

Bank Deposit Pricing in the Euro Area

Ugo Albertazzi¹ Finn Faber¹ Alessandro Gavazza²
Oana-Maria Georgescu¹ Ernest Lecomte¹

¹European Central Bank

²London School of Economics

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PRELIMINARY AND INCOMPLETE

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Motivation

- The increase in the European Central Bank (ECB)'s policy rates starting in 2022 has been associated with a smaller pass-through to bank deposit rates in the Euro area (a.k.a. the deposit beta) in comparison with past increases.
- This has spurred a debate about the factors underpinning the sluggishness in the remuneration of these instruments. Two leading hypotheses:
 1. Bank market structure and market power ([Grodzicki, Klaus, Pancaro, and Reghezza, 2023](#)).
 - ▶ Consolidation of the banking sector in many countries after the financial crisis of 2008 and the European sovereign debt crisis in 2012.
 2. Bank balance sheets:
 - ▶ Quantitative easing and large amounts of reserves with the Eurosystem ([Messer and Niepmann, 2023](#)) → few profitable lending opportunities (yield compression) and less need to compete to attract deposits.

Heated Debate in the Euro Area

European banks

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German banks accused of short-changing savers with low rates

Europe's largest retail deposit broker says country's lenders will make €40bn in 'unfair' profits this year



Two-thirds of Germany's municipality-owned Sparkassen are not paying any interest on overnight deposits, according to data from Raisin © ImageBroker/Alamy

Olaf Storbeck in Frankfurt MARCH 6 2023

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German banks are exploiting their market power to unfairly cash in on tens of billions of euros by not passing on higher interest rates to retail depositors, according to the head of the continent's largest retail deposit broker, Raisin.

Report

Competition on the Dutch savings market

Based on the characteristics of the Dutch savings market described above, ACM concludes that it is a dysfunctional oligopolistic market, where tacit coordination is also likely to be present.

The Dutch savings market is a highly concentrated market in which a few major banks serve a very large share of the market. Due to consumer inertia, smaller and foreign providers exert only limited competitive pressure on these major banks. Major banks focus mainly on maintaining savings volumes and there is a lack of strong competition to win new customers. All these factors indicate an oligopolistic market that is not functioning properly.

This Paper

- We analyze developments in the euro area deposit markets, by developing a framework to account for changes in both demand and supply factors.
- To this end, we build a unique bank-level dataset of deposit markets in the Euro area for 2007–2024 from different ECB databases.
 - Rich variation across deposit products (e.g., overnight versus term), markets (e.g., countries), time, and monetary policy regimes.
- Our analysis proceeds in two steps:
 1. We provide descriptive empirical evidence on deposits and their pricing.
 2. We build an IO-style equilibrium model of deposit markets that we use to quantify the different channels, most notably market power vs. balance sheet effects.
- Our (preliminary) empirical findings suggest:
 1. a limited role for explanations based on changes in banks' balance sheets
 2. evidence consistent with an increasing role for market power
 3. though not necessarily related to "market structure", but rather to changes in depositors' price sensitivity
 4. possibly reflecting changes in composition of pools (ongoing).

Contribution to the Literature on Deposit Markets

Studying deposit markets is relevant for banking competition and financial stability.
We aim to contribute as follows:

- Our data have some advantages over US deposit data.
 1. Substitution between different bank deposit products, e.g. overnight deposits vs. term deposits.
 2. Better coverage of interest rates, and match to deposit flows.
 3. Some unique balance sheet data from regulatory reports.
 4. (Although no branch-level deposits as reported in US FDIC data.)
- Descriptive analysis of deposit betas.

US: Hannan and Berger (1991), Neumark and Sharpe (1992), Drechsler, Savov, and Schnabl (2017), Drechsler, Savov, and Schnabl (2021), among others.
- IO-style model of deposit markets.

