Monitoring Banking Business Models in Europe

Contribution to the economy, resilience and robustness

Rym Ayadi, Professor HEC Montreal

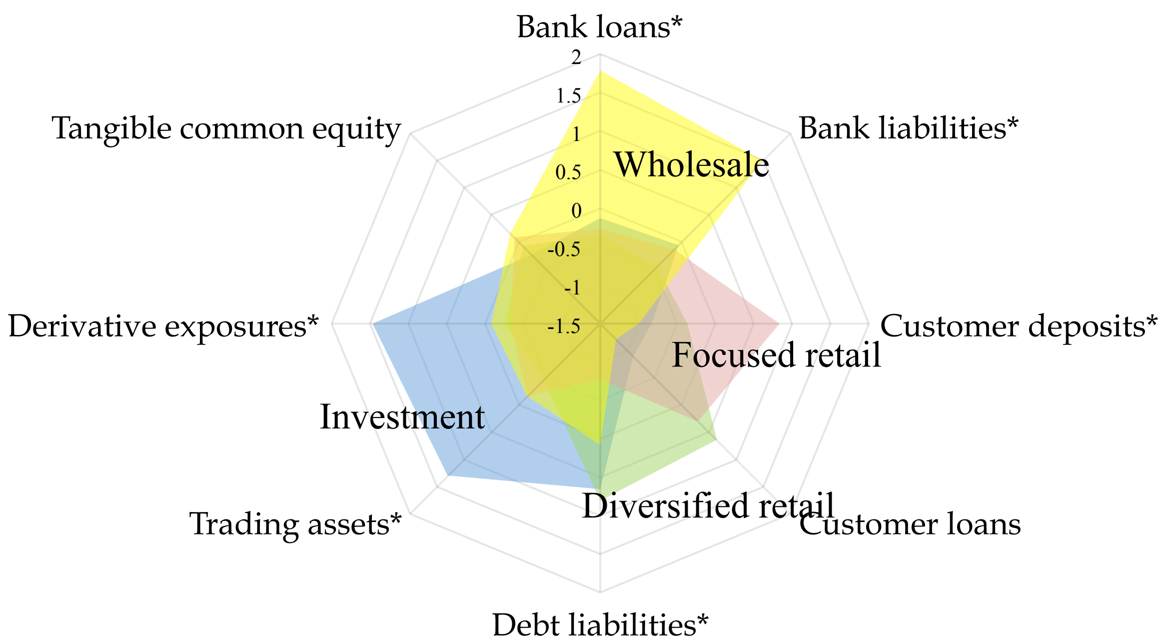
04 December 2014 - Launch at the European Parliament

Ayadi, R. and W.P. De Groen (2014), *Banking Business Models Monitor 2014 - Europe*, CEPS and HEC Montreal -Observatoire Publications.

See also previous related studies:
Ayadi, Arbak, and De Groen (2012), *Regulation of European Banks and Business Models: Towards a New Paradigm*, CEPS Paperbacks, June.
Ayadi, Arbak, and De Groen (2011), *Business Models in European Banking: A pre- and post-crisis screening*, CEPS Paperbacks, June.

A diversified banking industry in Europe

Standardized scores



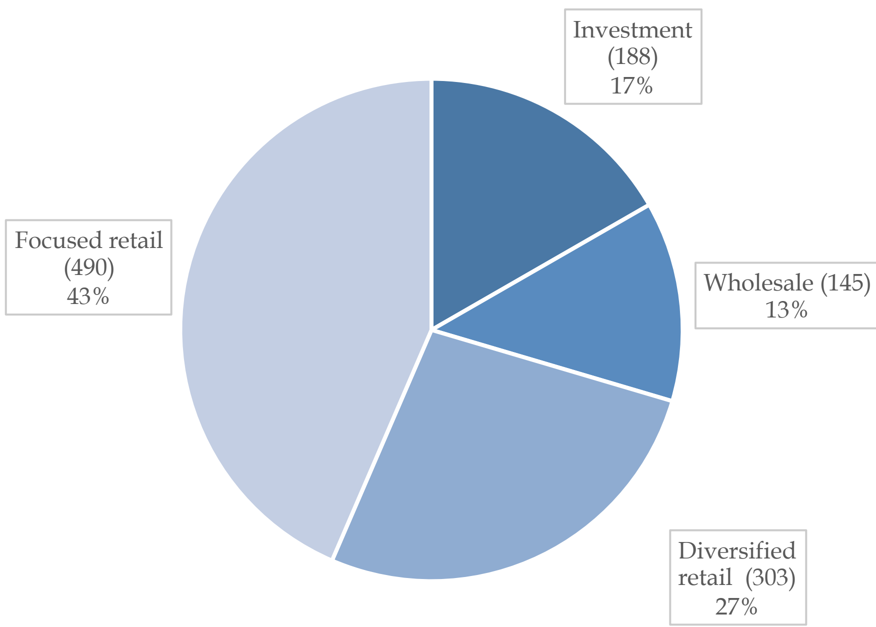
4 distinct banking models:

- 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.

