
The impact of international swap lines on stock returns of banks in emerging markets

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Literature shows that swap lines impacted interest rates and CDS spreads.

Method: ***Country-level*** regressions using a cross-country panel with a swap dummy plus controls

Assumption: all banks are affected equally. Cannot identify *liquidity* or *financial stability* concerns

- Aizenmann and Pasricha (2010)
- Baba and Shim (2010)
- Moessner and Allen (2013)

Recent studies study the impact of unconventional policies on firms for a particular country

Method: *Firm-level* regressions for country case study

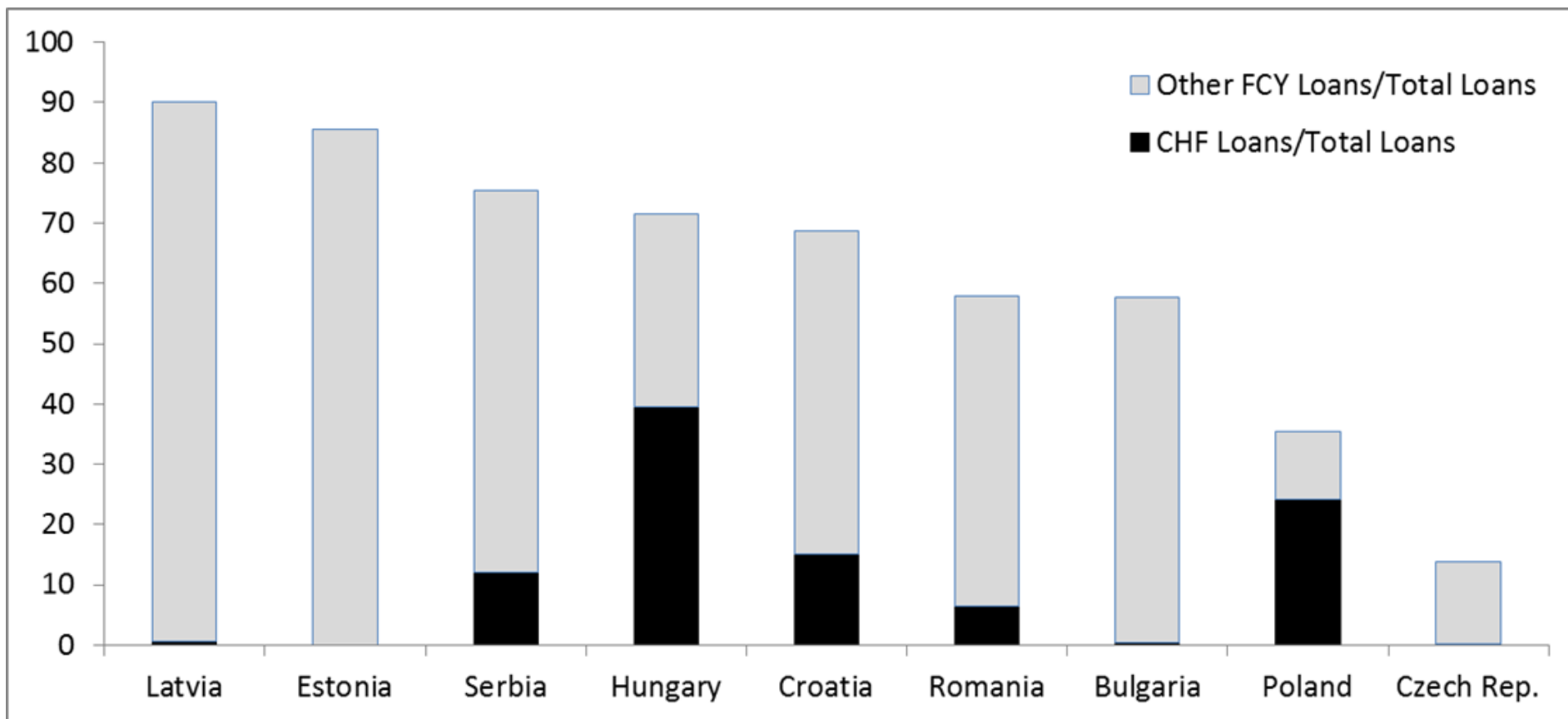
- Alfaro et al (2014) Brazilian capital controls and stock market performance of exporters
- Chodorow-Reich (2014) US QE and financial institutions' risk taking

This paper's objective:

Examine the response of stock prices for 47 banks in 15 **Central and Eastern European** (CEE) countries to international swap lines between the Swiss National Bank (SNB) and other central banks.

Examine the importance of **bank characteristics**: foreign currency exposure, funding structure, ownership, capital structure

Starting point: High prevalence of foreign currency loans to the non-banking sector as of 2009:Q1



Source: SNB's CHF Lending Monitor

Note: CHF, Swiss francs; FCY, foreign currency.

