Le Pont de Londres: interactions between monetary and prudential policies in cross-border lending

Matthieu Bussière, Robert Hills, Simon Lloyd, Baptiste Meunier, Justine Pedrono, Dennis Reinhardt, Rhiannon Sowerbutts

The views expressed here are those of the authors, and not those of the Bank of England the Banque de France and the Autorité de Contrôle Prudentiel et de Régulation.
Motivations

• Integrated banking systems and financial markets:
  - Spillover effects of monetary policy (Carney, 2019)
  - “Global Financial Cycle” (Gerko and Rey, 2017): centre Vs peripheral economies
  - EMEs: A policy toolkit to manage inflows including domestic prudential policy
    (Ostry et al., 2010; Kuttner and Shim (2016); Reinhardt and Sowerbutts (2015))
  ⇒ Interactions monetary policy (CE) - prudential policy (PE)

• Financial centres:
  - Major financial activities
  - A significant share of foreign international banking groups
  ⇒ Specific financial outflows/inflows: more responsive to global shock?
  ⇒ Heterogeneous banks: domestic/foreign? an onward destination for lending?

• Large global vs small banks:
  - Group structure: domestic / affiliates located in financial
  ⇒ Heterogeneous outflows / banks
Focus on French and UK banking systems

- UK banking system:
  - External liabilities: 250% of GDP
  - Over 200 international banks
  - 50% of assets from foreign-owned banks (20% in the US, 4% in Japan)
  - Significant activities in investment banking, trading and foreign lending

- French banking system:
  - Gsib Vs non-Gsib banks within the same banking system
  - 6 large and systemic banking groups:
    - 83% of total assets
    - One the most internationally active in the world
    - 6% of their affiliates are located in the UK (1% for non-Gsib)

⇒ Two banking systems to study heterogeneous cross-border lending and banks
This Paper

Make the most of bank heterogeneity to answer the following questions:

1. Can prudential policy shield countries from monetary policy spillover?
   Focus: Spillovers through French banks’ cross-border lending

2. How does bank size and size of parent bank matter?

3. How does a financial centre (UK) matter for these interactions?
   Is there a London Bridge?
   *London as an onward destination for lending?*
   *French large banking groups: funds channelled to their UK affiliates (1st arch) in order to be then lent to the rest of the world (2nd arch)*
Contributions

• Monetary policy spillovers: Rey (2013), Bruno and Shin (2014, 2015a, 2015b), Berrospide et al. (2017), Buch et al. (2019)

⇒ A focus on the euro area MP and cross-border lending: role of financial centre


⇒ Empirical assessments of interactions in an international environment


⇒ Global financial centres and banking flows

• Heterogeneity in banking flows: Kashyap and Stein (2000)

⇒ Nationality, location, size, systemic

• Identification of a London Bridge
Unconsolidated Banking Data

UK Banking Data
• Bank balance sheet using raw data from the Bank of England’s monetary and financial statistics reporting forms (BT, CC, CL)
• Current sample: 2000 Q1 to 2017 Q4

French Banking Data
• Bank balance sheet using supervisory data from the ACPR
• Current sample: 2000 Q1 to 2013 Q2, French banks only

Benefits of unconsolidated data
• Possible to decompose data of a given banking group/banking system
• Track cross-border lending from domestic/foreign affiliates
Banking Data – summary statistics

French GSIBs vs. non-GSIBs

<table>
<thead>
<tr>
<th></th>
<th>Affiliates in the UK</th>
<th>International share</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSIBS</td>
<td>6%</td>
<td>19%*</td>
</tr>
<tr>
<td>Non-GSIBs</td>
<td>1%</td>
<td>12%</td>
</tr>
</tbody>
</table>

French-owned banks from France vs. the UK

- Cross-border lending growth:
  - France: 2% (sd:0.36)
  - The UK: 10% (sd:0.50)

⇒ The role of the UK in channelling funds
⇒ More responsive cross-border lending from the UK

- International share
  - GSIBs in France: 19%
  - French-owned banks in the UK: 70%
Prudential and monetary policy Data

Prudential policy data
The 2019 update of Cerutti et al. (2017)

• New prudential policy: {-1;0;+1}
• 7 instruments (both lender- and borrower-targeted measures)
• Cumulate prudential policy actions over a 2-year period
• Account for lags and persistence

Monetary policy data
Monetary policy surprises from Kuttner (2001) and Gürkaynak et al. (2005)

• The difference between realised and anticipated monetary policy
• Cumulate surprises in a given quarter
Figure 2 – Heat map of French banks’ cross-border lending from France by recipient country, 2013Q2

Notes: Heat map of French banks’ cross-border lending from France by recipient country in 2013Q2. Figures are reported in billions of euros.

