ZLB(?) and Beyond:
Real and Financial (Side)Effects of
Low and Negative Interest Rates in the Euro Area

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Motivation

- **The ECB first cut the Deposit Facility Rate to zero in July 2012** and then moved it into **negative territory in June 2014** to combat the disinflationary pressures in the euro area

- The conventional wisdom suggests that **standard monetary policy measures become ineffective once they reach the ZLB** (Keynes (1936); Krugman (1998); Eggertsson and Woodford (2006); Eggertsson et al. (2018)) as both intertemporal substitution (because deposit rates are sticky at zero) and bank lending (due to a significant decline in pass-through of policy rates to lending rates) channels break down

- In addition, Brunnermeier and Koby (2018) theorize that **negative policy rates might be contractionary** due to erosion in bank profitability via narrower net interest margins which subsequently cause a contraction in lending

- However, several **recent papers question the empirical relevance of the ZLB**:

  - Altavilla et al. (2019b) show that healthy **banks are able to pass negative rates on to corporate deposits** while firms rebalance liquid assets towards tangible and intangible assets, thus increasing investment

  - They also point out that **bank lending channel remains active** due to lower provisions for non-performing loans which in turn increases the supply of credit

  - Rostagno et al. (2019) demonstrate that **negative policy rates lower interest rate expectations** as central bank thereby removes the non-negativity restriction and signals that future policy rate cuts are possible

  - Altavilla et al. (2019a) argue that policy rate cuts in negative territory have **more persistent impact on the term structure** compared to policy rate setting in positive environment

- **Our study** expands the literature on low and negative policy rates in the euro area as follows:

  - We **assess their macroeconomic impact** using a set of non-linear time series frameworks

  - We **analyze** their effects on a wide range of macroeconomic and financial variables to detect any **changes in monetary policy transmission mechanism** once the policy rate enters negative territory

  - Finally, we devote significant attention to the **analysis of potential side effects** which are often associated with a prolonged period of low and negative interest rates

Empirical strategy

▶ We employ **two different non-linear macroeconometric models**

▶ **First,** we consider **a time-varying parameter structural vector autoregression with stochastic volatility** (TVP-SVAR-SV) and perform **identification via sign restrictions**

   ▶ We use an agnostic set of restrictions to identify the MP shock, leaving the reaction of output and prices unrestricted

   ▶ Aggregate demand and supply shocks are also singled out so that the MP shock is isolated from business cycle disturbances

▶ **Second,** we make use of **non-linear local projections** (NL-LP) along the lines of Jordà (2005) and Ramey and Zubairy (2018) and disentangle the MP shock using the **high frequency comovement** of interest rates, stock prices and exchange rate **around the policy announcements**

   ▶ The high frequency surprises are taken from the Euro Area Monetary policy Event-Study Database (EA-MPD) of Altavilla et al. (2019a)

   ▶ To control for the information effect, we employ similar approach to Jarociński and Karadi (2020) and isolate it from pure monetary policy shock via sign restrictions

   ▶ To pin down the changes in the transmission mechanism once the policy rates reach the ZLB, we compute impulse responses across two states – pre-ZLB (Q1 2000 – Q2 2012) and post-ZLB (Q3 2012 – Q2 2019)

▶ Both models include the same set of variables – Real GDP, HICP, the EONIA, Euro Stoxx 50 and EUR/USD – and are estimated over the period from 2000 Q1 to 2019 Q2

