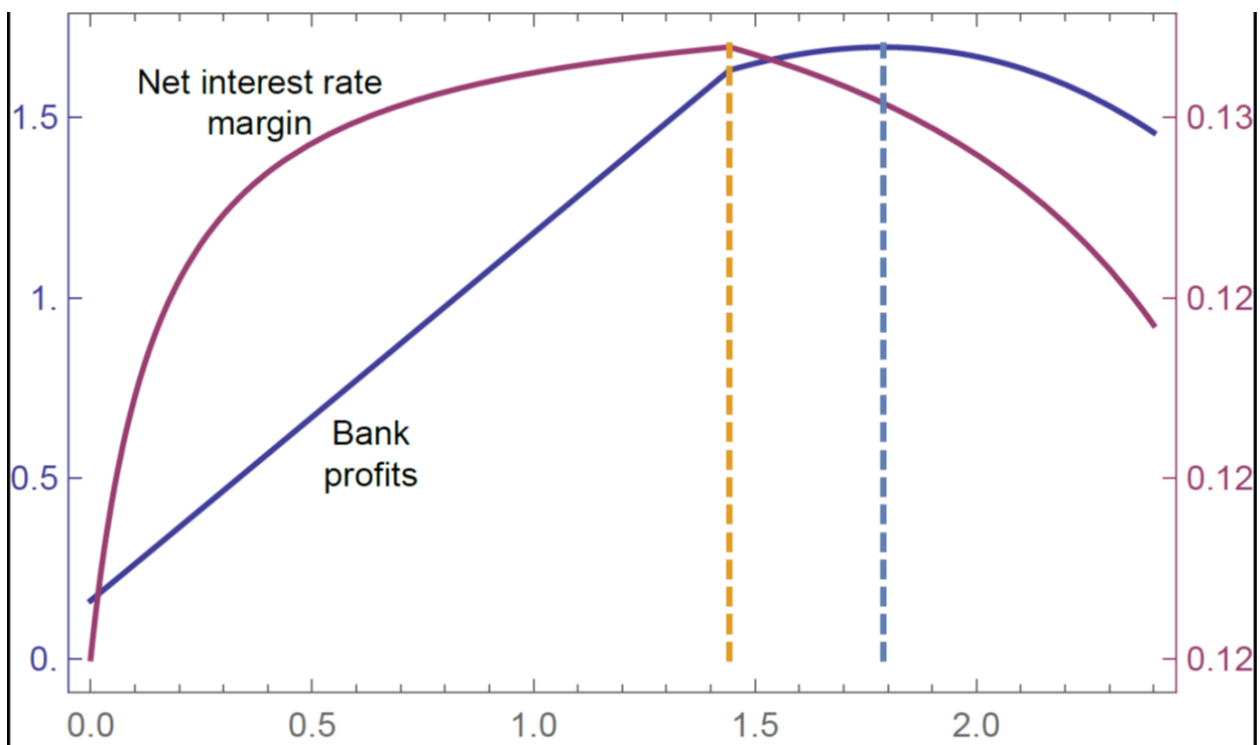


Figure 4

When the policy rate falls, bank profits can decrease even if the net interest margin still increases



