Monitoring Banking Business Models in Europe
Contribution to the economy, resilience and robustness

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04 December 2014 - Launch at the European Parliament


See also previous related studies:
A diversified banking industry in Europe

4 distinct banking models:
- Investment
- Wholesale
- Diversified retail
- Focused retail

Notes: Indicators marked with an asterisk (*) were used as instruments in the cluster analysis. The figures represent the number of standard deviations from the sample mean, implying that any observation above (below) the zero-axis is above (below) the sample mean.
A diversified banking industry in Europe

- Most banks are identified as retail banks ~70% (i.e. focused retail and diversified retail)

Observations by cluster (obs)

- Investment (188) 17%
- Wholesale (145) 13%
- Diversified retail (303) 27%
- Focused retail (490) 43%

Nr of different banks by cluster

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Nr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>42</td>
</tr>
<tr>
<td>Wholesale</td>
<td>27</td>
</tr>
<tr>
<td>Diversified retail</td>
<td>64</td>
</tr>
<tr>
<td>Focused retail</td>
<td>97</td>
</tr>
</tbody>
</table>

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A diversified banking industry in Europe

- STV banks (e.g. cooperatives and Savings banks) divided across four business models
- Highest share among wholesale banks (i.e. central institutions of cooperatives)
- SHV banks mainly investment oriented
A diversified banking industry in Europe

- Migration from one model to another
- Reinforces or reduces diversity
- Accumulate risk of certain business models
- Important to monitor and understand this phenomenon
Support to the real economy

Growth in outstanding customer loans (median values)

- Slowing loan growth during financial- and econ. crises
- Substantial for investment & wholesale banks during fin. Crisis
- Diversified retail banks continued for the longest period!
- STV banks (e.g. cooperatives continued to lend to the economy (in contrast to savings and commercial banks

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Performance - RoA

- Profits declined for all banks
- Wholesale & investment banks took severe hit in 2008/9
- Focused retail also took hit in 2011/2013
- Diversified retail banks performed best during crises
- STV banks (e.g. cooperatives continued to be profitable
Performance - RoE

- Similar results for RoE
- Relatively smaller gap between investment bank and other models due to lower equity ratio
- ROE converged between SHV & STV models
Resilience - Risk costs

Risk costs and depreciations
(% of non-trading assets, median values)

Recent losses mostly due to increase in write downs and losses on loans

Especially focused retail banks suffered

Less dramatic losses for others

SHV banks suffered more during fin-crisis and early stages of econ. Crisis as compared to STV banks
Resilience - Tail losses

Distribution of return on RWA (RoRWA), 2006-13

- Distribution of RoRWA
  - Long-tail for losses
- 1-in-20-year event could wipe out 3.8% of risk-adj. capital
Resilience - Tail losses

Return on RWA, tail loss estimates, 2006-13

- Comparison across business models
- Losses are high for:
  - Investment & focused retail models
- For all models, except wholesale, high losses under rarer events!

Notes: Figures provide the Harrell-Davis percentile estimates for the distribution of return on RWA. CET1 (i.e. 4.5%) and Tier-1 (i.e. 6.0%) stand for CRD IV minimum requirements for common equity and Tier-1 ratios.
Resilience - Tail losses

- Comparison across periods
- Losses are primarily high during Eurozone econ crisis.
- The peak losses of investment and focused retail banks during Eurozone crisis were particularly high!

Notes: Figures provide the Harrell-Davis 5th percentile estimates for the distribution of return on RWA. CET1 (i.e. 4.5%) and Tier-1 (i.e. 6.0%) stand for CRD IV minimum requirements for common equity and Tier-1 ratios.
Resilience - Tail losses

- Comparison across ownership types

- Losses are high for:
  - Public/Nationalised banks
  - For all models, except cooperative banks, high losses under rarer events!

Return on RWA, tail loss estimates, 2006-13 (obs)

Notes: Figures provide the Harrell-Davis percentile estimates for the distribution of return on RWA. CET1 (i.e. 4.5%) and Tier-1 (i.e. 6.0%) stand for CRD IV minimum requirements for common equity and Tier-1 ratios.
Resilience – Tail losses

• Assume capital requirements are binding
  – i.e. banks hold only minimum required amounts
• For investment, focused- and diversified retail banks
  – CET1 & T1 would be more than wiped out under a once-in-a-century event
  – For retail banks, possibly due to risk concentration
  – For investment banks, possibly due to inherent risks
• STV banks (e.g. cooperatives) are resilient to external shocks
• Need more data for better estimates
Robustness- Capital & leverage

- Banks across the four BMs increased Tier-1 capital ratios
- Differences are most cases not significant
Robustness - Capital & leverage

- Leverage ratio also increased
- Differences are statistically significant
  - Investment banks have lowest ratios
  - Wholesale banks also low despite improvement
- The STV banks (e.g. Cooperatives) started with the highest leverage ratio, but the leverage ratios have converged during the fin. and econ crises.
Robustness – Distance to default

• Do bus. models with more losses hold more capital?
• Estimate distance to default (Z-score)
  – Standardized measure for \( Z = \text{Equity} + \text{Earnings} \)
  – For those with high \( Z \), default much less likely
  – If \( Z < 0 \), losses wipe out capital \( \rightarrow \) insolvency
• Likely to under-estimate risks
  – Autocorr. & within-group corr. not considered
  – Multiple period risks not considered
  – Lower threshold w/ non-normal earnings distribution
Robustness – Distance to default

Distance to default estimates (Z-score, average)

- Diversified retail banks are far from default
- Focused retail banks face highest default likelihood
- Investment and wholesale banks are in-between

Note: A greater score implies greater distance to default and thus a lower default probability.
Robustness – Distance to default

- Pre-crisis distance to default Stakeholder-value (STV) clearly above Shareholder-value banks (SHV)
- Since burst the burst of fin. crisis in 2008 the gap has been closed, i.e. due to higher equity ratio (e.g. retained earnings, equity issuance, State aid, etc.)

