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Monetary Policy Spillover to Small Open Economies: Is the Transmission Different under Low Interest Rates?

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IBRN Initiative on Low Interest Rates and International Banking

Introduction and Literature

- Cross-border impacts of low or negative interest rate policies of core economies (US, Euro area, and UK) on lending in small open economies (Canada, Chile, Czech Republic, and Norway)
    - International bank lending channel (search for yield): core rate ↓ ⇒ funding from the core ↑ ⇒ lending in the periphery ↑
    - Portfolio channel of global banks: core rate ↓ ⇒ improving balance sheets of borrowers in the core ⇒ lending in the core ↑ ⇒ lending in the periphery ↓
- Cross-border transmission of monetary policy affects international banks' lending (di Giovanni et al., 2021; Cao and Dinger, 2022)
- Negative interest rates impact bank lending through policy rate pass-through and banks' ability to pass on costs (Basten and Mariathasan, 2018; Altavilla et al., 2021)
- Low and negative policy rates in core economies increase lending volumes and risk in SOEs, with financial stability implications (Jiménez et al., 2014; Cecchetti et al., 2020)

Similar Characteristics Shared By Countries

- Small, financially open, bank-oriented economies with global banks presence, exposed to international shocks
- Flexible exchange rates and inflation-targeting monetary policy regime

	Canada	Chile	Czech Republic	Norway
Credit to non-financial sector from all sectors to GDP	305%	188%	120%	284%
Credit to non-financial sector from banks to GDP	112%	88%	51%	80%
5-bank asset concentration	92%	77%	66%	64%
Share of foreign-owned banks in total assets	2%	44%	86%	29%
Share of cross-border liabilities in total assets	9%	12%	24%	35%
Share of cross-border assets in total assets	35%	6%	10%	21%
Share of loans to private sector in foreign currency	0%	11%	20%	8%
Year of inflation-targeting adoption	1991	1999	1998	2001
Currency regime	Freely floating	Managed floating	Managed floating	Freely floating
Capital mobility	"Open"	"Gate"	"Open"	"Open"

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Data and Measurements

- Confidential supervisory bank-level data, quarterly frequency, 2002–2019
- Over 95% of total assets covered across each country's banking system
- Both domestic-owned banks and foreign subsidiaries

	Czechia	Norway	Canada	Chile
No. of banks	21	226	9	15
No. of observations	1,353	8,904	639	885
Mean				
QoQ credit growth (%)				
Total loans	3.4	3.1	6.5	2.5
Mortgage loans	4.3	2.8	5.9	3.1
Consumer loans	4.9	0.7	6.4	3.1
Corporate loans	2.4	2.4	6.5	2.5
Bank controls (ratio in %)				
Deposits to liabilities	73.3	63.0	53.8	69.0
Capital to assets	10.4	10.0	5.6	8.0
Liquid assets	13.5	8.0	11.6	16.0
Securities assets	20.9	10.0	21.5	n.a.
Macro-financial controls (%)				
GDP growth	0.7	0.5	2.0	0.9
Inflation rate	0.5	0.5	1.9	0.8

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Core Country's Interest Rates
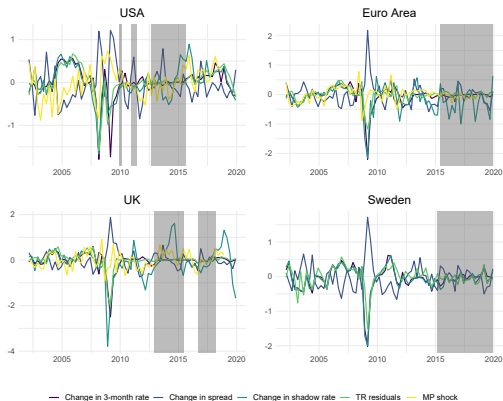
- **Baseline:** 3M interbank rate & YC slope
- **Alternatives:** shadow rate, SVAR residuals, TR residuals
- **LIRE periods** defined as 3M interbank rate below its 1st quartile

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Empirical Strategy

$$\Delta Y_{b,t} = \beta_1^c \Delta r_t^c + \beta_2^c \Delta Spread_t^c + \beta_3^c Low_t^c + \delta_1^c(\Delta r_t^c \times Low_t^c) + \\ \delta_2^c(\Delta Spread_t^c \times Low_t^c) + \gamma_1 X_{b,t-1} + \gamma_2 Z_{t-1} + f_b + \epsilon_{b,t}$$

- $\Delta Y_{b,t}$ is the QoQ log-change in lending of bank b at time t
- Δr_t^c is the QoQ change in interest rate in core country c
- $\Delta Spread_t^c$ is the QoQ change in spread (10Y government bond yield $-$ 3M interbank rate) in core country c
- Low_t^c dummy variable (3M interbank rate below its 1st quartile)
- $X_{b,t-1}$ are bank-specific controls, Z_{t-1} are macroeconomic controls, and f_b are bank fixed effects

- Estimated separately for each core-SOE country pair
- Due to confidentiality, data cannot be pooled