SNB swap line agreements in EUR/CHF

–Between the SNB and the ECB

from 20.October.2008 to 25.January.2010

–Between the SNB and the National Bank of Poland (NBP)

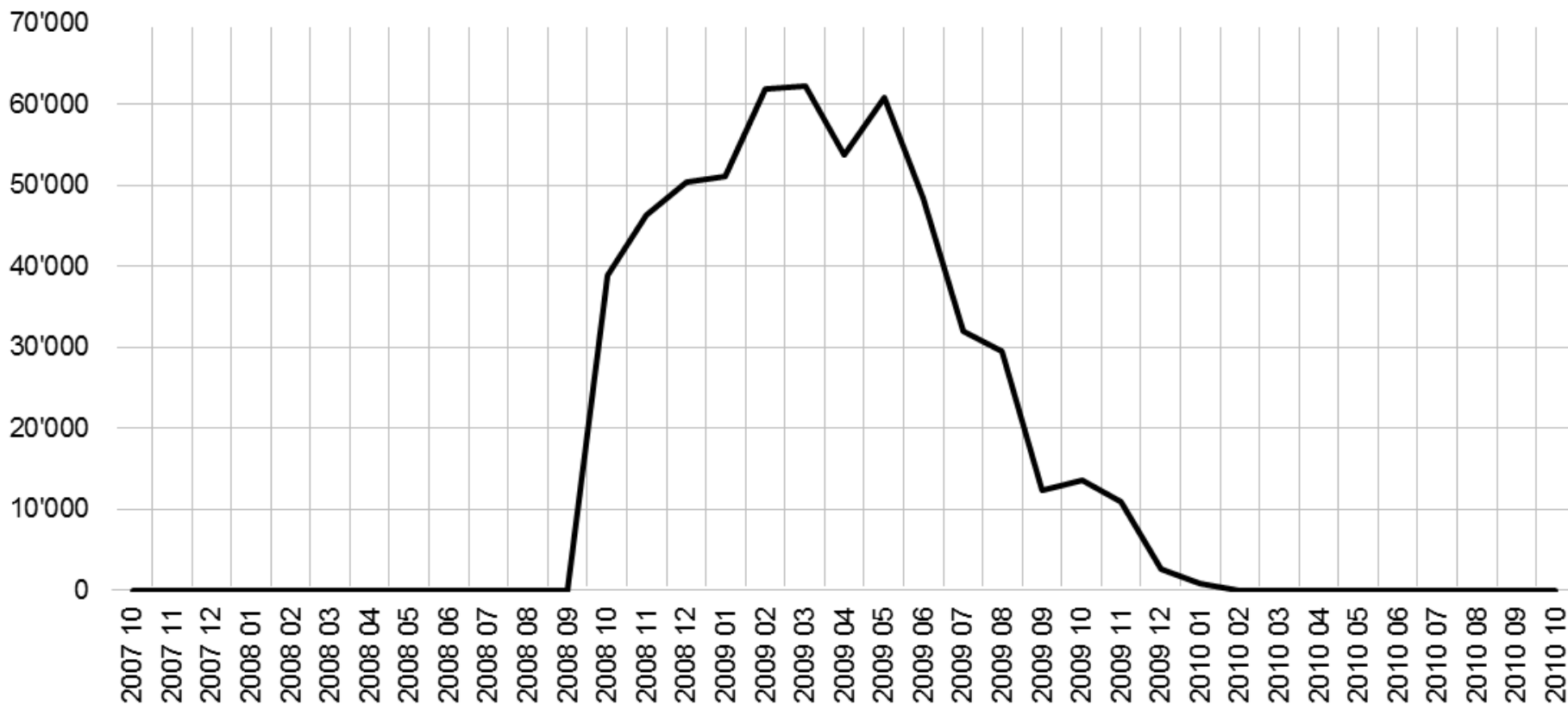
from 17.November.2008 to 25.January.2010

–Between the SNB and the National Bank of Hungary (MNB)

from 2.February.2009 to 25.January.2010

Balances from Swap Transactions against the CHF

in mio CHF



Source: SNB

Bank data

- Balance sheet information for **47** commercial banks in 15 CEE countries from January 3, 2005 to December 31, 2012.
- 2012 BankScope database – 462 active CEE banks
- 260 banks have detailed info for at least 5 years
- 92 banks are publicly traded
- Hand collect information on foreign currency exposure leaves 47 banks (18 local and 29 foreign)

Empirical Setup: Country-level regression

$$\Delta p_{i,j,t} = \beta_1 SWAP_{j,t}^{SNB|X} + \beta_2 SwapDate_t^{SNB|X} + \phi_k \Delta p_{i,j,t-k} + \alpha other_t + \vartheta_j + \mu_t + \epsilon_{i,j,t}$$

