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Global spillovers of macroprudential interventions

Matias Ossandon Busch

CEMLA/IWH

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II Financial Stability Course - BdE/CEMLA

Macropru spillovers - Introduction

This talk is (mostly) based on two sources.

- ECB report by Kok and Reinhardt (2020).
  - Report of the Financial Stability Committee Task Force on Cross-Border Spillover Effects of Macroprudential Measures.
  - Innitiative by European central banks.
- International Banking Research Network report by Buch and Goldberg (2017).
  - Summary report of the IBRN on macropru cross-border spillovers.
  - Summarizes 15 country-level studies using a comparable methodological approach.
- An updated overview of the field can be found in the International Banking Library.

Macropru spillovers - Introduction

A striking fact about recent decades in international finance in the rise of international banking.

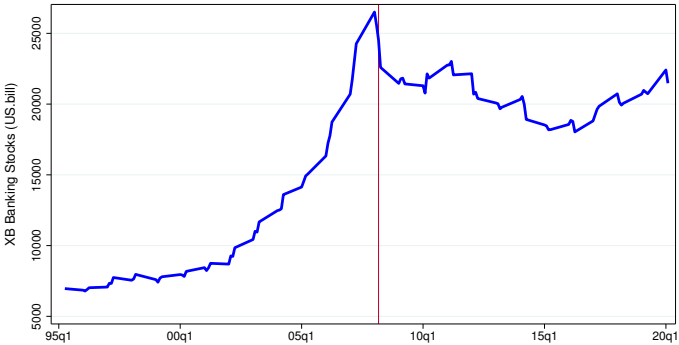
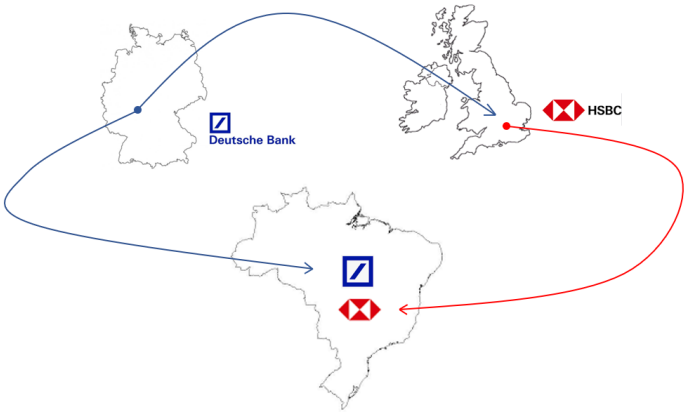


Fig.1: *Stock of global cross-border loans reported by the BIS reporting countries. Series expressed in US$ billions. Source: BIS Locational Banking Statistics.*

- Macropru cross-border spillovers operate through an interconnected financial system.

Macropru spillovers - Introduction

The (unintended) effects of macropru interventions that are triggered and funnelled via integrated financial markets.



- If the CCyB in the UK becomes tighter, will HSBC lend less to Brazilian borrowers?

Macropru spillovers - Introduction

Content of the talk

- Analytical concepts.
  - Theoretical rationales of XB spillovers.
  - Spillovers: direction and typologies.
  - Evidence: What we know (and what we don't!).
- Research approaches in macropru XB spillovers.
  - Methodological approaches.
  - Supply vs. demand in bank-level studies.
  - Data sources.

Analytical concepts

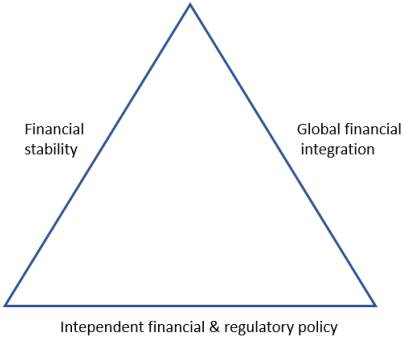
Theoretical rationales of XB spillovers

- Macroprudential policies aim at mitigating systemic risks in financial markets.
  - Operationalization: bank capital requirements, counterparty concentration limits, loan-to-value ratios, reserve requirements.
  - Target: bank lending growth, risk exposures, interconnectedness.

- The global nature of financial institutions challenges the effectiveness of domestic macropru interventions.
  - ... moving lending outside the regulatory perimeter.
  - ... shifts to non-covered entities (i.e. shadow banks).
  - ... changing geographical patterns of lending.

Analytical concepts

Theoretical rationales of XB spillovers



- A trilemma affects our understanding of macropru effectiveness (Obstfeld, 2014).
  - Countries attempt to regulate banks operating in global markets.
  - But... regulatory differences across countries opens the scope for global spillovers!