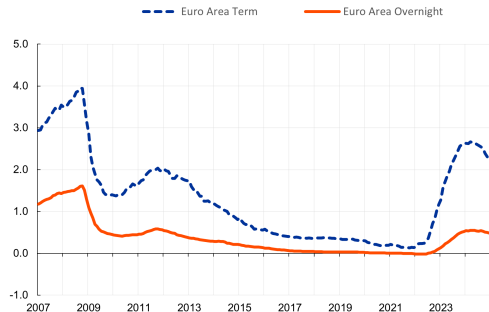
US: Ho and Ishii (2011), Egan, Hortaçsu, and Matvos (2017), Xiao (2020), Whited, Wu, and Xiao (2021), Aguirregabiria, Clark, and Wang (2024), among others.

Data

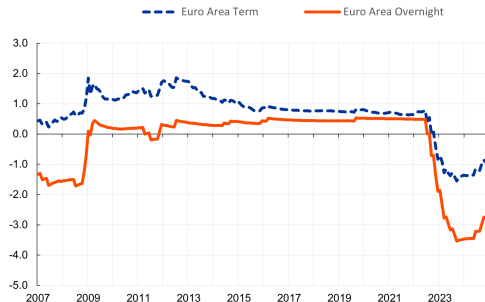
We combine several bank-level and macroeconomic variables for the period 2007q3–2024q4 from different ECB and commercial data sources.

- Deposit rates and volumes on three types of deposit products for households and corporates (IMFI):
 1. Sight (or overnight) deposits.
 2. Term deposits (or deposits with an agreed maturity): Less than 24 months, more than 24 months.
 3. Deposits redeemable at notice: Less than 3 months, more than 3 months.
- Bank-level characteristics:
 - IBSI: info on assets and liabilities.
 - Orbis: branches, employees.
 - CSDB: bank-credit ratings.
 - FINREP: excess-liquidity.
- Macro variables:
 - Unemployment, GDP growth, MM rates, sovereign yields etc.

Fact 1: Deposit beta have declined



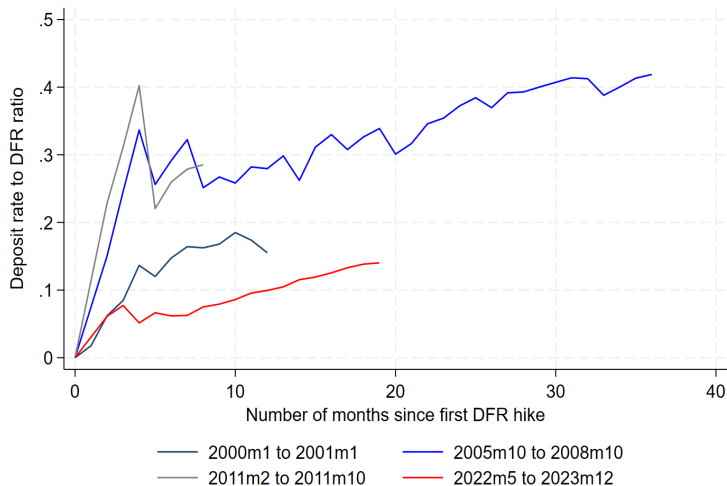
(a) Rates



(b) Spreads: Deposit Rates - Policy Rates

→ Striking behavior of aggregate spreads on deposit rates since 2022.

Fact 1: Sight Deposit Betas Have Declined



Fact 2: Deposit Betas Are (generally) Low

- We estimate the following regression (Drechsler, Savov, and Schnabl, 2021):

$$\Delta r_{i,j,t} = \alpha_j + \sum_{l=0}^2 \beta_{jl} \Delta r_{t-l}^{\epsilon} + \delta_j X_{c,t} + \theta_i + \varepsilon_{i,j,t}$$

- $r_{i,j,t}$ is the interest rate set by bank i on deposit product type j (i.e., household sight deposit, corporate sight deposit, term deposit) in quarter t ;
 - r_{t-l}^{ϵ} is the 3-month Euribor rate in quarter t .
- The parameter β_{j0} measures the short-term pass-through:
 - 0.15 for household sight deposits, 0.28 corporate sight deposits, 0.63 term deposits.
- The sum $\sum_{l=0}^2 \beta_{jl}$ measures the long-term pass-through:
 - 0.25 for household sight deposits, 0.44 corporate sight deposits, 0.88 term deposits.