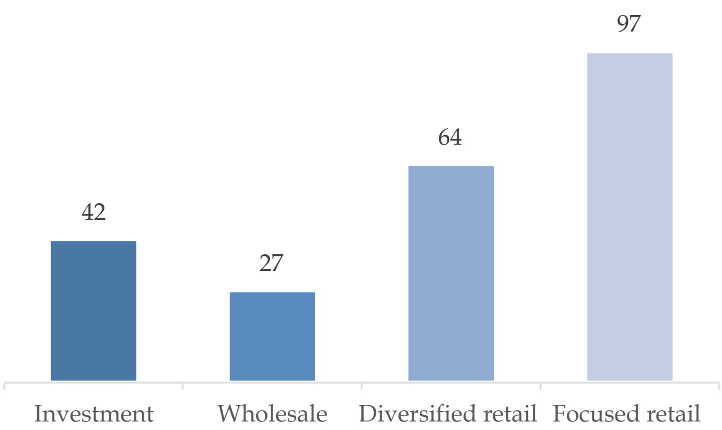
A diversified banking industry in Europe

Observations by cluster (obs)

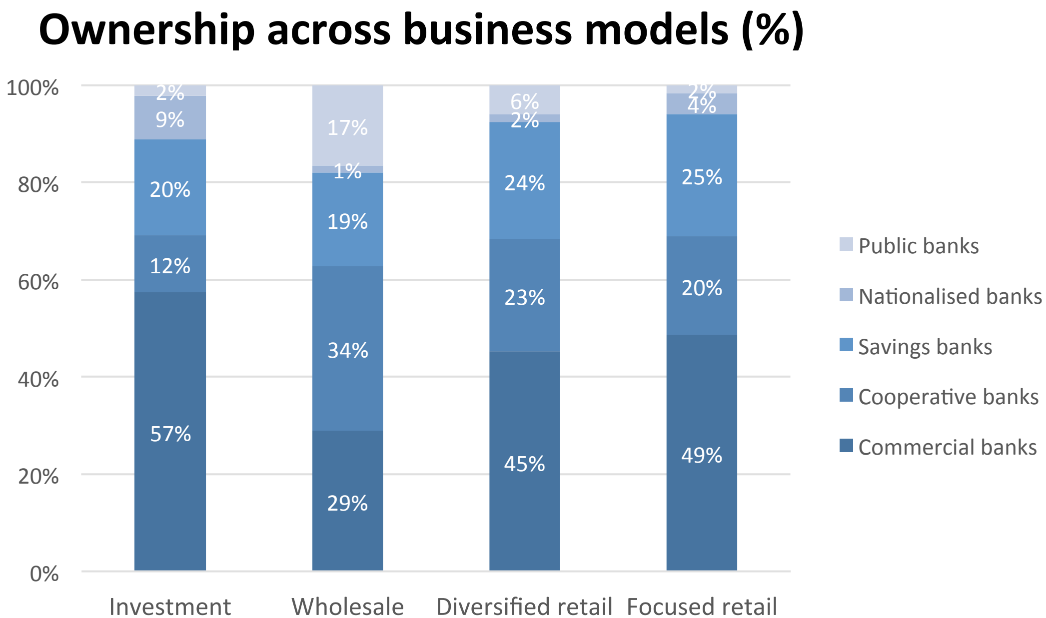


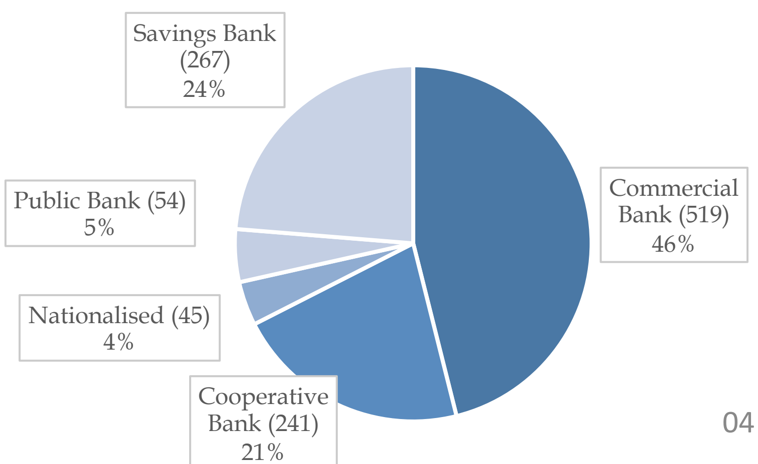
- Most banks are identified as retail banks ~70% (i.e. focused retail and diversified retail)

