

Banks' Response to Negative Interest Rates

Evidence from the Swiss Exemption Threshold

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¹The views expressed in this presentation do not necessarily represent the perspectives of FINMA

Motivation. Negative Rates.

- ▶ reality in DNK, SWE, EUR, **Switzerland** since 2014/15
- ▶ long thought of as impracticable (“Zero Lower Bound”)
- ▶ limited research explicitly on transmission in neg. rate environments
 - ▶ *theoretical*: Brunnermeier & Koby (2017)
 - ▶ *empirical*: Heider et al., Demiralp et al., Lucas et al. (2017)

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- ▶ **Why might the transmission of negative rates be special?**
 - ▶ **cash** provides a non-negative return
 - ▶ reluctance to charge negative rates on **household deposits**
 - ▶ (interaction of low rates & capital req's; “reversal rate”)

This Paper.

- ▶ **Anatomy of negative rate transmission by retail banks in CH.**
 - ▶ exploits *Swiss policy design* for identification
- ▶ **Results:** banks' responses reflect two objectives
 - ▶ *to re-allocate costly reserves*
 - ▶ *to compensate for the effect on income*

This Paper.

- ▶ **Anatomy of negative rate transmission by retail banks in CH.**

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- ▶ **Results:** banks' responses reflect two objectives

- ▶ *to re-allocate costly reserves*

- ▶ *to compensate for the effect on income*

- ▶ **More exposed banks ...**

1. ... reduced balance sheet size more.

2. ... **lend** & invested more in financial assets.

- ▶ *also more than under rate cut in positive rate environment*

3. ... **raised mortgage rates more**, primarily due to risk-taking.

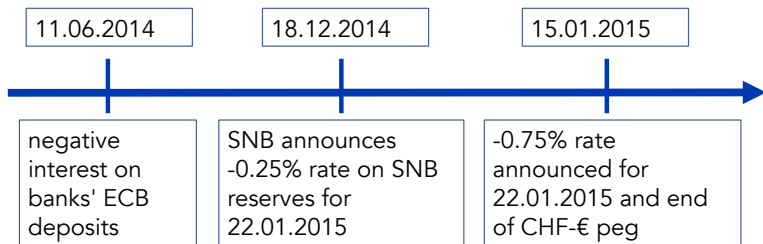
4. ... generated more fee income.

The SNB's Negative Rate Policy.

- ▶ applied to each bank's SNB **reserves** $> 20 * \text{Min.Res Req.}$ (MRR)
- ▶ at the time, **system-wide liquidity** amounted to $24 * \sum \text{MRRs}$
- ▶ **idea:** change marginal, but not total cost of holding liquidity

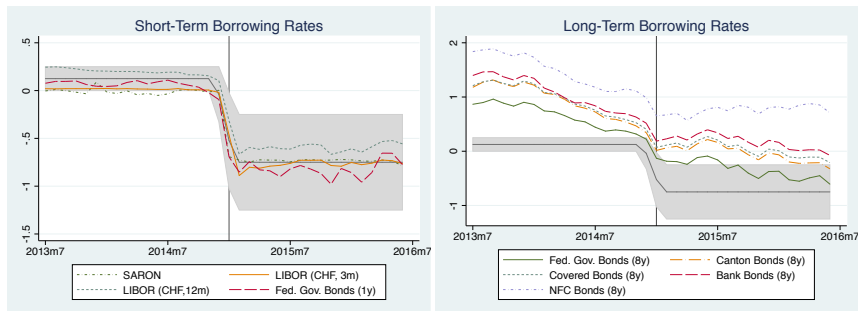
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- ▶ at the time, **system-wide liquidity** amounted to $24 * \sum \text{MRRs}$
- ▶ **idea:** change marginal, but not total cost of holding liquidity
- ▶ **before:** no interest payment on SNB reserves & monetary policy targeted LIBOR (3m, CHF) via open market operations



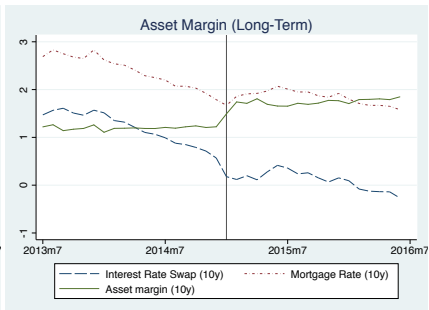
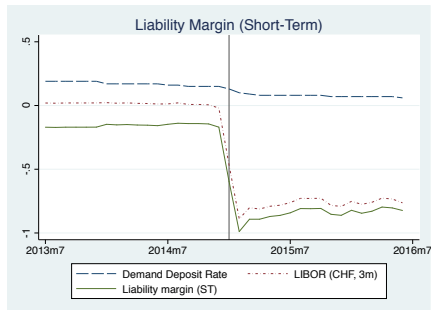
The SNB's Negative Rate Policy.

rapid transmission from deposit facility rate to other assets



The SNB's Negative Rate Policy.

squeezed liability margins & **increasing asset margins**



Empirical Strategy. Data.