Fact 3: Deposit Betas Are Asymmetric

$$\Delta r_{i,j,t} = \alpha_j + \sum_{l=0}^2 \beta_{jl}^+ \Delta r_{t-l}^{\epsilon} \times 1(\Delta r_{t-l}^{\epsilon} > 0) + \sum_{l=0}^2 \beta_{jl}^- \Delta r_{t-l}^{\epsilon} \times 1(\Delta r_{t-l}^{\epsilon} \leq 0) + \delta_j X_{c,t} + \theta_i + \varepsilon_{i,j,t}$$

Short-term pass-through:

- increasing rates: 0.02 for household sight deposits, 0.10 corporate sight deposits, 0.29 for term deposits
- decreasing rates: 0.21 for household sight deposits, 0.38 corporate sight deposits, 0.80 for term deposits

Long-term pass-through:

- increasing rates: 0.12 for household sight deposits, 0.22 corporate sight deposits, 0.62 for term deposits
- decreasing rates: 0.35 for household sight deposits, 0.57 corporate sight deposits, 1.04 for term deposits

An IO Model of Deposit Markets: Depositors

- I_{mt} potential depositors (households or firms) indexed by i ; J_{mt} deposit products, indexed by j , in market m , and quarter t .
- Consumers deposit an amount of money d_{imt} into a bank deposit product, or an alternative use that gives them the value of the outside option $j = 0$.

$$U_{ijmt} = \alpha_{imt} d_{imt} r_{jmt} + \beta X_{jmt} + \xi_{jmt} + \varepsilon_{ijmt}.$$

- r_{jmt} is the interest rate, X_{jmt} are observable product characteristics, and ξ_{jmt} are unobservable product characteristics.
- ε_{ijmt} is an idiosyncratic taste shock that follows a GEV distribution that yields a nested logit probability of household choice, with these non-overlapping nests $B(j)$ (Cardell, 1997):
 1. Sight deposits;
 2. Term deposits;
 3. Deposits redeemable at notice;
 4. The outside option, return r_t

Model: Bank Rate Setting

- Banks choose the interest rates of their J_l deposit products to maximize their flow profits, given their lending rates and other costs:

$$\max_{r_{jmt}} \sum_{j \in J_l} (R_{lt} - r_{jmt} - c_{jmt}) q_{jmt},$$

R_{lt} is the return on bank l 's assets (lending rate and the return on its securities), c_{jmt} are the operating costs of offering product j , and q_{jmt} are product j 's volume of deposits.

- The optimal rate r_{jmt} :

$$r_{jmt} = - \underbrace{\frac{q_{jmt}}{\frac{\partial q_{jmt}}{\partial r_{jmt}}}}_{\text{Market Power}} + \underbrace{(R_{lt} - c_{jmt})}_{\text{Balance Sheet}} + \underbrace{\frac{\sum_{j' \neq j \in J_l} (R_{lt} - r_{j'mt} - c_{j'mt}) \frac{\partial q_{j'mt}}{\partial r_{jmt}}}{\frac{\partial q_{jmt}}{\partial r_{jmt}}}}_{\text{Cross-Elasticity} \approx 0}.$$