Nr of different banks by cluster



A diversified banking industry in Europe

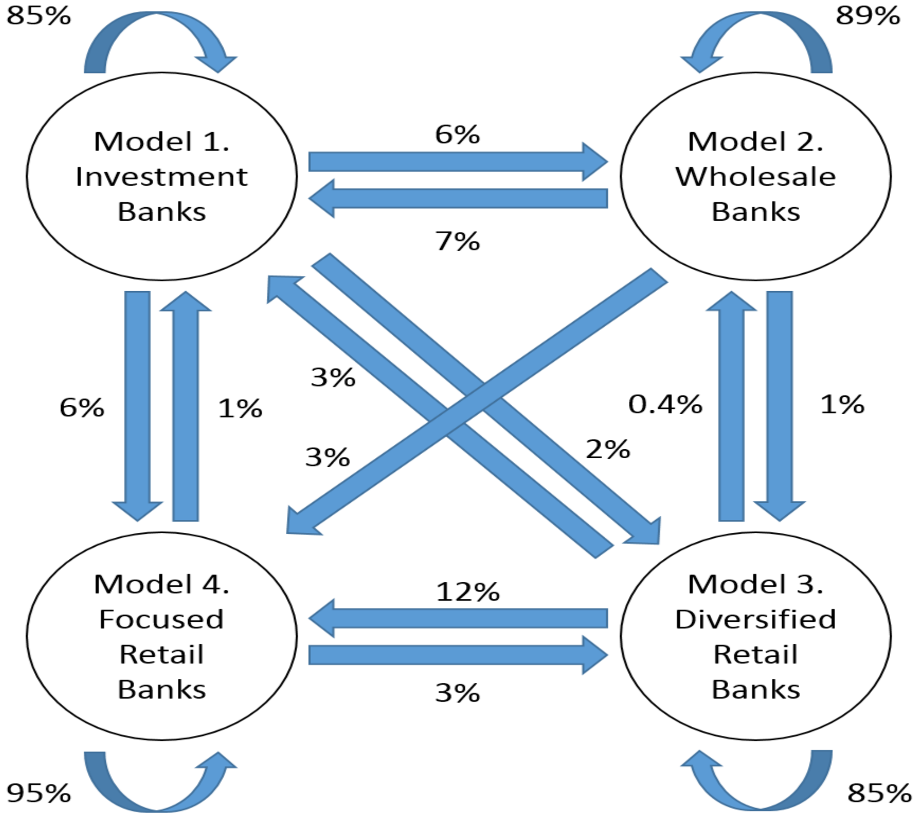




- STV banks (e.g. cooperatives and Savings banks) divided across four business models
- Highest share among wholesale banks (i.e. central institutions of cooperatives)
- SHV banks mainly investment oriented

A diversified banking industry in Europe

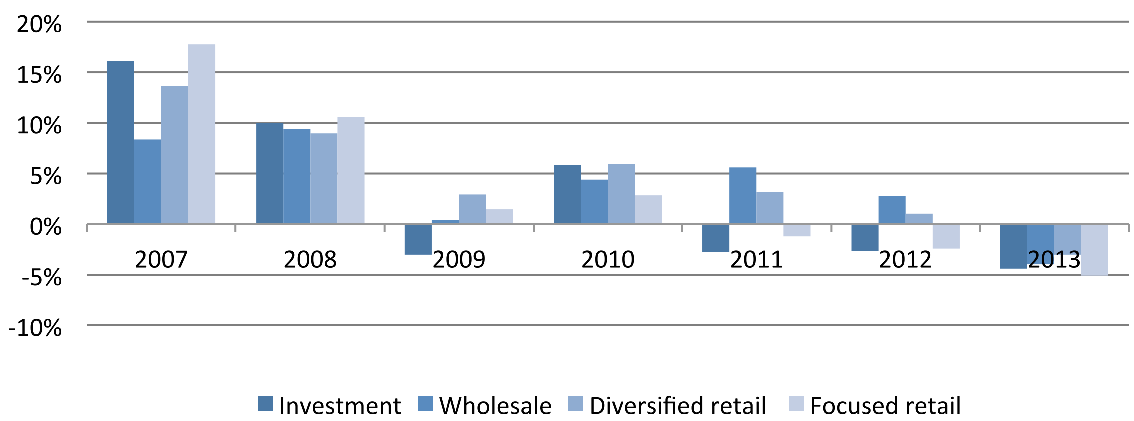
Model transition matrix(%)