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Baseline Results

	(1) US	(2) EA	(3) UK	(4) US	(5) EA	(6) UK	(7) SE
		Canada			**Chile**		
Δr_t^c	**2.98****	**3.73***	**4.46****	0.47	**2.18*****	**1.36****	
	(1.45)	**(1.97)**	**(1.94)**	(0.68)	**(0.56)**	**(0.62)**	
$\Delta Spread_t^c$	2.00	0.54	2.07	-0.16	0.54	**-0.83*****	
	(1.32)	(1.56)	(1.57)	(0.28)	(0.44)	**(0.26)**	
$\Delta r_t^c * Low_t^c$	**-38.74***	-18.86	-10.07	-8.13	10.16	-1.67	
	(21.93)	(14.35)	(10.22)	(8.60)	(12.26)	(2.97)	
$\Delta Spread_t^c * Low_t^c$	-3.94	-2.73	-2.13	-0.51	-0.75	0.21	
	(2.42)	(2.31)	(2.50)	(1.05)	(0.91)	(0.95)	
		Czech Republic			**Norway**		
Δr_t^c	0.06	**1.82*****	0.83	**2.68*****	**1.38*****	**4.11*****	**2.75*****
	(0.47)	**(0.59)**	(0.56)	**(0.38)**	**(0.43)**	**(0.50)**	**(0.46)**
$\Delta Spread_t^c$	0.03	**1.35*****	0.63	**1.32*****	0.32	**1.22*****	**1.71*****
	(0.45)	**(0.50)**	(0.57)	**(0.35)**	(0.30)	**(0.42)**	**(0.40)**
$\Delta r_t^c * Low_t^c$	-5.98	1.55	-3.83	**-7.26*****	-0.97	-7.63	**-5.70****
	(6.58)	(7.50)	(3.02)	**(2.27)**	(5.31)	(6.88)	**(2.62)**
$\Delta Spread_t^c * Low_t^c$	0.13	**-2.46****	0.08	-1.28	0.03	-0.28	**-1.55****
	(1.00)	**(1.11)**	(0.95)	(0.92)	(0.83)	(0.94)	**(0.68)**

- Positive effect in "normal" times mirrored by negative effect in low interest rate periods
- Spillovers via both short-term and long-term rates and different core-periphery country pairs

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The Role of International Banks

	Canada US	Canada EA	Canada UK	Chile US	Chile EA	Chile UK	Czechia US	Czechia EA	Czechia UK	Norway US	Norway EA	Norway UK	Norway SE
Δr_t^c		++	+		+++	++				+++	+++	+++	+++
$\Delta r_t^c * F_b^c$											++		+++
$\Delta r_t^c * Low_t^c$	-							-					- -
$\Delta r_t^c * Low_t^c * F_b^c$			-					++				- -	-
$\Delta Spread_t^c$					++			+		+++	+++	+++	
$\Delta Spread_t^c * F_b^c$					- - -								+
$\Delta Spread_t^c * Low_t^c$				- - -	- - -			- -				- - -	
$\Delta Spread_t^c * Low_t^c * F_b^c$				+++	+++	+++			+				

- F_b^c: Indicates if bank b has a related entity (branch, subsidiary, or HQ) in core country c.
- Low interest rate periods: In Norway, the negative effect of SE and UK short rates intensifies for banks that have a family member in SE or UK (internal capital market channel)
  - Mixed messages for other countries, with effects going often in opposite direction
- "Normal" times: The effect is mostly statistically insignificant
  - Possible reasons: (1) Limited bank variation for triple interaction. (2) Interbank markets can substitute for internal liquidity shifting

Bank Lending Across Loan Categories

		Canada			Chile			Czechia			Norway			
		US	EA	UK	US	EA	UK	US	EA	UK	US	EA	UK	SE
Δr_t^c	Mortg.	++	++	+++					++			+++	+++	+++
	Cons.					+++	+	++	++		+++	+		
	Firm		++			++		++	++	++		+++	+++	+++
$\Delta r_t^c * Low_t^c$	Mortg.	-	- - -	-	- -									- -
	Cons.						-						- - -	- -
	Firm				-									-
$\Delta Spread_t^c$	Mortg.			+				+						
	Cons.					+							++	
	Firm								++		+++	+		++
$\Delta Spread_t^c * Low_t^c$	Mortg.	- -									-			- -
	Cons.					-						+++		
	Firm						+							

- Low interest rate periods: the negative effect seems to be passed mostly through mortgages and consumer loans
  - Search-for-yield channel dominates (higher IR margin)
- "Normal" times: transmission works through all loan categories, with corporate loans being most affected in all countries
  - Foreign currency loans used by firms as natural hedge; lower IR fixation of firm loans – faster transmission

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Implications for Financial Stability

		Canada			Chile			Czechia			Norway			
		US	EA	UK	US	EA	UK	US	EA	UK	US	EA	UK	SE
Δr_t^c	Z-score	+++	+++	+++				--			+++	+++	++	++
	sd(ROA)										---	---		---
	NPL	---	---				-		++		---	---		--
$\Delta r_t^c * Low_t^c$	Z-score		+++		+++	+		+			+++	+++	+++	
	sd(ROA)		---		---							---		
	NPL	--	---	---					--					
$\Delta Spread_t^c$	Z-score								--	---	---	---	---	---
	sd(ROA)												+++	+++
	NPL		++	++				---		---		---		
$\Delta Spread_t^c * Low_t^c$	Z-score		--								+++	---	+++	
	sd(ROA)											---		
	NPL							+++	+++	++		++		