- ▶ **sample period:** pre: 2013m7 - 2014m12, post: 2015m1 - 2016m6
- ▶ **supervisory data**
 - ▶ monthly balance sheets
 - ▶ quarterly risk-taking measures
 - ▶ semi-annual income statements
- ▶ essentially **universe of banks chartered in Switzerland**
- ▶ **focus on 50 domestically owned "retail banks" for identification**
 - ▶ **retail banks:** $\geq 55\%$ of income from "balance sheet effective" activities (on average in past 3 yrs)
 - ▶ **drop:** Wealth Mgmt., Universal, Cooperative & foreign-owned banks

Empirical Strategy. Data.

Variable	Obs	Banks	Periods	Mean	SD	Min	Max
Exposed SNB Reserves/TA		50		-5.76	4.30	-12.94	8.75
Net Interbank Pos: % of TA	1800	50	36	-0.86	4.39	-16.92	10.07
Loan Assets: % of TA	1800	50	36	8.49	4.23	1.58	22.29
Mortgage Assets: % of TA	1800	50	36	72.78	9.72	32.39	88.69
Fin. Assets: % of TA	1800	50	36	4.70	2.71	0.56	18.42
Deposit Funding: % of TA	1800	50	36	67.59	7.58	39.11	95.99
Bond Funding: % of TA	1800	50	36	13.04	5.58	0.00	25.58
FX Share Total Assets	1800	50	36	2.73	3.33	0.01	17.57
FX Share Total Liabilities	1800	50	36	4.38	5.31	0.00	27.75
RWA Density	600	50	12	0.46	0.12	0.02	1.13
Credit Risk Share of Req. Equity	600	50	12	0.94	0.21	0.65	2.56
Market Risk Share of Req. Equity	600	50	12	0.01	0.03	0.00	0.23
OpRisk Share of Req. Equity	600	50	12	0.06	0.02	0.04	0.20
CET1 / TA	600	50	12	7.69	1.58	4.02	12.33
CET1 / RWA	600	50	12	15.66	3.01	8.37	23.72
CET1/RWA - B3 Requirement	600	50	12	8.21	3.04	0.57	16.32

Empirical Strategy. Identification.

- ▶ **Difference-in-Difference Model**

$$Y_{i,t} = \alpha + \beta \cdot ER_i + \gamma \cdot \text{Post}_t + \delta \cdot (ER_i \times \text{Post}_t) + u_{i,t}$$

- ▶ **Exposed Reserves:** $ER_i = \frac{\text{SNB Reserves}_{i,12/2014} - \text{SNB Exemption}_i}{\text{Total Assets}_{i,12/2014}}$

Empirical Strategy. Identification.

