Bank Capital (Requirements) and Credit Supply: evidence from Pillar 2 decisions

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The views expressed in this presentation are only the ones of the authors and do not necessarily represent those of the National Bank of Belgium.
The Supervisory Review and Evaluation Procedure

Figure: SREP 2011-2014 (Source: IMF country report 13/138. Belgium: technical note on financial conglomerate supervision)
Our data: computed over 124 bank-quarter observations

- **Required capital ratio**
  - average is 11.2% of risk-weighted assets
  - more importantly (for analysis), standard deviation is 2.0%

- **Actual capital ratio**
  - average is 14.9% of risk-weighted assets
  - and a standard deviation of 3.7%

- On average, banks hold a sizable cushion/buffer
Required and actual capital ratio: summary statistics

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- On average, banks hold a sizable cushion/buffer

Compared with e.g. Aiyar, Calomiris and Wieladek (UK, 1998-2007, 88 regulated banks)

*the variation in minimum capital requirements as a share of risk-weighted assets over the sample period was large. The mean capital requirement ratio was 10.8%, the standard deviation 2.26%*
Questions and main findings of this paper

1. Does regulatory capital affect corporate credit supply?
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1. Does regulatory capital affect corporate credit supply?
   ▶ YES
   ▶ On the intensive and extensive margin of credit supply
   ▶ Microprudential capital requirements also affect lending (unintentionally), if:
     ▶ raising external equity is costly
     ▶ costs are transmitted to borrowers

2. Are all banks and firms equal?
   ▶ Bank heterogeneity in line with capital structure theories
   ▶ Firm heterogeneity in line with impact on risk-weighted assets

3. Does regulatory capital affect banks' balance sheet?
   ▶ Yes, off-setting channels lead to aggregate balance sheet effects
   ▶ Yes, reduction in domestic mortgages and foreign corporate lending
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Literature on capital requirements and credit supply

Large literature on effect of introduction Basel I, II and III

- drawback 1: implementation is usually uniform across banks
- drawback 2: response to (lending) crisis
- drawback 3: coinciding events/confounding factors

However, recently, evidence on bank-specific (time-varying) capital requirements
- bank level data
  - UK, 1998-2007, aggregate lending (Aiyar, Calomiris and Wieladek; 2014, 2016); euro-area, 2011-2012, EBA, aggregate lending: (Mesonnier and Monks, 2015); France, 2003-2011, lending standards (Labonne and Lame, 2014); Belgium, 2003-2015, mortgage lending rates (Ferrari, Pirovano and Rovira Kaltwasser, 2016); ...
- firm-bank level data
  - UK, mortgage lending (Uluc and Wieladek, 2016); Spain, corporate lending, dynamic provisioning (Jimenez et al., 2016); France, corporate lending, Basel 2 IRB (Fraisse, Lame and Thesmar; 2016); EBA, corporate lending (Gropp et al.; 2016); Norway, Basel III (Getz Wold and Juelsrud, 2017); ...
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Data and empirical setup

(1) Corporate credit register
   ▶ firm-bank-quarter level
   ▶ intensive and extensive margin
   ▶ based on authorized amount
   ▶ breakdown according to maturity and type

(2) Bank capital: actual and required

(3) Bank and firm balance sheet data
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Empirical specification

Credit Growth (Quarterly)_{b,f,t} = \beta \times \text{Required cap. ratio}_{b,t-1}
+ \gamma \times \text{Bank Controls}_{b,t-1} + \nu_{f,t} + \nu_{b} + \epsilon_{b,f,t}

\nu_{f,t} \text{ are firm-time fixed effects: demand control}
\nu_{b} \text{ are bank fixed effects: business model, corporate structure}
Interaction with bank characteristics: theory

Modigliani and Miller’s irrelevance theorem
▶ loan rates and lending volume should be independent of funding structure (leverage)
▶ if not, presence of frictions

Indirect test: exploit heterogeneity across banks in the perceived cost of capital
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- TRADE-OFF: lower cost of capital for larger and safer banks (Gandhi and Lustig, 2015; Baker and Wurgler, 2015; Kashyap et al., 2010)
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► PECKING ORDER: scope for earnings retention and passive capital management (De Jonghe and Öztekin, 2015)
► MARKET TIMING: banks that recently built financial slack (recent equity expansion or asset shrinkage)
Interaction with bank characteristics: results

