

Differential Effects of Unconventional Monetary Policy

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Background, Motivation and Relevance

What is Unconventional Monetary Policy? UMP is generally referred to as all central bank actions that change the size of its balance sheet but not its key interest rate. In this paper, I investigate the European Central Bank's quantitative easing (QE) program, also known as Asset Purchase Program (APP). It ran from 2015 to 2018.

The Portfolio Rebalancing Channel. The aim of QE was to raise inflation via the portfolio rebalancing channel. By purchasing fixed income assets, the ECB increased their prices and decreased their yields (quantitative easing). Asset holders then swap fixed income assets for other assets such as corporate loans (portfolio rebalancing), also reducing the interest rates of those. This is then hoped to increase business borrowing and investment, thereby raising inflation.

Motivation and Research Question. Previous research has found that conventional monetary policy (interest rate changes) affects manufacturing activities more than services. If also QE effects vary over industries, then regions with e.g. more manufacturing may benefit more than others. In that case QE leads to spatial redistribution, much like fiscal transfers between regions. It is important to understand these unintended effects. Therefore I ask "Did QE have differential effects across German industries through portfolio rebalancing?" Specifically, I test for differences in lending across (1) institutional sectors to see if banks simply substituted government bonds for government loans, (2) economic sectors, and (3) types of loans (housing vs. non-housing) because excessive housing lending is a key source of financial instability and it is important to know if QE contributes to it.

This Paper's Innovation. To the best of my knowledge, there is no research yet on differential effects of QE that employs microdata. The main advantage compared to aggregate data is that I can exploit the cross-sectional variance over a huge number of observations (almost 1,500 banks) and control for confounding factors at the level of the individual bank.

