“Banking Barriers to the Green Economy”

by Hans Degryse, Tarik Roukny, and Joris Tielens

Discussion by:

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Climate Change: Economic Impact and Challenges for Central Banks and the Financial System
Summary

• The more homogeneous the banking market is in a sector
  => the more banks profit maximization encourages supporting legacy firms from disruption
  => the less innovation is supported in the form of credit to entrants

• Incredibly important story.
• A very European story in:
  i.  the central role of banks
  ii. markets (countries) with regional barriers / dominant player advantages
  iii. concentration of banking markets
Comments on positioning research relative to what matters & research
Concentrated bank market vs homogenous banks

The abstract and intro language blur concentration with homogeneity.

- The theory and empirical results are really about **homogenous banks** in a market dominated by them.
- Or perhaps, the **lack of a non-homogenous bank**.
  - In the result I saw, the results do not hold for concentration
    - I would not put them both in the estimation at the same time – competing for variation

This notion of not having heterogeneity is new (I think)...

- Are banks as homogeneous as they are concentrated in the cross section of Europe?
- Authors should emphasize, not mask with blurring with concentration
  - **What is the scope of the problem beyond the Belgium market?**
  - **What are the implications in aggregate? .. blown up to which markets?**
Concentration of top 3 banks in 20 most concentrated EU countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland</td>
<td>94.17</td>
</tr>
<tr>
<td>Estonia</td>
<td>93.19</td>
</tr>
<tr>
<td>Malta</td>
<td>91.54</td>
</tr>
<tr>
<td>Denmark</td>
<td>89.61</td>
</tr>
<tr>
<td>Lithuania</td>
<td>88.68</td>
</tr>
<tr>
<td>Portugal</td>
<td>87.58</td>
</tr>
<tr>
<td>Netherlands</td>
<td>87.54</td>
</tr>
<tr>
<td>Slovakia</td>
<td>78.15</td>
</tr>
<tr>
<td>Cyprus</td>
<td>76.03</td>
</tr>
<tr>
<td>Greece</td>
<td>75.15</td>
</tr>
<tr>
<td>Spain</td>
<td>73.16</td>
</tr>
<tr>
<td>Italy</td>
<td>71.10</td>
</tr>
<tr>
<td>Germany</td>
<td>70.36</td>
</tr>
<tr>
<td>Belgium</td>
<td>67.65</td>
</tr>
<tr>
<td>Croatia</td>
<td>65.26</td>
</tr>
<tr>
<td>Austria</td>
<td>62.50</td>
</tr>
<tr>
<td>Slovenia</td>
<td>61.65</td>
</tr>
<tr>
<td>Romania</td>
<td>61.12</td>
</tr>
<tr>
<td>Czech Rep.</td>
<td>60.23</td>
</tr>
<tr>
<td>Ireland</td>
<td>59.36</td>
</tr>
</tbody>
</table>

Bank concentration: percent of bank assets held by top three banks in the European Union. The average for 2017 based on 26 countries was 69.75 percent. The highest value was in Finland: 94.17 percent and the lowest value was in Poland: 42.18 percent. The indicator is available from 1996 to 2017. Below is a chart for all countries where data are available.

Measure: percent; Source: Bankscope

Note: the U.S. is 34.84
Additional Importance

• The EC/EU and European governments are leading rest of the world in looking to finance to achieve goals in climate change mitigation through legislation, support for research, and direct finance.
  • Achievements: impressive and game-changing.
    • eco-labeling
    • encouraging long-horizon considerations of sustainability
    • taxation
  • Additional voices argue for monetized disclosure that puts a monetary term on income statement items in terms of impact-adjusted cost or income
• Yet: The $31 trillion of sustainable investment is overwhelmingly not additionally. It’s not creating much new investment.
• Customer demand may shift some with further disclosure, but there is a limit.
• Taxation may help where taxes are politically feasible.
Additional Importance