- Δp_{ijt} = change in stock price of bank i in country j at time t
- $SWAP_{jt}^{SNB|X} = SwapCountry_j^{SNB|X} SwapDate_t^{SNB|X} = 1$ for the period and country when the swap lines with country or group X are active ; $\beta_1 > 0$
- β_2 measures spillover to CEE countries without a swap line
- $other_t$ = controls (VIX, EUR/CHF return, European bank stock index)
- Country and quarterly effects

Control variables to isolate swap line impact

VIX: aggregate financial market volatility

EUR/CHF return: fluctuations in the foreign currency constitute a risk for banks from emerging market economies

STOXX index of 600 European banks

Baseline results of country-level regression

SNB MNB	0.2899***			
	(0.0623)			
MNB – Date	0.2864***			
	(0.0976)			
SNB NBP		0.1761***		
		(0.0354)		
NBP – Date		0.2929***		
		(0.0952)		
SNB-CEE			0.2155***	
			(0.0436)	
CEE – Date			0.2794***	
			(0.0924)	
SNB ECB				-0.0414
				(0.0502)
ECB – Date				0.4892***
				(0.1523)
R-squared	0.048	0.048	0.048	0.048

Interpretation

SNB | MNB positive, significant : banks in Hungary benefited from the swap line between the SNB and the MNB

Stock prices of Hungarian banks increased **daily on average 0.29% more** than the CEE average during the period when the swap lines were active. Accumulated **return of 7.25 %**

MNB– date positive, significant: CEE banks outside of Hungary also benefited from the swap line between the SNB and the MNB

Similar results for the SNB | NBP and **SNB | CEE** regressions (where Hungary and Poland are pooled together due to the low # of banks in Hungary).

Coefficients of the control variables in the baseline regression

Bank performance (Lag 1)	-7.3347**	-7.3264**	-7.2932**	-7.3237**
	(3.1066)	(3.1086)	(3.1118)	(3.1078)
Bank performance (Lag 2)	-3.1197***	-3.1109***	-3.0819***	-3.1089***
	(0.8593)	(0.8602)	(0.8608)	(0.8581)
Bank performance (Lag 3)	-1.4538*	-1.4459*	-1.4305*	-1.4438*
	(0.8420)	(0.8383)	(0.8376)	(0.8401)
VIX	-0.0242***	-0.0251***	-0.0247***	-0.0241***
	(0.0054)	(0.0055)	(0.0055)	(0.0054)
Exchange rate (CHF/EUR) return	18.8622***	18.7436***	18.9286***	18.8630***
	(3.3138)	(3.2947)	(3.3183)	(3.3137)
European banking systems performance	17.0030***	16.9765***	17.0080***	17.0028***
	(5.9493)	(5.9441)	(5.9511)	(5.9493)

Robustness check with different sample periods

Limiting the sample period to

- After Lehman files for bankruptcy on 15 Sept 2008
- After Lehman files for bankruptcy on 15 Sept 2008 and before Greece officially requests financial support on 23 April 2010
- After 1 March 2009 (30 days after the swaps were introduced)
- Finding: Results in the baseline regression are **robust**
- **But** in the last subsample, date dummy loses its significance: **spillovers** to other countries were **temporary**

Robustness check different sample periods

	Full sample	After 15 sep 2008	Between 15 sep 2008 and 23 apr 2010	30 days after the Swap dates
SNB CEE	0.2155***	0.2141***	0.2023***	0.3658**
	(0.0436)	(0.0428)	(0.0419)	(0.1657)
CEE – Date	0.2794***	0.2861***	0.2548***	0.1550
	(0.0924)	(0.0935)	(0.0832)	(0.1956)
VIX	-0.0242***	-0.0205***	-0.0165**	-0.0279***
	(0.0054)	(0.0052)	(0.0084)	(0.0087)
Exchange rate (CHF/EUR) return	18.8622***	15.4017***	37.9272***	0.5723***
	(3.3138)	(2.3985)	(10.3117)	(0.1548)
European banking systems performance	17.0030***	16.6209***	18.3878***	0.1894***
	(5.9493)	(5.7324)	(6.1878)	(0.0625)

Robustness check: announcement effect

Introduce dummy variables that take the value 1 between the announcement of the swap line agreement and the time when they were first effective.

Finding: **No signaling channel present.** Hungarian and Polish banks benefited from swap line access over the full period.