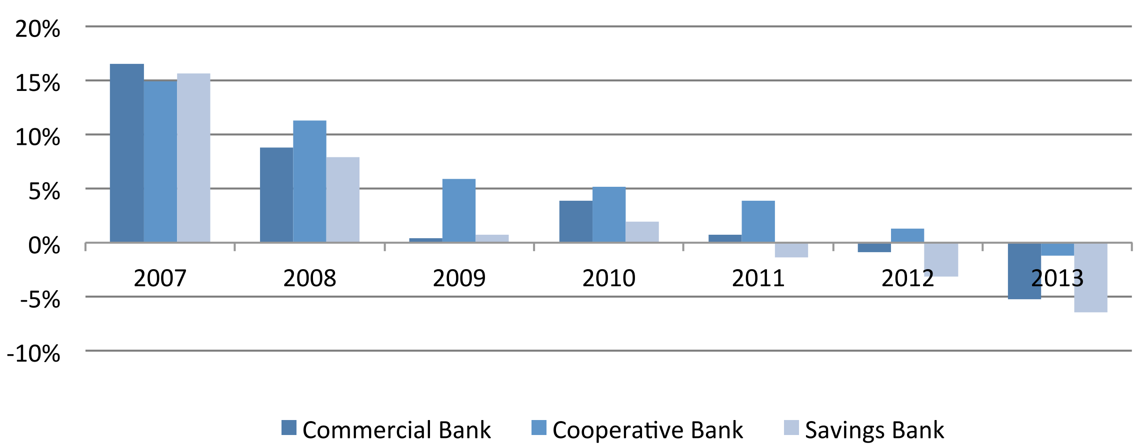


- Migration from one model to another
- Reinforces or reduces diversity
- Accumulate risk of certain business models
- Important to monitor and understand this phenomenon

Support to the real economy

Growth in outstanding customer loans (median values)