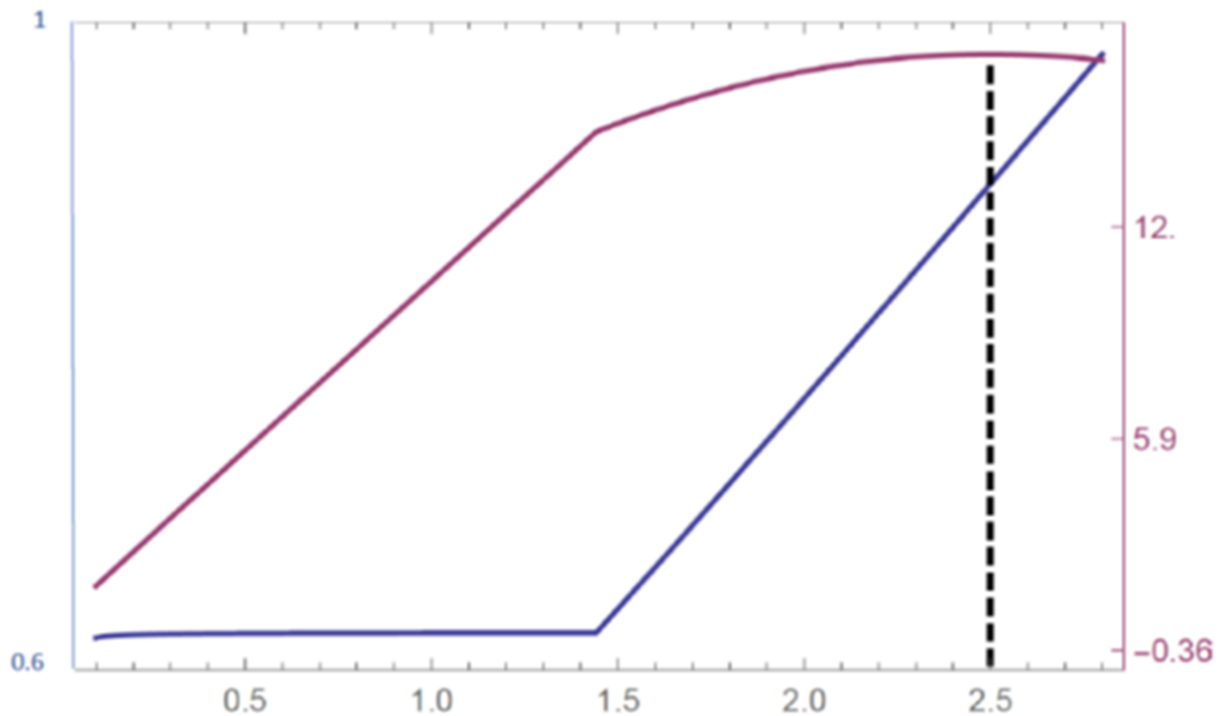
Note: The blue line represents bank profits, while the purple line shows the net interest rate margin. In the interval between the blue dashed line and the yellow dashed line, a lower policy rate reduces bank profits but still increases the net interest margin.

How exactly does monetary policy influence banks' risk-taking?^[6] Banks take more risk when the cost of prudent behaviour, e.g. costly screening, outweighs the benefit.^[7] The benefit of prudent behaviour is captured by the ability to lend and earn the rent for intermediating. Prudent banks can attract more outside financing, leverage up more and accrue more profits. Therefore, monetary policy affects risk-taking through its effect on the lending volume.

When a policy rate cut makes it more difficult to expand lending, banks find it less attractive to screen borrowers. This implies that when the policy rate falls below the reversal rate, a policy rate cut leads to increased risk-taking. However, monetary policy may also induce increased risk-taking above the reversal rate (Figure 5). This occurs when banks have market power. With market power, an increase in the lending volume reduces the loan rate, which then further reduces the benefit from screening.

Figure 5

A lower policy rate reduces bank screening – increasing risk-taking – and this may or may not coincide with less lending



Notes: The blue line represents the optimal level of screening, while the purple line shows the lending volume. The dotted vertical line identifies the reversal rate.

Conclusion: central banks and banking supervisors should exercise caution

Our research suggests that there are potential side effects of monetary stimulus in a low interest rate environment: reduced lending and increased risk-taking by banks. As a result, it is important for central banks to take financial stability considerations into account when deciding on monetary policy, since there may be conflicts in the long run between price stability and financial stability. Moreover, our modelling framework suggests that the competitive nature of lending and deposit markets needs to be taken into account when assessing these trade-offs.