Estimation: Depositors

- Assume across-market heterogeneity of depositors only: $\alpha_{imt} = \alpha_{mt}$ and $d_{imt} = d_{mt}$. $\rightarrow$ Nested logit linear regression equation (Berry, 1994):

$$\log(s_{jmt}) - \log(s_{0mt}) = \tilde{\alpha}_{mt}(r_{jmt} - r_{0mt}) + \beta X_{jmt} + \lambda \log(s_{jmt|B(j)}) + \xi_{jmt},$$

where s_{jmt} is the market share of product j ; s_{0mt} is the market share of the outside option $j = 0$; $s_{jmt|B(j)}$ is the market share of product j within its nest $B(j)$; $\tilde{\alpha}_{mt} = \alpha_{mt}d_{mt}$; λ defines the corr. of unobservable preferences within nests (if close to 1 within nest products are closer substitutes)

- In practice, we estimate:

$$\log(q_{jmt}) = \tilde{\alpha}_{mt}r_{jmt} + \beta X_{jmt} + \eta_{mt} + \lambda \log(s_{jmt|B(j)}) + \xi_{jmt},$$

where q_{jmt} is the volume of deposits and η_{mt} is a market-time fixed effect that absorbs the outside option.

Estimation: Depositors

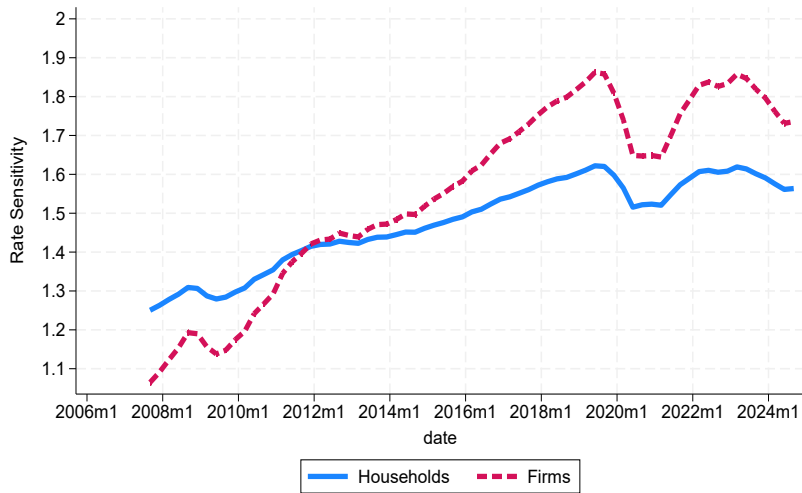
- The interest rate r_{it} and the within-nest market share $s_{jmt|B(j)}$ are likely correlated with the unobservable ξ_{it} . Instruments:
 1. Yield of the German Bund at time t matched to the corresponding maturity of the deposit product: e.g., 1-month yield for overnight deposits.
This instrument exploits the variation in interest rates across the yield curve (i.e. level and rotation of the yield curve) over time.
 2. For the within-nest market share $s_{jmt|B(j)}$, we use the (log of the) number of banks offering products in the nest.