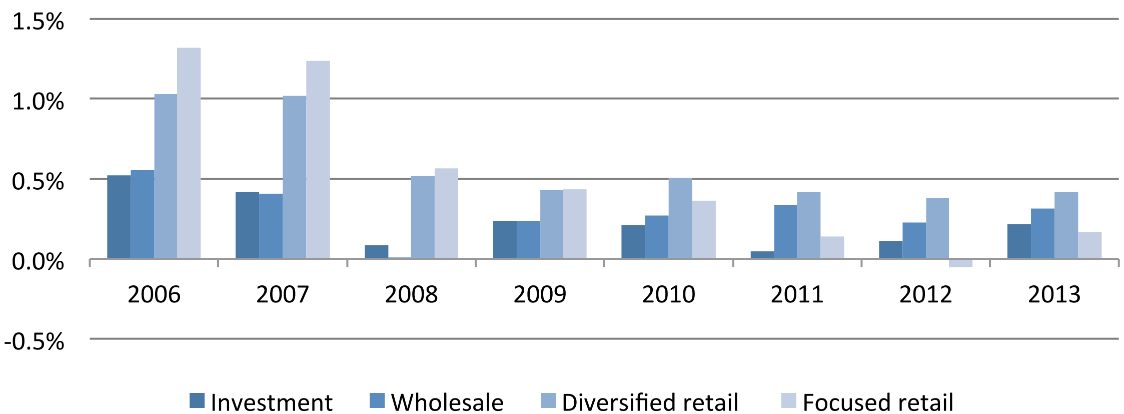


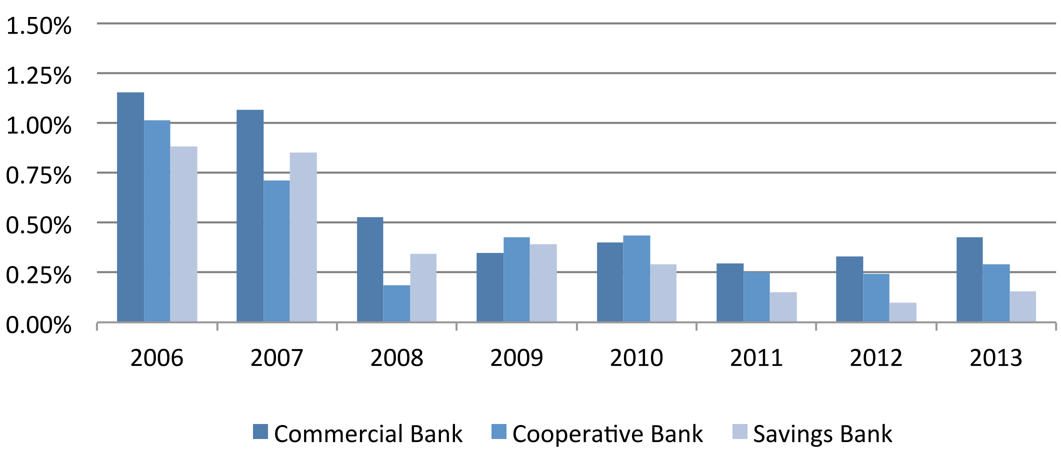


- Slowing loan growth during financial- and econ. crises
- Substantial for investment & wholesale banks during fin. Crisis
- Diversified retail banks continued for the longest period!
- STV banks (e.g. cooperatives continued to lend to the economy (in contrast to savings and commercial banks

Performance - RoA

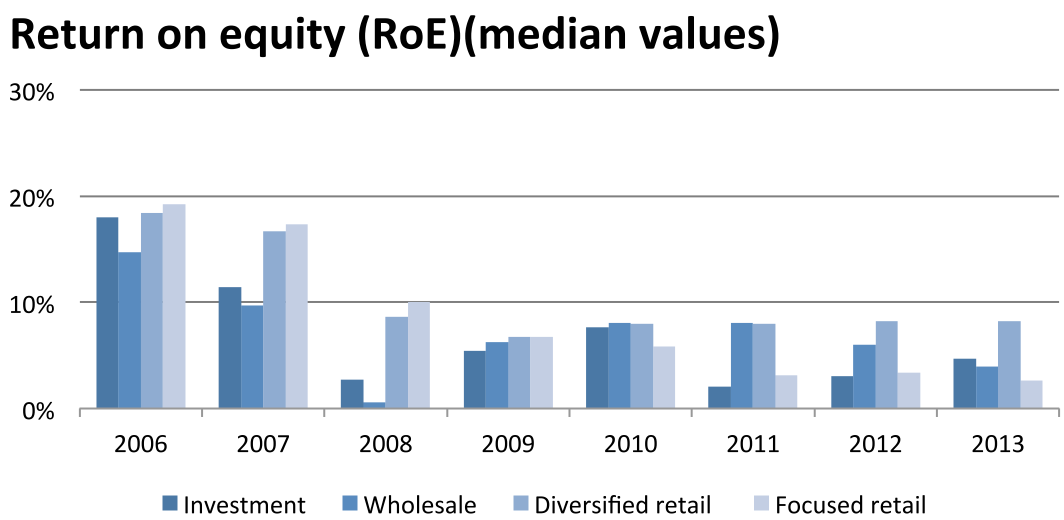
Return on assets (RoA)(median values)

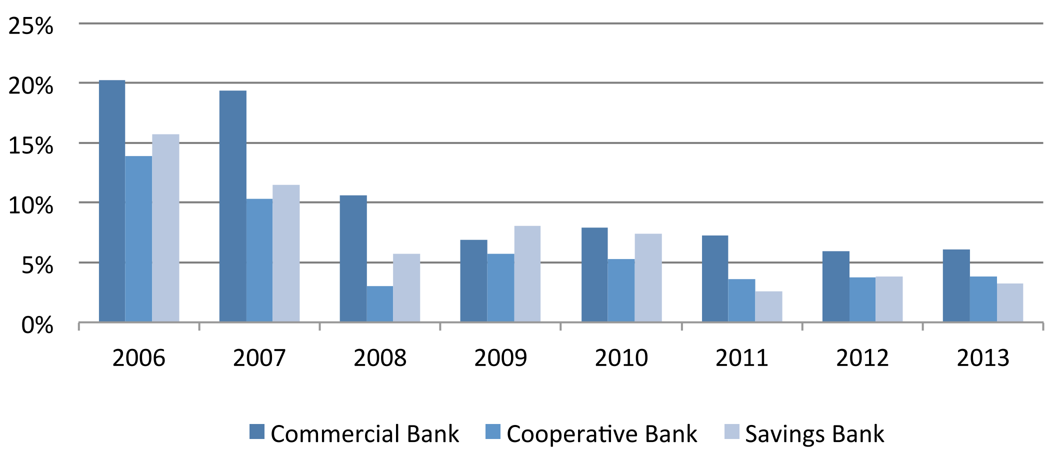




- Profits declined for all banks
- Wholesale & investment banks took severe hit in 2008/9
- Focused retail also took hit in 2011/2013
- Diversified retail banks performed best during crises
- STV banks (e.g. cooperatives continued to be profitable