The (negative) impact of higher capital requirements on credit supply is smaller for: larger and safer banks, more profitable banks, and banks with more financial slack.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Credit growth</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Actual capital ratio</td>
<td>-0.131**</td>
<td>-0.131**</td>
<td>-0.125**</td>
<td>-0.147**</td>
<td>-0.136**</td>
</tr>
<tr>
<td></td>
<td>(0.0535)</td>
<td>(0.0477)</td>
<td>(0.0550)</td>
<td>(0.0583)</td>
<td>(0.0536)</td>
</tr>
<tr>
<td>Previous year actual capital ratio</td>
<td>-0.00497</td>
<td>-0.0337</td>
<td>0.00909</td>
<td>-0.00184</td>
<td>-0.000395</td>
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<tr>
<td></td>
<td>(0.0470)</td>
<td>(0.0448)</td>
<td>(0.0444)</td>
<td>(0.0441)</td>
<td>(0.0460)</td>
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<tr>
<td>Required capital ratio</td>
<td>-0.107</td>
<td>-0.210**</td>
<td>-0.132*</td>
<td>-0.124*</td>
<td>-0.105</td>
</tr>
<tr>
<td></td>
<td>(0.0672)</td>
<td>(0.0743)</td>
<td>(0.0738)</td>
<td>(0.0675)</td>
<td>(0.0695)</td>
</tr>
<tr>
<td>Previous year required capital ratio</td>
<td>-0.252***</td>
<td>-0.256***</td>
<td>-0.264***</td>
<td>-0.267***</td>
<td>-0.243***</td>
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<tr>
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<td>(0.0482)</td>
<td>(0.0411)</td>
<td>(0.0515)</td>
<td>(0.0531)</td>
<td>(0.0496)</td>
</tr>
<tr>
<td>Required capital ratio x Bank Characteristic</td>
<td>0.0480**</td>
<td>-0.0709***</td>
<td>0.118</td>
<td>0.0848***</td>
<td>-0.0466</td>
</tr>
<tr>
<td></td>
<td>(0.0177)</td>
<td>(0.0154)</td>
<td>(0.0775)</td>
<td>(0.0269)</td>
<td>(0.0557)</td>
</tr>
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<tr>
<th>Bank Characteristic</th>
<th>(lagged) log Total Assets</th>
<th>(lagged) loan loss provisions to total loans</th>
<th>(lagged) Return on equity</th>
<th>(lagged) Quarterly growth in Common Equity</th>
<th>(lagged) Quarterly growth in Assets</th>
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<tbody>
<tr>
<td>Observations</td>
<td>1,022,324</td>
<td>1,022,324</td>
<td>1,022,324</td>
<td>1,022,324</td>
<td>1,022,324</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.467</td>
<td>0.467</td>
<td>0.467</td>
<td>0.467</td>
<td>0.467</td>
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Interaction with firm characteristics: channels

Should all firms be treated equally?

\[
\frac{\text{Equity}}{\sum_{i=1}^{N} w_i A_i}
\]

- No, depending on their effect on risk-weighted assets
- No, depending on the returns they generate

How we test it: exploit heterogeneity across firms
Interaction with firm characteristics: channels

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How we test it: exploit heterogeneity across firms

- cutting more for larger firms has more sizable effect

- cutting less on riskier firms, for a given size, affects RWA more
- cutting less on high interest-paying firms, for a given risk, affects bank profits less (earnings retention)
- effect of firm age is ambiguous; older firms are less risky (survivorship bias) but also larger on average
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The (negative) impact of higher capital requirements on credit supply is smaller for: **smaller, younger and less risky** firms, as well as firm which pay **higher implicit interest rates**

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<td></td>
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<td>(0.0990)</td>
<td>(0.0958)</td>
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<td>Previous year actual capital ratio</td>
<td>-0.0214</td>
<td>-0.0234</td>
<td>-0.0206</td>
<td>-0.0163</td>
</tr>
<tr>
<td></td>
<td>(0.0618)</td>
<td>(0.0631)</td>
<td>(0.0603)</td>
<td>(0.0553)</td>
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<td>Required capital ratio</td>
<td>-0.183</td>
<td>-0.180</td>
<td>-0.185*</td>
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<td>(0.105)</td>
<td>(0.108)</td>
<td>(0.101)</td>
<td>(0.0889)</td>
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<td>Prev. year required capital ratio</td>
<td>-0.266***</td>
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<tr>
<td></td>
<td>(0.0658)</td>
<td>(0.0679)</td>
<td>(0.0644)</td>
<td>(0.0683)</td>
</tr>
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<td>Required capital ratio x Firm Characteristic</td>
<td>-0.909***</td>
<td>-0.142***</td>
<td>0.0553*</td>
<td>0.0590***</td>
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<tr>
<td></td>
<td>(0.0201)</td>
<td>(0.0321)</td>
<td>(0.0259)</td>
<td>(0.0132)</td>
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<tr>
<th>IA</th>
<th>lagged firm size</th>
<th>lagged firm age</th>
<th>lagged Altman Z</th>
<th>lagged cost of borrowing</th>
</tr>
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<td>Observations</td>
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Broad balance sheet categories: bank-level evidence

Using bank-level, aggregate balance sheet data, we find that:

▶ Asset side exhibits derisking and reorientation

▶ Bank funding reacts mixed
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Using bank-level, aggregate balance sheet data, we find that:

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  - Reduction, but statistically insignificant, in domestic term loans!
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Overall, mix of channels resulting in adjusted balance sheet
Conclusion: Summary of findings

1. Statistically significant, and economically relevant corporate credit supply effects

2. (bank heterogeneity) Negative effect is smaller for:
   - large and safe banks (lower cost of equity)
   - more profitable banks (earnings retention)
   - banks that recently raised capital ratio

3. (firm heterogeneity) Negative effect is larger:
   - for larger and older firms
   - for riskier and more indebted firms
   - for low borrowing cost firms

4. Offsetting effects (mortgages, foreign lending, equity subsidy)
Conclusion: Summary of findings

1. Statistically significant, and economically relevant corporate credit supply effects
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   - especially for (long) term loans

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Conclusion: Implications and road ahead

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- Larger cut in: Foreign lending and domestic mortgages
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What if requirements would be disclosed?