Deposit Supply Estimates

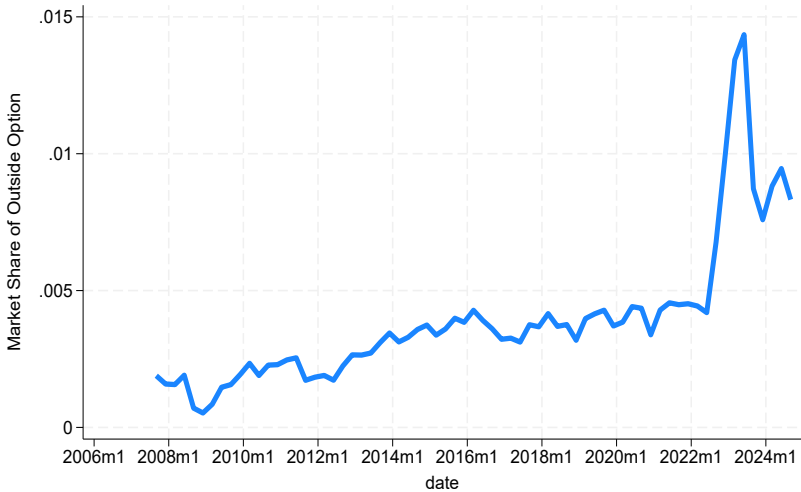
	(1)	(2)	(3)	(4)
	Households-Firms	North-South	Positive-Negative	Macro
Interest Rate	0.959*** (0.054)	1.303*** (0.078)	1.162*** (0.083)	
Δ Interest Rate, Firms	0.205*** (0.059)	-0.110 (0.092)	-0.067 (0.106)	
Δ Interest Rate, South		-0.754*** (0.118)	-0.486*** (0.133)	
Δ Interest Rate, Firms * South		0.137 (0.156)	0.285 (0.189)	
Δ Interest Rate, Negative Policy Rates			0.238 (0.170)	
Δ Interest Rate, Firms * Negative Policy Rates			0.502* (0.202)	
Δ Interest Rate, South * Negative Policy Rates			-0.105 (0.220)	
Δ Interest Rate, Firms * South * Negative Policy Rates			-1.111*** (0.307)	
Δ Interest Rate * log(GDP per Capita)				0.212*** (0.048)
Δ Interest Rate * log(Unemployment Rate)				-0.329 (0.190)
Δ Interest Rate, Firms * log(GDP per Capita)				0.072 (0.061)
Δ Interest Rate, Firms * log(Unemployment Rate)				-0.397 (0.249)
Log within-nest Market Share	0.690*** (0.050)	0.418*** (0.052)	0.389*** (0.059)	0.219** (0.077)
Market-Date FE	Yes	Yes	Yes	Yes
Observations	48,740	48,740	48,740	48,740

Column (4): Average sensitivity $\tilde{\alpha}_{mt}$ equals 1.144, with a standard deviation 0.344.

Rate Sensitivity, Germany



Market Share of the Outsize Option, Germany



Estimation: Banks

- Having obtained estimates of depositors' semi-elasticities, we test the main prediction of the pricing formula, the negative unitary coeff. for the markdown in the first-order conditions for the optimal rate:

$$r_{jmt} = -\frac{q_{jmt}}{\frac{\partial q_{jmt}}{\partial r_{jmt}}} + (R_{lt} - c_{jmt}) + \frac{\sum_{j' \neq j \in J_l} (R_{lt} - r_{j'mt} - c_{j'mt}) \frac{\partial q_{j'mt}}{\partial r_{jmt}}}{\frac{\partial q_{jmt}}{\partial r_{jmt}}}$$

- The gross revenues to obtain gross revenue $h_{jmt} \equiv R_{lt} - c_{jmt}$ is assumed to be explained by the following regression:

$$h_{jmt} = \gamma_X X_{jmt} + \gamma_Z Z_{lt} + \nu_{jmt},$$

where X_{jmt} and Z_{lt} are product and bank attributes, and ν_{jmt} is the unobservable.

- We (1) “test” pricing model; (2) analyze gross margins.
- Mark-down possibly endogenous due to correlation with ν_{jmt} : IV number of banks in same nest (uncorrelated with bank-specific determinants of gross revenues).

Bank Estimates

	(1) Interest Rate All	(2) Interest Rate Liquidity	(3) Gross Revenue All	(4) Gross Revenue Liquidity
Markdown	-0.867*** (0.167)	-1.075*** (0.200)		
Deposits Redeemable at Notice:				
Less than 3 months	0.494*** (0.012)	0.455*** (0.014)	0.500*** (0.010)	0.452*** (0.011)
More than 3 months	0.980*** (0.021)	0.923*** (0.025)	0.989*** (0.019)	0.918*** (0.021)
Term Deposits:				
Less than 24 months	0.761*** (0.028)	0.756*** (0.034)	0.777*** (0.024)	0.746*** (0.026)
More than 24 months	1.260*** (0.011)	1.173*** (0.012)	1.265*** (0.010)	1.170*** (0.011)
Log Number of Branches	0.011 (0.010)	0.018 (0.012)	0.018*** (0.005)	0.014* (0.006)
Log Number of Employees per Branch	0.060*** (0.012)	0.063*** (0.013)	0.066*** (0.008)	0.059*** (0.009)
A rating	-0.052*** (0.011)	-0.101*** (0.014)	-0.056*** (0.010)	-0.098*** (0.012)
B rating	0.032** (0.011)	0.005 (0.012)	0.032** (0.011)	0.006 (0.012)
Log(Assets)	0.035*** (0.007)	0.063*** (0.010)	0.039*** (0.005)	0.060*** (0.006)
Excess Liquidity/Assets		0.023 (0.078)		0.032 (0.074)
Fixed Effects	Market-Date	Market-Date	Market-Date	Market-Date
Observations	48,740	41,069	48,740	41,069
R ²			0.907	0.917