▶ The use of alternative frameworks for deriving non-linear impulse response functions and identification strategies help to ensure that our results regarding the efficacy of negative interest rates and the relevance of the ZLB are neither model- nor identification strategy- specific
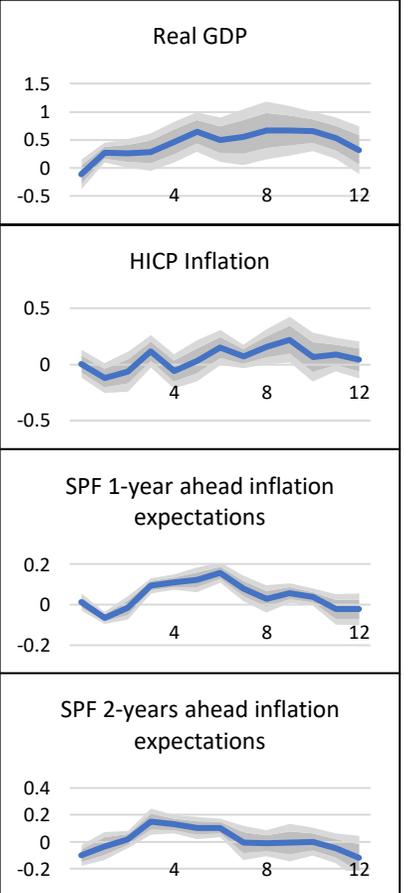
Aggregate demand has remained responsive to policy rate cuts below the ZLB but price pressures have tailed off
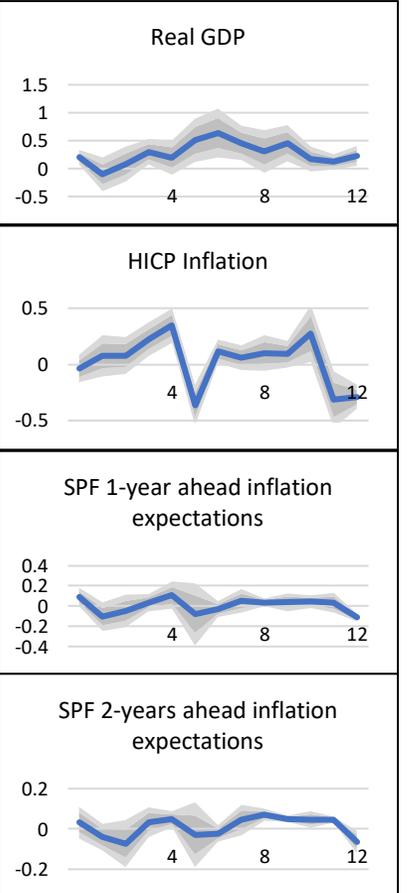
TVP-SVAR-SV
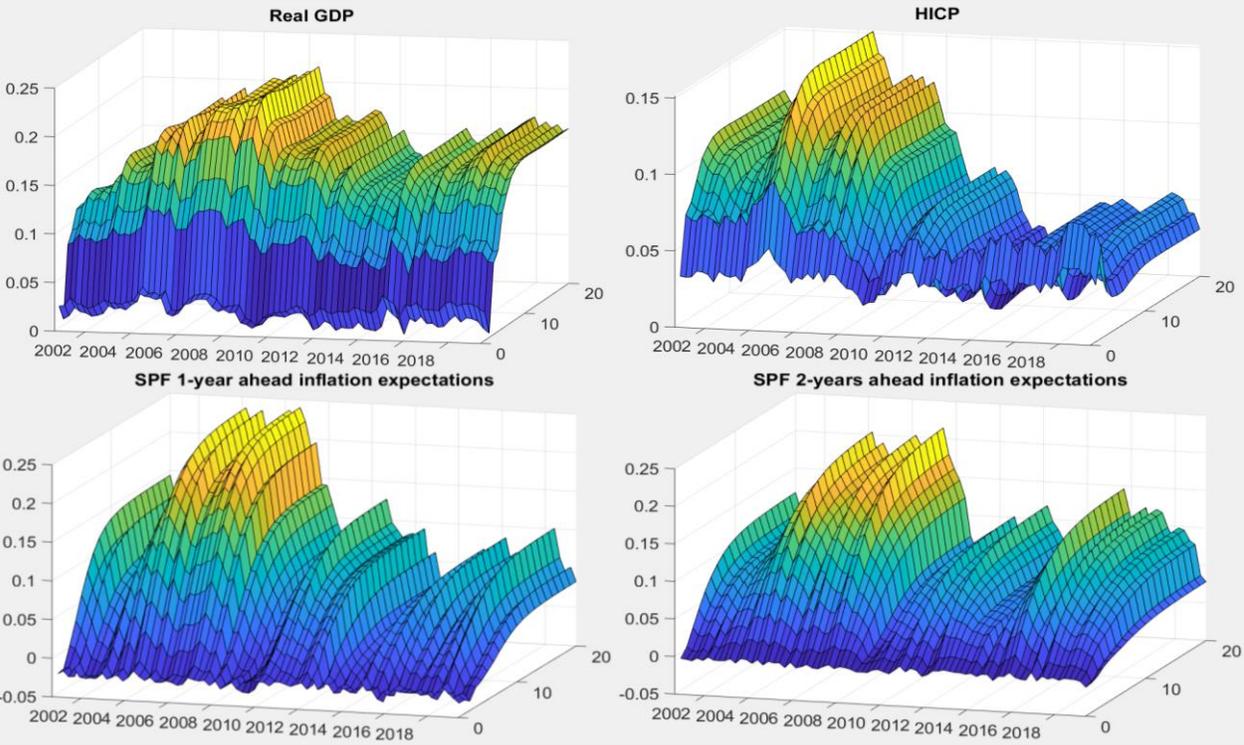
NL-LP