▶ Difference-in-Difference Model

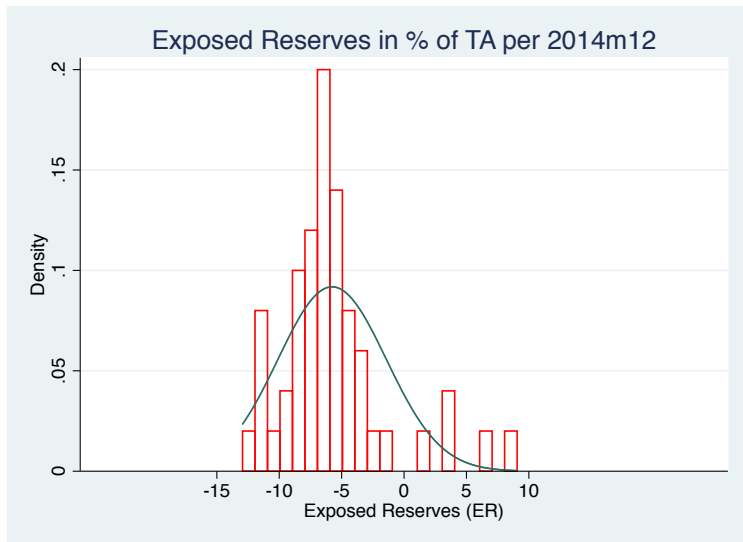
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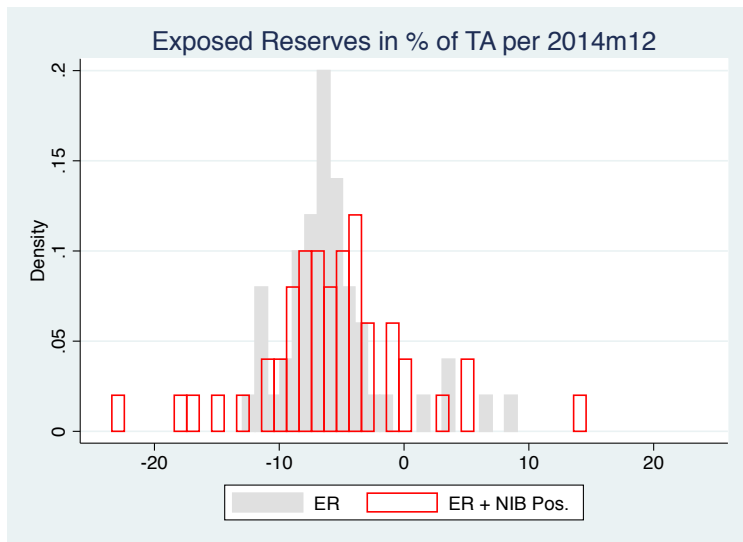
▶ Assumptions:

- ▶ timing & threshold design \Rightarrow **banks did not anticipate exposure**
- ▶ cont. & symmetric treatment: **ΔER_i is equally costly for $ER_i \gtrless 0$**
 - ▶ *loosing spare capacity ($ER_i < 0$) = giving up an arbitrage opp.*
- ▶ no differential exposure to FX shock
- ▶ \Rightarrow narrow sample, parallel trends, dummies for $ER_i \gtrless 0$

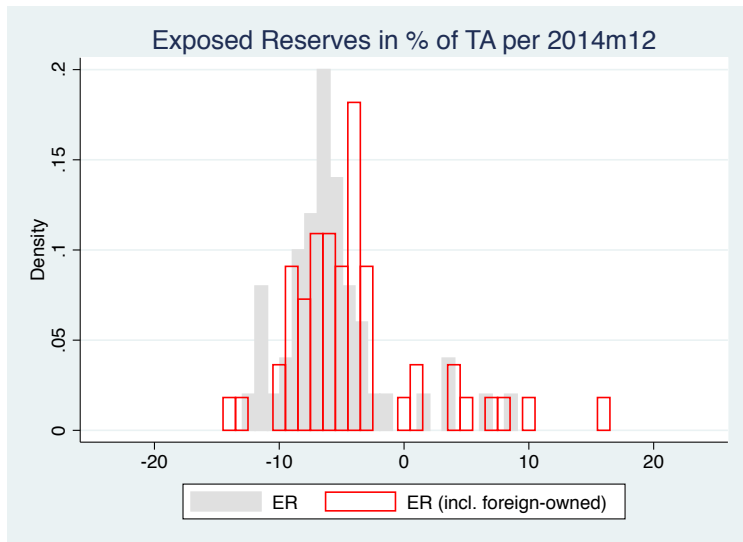
Exposed Reserves. Benchmark.



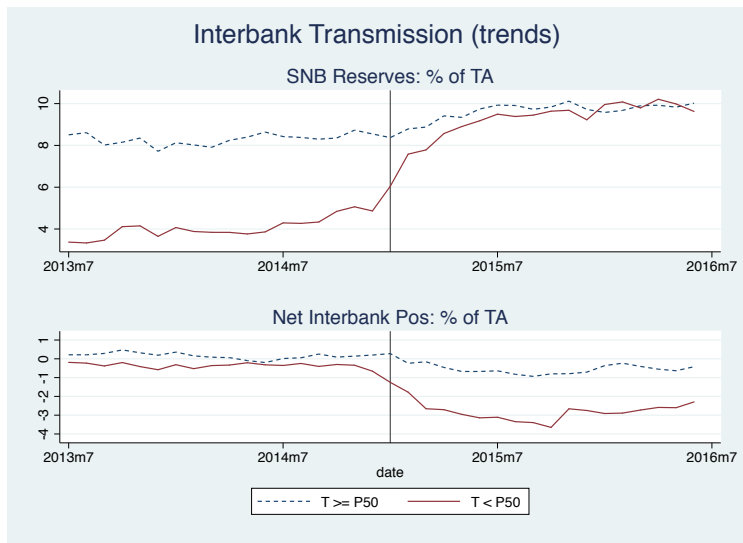
Exposed Reserves + Interbank Exposure.