Figure 3 – Heat map of French-owned banks’ cross-border lending from the UK by recipient country, 2013Q2

Notes: Heat map of French-owned banks cross-border lending from the UK by recipient country in 2013Q2. Figures are reported in billions of US dollars.
Figure 4 – Heat map of cumulated prudential policy actions by country, 2011Q3-2013Q2

Notes: We sum all types of prudential policy actions, excluding reserve requirements, in a given quarter and country from the extended Cerutti et al. (2017) dataset. We then cumulate the prudential policy actions over a two-year period (2011Q3-2013Q2) to construct a proxy for the overall prudential policy setting over this time span. Importantly, this measure can take positive and negative values, although over this specific time period, all countries’ prudential policy proxies happen to be weakly positive. Positive (negative) values indicate a net tightening (loosening) of overall prudential policy over the period.
Hypotheses

H1: A country with tighter prudential policy ahead of a monetary policy tightening in centre economies should face smaller volatility in capital flows through cross-border lending than a country with looser prudential policy.

H2: Bank size or being part of a large banking group affects the interactions (larger banks are less affected by monetary policy shocks than smaller banks (e.g. Kashyap and Stein 2000).)

H3: Bank nationality affects the interactions

H4: Bank location affects the interactions: role of financial centre Is there a London Bridge?
Monetary Policy Spillovers: EA monetary policy and French banks

\[ \Delta Y_{b,j,t} = \alpha_0 + \sum_{k=0}^{3} \alpha_{1,k} MP_{t-k}^{EA} + \alpha_4 X_{b,t-1} + \alpha_5 Z_{j,t-1} + \alpha_6 G_{t-1} + f_b + f_j + \epsilon_{b,j,t} \]

where \( \Delta Y_{b,j,t} \) is credit growth of bank \( b \) to receiving country \( j \) at time \( t \)

- \( MP_{t}^{EA} \): is monetary policy surprise in home = \{EA\}
- \( X_{b,t-1} \): bank controls
  balance sheet size, capital ratio, liquid assets, deposit share, commitments ratio, degree of internationalization
- \( Z_{j,t-1} \): receiving country controls
  GDP growth, credit growth
- \( G_{t-1} \): global time varying controls
  VIX, US and UK monetary policy
- \( f_b \): bank fixed effects; \( f_j \): receiving-country fixed effects
- \( \epsilon_{b,j,t} \): clustered by bank and time
Prudential Policy Interactions

\[ \Delta Y_{b,j,t} = \alpha_0 + \alpha_2 Pru_{j,t-4}^{dest.} + \sum_{k=0}^{3} \alpha_{3,k} \left( MP_{t-k}^{EA} \times Pru_{j,t-4}^{EA} \right) + \alpha_4 X_{b,t-1} + \alpha_5 Z_{j,t-1} + f_b + f_j + f_t + \varepsilon_{b,j,t} \]

- \( Pru_{j,t-4}^{dest.} \): prudential stance in receiving country \( j \), cumulated over two years from \( t - 11 \) to \( t - 4 \), i.e. prior to monetary policy surprises

- \( f_t \): time fixed effects, controlling for all time-varying global conditions

⇒ Bank heterogeneity: sub-samples
Baseline Results based on French banks

<table>
<thead>
<tr>
<th></th>
<th>MP Spillover</th>
<th>Hybrid</th>
<th>Interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Sigma_{k=0}^{0}(M_{t-k}^{ea} \cdot Pru_{j,t-4}^{dest})$</td>
<td>0.110**</td>
<td>0.060</td>
<td></td>
</tr>
<tr>
<td>$\Sigma_{k=0}^{1}(M_{t-k}^{ea} \cdot Pru_{j,t-4}^{dest})$</td>
<td>0.221***</td>
<td>0.201***</td>
<td></td>
</tr>
<tr>
<td>$\Sigma_{k=0}^{2}(M_{t-k}^{ea} \cdot Pru_{j,t-4}^{dest})$</td>
<td>0.264***</td>
<td>0.256***</td>
<td></td>
</tr>
<tr>
<td>$\Sigma_{k=0}^{3}(M_{t-k}^{ea} \cdot Pru_{j,t-4}^{dest})$</td>
<td>0.376***</td>
<td>0.313***</td>
<td></td>
</tr>
</tbody>
</table>