PRE-ZLB (Q1 2000 – Q2 2012)

POST-ZLB (Q3 2012 – Q2 2019)

■ 68% confidence interval   ■ 90% confidence interval   ── median

Note: Figures show impulse response functions (cumulative in case of the TVP-SVAR-SV) to the MP shock which has been normalized to a 10 bps drop in the EONIA
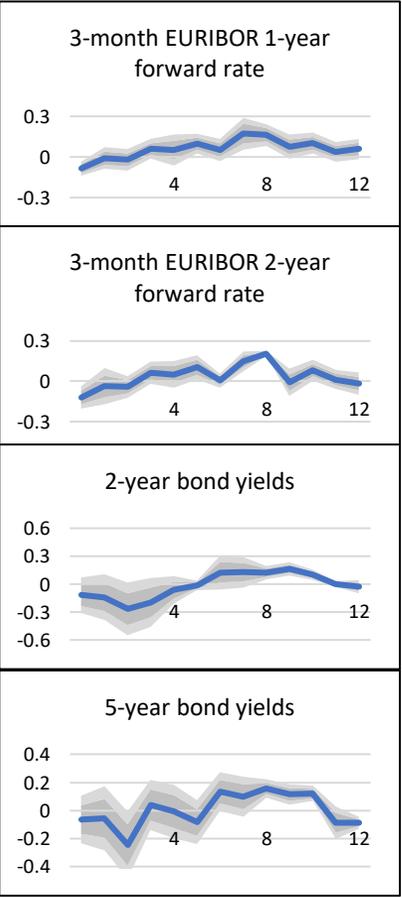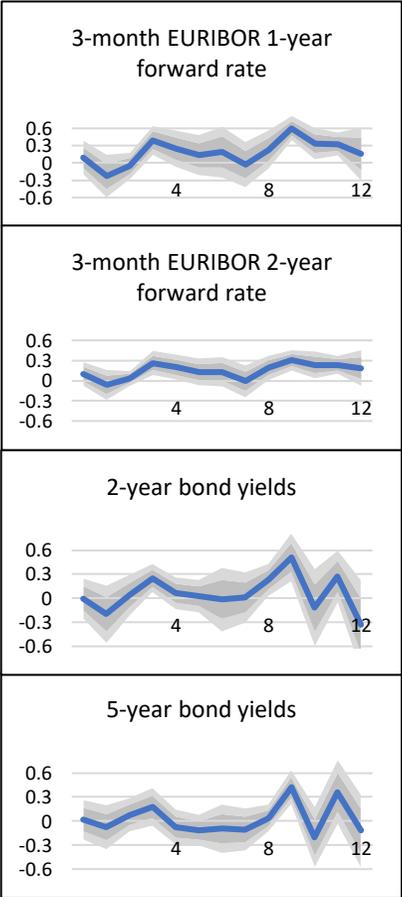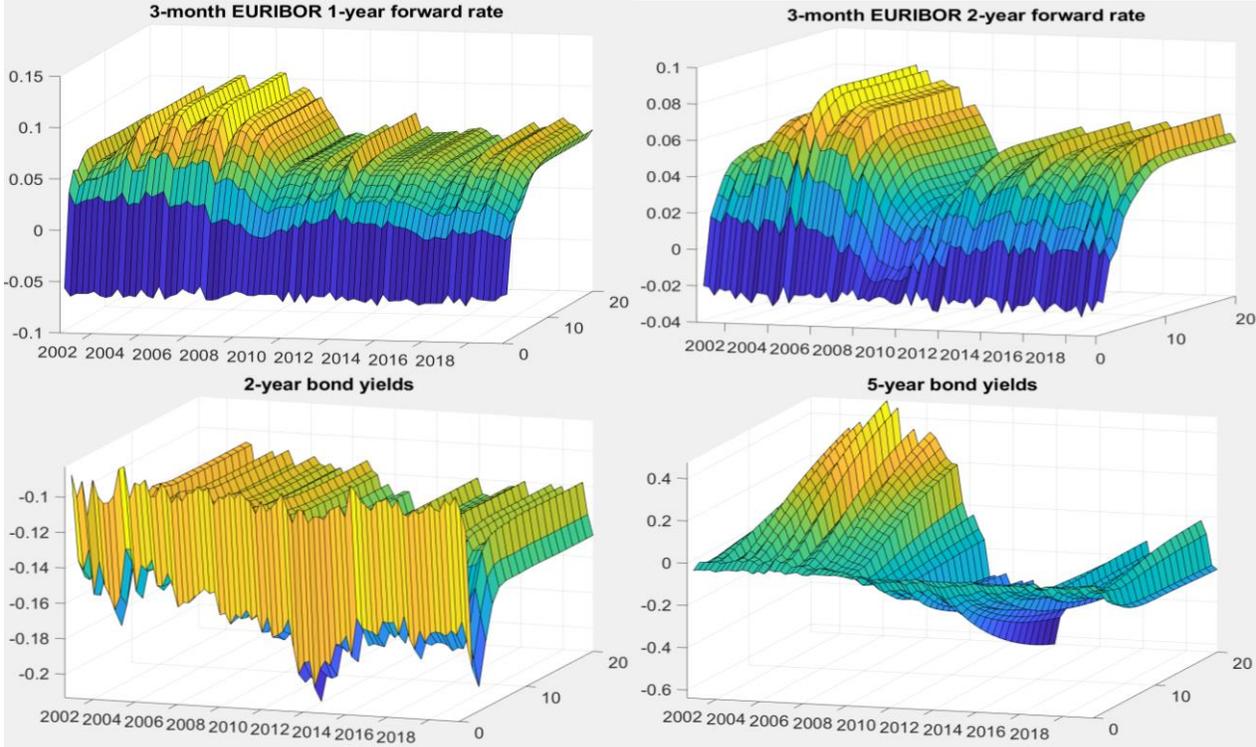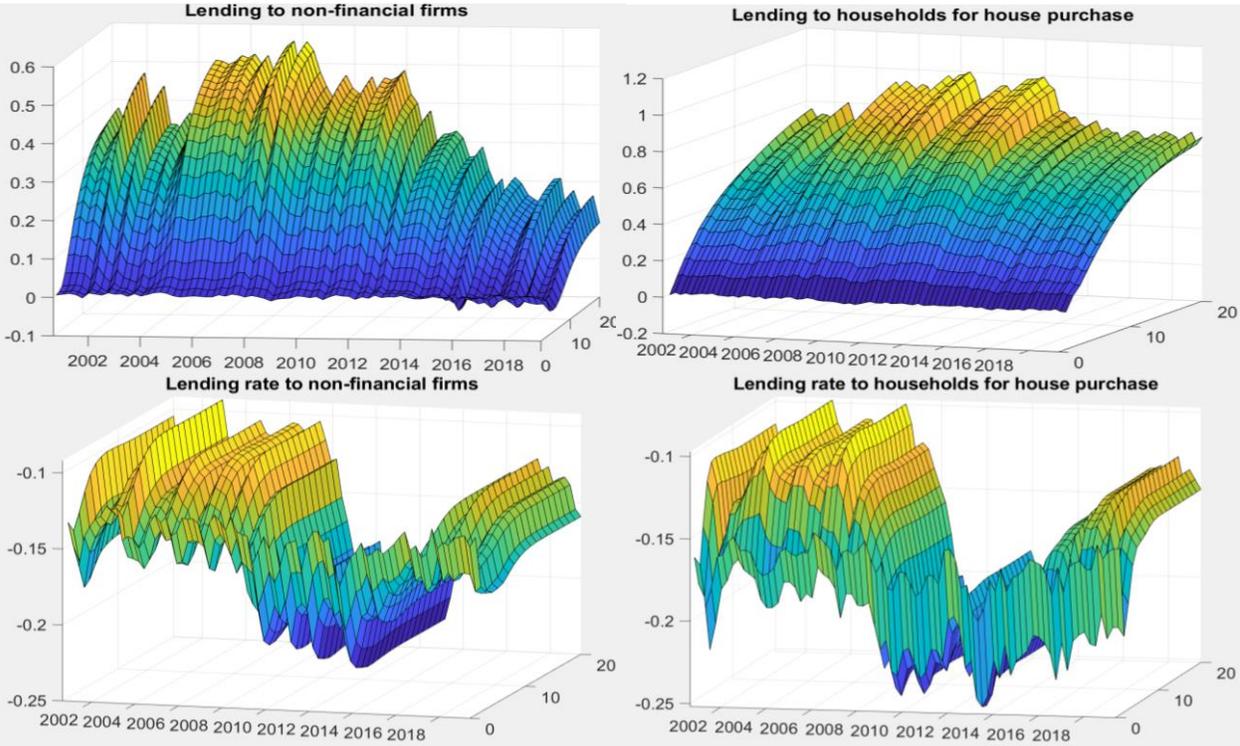
Sub-zero policy rates have lowered interest rate expectations and compressed the yield curve