- The lacking piece is innovation
  - Europe leads in process innovation breakthroughs
  - But climate change mitigation is also about “entrant” innovation, “California style”.
    (Tangent: Larger point – Engage with U.S. innovation ecosystem)

- That makes this paper even more important
  - Europe does not run off a equity/VC- based system of innovation

- The results suggest that the banking system is hindering the innovation needed to make progress on climate change.
Reinforcement of that point about entrants

• “Firm Boundaries Matter: Evidence from Conglomerates and R&D Activity” Amit Seru
  • Conglomerate form stifles innovation

• “Do unions affect innovation?” Daniel Bradley, Incheol Kim, and Xuan Tian
  (Management Science forthcoming)
  • Unionization causes declines in innovation. Me: role of maturation?

• Private pre-IPO firms vs public firm status matters for lending for innovation
  • “Does Banking Competition Affect Innovation?” Jess Cornaggia, Yifei Mao, Xuan Tian, Brian Wolfe
  • “Does Going Public Affect Innovation?” Shai Bernstein
  • Punchline: Innovation declines after IPO, and banking competition enables lending for innovation in private sectors.
Idea of Innovation being Stifled – US Style

• “Killer Acquisitions” Colleen Cunningham, Florian Ederer, Song Ma
  • Incumbent firms may acquire innovative targets solely to discontinue the target's innovation projects and preempt future competition

• “Catering Innovation” Xinxin Wang
  • Acquirer market concentration decreases inventors’ propensity to become entrepreneurs
  • Acquirer concentration increases technological overlap with potential acquirers.

• “Kill Zone” Sai Krishna Kamepalli, Raghuram Rajan, Luigi Zingales
  • The prospect of an acquisition by the incumbent platform undermines early adoption by customers, reducing prospective payoffs to new entrants.
Comments on paper details
Theory Comment: Collusion?

Collusion vs smallest bank incentive

- I read the story and keep looking for the word collusion
- Maybe that is the wrong instinct
- Banks “coordinate” over a host of things – syndication, policy stances, creating frictions and/or solutions to technology innovation, hold up on adoption

In authors’ model, the lowest bank plays a key role in not giving the entrant a loan

- But there is always a lower bank, even if not modeled
- Perhaps more natural to think of this setting as collusion?

- The distinction matters for policy
Estimating Equation

\[ \text{GrowthInnovLending}_{s,t} = \alpha \text{ExcessGHG}_{s, t-1} + \beta \Delta B4_{s, t-1} + \gamma \text{ExcessGHG}_{s, t-1} \times \Delta B4_{s, t-1} + \text{controls} + \delta_s + \delta_t \]

Best lending growth measure:
- Credit growth as new loans to firms under age 5
- Mean 0.0297    Median 0.222 across 197 sector-time observations
Results

The main result

- Credit growth to entrants is statistically lower ("hindered")
  - in sectors with **homogeneous banks** (low $\Delta B4$) that also have a **high stake to firms with legacy technologies** (high excess GHG greenness)

<table>
<thead>
<tr>
<th>Covariates</th>
<th>(1)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta B4_{s,t-1}$</td>
<td>0.023</td>
<td>0.024</td>
</tr>
<tr>
<td>$(0.023)$</td>
<td>$(0.023)$</td>
<td></td>
</tr>
<tr>
<td>$\Delta_{s,t-1}^{mean}$</td>
<td>0.00003</td>
<td>0.0001</td>
</tr>
<tr>
<td>$(0.00003)$</td>
<td>$(0.00004)$</td>
<td></td>
</tr>
<tr>
<td>$\Delta_{s,t-1}^{median} \times \Delta B4_{s,t-1}$</td>
<td>0.0001**</td>
<td>0.0002***</td>
</tr>
<tr>
<td>$(0.0001)$</td>
<td>$(0.0001)$</td>
<td></td>
</tr>
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</table>
Estimating Equation

\[
GrowthInnovLending_{s,t} = \alpha \text{ExcessGHG}_{s,t-1} + \beta \Delta B4_{s,t-1} + \gamma \text{ExcessGHG}_{s,t-1} \ast \Delta B4_{s,t-1} + controls + \delta_s + \delta_t
\]