Performance - RoE

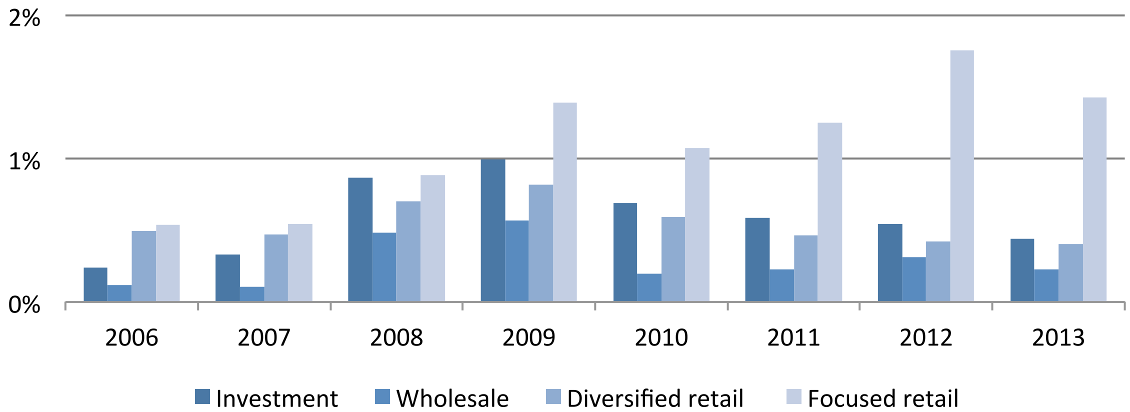


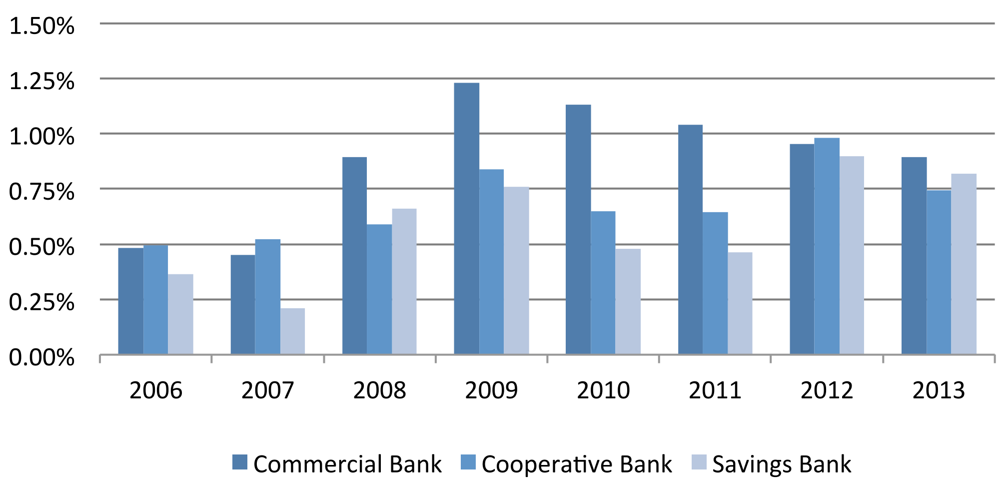


- Similar results for RoE
- Relatively smaller gap between investment bank and other models due to lower equity ratio
- ROE converged between SHV & STV models