References

- Borio, C. and Zhu, H. (2012), “Capital regulation, risk-taking and monetary policy: A missing link in the transmission mechanism?”, *Journal of Financial Stability* Vol. 8, No 4, pp. 236-251.
- Brunnermeier, M. K. and Koby, Y. (2018), “The reversal interest rate”, *NBER Working Papers*, No. 25406.
- Brunnermeier, M. K. and Sannikov, Y. (2014), “A macroeconomic model with a financial sector” *American Economic Review*, Vol. 104, No 2, pp. 379-421.
- Coibion, O., Gorodnichenko, Y. and Wieland, J. (2012), “The optimal inflation rate in New Keynesian models: Should central banks raise their inflation targets in light of the zero lower bound?”, *Review of Economic Studies*, Vol. 79 No 4, pp. 1371-1406.
- Dell’Ariccia, G., Laeven, L. and Marquez, R. (2014), “Real interest rates, leverage, and bank risk-taking”, *Journal of Economic Theory*, Vol. 149, pp. 65-99.
- Gertler, M. and Karadi, P. (2011), “Model of unconventional monetary policy”, *Journal of Monetary Economics*, Vol. 58, No 1, pp. 17-34.

Gertler, M. and Kiyotaki, N. (2010), “Financial intermediation and credit policy in business cycle analysis” in B. M. Friedman and M. Woodford (eds.), *Handbook of Monetary Economics*, Vol. 3, Chapter 11, Elsevier, pp. 547-599.

He, Z. and Krishnamurthy, A. (2012), “A model of capital and crises”, *Review of Economic Studies*, Vol. 79, pp. 735-777.

Heider, F. and Leonello, A. (2021), “Monetary policy in a low interest rate environment: Reversal rate and risk-taking”, *ECB Working Papers*, forthcoming.

Heider, F., Saidi, F. and Schepens G. (2019), “Life below zero: Bank lending under negative policy rates”, *Review of Financial Studies*, Vol. 32, No 10, pp. 3728-3761.

Holmström, B. and Tirole, J. (1997), “Financial intermediation, loanable funds, and the real sector”, *Quarterly Journal of Economics*, Vol. 106, No 1, pp. 663-691.

Jiménez, G., Ongena, S., Peydró, J.-L. and Saurina J. (2014), “Hazardous times for monetary policy: What do twenty-three million bank loans say about the effects of monetary policy on credit risk-taking?” *Econometrica*, Vol. 82, No 2, pp. 463-505.

Martinez-Miera, D. and Repullo, R. (2017), “Search for yield”, *Econometrica*, Vol. 85, No 2, pp. 351-378.

Ulate, M. (2021), “Going negative at the zero lower bound: The effects of negative nominal interest rates” *American Economic Review*, Vol. 111, No 1, pp. 1-40.

-
1. This article was written by Florian Heider and Agnese Leonello (Directorate General Research, European Central Bank). The authors gratefully acknowledge comments from Ana Borlescu, Luc Laeven, Alex Popov and Zoë Sprokel. The article is based on the forthcoming ECB Working Paper “Monetary policy in a low interest rate environment: Reversal rate and risk taking”. It features research-based analysis conducted within the [ECB's Research Task Force](#) on monetary policy, macroprudential policy and financial stability. The views expressed here are those of the author and do not necessarily represent the views of either the European Central Bank or the Eurosystem.
 2. For deposits held by non-financial corporations, the truncation at zero is slightly weaker. Most corporate deposit rates do not cross the ZLB and the interval between the 25th and the 75th percentile shrinks so that more and more corporate deposit rates become close to zero (see Heider et al., 2019; Heider and Leonello, 2021).
 3. Examples of macroeconomic models with financial frictions are, among others: Gertler and Kiyotaki (2010), Gertler and Karadi (2011), He and Krishnamurthy (2012), Brunnermeier and Sannikov (2014).
 4. “Skin in the game” denotes a situation where a decision maker has a significant stake with her own money in an investment, which she can lose if the investment fails. This puts the decision maker in the same position as outside investors.
 5. Heider and Leonello (2021) show that reverse occurs when the semi-elasticity of the deposit rate with respect to the policy rate crosses the semi-elasticity of the loan rate from above.
 6. The risk-taking channel of monetary policy is introduced by Borio and Zhu (2012). For an empirical test, see Jiménez et al. (2014).
 7. Risk-taking can show up as “search for yield” behaviour, i.e. the substitution of safe low-yield assets with riskier high-yield ones (Martinez-Miera and Repullo, 2017). Alternatively, low profits can induce banks to abandon prudent, but costly, behaviours (Dell’Ariccia et al., 2014).

Copyright 2021, European Central Bank