TVP-SVAR-SV

NL-LP

PRE-ZLB (Q1 2000 – Q2 2012)

POST-ZLB (Q3 2012 – Q2 2019)

68% confidence interval   90% confidence interval   median

Note: Figures show impulse response functions (cumulative in case of the TVP-SVAR-SV) to the MP shock which has been normalized to a 10 bps drop in the EONIA
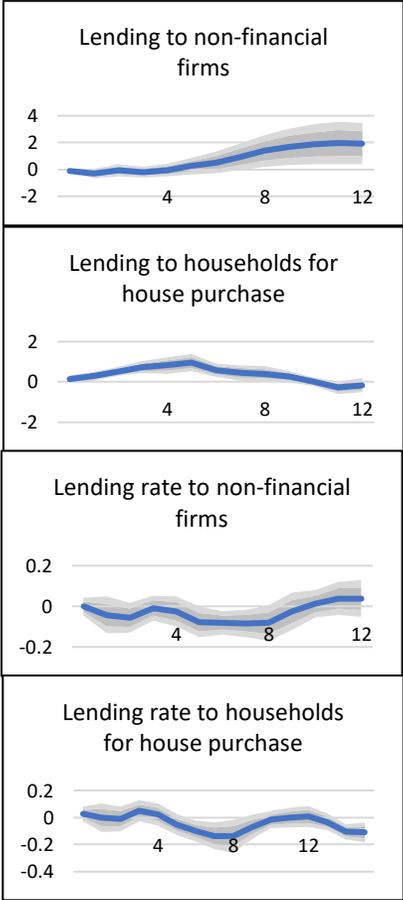
Bank lending channel has remained active below the ZLB despite the breakdown in pass-through of policy rates to lending rates
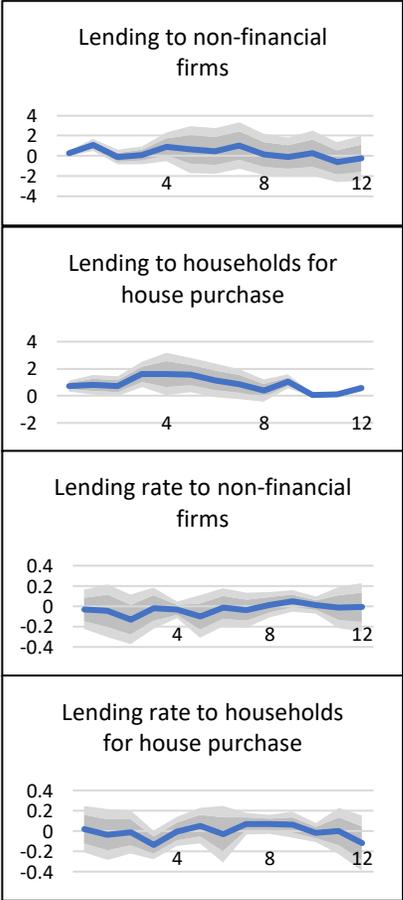

