheaper deposit funding. Figure 1 illustrates this fact. Until June 2014, a lower policy rate is associated with a lower market rate (EONIA, the overnight interbank rate) and lower deposit rates, e.g., in late 2011 and mid-2012. After June 2014, market rates follow policy rates into negative territory, while deposit rates become “downward sticky” and stay above zero.

Figure 1: Deposit Rates on Overnight Deposits (Households and Non-financial Corporations).



Note: This figure shows the evolution of the median overnight deposit rates at euro area banks between January 2011 and December 2015, in comparison to the euro overnight index average (EONIA) of unsecured lending transactions in the interbank market. The data are taken from the ECB IMIR interest rate statistics database, which provides monthly data on deposit rates for euro area banks at the monetary financial institution (MFI) level.

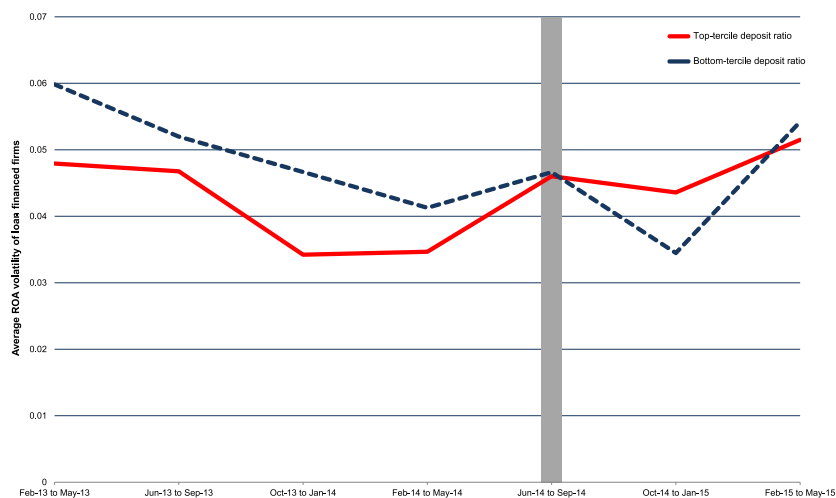
What the results tell us

The relative reduction in net worth of the high-deposit banks implies that these banks have a greater incentive to increase their risk-taking and reduce their lending than low-deposit banks. We test this hypothesis using a sample of syndicated loans granted by euro area banks between 2011 and 2015. The research set-up compares the risk-taking and lending behaviour of banks with different deposit ratios (customer deposits divided by total assets) around the ECB’s introduction of negative policy rates in June 2014 (a “differences-in-differences” approach).

Figure 2 illustrates the main finding for bank risk-taking. Risk is measured by the standard deviation of the return on assets (ROA) of the firm that receives the loan, calculated during the five years before the loan is granted. The lines in Figure 2 represent the average of this risk measure for all loans granted by one of two groups of banks:

- > high-deposit banks (solid line, treated group), i.e. banks in the top tercile of the distribution of the deposit ratio;
- > low-deposit banks (dashed line, control group), i.e. banks in the bottom tercile of the distribution.

Figure 2: Impact on bank risk-taking – ROA Volatility of Firms Associated with Loans Granted by Banks with High vs. Low Deposit Ratios



Note: This figure plots the four-month average of ROA volatility of both private and publicly listed firms that received loans from euro area banks in the top (solid line) and bottom tercile (dashed line) of the distribution of the average ratio of deposits over total assets in 2013. For a given loan at date t , the associated ROA volatility is measured as the five-year standard deviation of the borrower firm's return on assets (ROA, using pre-tax profits) from year $t - 5$ to $t - 1$. We plot the four-month average of ROA volatility to ensure that we have enough observations for the calculation of the mean.

In the period leading up to the introduction of negative policy rates, the risk measure for both groups of banks moves in parallel. Loan risk decreases, with high-deposit banks lending less to risky firms than low-deposit banks. This gap closes when policy rates become negative and the previous trend is eventually reversed, implying significantly greater risk-taking by high-deposit banks after June 2014.^[3] Further estimates show that a one standard deviation (9%) increase in the ratio of deposits to total assets increases the risk measure by 16%.