Exposed Reserves. Foreign-Owned Retail Banks.



Parallel Trends. Liquid Assets.



Withdraw from SNB & Move Liquidity to IB Market.

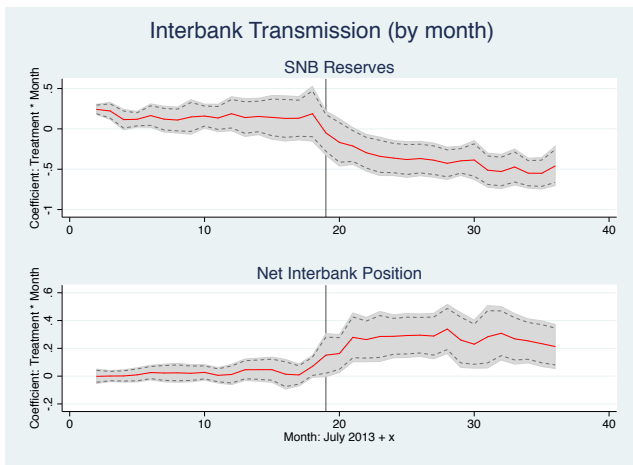
- ▶ 1 sd increase in $ER_i \Rightarrow 2.32\text{pp}$ [1.12pp] lower **SNB Res./TA** [**NIB Pos/TA**]
- ▶ some evidence of negative net effect on **LCR**

	(1)	(2)	(3)	(4)
	SNB Reserves	NIB Pos	SNB Reserves	NIB Pos
Post*ER	-0.54*** (0.07)	0.24*** (0.07)	-0.54*** (0.04)	0.26*** (0.04)
Post	0.08 (0.40)	-0.15 (0.47)	-	-
ER	0.77*** (0.10)	-0.03 (0.11)	-	-
Obs.	1,800	1,800	1,800	1,800
R2	0.49	0.05	-	-
Bank FE	No	No	Yes	Yes
Year FE	No	No	Yes	Yes

outcomes in % of TA // SE's clustered by bank

Withdraw from SNB & Move Liquidity to IB Market.

$$Y_{i,t} = \alpha + \beta \cdot ER_i + \bar{\gamma} \cdot 1_{t=\{2013m8,\dots\}} + \delta_1 \cdot (ER_i \times 1_{t=2013m8}) + \delta_2 \cdot (ER_i \times 1_{t=2013m9}) + \dots + \varepsilon_{i,t}$$



outcomes in % of TA // SE's clustered by bank

Results. Reduce Balance Sheet Size.

- ▶ 1 sd increase in $ER_i \Rightarrow 1.03\text{pp}$ [0.60pp] lower **TA growth** [$Bonds/TA$]
- ▶ more stable dep. funding \Rightarrow fraction of **Dep./TA** increases

	(1) Deposit Funding	(2) Bond Funding	(3) TA (yoy growth)	(4) Deposit Funding	(5) Bond Funding	(6) TA (yoy growth)
Post*ER	0.25*** (0.09)	-0.10** (0.04)	-0.39*** (0.09)	0.22*** (0.06)	-0.14*** (0.03)	-0.24*** (0.07)
Post	0.26 (0.55)	0.36 (0.27)	-1.33** (0.52)	-	-	-
ER	0.08 (0.45)	-0.47** (0.19)	0.03 (0.11)	-	-	-
Obs.	1,800	1,800	1,800	1,800	1,800	1,800
R2	0.02	0.16	0.07	-	-	-
Bank FE	No	No	No	Yes	Yes	Yes
Year FE	No	No	No	Yes	Yes	Yes

outcomes in % of TA // SE's clustered by bank

Results. Lend & Invest More.