TVP-SVAR-SV

NL-LP

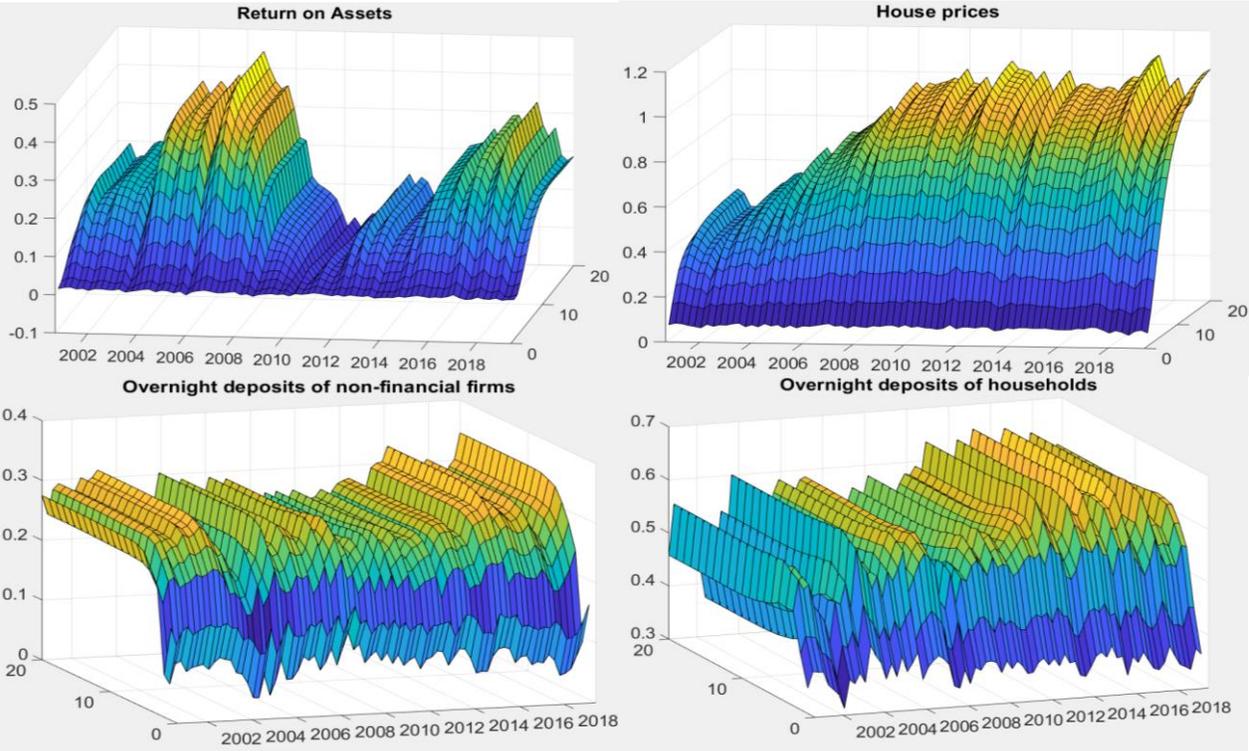**PRE-ZLB (Q1 2000 – Q2 2012)**

POST-ZLB (Q3 2012 – Q2 2019)