The fact that syndicated loans typically consist of multiple banks lending to one firm also allows us to analyse the evolution of the share of each bank in a loan. We compare the same bank lending to the same firm before and after June 2014. We find that, on average, high-deposit banks reduce the size of their loan shares. Additionally, we also observe a relative reduction in the volume of the loans granted by high-deposit banks. Taken together, these observations hint at a potential reduction in loan supply by high-deposit banks relative to low-deposit banks.

Finally, our results indicate that the risk-taking by high-deposit banks is not necessarily an undesirable outcome as it appears to relax credit constraints for firms. The riskier firms that are granted a loan are often private firms, or firms that were not able to borrow in the syndicated loan market before, or firms with little debt in general – all of which suggest that these firms were credit constrained in the past.

Conclusions

When central banks charge negative rates to stimulate a post-crisis economy, they enter uncharted territory. We show that negative policy rates lead to more risk-taking and less lending by high-deposit banks, as compared to low-deposit banks, in the market for syndicated loans. Although high-deposit banks lend less, their risk-taking can help relax constraints on credit-constrained firms.

Two important caveats apply. First, our set-up only allows us to make *relative* statements about the behaviour of high-deposit banks vis-à-vis low-deposit banks. For example, the relative reduction in lending for high-deposit banks does not necessarily imply that lending actually decreased overall. Indeed, the total amount of lending to non-financial companies in the euro area has been steadily growing since mid-2014. Second, in order to be able to properly control for credit demand effects we need loan-level data, which we are only able to obtain for the syndicated loan market. A potential downside of these data is that they only represent around 10 percent of the loans granted by the banks in our study.

Finally, the net worth channel described in this article is by no means the only channel through which negative rates could impact bank behaviour. Demiralp et al. (2017), for example, examine the role of banks' excess liquidity positions in the pass-through of negative rates, while Nucera et al. (2017) study the impact of bank business models more in general. Overall, further research on the effects of negative rates is needed to fully understand how they impact bank lending, risk-taking and ultimately the real economy.

References

Bernanke B.S., and Gertler, M. (1995), "Inside the Black Box: The Credit Channel of Monetary Policy Transmission", *Journal of Economic Perspectives*, Vol. 9, No 4, pp. 27-48.

Demiralp S., Eisenschmidt, J. and Vlassopoulos, T. (2017), "[🔗](#) **Negative Interest Rates, Excess Liquidity and Bank Business Models: Banks' Reaction to Unconventional Monetary Policy in the Euro Area**", *Working Paper*.

Heider F., Saidi, F. and Schepens, G. (2017), "[🔗](#) **Life Below Zero: Bank Lending Under Negative Policy Rates**", *Working Paper*.

Nucera F., Lucas, A., Schaumburg, J. and Schwaab, B. (2017), "Do Negative Interest Rates Make Banks Less Safe?" *ECB Working Paper*, No 2098.

[1] Disclaimer: This article was written by Glenn Schepens (Economist, Directorate General Research, Financial Research Division) and is based on joint research with Florian Heider (Principal Economist, Directorate General Research, Financial Research Division) and Farzad Saidi (Stockholm School of Economics). The author would like to thank Jens Eisenschmidt, Florian Heider, Geoff Kenny, Simone Manganeli, Silvia Margiocco and Zoe Sprokel for their helpful comments and suggestions. The views expressed here are those of the author and do not necessarily represent the views of the European Central Bank and the Eurosystem.

[2] There are, of course, also other factors affecting banks' net worth (e.g. an improved risk outlook or higher valuations of securities). As explained below, these factors should not bias our analysis as long as they have a similar impact on high and low deposit banks, after controlling for a number of bank characteristics.

[3] Note that the increase in our risk measure does not necessarily imply that there is *excessive* risk-taking by banks.

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