Resilience - Risk costs

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

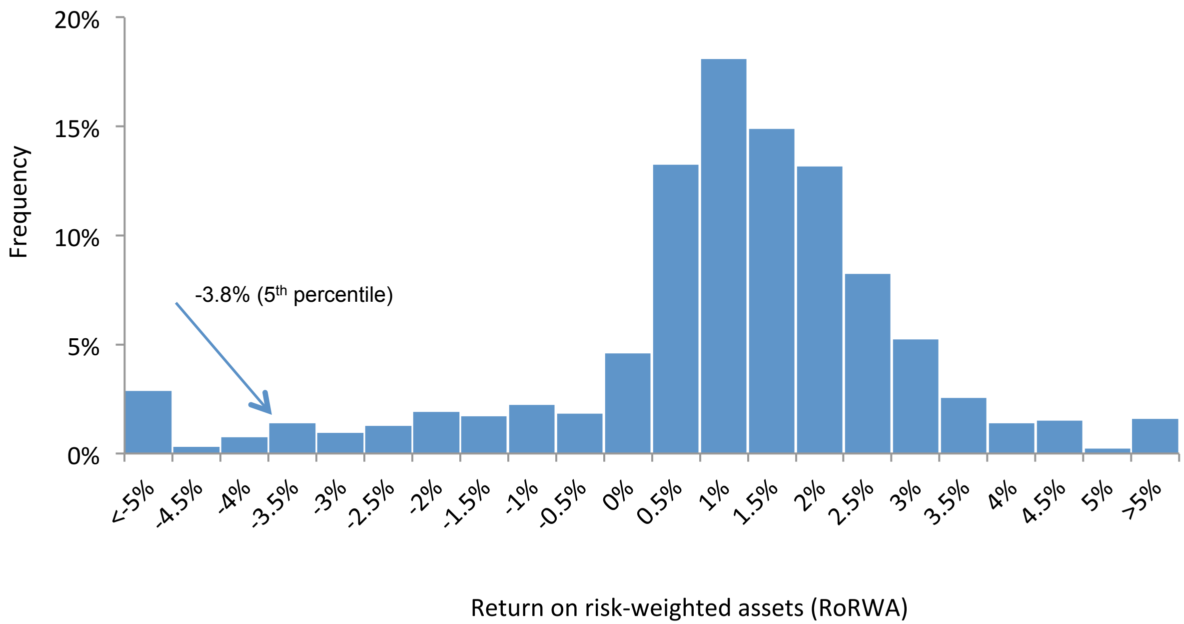




- Recent losses mostly due to increase in write downs and losses on loans
- Especially focused retail banks suffered
- Less dramatic losses for others
- SHV banks suffered more during fin-crisis and early stages of econ. Crisis as compared to STV banks

Resilience - Tail losses

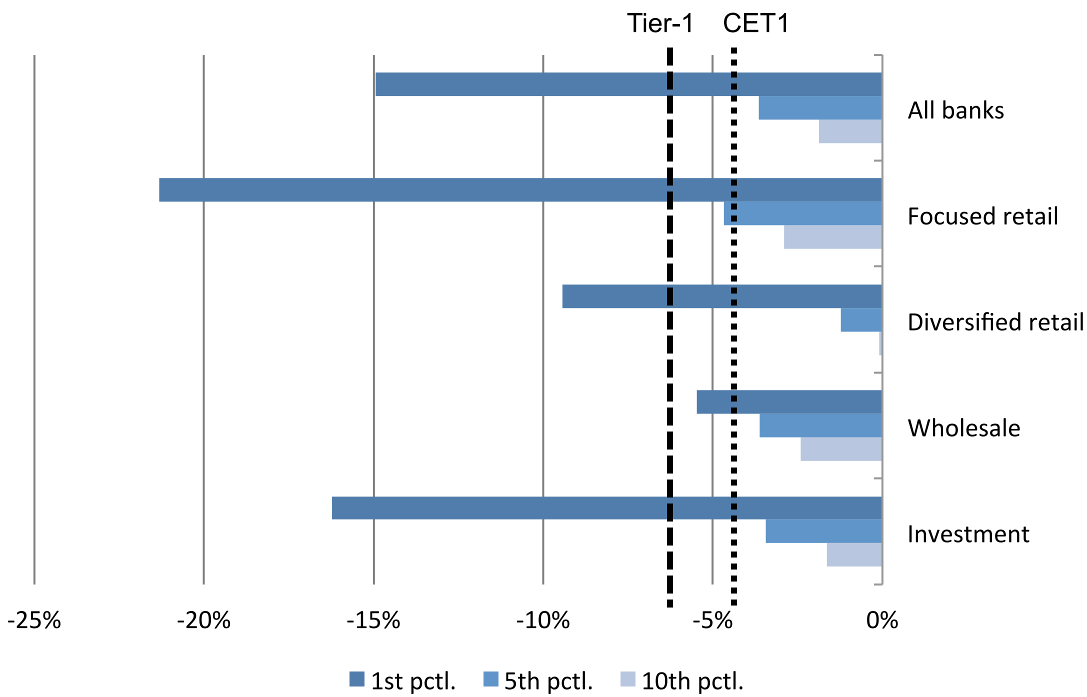
Distribution of return on RWA (RoRWA), 2006-13