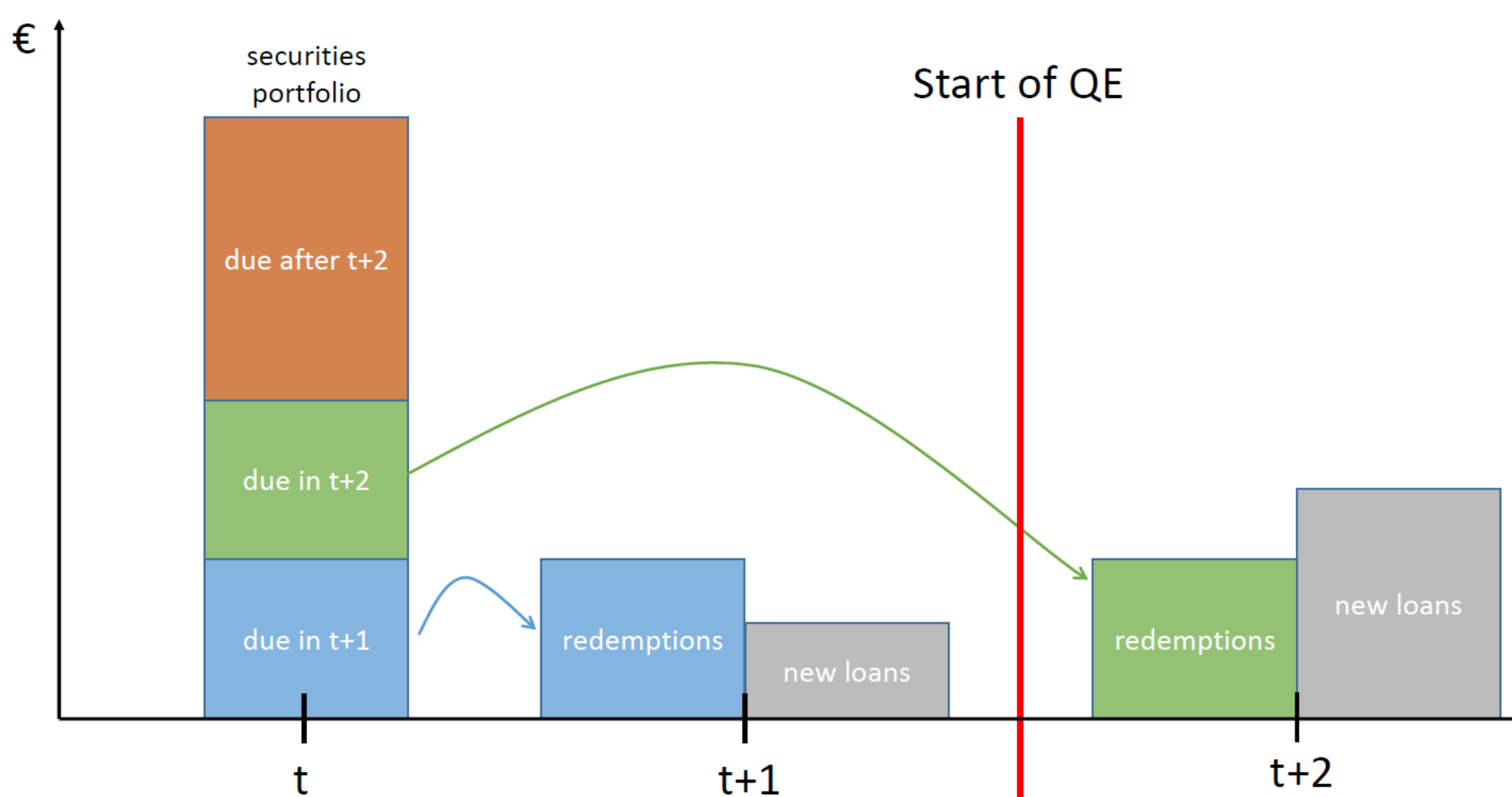
Data and Identification

In this paper I link four quarterly datasets on German banks over 2011-2018, containing: (1) balance sheet items, (2) securities holdings and (3) detailed securities information by ISIN code, and (4) bank lending to various economic sectors.

How do you identify unconventional monetary policy exposure?

Following Tischer (2018),

I use the volume of redemptions at bank level. Whenever a bond matures, the bank holding that bond loses an income-generating asset and has to make a decision: Should it re-invest into bonds or switch to other assets like corporate



loans? It is then that a bank is actually exposed to the yield-squeezing effect of QE. Hence, the more redemptions a bank has, the stronger is its exposure towards QE. Importantly, redemptions are exogenous to loan growth as they are predetermined by the bank's pre-QE bond portfolio. A bank could, of course, adjust its portfolio as a reaction to QE. However, German banks are generally buy-and-hold investors who hardly have any bonds in their trading books. Neither do they change their trading activity after the start of QE, as you can see in the descriptive statistics box on the right side.

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- Paludkiewicz, Karol (2021): Unconventional Monetary Policy, Bank Lending, and Security Holdings: The Yield-Induced Portfolio-Rebalancing Channel. In: Journal of Financial and Quantitative Analysis 56 (2), pp. 531-568.
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Descriptive Statistics

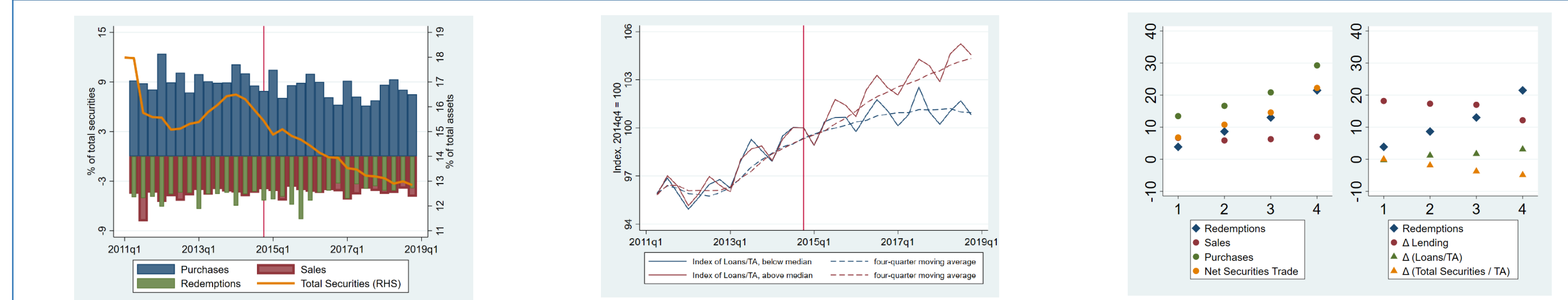


Figure 1. Breakdown of bond portfolio changes.

Figure 2. Share of bank loans in total assets.

Figure 3. Within-quartile means (% of total assets)

Figure 1 shows that the banking system's aggregate bond portfolio decreased after 2015 because purchases decreased while sales remained constant. This shows that banks let it run down through redemptions rather than actively sell bonds.