Robustness check signalling effect

SNB CEE	0.2157***			
	(0.0436)			
CEE – Date	0.2870***			
	(0.0956)			
SNB ECB		-0.0414		
		(0.0502)		
ECB – Date		0.4892***		
		(0.1523)		
SNB MNB			0.2899***	
			(0.0623)	
MNB – Date			0.2875***	
			(0.0972)	
SNB- NBP				0.1761***
				(0.0353)
NBP – Date				0.3010***
				(0.0992)
CEE – Signal	0.2979			
	(0.1904)			
ECB – Signal		0.1196		
		(0.5083)		
MNB – Signal			0.2796*	
			(0.1537)	
NBP – Signal				0.3171
				(0.2185)

Robustness check: other swap agreements

Control for the other SNB swap lines with major central banks

- SNB-ECB swap line in EUR/CHF
- SNB swap line with major central banks in USD
- SNB swap line with major central banks in various currencies

Finding: SNB | CEE remains positive and significant. Only banks in countries with **direct access to the swap line** benefited.

Robustness check other swap lines

SNB CEE	0.2602***	0.2601***	0.2435***	0.2487***
	(0.0441)	(0.0440)	(0.0357)	(0.0359)
SNB ECB	0.0695	0.0692*		
	(0.0441)	(0.0414)		
SNB USD	0.0998		0.0577	
	(0.1237)		(0.1160)	
SNB CBs	-0.1069***			-0.0557
	(0.0297)			(0.0517)

Bank-level regression

- Added variables to the baseline country-level regression:
 - **bank characteristics**
 - interaction term between the swap dummy and bank characteristics
- If the interaction term is significant and positive:
individual banks with particular characteristics benefited from swap lines more than the country average
 - i.e. **banks did not respond uniformly** to liquidity provision

Testable propositions regarding bank characteristics

- 1. FX Exposure:** Banks with high levels of foreign currency loans benefit more from swap lines than do banks with low levels of foreign currency loans
- 2. Funding Structure:** Banks with a higher dependence of short-term funding are more reliant on swap lines
- 3. Ownership:** Foreign-owned banks are less reliant on swap lines than are domestic banks
- 4. Capital Structure:** Banks with a weak capital structure are reliant on swap lines

Bank characteristics

1. Foreign currency exposure
 - Swiss franc assets / total assets
 - foreign currency assets / total assets
 - net Swiss franc assets / total assets
 - net foreign currency assets / total assets
2. Funding fragility
 - Deposits from other banks + short term borrowing / total deposits
3. Ownership
 - Dummy = 1 if foreign ownership > 50%
 - Dummy = 1 if subsidiary of an international banking group
4. Capital structure
 - Total capital ratio: Tier 1 + 2 capital / risk adjusted assets
 - Tier 1 ratio: Tier 1 capital / risk adjusted assets

Foreign currency exposure matters less

SNB CEE	0.2973***	0.1798***	0.3060***	0.2485***
	(0.0274)	(0.0265)	(0.0327)	(0.0375)
Share of assets in CHF	-0.0165			
	(0.0897)			
SNB CEE * Share of assets in CHF	0.0063			
	(0.1146)			
Share of assets in foreign currencies		-0.0327*		
		(0.0178)		
SNB CEE * Share of assets in foreign currencies		0.1631***		
		(0.0225)		
Net position in CHF			-0.0328	
			(0.1015)	
SNB CEE *			-0.0953	
Net position in CHF			(0.1023)	
Net position in foreign currencies				0.0622
				(0.0690)
SNB CEE * Net position in foreign currencies				-0.0769
				(0.0603)

Funding structure matters

SNB CEE	0.2149***	0.1338***
	(0.0296)	(0.0322)
Funding fragility		-0.1569***
		(0.0539)
SNB CEE * Funding fragility		0.2877***
		(0.0919)

Ownership type matters for fx liquidity provision

SNB CEE	0.3198***	0.2433***
	(0.0727)	(0.0338)
Foreign ownership	0.0324	
	(0.0208)	
SNB CEE * Foreign ownership	-0.1040*	
	(0.0729)	
Member of Int. Banking group		0.0132
		(0.0178)
SNB CEE * Member of Int. Banking group		0.0225*
		(0.0212)

Capital structure matters for financial stability

SNB CEE	0.5691^{***}	0.4301^{***}
	(0.1378)	(0.0734)
Total capital ratio	0.0015	
	(0.0025)	
SNB CEE * Total capital ratio	-0.0243^{**}	
	(0.0120)	
Tier 1 capital ratio		0.0021
		(0.0019)
SNB CEE * Tier 1 capital ratio		-0.0148^{**}
		(0.0059)

Final remarks

- First study to examine the impact of swap lines on banks across countries
 - Stock prices of CEE banks responded strongly to SNB swap lines
 - Gains from swap lines beyond national jurisdictions were limited
 - The transmission of liquidity provision through swap lines is different from the one of QE

Final remarks

- Banks with different characteristics responded differently to swap lines
 - The effectiveness of swap lines is partially dependent on the structure of the banking system
- Local and weakly capitalized banks responded the strongest to SNB swap lines
 - liquidity provision function for national jurisdictions (domestic/local banks)
 - Swap lines also took on functions linked to financial stability (weakly capitalized banks)