$\Sigma_{k=0}^{0}M_{t-k}^{ea}$ -0.230** -0.361***
$\Sigma_{k=0}^{1}M_{t-k}^{ea}$ -0.022 -0.201
$\Sigma_{k=0}^{2}M_{t-k}^{ea}$ -0.180 -0.359*
$\Sigma_{k=0}^{3}M_{t-k}^{ea}$ -0.045 -0.355
$Pru_{j,t-4}^{dest}$ 0.000 0.003

- Time FE NO NO YES
- Bank FE YES YES YES
- Receiving Country FE YES YES YES
- Other Systemic MoPo YES YES N/A
- Observations 46,045 42,802 42,802
- R-squared 0.02 0.02 0.04
- Adjusted R-squared 0.02 0.02 0.04

Dependent variable is quarterly % change in cross-border lending, winsorised at the 10% level. We document cumulated monetary policy coefficients to emphasise the cumulative effect of a 1 percentage point EA MP surprise.

- Monetary policy surprise tightening reduces cross-border credit growth out
- Receiving country prudential policy significantly offsets such spillovers
Bank size and GSIB affiliation

<table>
<thead>
<tr>
<th></th>
<th>All banks</th>
<th>Large</th>
<th>Small</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>$ \Sigma_{k=0}^{0}(M p_{t-k}^{\text{home}} \cdot P r u_{j,t-4}^{\text{dest}})$</td>
<td>GSIB</td>
<td>Non-GSIB</td>
<td>GSIB</td>
</tr>
<tr>
<td></td>
<td>-0.001</td>
<td>0.118*</td>
<td>0.052</td>
</tr>
<tr>
<td>$ \Sigma_{k=0}^{1}(M p_{t-k}^{\text{home}} \cdot P r u_{j,t-4}^{\text{dest}})$</td>
<td>0.067</td>
<td>0.369***</td>
<td>0.157</td>
</tr>
<tr>
<td>$ \Sigma_{k=0}^{2}(M p_{t-k}^{\text{home}} \cdot P r u_{j,t-4}^{\text{dest}})$</td>
<td>0.048</td>
<td>0.539***</td>
<td>0.173</td>
</tr>
<tr>
<td>$ \Sigma_{k=0}^{3}(M p_{t-k}^{\text{home}} \cdot P r u_{j,t-4}^{\text{dest}})$</td>
<td>0.070</td>
<td>0.641***</td>
<td>0.190</td>
</tr>
<tr>
<td>Pru_{j,t-4}^{\text{dest}}</td>
<td>0.003</td>
<td>0.004</td>
<td>-0.001</td>
</tr>
<tr>
<td>Time FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Bank FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Receiving Country FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>19,896</td>
<td>22,906</td>
<td>6,959</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.06</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.05</td>
<td>0.04</td>
<td>0.01</td>
</tr>
</tbody>
</table>

French-based banks separating banks with GSIBs parents from non-GSIB parents (columns 1 and 2). Large banks (above EUR 100bn in assets) and small banks (below EUR 100bn assets) and GSIB affiliation.

- Sensitive: small banks which are not part of a larger GSIB group
- Not sensitive: large banks or banks which are part of a GSIB group

⇒ Size of the parent entity plays an important role
The “London Bridge” of French GSIBs

French large banks have located a large share of their activities in wholesale banking in London – including lending towards the euro area.

Sapir et al. (2017), Batsaikhan et al. (2017) or Kaya et al. (2018)

The UK as an onward destination for lending

First arch:
cross-border loans for French-based banks originated from France towards the UK.

Second arch:
cross-border lending made from the UK by local affiliates of French banks to third-party countries

\[ Pru_{j,t-4}^{RoW} : Prudential \ stance \ in \ the \ rest \ of \ the \ world \ (i.e \ excluding \ France \ and \ the \ UK) \]
## The “London Bridge” of French GSIBs: First arch