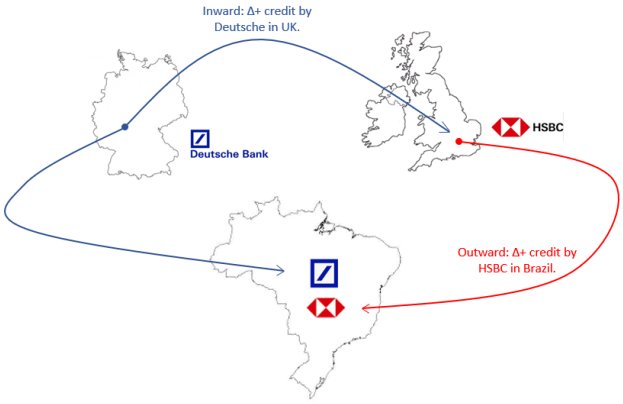
Analytical concepts

Are spillovers explained by regulatory arbitrage?

- Yes, as regulatory changes in one jurisdiction may lead banks to capitalize on loopholes channelled via market integration (see Buch and Goldberg, 2017).
  - Example: banks relocate the source country of lending, swapping local lending by XB lending from abroad.
- But spillovers can also reflect changing credit supply/demand conditions and represent 'efficient' market outcomes.
  - Domestic CCyB changes may tighten interest margins and lead to a realocation of lending abroad.

Analytical concepts

Inward vs. outward spillovers.



- Inward vs. outward spillovers are two sides of the same coin: both reflect a global relocation of capital driven by macropru interventions.

Analytical concepts

Inward vs. outward spillovers (cont'd)

- Outward spillovers capture the effect of domestic policies on banks' foreign activities.
  - These spillovers can have second-order effects i.e. on the domestic credit market.
- Inward spillovers represent domestic effects of foreign or domestic policies channelled through financial integration.
  - Case 1: inward effect of foreign policies affecting banks active in the domestic country.
  - Case 2: inward effect of domestic policies that lead to a relocation of capital towards the domestic country by foreign banks.

Analytical concepts

Global banks' organizational structure: branches and subsidiaries (subs)

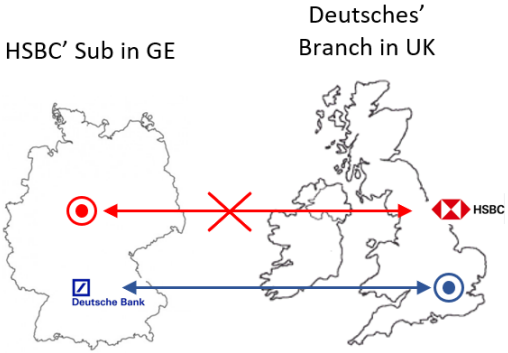
	Subsidiary	Branch
Deposit insurer of the home unit	Home	Home
Deposit insurer of the foreign unit	Foreign	Home
Supervisor of the home unit	Home	Home
Supervisor of the foreign unit	Foreign	Home
Home unit responsible for foreign unit's liabilities	No	Yes
Foreign unit responsible for home unit's liabilities	Yes	Yes

Tab.1: *Regulatory differences between branches and subsidiaries. Source: Calzolari et al., 2019.*

- The potential of spillovers is conditional on the degree of centralization of global banks' structures, with branches-oriented structures being more prone to trigger spillovers.

Analytical concepts

Global banks' organizational structure: branches and subsidiaries (cont'd)



- Subs have their own banking license and capital, being partially ring-fenced.
- Branches share their liabilities and assets with the home unit.

Analytical concepts

Global banks' organizational structure: branches and subsidiaries (cont'd)

- Dalen and Olsen (2003) describe theoretically how spillovers can emerge in branches' and subs' structures.
  - With uncoordinated regulation, regulators increase reserve requirements (RR) to protect countries against private asset quality information.
  - Tighter RR in country A lead to a portfolio reallocation in which credit quality in country B decreases.
  - Branches reduce regulatory arbitrage incentives, but...
  - ... they create a home-bias distortion as the home country does not internalize losses from a bankruptcy in the host country.

Analytical concepts

Global banks' organizational structure: branches and subsidiaries (cont'd)

- Policy responses to prevent spillovers tend to move towards supranational supervision (i.e. ESM in Europe, Basel III).
- However, organizational forms can be endogenous to giving up national supervision, giving rise to new spillover channels!
- Calzolari et al. (2019) present a theorical model in this direction:
  - With a subs structure, a *conditioning effect* creates a positive externality, as home country regulators benefit from host country monitoring.
  - As long as this *conditioning effect* dominates, a supranational regulation increases the monitoring of subs, leading banks to prefer branches.
  - This preference for branches opens the scope for inward spillovers of macropru!