**Omitted variable**: Anything that is causing sector-year growth in entrant lending that is correlated with the banking distribution of clients in industries Belgium that happen to also be lagging the EU in GHG

- Historical bank distribution in agrarian vs industrial society could be at play
- Industries that Belgium has had an continuing competitive advantage in “brown” production techniques
- Many others possible

- Point: Hard to make the “hinder innovation” claim (my terminology) vs “consistent with hindering. But authors should focus efforts herein. It’s important.
Empirics Suggestion 1: Can you make progress on causation by disaggregating?

Why not follow this main result with estimations at the bank-sector-time level?

- Using all banks, not just 4?
- Authors: “sector-year analysis mimics our theory”

- Theory is guidance here, but big assumptions about the limit of banks and outside options for entrants that could be loosened in the empirics

- Why?
  - Do within analysis so that omitted variables of historical bank relationship with sectors can be absorbed
  - This also allows for an estimation based on changes in ExcessGHG patterns
Empirics Suggestion 2: Dependent Variable

\[
\text{GrowthInnovLending}_{s,t} = \alpha \text{ExcessGHG}_{s,t-1} + \beta \Delta B4_{s,t-1} + \\
\gamma \text{ExcessGHG}_{s,t-1} \ast \Delta B4_{s,t-1} + \text{controls} + \delta_s + \delta_t
\]

Best lending growth measure: Credit growth as new loans to firms under age 5
- Mean 0.0297    Median 0.222 across 197 sector-time observations

Second best lending growth measure: # New loans to firms under age 5
- Mean 380    Median 194

- Need to decide if sticking to an innovation story. If so (which I think is best):
  - Use these two variables only in main table
  - Estimate new loans count in negative binomial
  - Label other credit growth variables in a placebo table
Empirics Suggestion 3: GHG Variables

\[
\text{GrowthInnovLending}_{s,t} = \alpha \text{ExcessGHG}_{s,t-1} + \beta \Delta B4_{s,t-1} + \\
\gamma \text{ExcessGHG}_{s,t-1} \times \Delta B4_{s,t-1} + \\
\lambda_1 \text{GHG}_{s,t-1} + \lambda_2 \text{GHG}_{s,t-1} \times \Delta B4_{s,t-1} + \lambda_3 \text{HHI}_{s,t-1} + \\
\lambda_4 \text{HHI}_{s,t-1} \text{GHG}_{s,t-1} + \lambda_5 \text{HHI}_{s,t-1} \Delta B4_{s,t-1} + \\
\delta_s + \delta_t
\]

ExcessGHG

- Measured in a GHG/value deviation from EU mean or median
- Of course that varies widely by sector
- Authors control for emissions level, but hugely skewed and the interaction effect has a strange relationship to that control
- Better to estimate in percentage change to parallel dependent variable and not get results just as a collinear bounce effect off the small sample interactions
Empirics Comment 4: Concentration Variables

\[ \text{GrowthInnovLending}_{s,t} = \alpha \text{ExcessGHG}_{s,t-1} + \beta \Delta B4_{s,t-1} + \]
\[ \gamma \text{ExcessGHG}_{s,t-1} \times \Delta B4_{s,t-1} + \]
\[ \lambda_1 \text{GHG}_{s,t-1} + \lambda_2 \text{GHG}_{s,t-1} \times \Delta B4_{s,t-1} + \lambda_3 \text{HHI}_{s,t-1} + \]
\[ \lambda_4 \text{HHI}_{s,t-1} \times \text{GHG}_{s,t-1} + \lambda_5 \text{HHI}_{s,t-1} \times \Delta B4_{s,t-1} + \]
\[ \delta_s + \delta_t \]

\( \Delta B4 = \) market share of #1 minus market share of #4 bank

- Isn’t this highly correlated with HHI?
- I don’t understand controls