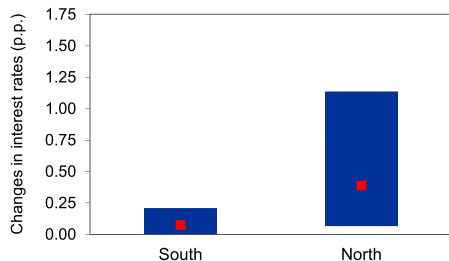
Preliminary Conclusions

- Critical differences between household and firm deposits, between sight and term deposits, and across monetary policy regimes
- Reviewing the stylized facts
 - Low and asymmetric betas
 - ▶ market power supported by the analysis
 - ▶ estimated price-sensitivity powerful factor in deposit pricing
 - ▶ gross revenues significantly affected by quality indicators
 - Reduced betas in 2022
 - ▶ heterogeneous (increasing) estimated mark-down, in some economies
 - ▶ banks balance sheet factors not relevant factor
 - ▶ (ongoing!) Within market heterogeneous rate-sensitivity of depositors and changes in pool (yield-sensitive depositors switch to alternative saving products).

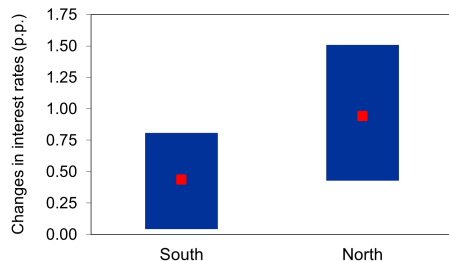
Thank you for your attention and comments!