Figure 2 shows the evolution of the share of loans in total assets of banks which are above and below the median of redemptions cumulated over 2015 to 2018. Both coincide before QE and then deviate, suggesting that portfolio rebalancing is at work. A possible problem here is that loans over total assets can grow because loans grow or because assets shrink.

In **figure 3**, the sample was split at the quartiles of redemptions (cumulated over 2015 to 2018) and then the mean of each variable depicted was computed for each subsample. Dots indicate cumulative changes as % of total assets over 2015 to 2018. Triangles indicate the change between end-2014 and end-2018 values. While there is a slight positive correlation between redemptions and the change in loans over total assets (green triangles, right panel), the correlation between redemptions and cumulative change in lending is negative (red dots, right panel). This speaks against portfolio rebalancing.

Econometric Strategy

Main Specification:

$$\Delta Lending_{it}^{cum} = \alpha_i + \beta_1 * Redemptions_i^{median} * \alpha_t + \gamma' * A_{it} + \delta' * B_{i,t-1} + u_{it}$$

$$\Delta Lending_{it}^{cum} = \sum_{k=2011m2}^t \frac{\Delta Lending_{ik}}{TA_{i,k-1}}$$

- Cumulative quarterly change in lending since Feb 2011
- Illustrates time dynamics (see results box)

$Redemptions_i^{median}$

- Equal to 1 if a bank is above the median of redemptions cumulated over Oct 14 to Dec 18
- Indicates treatment group

α_t

- Time dummy

A_{it} bank's trade position

- Equal to 1 if a bank is above the median of purchases respectively sales of bonds, cumulated over Oct 14 to Dec 18

B_{it} bank controls

- Deposits, wholesale funding, equity, interbank claims, CB liquidity, total asset growth

Results

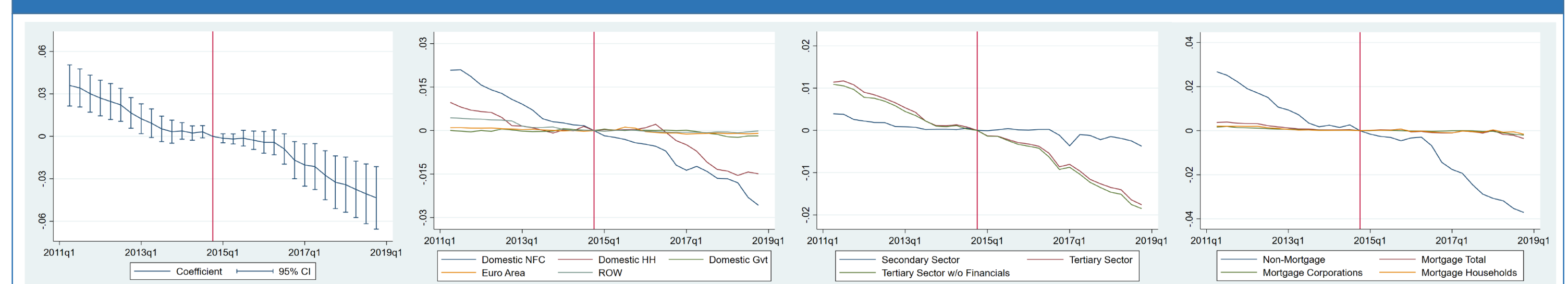


Figure 4. β_1 of the regression equation stated above for different dependent variables, from left to right: Total lending to non-financial corporations, lending to institutional sectors, lending to economic sectors, lending by type of loan.

Figure 4 shows the coefficient β_1 for each quarter, with 2014Q4 being the reference quarter in which the time dummy α_t is zero. If there was a positive effect of redemptions on loan growth, the respective curve's slope would deviate from its pre-QE trend and become more positive/less negative. Instead, the cumulative change in lending of treatment group banks vis-à-vis control group banks is either constant or decreasing at a constant rate in both periods. The leftmost graph says that the cumulative change between 2014Q4 and 2018Q4 was four percentage points of total assets below that of control group banks.

The results contain no evidence that the portfolio rebalancing channel was at work in Germany during the APP, nor is there any evidence for differential effects. This is at odds with some of the previous literature: Tischer (2018) and Paludkiewicz (2021) both show a strong connection between redemptions and loan growth using the same data. Lewis and Roth (2017), however, find no evidence for portfolio rebalancing either using aggregate data. A no-evidence result is well in line with theories that argue that the market for bank loans is solely driven by the demand side (except in times of acute market stress) and all supply-side measures merely constitute "pushing the string".