Cross-border lending from France to the UK

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GSIBs</td>
<td>Non-GSIBs</td>
</tr>
<tr>
<td>$\Sigma_{k=0}^{0}(MP_{t-k}^{EA} \cdot Pru_{j,t-4}^{dest})$</td>
<td>0.160***</td>
<td>0.057</td>
</tr>
<tr>
<td>$\Sigma_{k=0}^{1}(MP_{t-k}^{EA} \cdot Pru_{j,t-4}^{dest})$</td>
<td>0.302***</td>
<td>0.094</td>
</tr>
<tr>
<td>$\Sigma_{k=0}^{2}(MP_{t-k}^{EA} \cdot Pru_{j,t-4}^{dest})$</td>
<td>0.499***</td>
<td>0.074</td>
</tr>
<tr>
<td>$\Sigma_{k=0}^{3}(MP_{t-k}^{EA} \cdot Pru_{j,t-4}^{dest})$</td>
<td>0.623***</td>
<td>0.084</td>
</tr>
<tr>
<td>$Pru_{j,t-4}^{dest}$</td>
<td>0.002</td>
<td>-0.001</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Time FE</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Bank FE</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Receiving Country FE</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>626</td>
<td>863</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.15</td>
<td>0.08</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.06</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Prudential policy measure is the sum of prudential policy actions (excluding reserve requirements) over a 2-year period, averaged across the world (excluding the euro area and the UK).

- First arch is confirmed for GSIB banking groups
  ⇒ Bank heterogeneity matters for the London Bridge
### Foreign lending from the UK: Second arch

<table>
<thead>
<tr>
<th></th>
<th>French-owned UK affiliates in the UK</th>
<th>EA-owned UK affiliates</th>
<th>UK-owned banks in the UK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All destinations</td>
<td>Excluding vis-à-vis EA</td>
<td>All destinations</td>
</tr>
<tr>
<td>$\sum_{k=0}^0(MP_{t-k}^{EA} \cdot Pru_{j,t-4}^{\text{dest}})$</td>
<td>0.198**</td>
<td>0.288**</td>
<td>0.089**</td>
</tr>
<tr>
<td>$\sum_{k=0}^1(MP_{t-k}^{EA} \cdot Pru_{j,t-4}^{\text{dest}})$</td>
<td>0.202</td>
<td>0.323*</td>
<td>0.122*</td>
</tr>
<tr>
<td>$\sum_{k=0}^2(MP_{t-k}^{EA} \cdot Pru_{j,t-4}^{\text{dest}})$</td>
<td>0.222</td>
<td>0.377</td>
<td>0.163*</td>
</tr>
<tr>
<td>$\sum_{k=0}^3(MP_{t-k}^{EA} \cdot Pru_{j,t-4}^{\text{dest}})$</td>
<td>0.103</td>
<td>0.238</td>
<td>0.182*</td>
</tr>
<tr>
<td>$Pru_{j,t-4}^{\text{dest}}$</td>
<td>-0.003</td>
<td>-0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Time FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Bank FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Receiving Country FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>10,519</td>
<td>6,388</td>
<td>54,655</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.025</td>
<td>0.027</td>
<td>0.021</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.012</td>
<td>0.007</td>
<td>0.016</td>
</tr>
</tbody>
</table>


- The two arches are confirmed!
- The UK as an onward destination for specific lending in third-party countries
  ⇒ Financial centre matter
  ⇒ An extended London Bridge
Conclusion

• Two unique databases:
  ✓ Exploit heterogeneity
  ✓ A global approach

• EA monetary policy: spillover effects

• Prudential policies in recipient country: offset spillovers
⇒ Prudential policies help insulate countries from the global financial cycle

• Interactions depend on bank heterogeneity:
  ✓ Bank size and banking group
  ✓ Bank nationality
  ✓ Financial centre

• A global approach: evidence of a London Bridge:
  ✓ UK as an onward destination for specific lending in third-party countries
Thank you
Appendix

Figure 2 – Heat map of French banks’ cross-border lending from France by recipient country, 2013Q2

Notes: Heat map of French banks’ cross-border lending from France by recipient country in 2013Q2. Figures are reported in billions of euros.

Figure 3 – Heat map of French-owned banks’ cross-border lending from the UK by recipient country, 2013Q2

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Notes: We sum all types of prudential policy actions, excluding reserve requirements, in a given quarter and country from the extended Cerusti et al. (2017) dataset. We then cumulate the prudential policy actions over a two-year period (2011Q3-2013Q2) to construct a proxy for the overall prudential policy setting over this time span. Importantly, this measure can take positive and negative values, although over this specific time period, all countries’ prudential policy proxies happen to be weakly positive. Positive (negative) values indicate a net tightening (loosening) of overall prudential policy over the period.
Prudential instruments: general capital requirements, sector-specific capital buffers, loan-to-value (LTV) ratio limits, reserve requirements for both foreign and local-currency deposits, interbank exposure limits, and concentration ratio limits.