68% confidence interval   90% confidence interval   median

Note: Figures show impulse response functions (cumulative in case of the TVP-SVAR-SV) to the MP shock which has been normalized to a 10 bps drop in the EONIA

Limited evidence to suggest that negative policy rates have adversely affected either bank profitability, property prices or bank deposits

TVP-SVAR-SV

NL-LP

PRE-ZLB (Q1 2000 – Q2 2012)

POST-ZLB (Q3 2012 – Q2 2019)

■ 68% confidence interval   ■ 90% confidence interval   — median

Note: Figures show impulse response functions (cumulative in case of the TVP-SVAR-SV) to the MP shock which has been normalized to a 10 bps drop in the EONIA
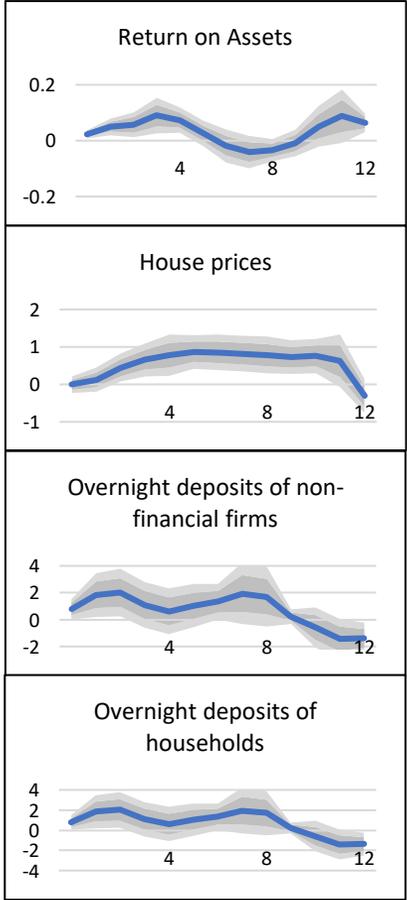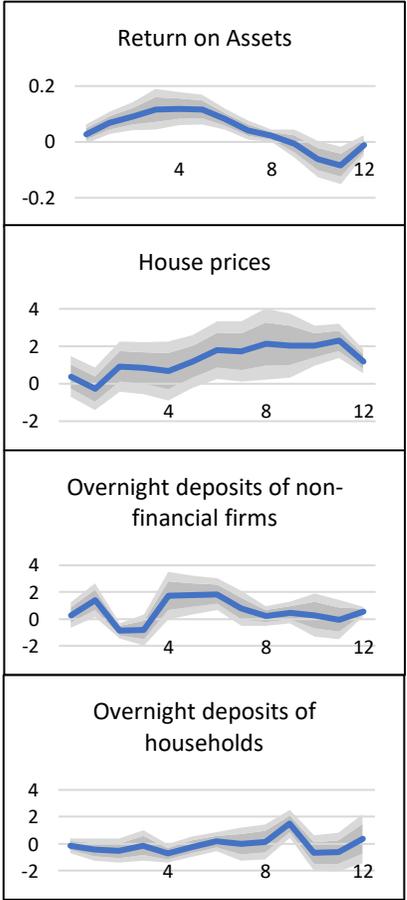
Conclusions

▶ **Our findings suggest** that the **policy rate** has continued to **support the aggregate demand** in the euro area **even in sub-zero territory**, expanding the growing literature which questions the empirical relevance of the ZLB

▶ However, the **reaction of inflation** and its expectations has **significantly deteriorated** in the **post-ZLB** period

▶ We also show that policy rate cuts below the zero have more persistent impact on the term structure and interest rate expectations

▶ We find limited evidence to support the view that negative interest rates cause a contraction in lending despite the disconnect of lending rates from the policy rate

▶ **Regarding the side effects** which are often associated with a prolonged period of low and negative interest rates, we find:

  ▶ **limited evidence** that they have an **adverse effect on bank profitability**

  ▶ **no evidence** to suggest that they **generate price bubbles** in the real estate market

  ▶ they **do not lead agents to hoard cash**