- We replace lending with three different bank risk measures: z-score, standard deviation of ROA, and NPL

- Expansionary monetary policy in core economies is associated with higher bank risk in SOEs, especially when interest rates in the core economies are low or negative
  - A decrease in core countries' policy rates is associated with lower z-score (higher bank risk), higher sd(ROA), and higher NPL
  - Spillovers mainly via short-term interest rates

Further Specifications

- Undertaking multiple sensitivity checks results in quantitatively and qualitatively similar findings:
  - Persistently low interest rates: The duration of low policy rates has significant implications
    - Utilization of $Low\_for\_long^c$ variable - representing consecutive quarters with Low^c dummy equals one
    - As low policy rates persist in core countries, lending becomes more subdued in SOEs
    - Impact seen through spread/YC slope
  - Alternative monetary policy indicators: Inclusion of shadow rates, MP shocks
  - Alternative sets of control variables: Additional macro-level and bank-level controls, controls for the core countries, SOEs' house price growth, banks' balance sheet structure, risk, and size
  - Alternative estimations: Variations such as dynamic model, YoY instead of QoQ, different winsorization schemes, richer lag structure, and symmetry of easing and tightening MP actions

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Conclusions and Policy Implications

- Monetary policy spillovers from core countries to SOEs:
  - Low interest rates: Further expansionary monetary policy shocks from core lead to increased lending in periphery - international bank lending channel.
  - High interest rates: Expansionary monetary policy in core may result in shrinking lending volumes in periphery - portfolio channel.

- Policy implications: Central banks in SOEs should monitor potential regime switches between high and low interest rate periods in core countries.
  - Monetary policy expansions in core may initially tighten credit supply in periphery.
  - With sufficiently low interest rates in core, credit supply in periphery can start increasing.
  - Reverse likely to occur when core begins tightening monetary policy.

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Thank You for Your Attention

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Figure 1: Baseline monetary policy indicators vs. lending growth

(A) QoQ lending growth vs. change in 3-month rate

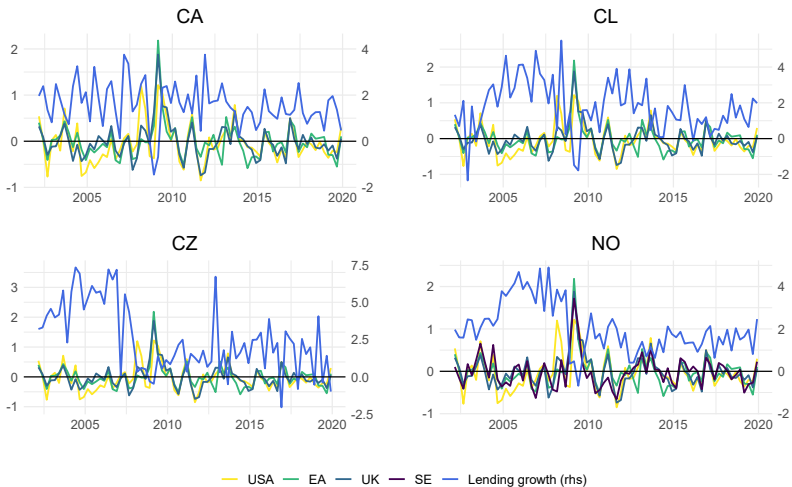USA — EA — UK — SE — Lending growth (rhs)
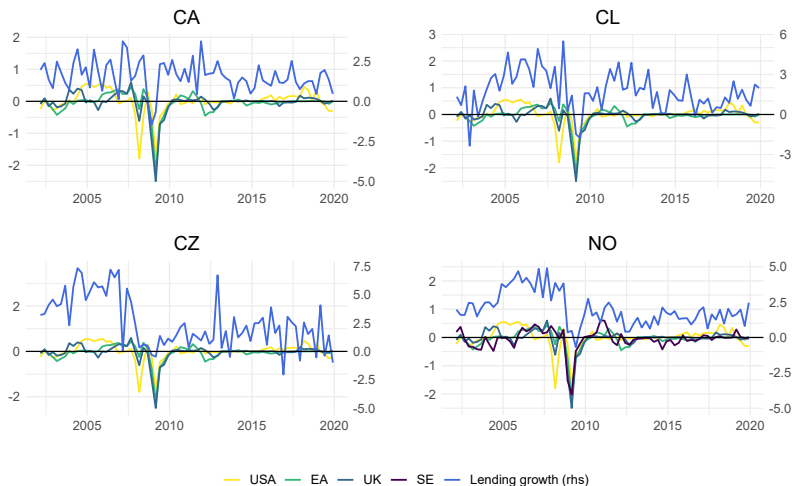
(B) QoQ lending growth vs. change in spread

Figure 2: Baseline and alternative monetary policy indicators