Fact 4: Deposit Betas in the Cross-Section

Figure: Change in interest rates between December 2021 and March 2024



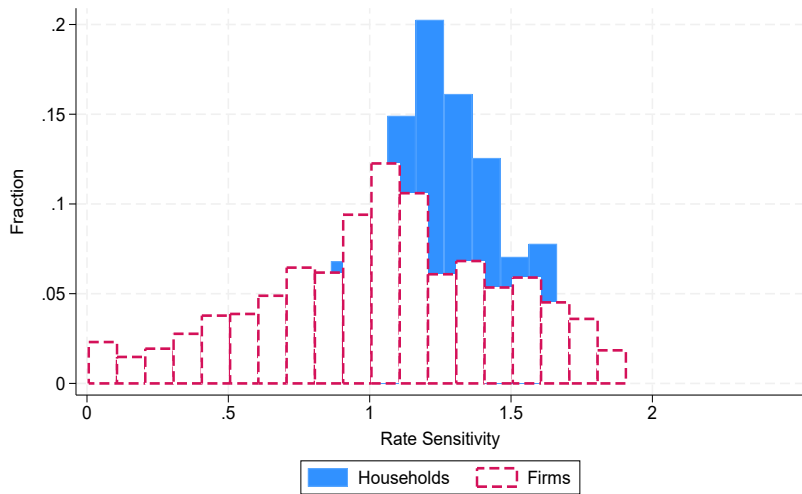
(a) Household sight deposits



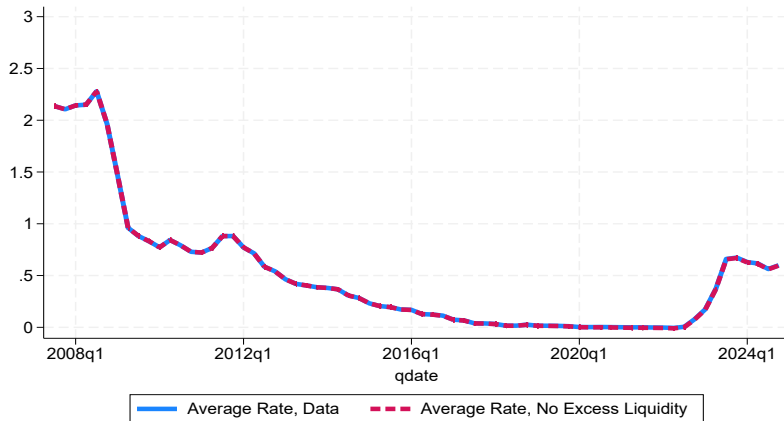
(b) Corporate sight deposits

- Banks in Southern countries increased their deposit rates by less.

Rate Sensitivity

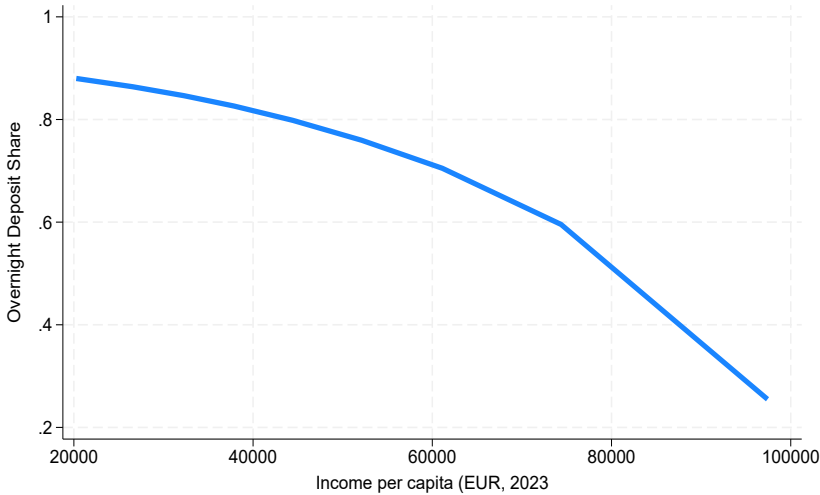


Counterfactual Analysis: No Excess Liquidity (Germany)

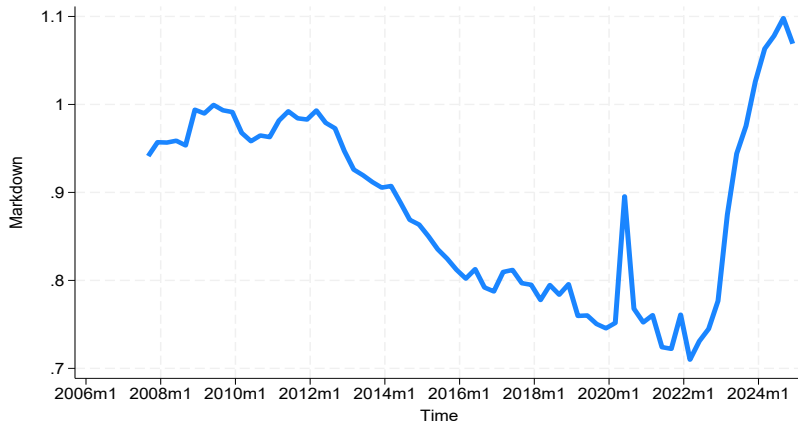


No differences: overnight deposit rates would have been almost identical in 2022–2024.

Within-Market Heterogeneity (Germany)



Markdown (Germany)



Based on (preliminary) demand estimates with within-market heterogeneity.

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