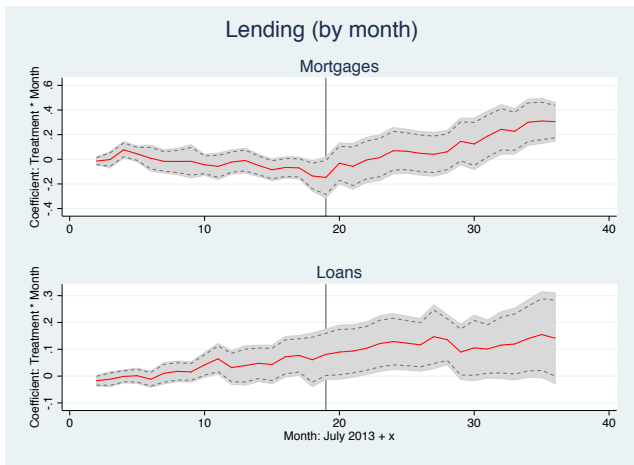
- ▶ 1 sd increase in $ER_i \Rightarrow 0.60pp$ [$0.68pp$] more **Loans/TA** [**Mortg/TA**]
- ▶ no such effect in response to **08/2011 rate cut**
- ▶ same picture for **Financial Assets/TA**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Loans	Mortg.	Loans (yoy growth)	Mortg. (yoy growth)	Loans	Mortg.	Loans	Mortg.
Post*T	0.14*** (0.02)	0.16*** (0.05)	0.62** (0.28)	0.07 (0.05)	0.11*** (0.02)	0.16*** (0.03)	-0.04 (0.03)	-0.03 (0.06)
T	ER	ER	ER	ER	ER+NIB	ER+NIB	ExR +NIB	ExR +NIB
Obs.	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

outcomes in % of TA // SE's clustered by bank

Results. Lend & Invest More.

$$Y_{i,t} = \alpha + \beta \cdot ER_i + \bar{\gamma} \cdot 1_{t=\{2013m8,\dots\}} + \delta_1 \cdot (ER_i \times 1_{t=2013m8}) + \delta_2 \cdot (ER_i \times 1_{t=2013m9}) + \dots + \varepsilon_{i,t}$$



outcomes in % of TA // SE's clustered by bank

Results. Maintain Profitability ...

- ▶ maintain profitability through **higher fees & mortgage rates**
- ▶ no comparable effect in response to **08/2011 rate cut**
- ▶ profitability of **WM banks** is more negatively affected

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	NII	Int. Earned	Net Fees	Mortg. 5 yrs	Mortg. 15 yrs	Mortg. Libor	Gross Profits (yoy growth)
Post*ER	0.01*** (0.00)	0.03*** (0.00)	0.17*** (0.05)	0.04*** (0.00)	0.06*** (0.01)	0.00 (0.00)	2.77*** (0.67)
Obs.	300	300	300	1,280	171	512	300
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

outcomes in % of TA // SE's clustered by bank

Results. ... through Risk-Taking.

- ▶ lending & higher rates seem to reflect **risk-taking**
- ▶ banks closer to **risk-weighted cap. req.** (despite higher CET1/TA)
- ▶ some evidence that **market power helps** to cut deposit rates & raise fees

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	RWA	Credit	Market	Op.	IRR:	IRR:	IRR:
	Density	Risk	Risk	Risk	Bank	Avg.	2y
Post*ER	0.35***	-0.03	0.02***	0.03*	0.10***	-0.02	0.18***
	(0.11)	(0.22)	(0.01)	(0.02)	(0.04)	(0.04)	(0.04)
Obs.	600	600	600	600	600	600	600
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

SE's clustered by bank

Robustness. Alternative Treatments.

- ▶ **Exposed Reserves + Net Interbank Borrowing**
 - ▶ *close substitutes & rapid transmission to IB market*
 - ▶ *more easily comparable to rate cut in 08/2011*
- ▶ **Distance of Deposit Rates in 12/2014 from Zero**
 - ▶ *Heider et al. (2017)*
 - ▶ *cannot use deposit ratio b/c of exemption threshold*
- ▶ **(Liquidity Requirements – SNB Exemption)/TA**
 - ▶ *on avg. 84% of HQLA = SNB Reserves*
 - ▶ *phase in by 2019; req. in 2016: 60% of NOs*
 - ▶ *exposed banks reduce their LCR*

Further Analyses.

- ▶ comparison with 2011 rate cut shows stronger expansion now
- ▶ Retail vs. Wealth Management Banks:
WM are more severely affected by negative rates
- ▶ role of ex post capitalization (“reversal rate”) inconclusive
banks are well-capitalized

Conclusion.

- ▶ (transmission to the **interbank market** as intended)
- ▶ evidence of **reduced size**, but (at least) maintained lending
- ▶ compensation of squeezed margins through **fees & risk-taking**
- ▶ possible conflict with **financial stability**:
capital regulation (risk-taking), LCR phase-in
- ▶ rate cut is **more expansionary** & implies more compensatory behaviour than cut in positive rate territory

Thank you for your attention.