Note: A greater score implies greater distance to default and thus a lower default probability.
Risks – RWA vs. Z-score

• Relationship between default risk & RWA
  – Does RWA point out underlying risks?
  – Use average risk weight: RWA / total assets
  – Is default risk lower for banks with low risk weight?

• Complicating factor
  – High RWA → High capital
  – More capital could offset default risks
  – Control for capital ratios
Robustness – RWA vs. Z-score

Relationship between Z-score and RWA

<table>
<thead>
<tr>
<th></th>
<th>Investment</th>
<th>Wholesale</th>
<th>Diversified retail</th>
<th>Focused retail</th>
<th>All banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>RWA/TA</td>
<td>2.1</td>
<td>15.5**</td>
<td>-36.4***</td>
<td>-30.4***</td>
<td>-19.9***</td>
</tr>
<tr>
<td></td>
<td>-6.5</td>
<td>-6</td>
<td>-5.1</td>
<td>-4.3</td>
<td>-3.5</td>
</tr>
<tr>
<td>TCE</td>
<td>-16.4</td>
<td>60.1*</td>
<td>248.0***</td>
<td>235.3***</td>
<td>157.2***</td>
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<tr>
<td></td>
<td>-73</td>
<td>-32.8</td>
<td>-65.5</td>
<td>-34.8</td>
<td>-36.3</td>
</tr>
<tr>
<td>Cons.</td>
<td>14.3***</td>
<td>4.8**</td>
<td>30.5***</td>
<td>18.6***</td>
<td>19.3***</td>
</tr>
<tr>
<td></td>
<td>-2.7</td>
<td>-1.9</td>
<td>-5.4</td>
<td>-2.2</td>
<td>-1.9</td>
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<td>Obs.</td>
<td>163</td>
<td>106</td>
<td>281</td>
<td>368</td>
<td>918</td>
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<tr>
<td>Log L.</td>
<td>-675.7</td>
<td>-394.3</td>
<td>-1323</td>
<td>-1487</td>
<td>-4012</td>
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<tr>
<td>F statistic</td>
<td>0.0537</td>
<td>9.117</td>
<td>33.85</td>
<td>29.55</td>
<td>17.01</td>
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<tr>
<td>p-value</td>
<td>0.948</td>
<td>0.000225</td>
<td>0.00E+00</td>
<td>0</td>
<td>5.59E-08</td>
</tr>
</tbody>
</table>

Notes: Regressions present results for Tobit univariate regressions with the Z-score as the dependent variable and left-censored at zero. Robust standard errors are in parentheses. ***, **, and * signify significance at 1%, 5%, and 10% p-values. RWA: risk-weighted-assets as % of total assets; TCE: tangible common equity as % of tangible assets; Log L.: log likelihood ratio.

- Z-score should decrease with RWA
  - Higher risk-weight implies greater default risk (i.e. lower Z-score)
  - Holds for both types of retail banks

- For investment & wholesale banks
  - (Potential) positive relation
  - Banks with lower RWA may be closer to default!
  - More data needed
Robustness– Liquidity

• Hard to measure due to unavailability of data
  – Share of liq. assets not adequately informative
  – Problems in disclosure standards

• Construct estimate of NSFR
  – Based on balance sheet info.
  – Use assumptions similar to IMF (GFSR, Sep. 2011)
  – Available stable funding / required stable funding
  – Basel III requirement is 100%
Robustness – Liquidity

Evolution of net stable funding ratio (NSFR)

- NSFR lower than 100% for all models
- Investment & wholesale banks severely illiquid, esp. in 2008!
- Retail banks closest to requirements

Notes: Assumptions for construction of NFSR are similar to those put forward in IMF (2011a), to the extent of data availability.
Policy relevance

• CRD IV/Basel III capital and liquidity requirements
  – Must distinguish along business models
  – Minimum requirements are insufficient
  – RWA does not capture risk for investment banks

• Leverage ratio
  – Can address weakness w/ risk-sensitive requirements
  – Have to calibrate by considering micro- & macro-prudential benefits & potential costs
  – Need EU-wide definition for disclosure to be effective

• Min. req. of 3% leverage ratio would imply shortfalls for
  – Most of the investment banks (~59%)
  – More than one-third of wholesale banks (~39%)
  – Almost one-quarter of diversified retail banks (~23%)
  – Least of the focused retail banks (~15%)
  – Should it complement the banking structural reforms?
For the success of the monitoring exercise

• Disclosure, disclosure and disclosure
  – Clear need for stronger and harmonised disclosure requirements for all banks in particular the STV
  – No harmonization even on simple terms
    • Eg. Customer deposits sometimes includes CB deposits/debt issued by corporations
    • Eg. Cash-like assets sometimes include public debt held
  – Deadline needed to shift to XBRL reporting
Business Models Monitor- Global exercise

• The BMM is a global exercise - other versions of the Monitor are being developed for US, Canada, LA and Asia at HEC Montreal

• These BMM will be launched next year in the respective regions

• 2015 BBM in Europe will be launched in Nov-Dec 2015