Analytical concepts

Spillover channels: a (non-comprehensive) typology

- Bank lending channel (see, i.e., Tripathy, 2020).
  - Changes in domestic loan supply driven by a global reaction to either domestic or foreign macropru policies.
- Risk-taking channel (see, i.e., Ongena et al., 2012).
  - Tighter domestic policies can lead banks to extend loans abroad to more opaque firms.
- Non-bank channel (see, i.e., Goodhart et al., 2013).
  - Migration to activities outside the regulatory perimeter (Shadow banks, Fintech).
  - Spillovers can take the form of a substitution of bank for market-based finance.

Analytical concepts

Spillover channels: a (non-comprehensive) typology (cont'd)

- Trade channel (see, i.e., Darracq Pariès et al., 2019).
  - Policies may impact the real activity affecting trade flows.
  - An impact on trade finance in the exporting country can also affect importing firms' funding conditions.
- Financial contagion channel (see, i.e., Roncoroni et al., 2019).
  - The increasing complexity and interconnectedness of financial systems can trigger intra-financial spillovers.
- Macroeconomic spillovers.
  - Macro-financial spillovers can be triggered by exchange rates and asset prices.

Evidence on macropru spillovers

What do we know?

- Evidence from macro data.

  Roncoroni et al. (2019); Darracq Pariès et al. (2019); Kang et al. (2017).

  ⇒ Domestic leaks in domestic macropru policy driven by foreign banks.
  ⇒ Inward spillovers triggered by policies targeting local banks.
  ⇒ Outward spillovers triggered by policies targeting borrowers.

- Evidence from micro data.

  Buch and Goldberg (2017); Aiyar et al. (2014b); Aiyar et al. (2014a); Danisewicz et al. (2017); Becker et al. (2017).

  ⇒ Macropru effectiveness is affected by foreign banks' activities.
  ⇒ Credit substitution is strongly related to banks' ownership structures.
  ⇒ Liquidity management on a consolidated basis explains the size of the spillovers.

Evidence on macropru spillovers

What don´t we know?

- Spillovers from banking activities different than credit.
  - ⇒ Policies targeting bank credit may also affect non-credit activities.
  - ⇒ Little is known, i.e., about spillovers via bonds, equity, or derivatives markets.

- Spillovers via non-bank financial channels.
  - ⇒ Banks may circumvent regulation via migrating to shadow banking.
  - ⇒ Non-financial firms may react by activating intra-firm credit markets.

- Spillovers via real-sector cross-border linkages.
  - ⇒ These spillovers operate via supply chain and trade-finance channels.

Research approaches in macropru XB spillovers

Sum of methodological approaches

- Structural models based on theoretical approaches and simulations.
  - Applications: industrial economics, agent-based models, DSGE models.
- Contagion and stress-test models.
  - Empirical studies with granular data.
  - Stress-test models can look at macro-feedback effects.
- Microeconometric empirical studies.
  - Macro-view: inward/outward spillovers using cross-country panel data.
  - Micro-view: quasi-experimental studies using loan and bank-level data.

Research approaches in macropru XB spillovers

Cross-country study by Cerutti, Claessens, and Laeven (2017).

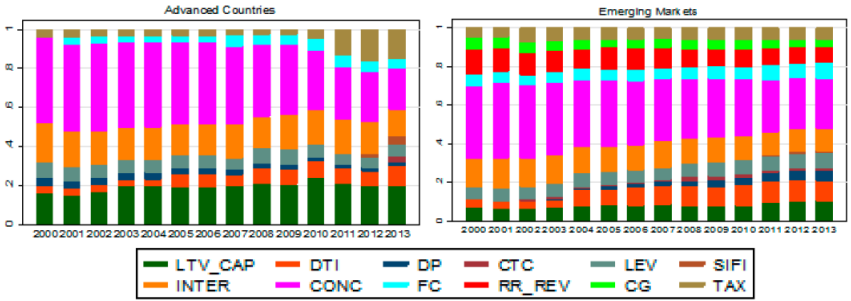


Fig.2: *Use of macroprudential tools by advanced (left) and emerging (right) economies. Source: Cerutti et al. (2017).*

- Differential use of macropru tools by advanced vs. emerging economies.
- Effect on credit is weaker in bust periods and in open, financially-developed economies.

Research on macropru spillovers

Quasi-experimental study by Aiyar, Calomiris, and coauthors (2014).

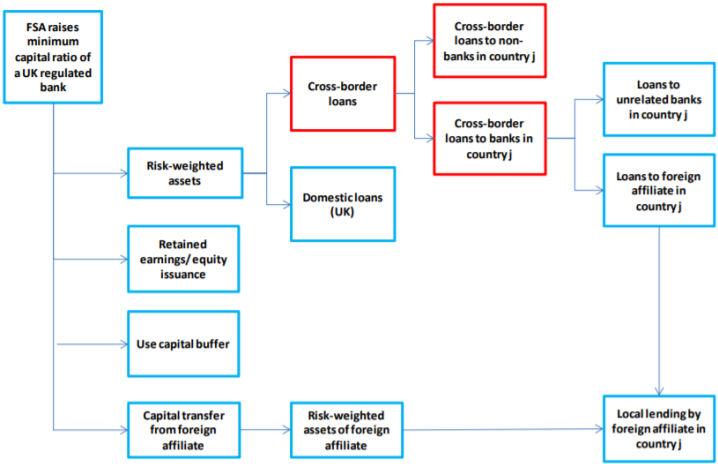


Fig.3: *Macropru spillovers via XB banking. Source: Aiyar et al. (2014a).*

Research on macropru spillovers

Quasi-experimental study by Aiyar, Calomiris, and coauthors (2014).

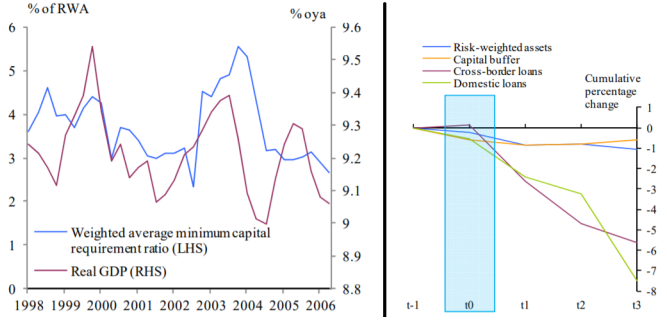


Fig.4: *Time-varying capital requirements in the UK (left) and summary of spillovers via XB banking (right).*
Source: Aiyar et al. (2014a).

- Capital requirements increase in boom, and decrease in bust.
- Effect is stronger on XB credits vis-á-vis banks vs. non-banks!

Research on macropru spillovers

Supply vs. demand in bank-level studies.

- A key challenge in empirical studies is to separate credit demand from supply effects.
  - ... a negative coefficient on Macropru can represent negative supply shocks driven by the policy, or...
  - ... an unobserved lower demand for credit from borrowers' side!
- Aiyar et al. (2014a) approach this challenge by comparing XB credit from the UK in countries with multiple bank relationships with UK banks.

$$\Delta l_{ijt} = \sum_{k=0}^{K} \beta_{t-k} \Delta KR_{it-k} + \Psi G_{it} + \Lambda F_{jt} + e_{ijt}$$

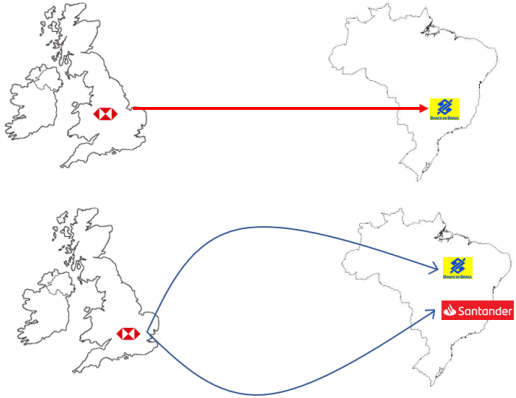
Research on macropru spillovers

Supply vs. demand in bank-level studies.

- In this example, HSBC has a single bank relationship with Brazil via BB.
- If a researcher observes a drop in credit to Banco do Brasil (BB) following a macropru intervention in the UK...
- ... she cannot observe whether the drop is driven by less supply from HSBC or less demand from BB.

Research on macropru spillovers

Supply vs. demand in bank-level studies.



- A solution is to focus on multiple bank-relationships.
- Then, country-time FE absorb common demand shocks affecting all lender-borrower relationships in a destination country.

Research on macropru spillovers

Data sources

- Macroprudential policy datasets.
  - Cerutti et al. (2017): country-level data for 64 countries (2000-2014). 6 policy groups.
  - Budnik and Kleibl (2018): Macropru Evaluation Database of the ECB (1995-2018).
  - Kuttner and Shim (2013): BIS database on macropru measures in the housing market.
- Capital (banking) XB flows datasets.
  - BIS International Banking Statistics: bilateral positions across countries (aprox. 2000-2020).
  - IMF International Financial Statistics; ECB balance sheet item (BSI) statistics.
  - Bank-level data: regulatory call reports (BankScope, Dealscan for syndicated loans).

Final remarks

- Global macropru spillovers refer to the consequences of policy interventions in other jurisdictions.
  - Financial cross-border linkages are central in the transmission mechanism.
  - Multiple methodological approaches are being used.
  - While more public data is available, research at the frontier strongly relies on (confidential) regulatory data.
- Ample scope for policy and research work.
  - Most of our knowledge is focused on spillovers driven by banks; little is known about non-banking and supply-chain channels.
  - International innitiatives are key to stocktake comparable evidence.

Literature

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