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

Resilience - Tail losses

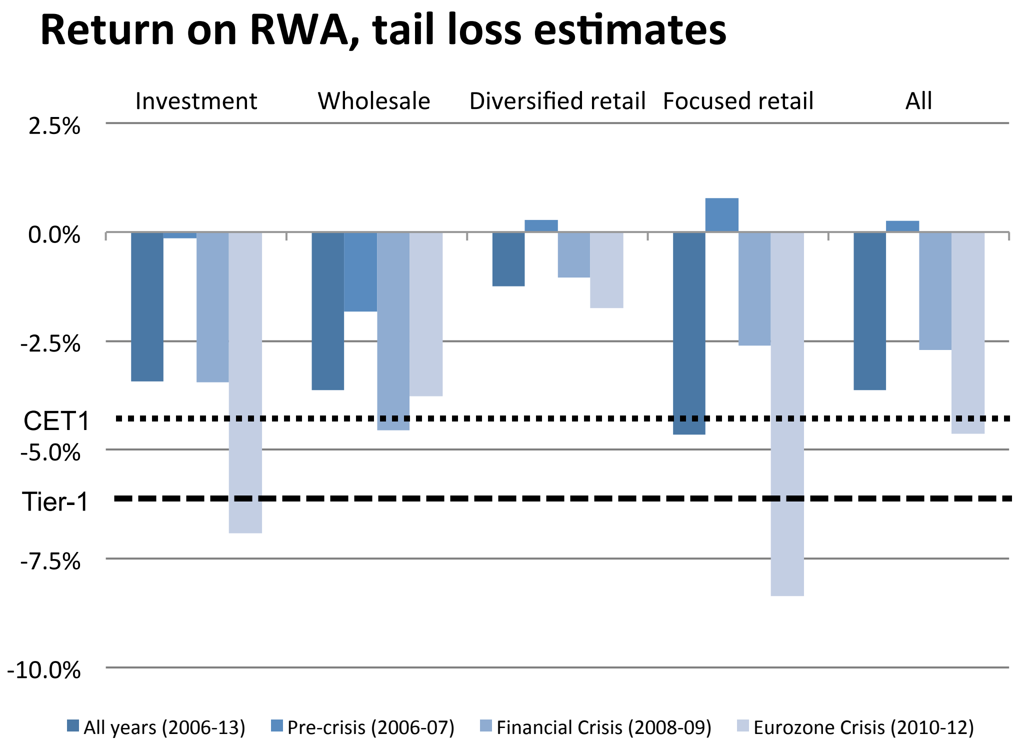
Return on RWA, tail loss estimates, 2006-13



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.

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

Resilience - Tail losses

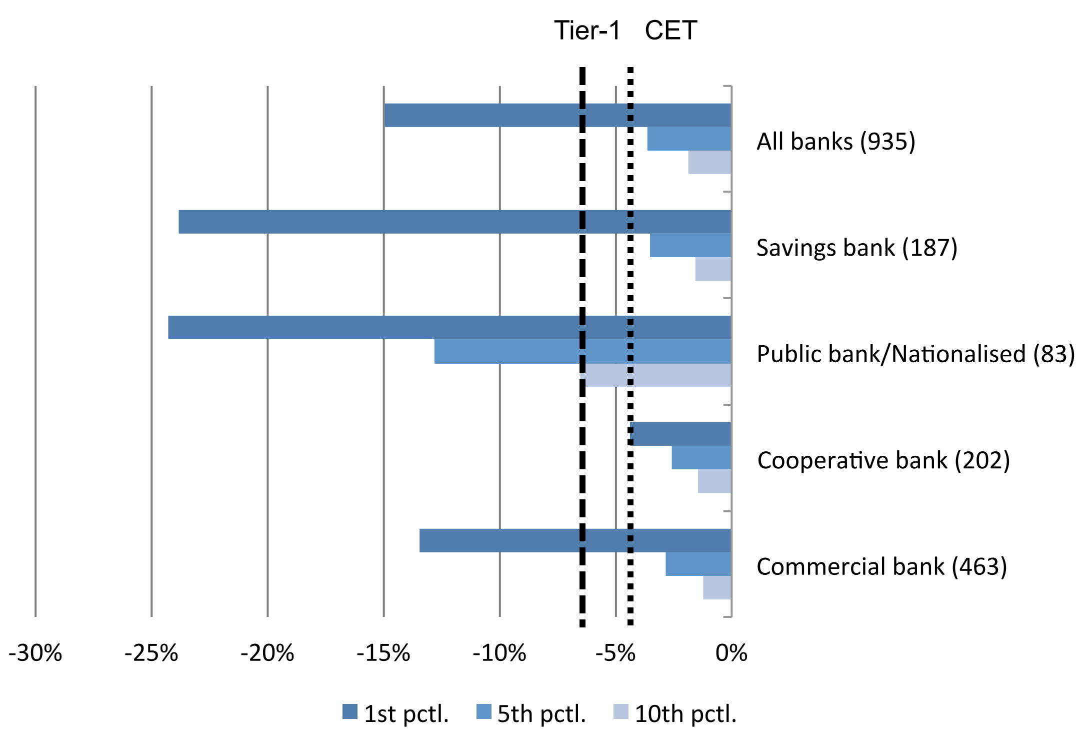


Notes: Figures provide the Harrell-Davis 5th percentile estimates for the distribution of return on RWA. CET1 (i.e. 4.5%) and Tier-1 (i.e. 6.0%) stand for CRD IV minimum requirements for common equity and Tier-1 ratios.

- 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!

Resilience - Tail losses

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



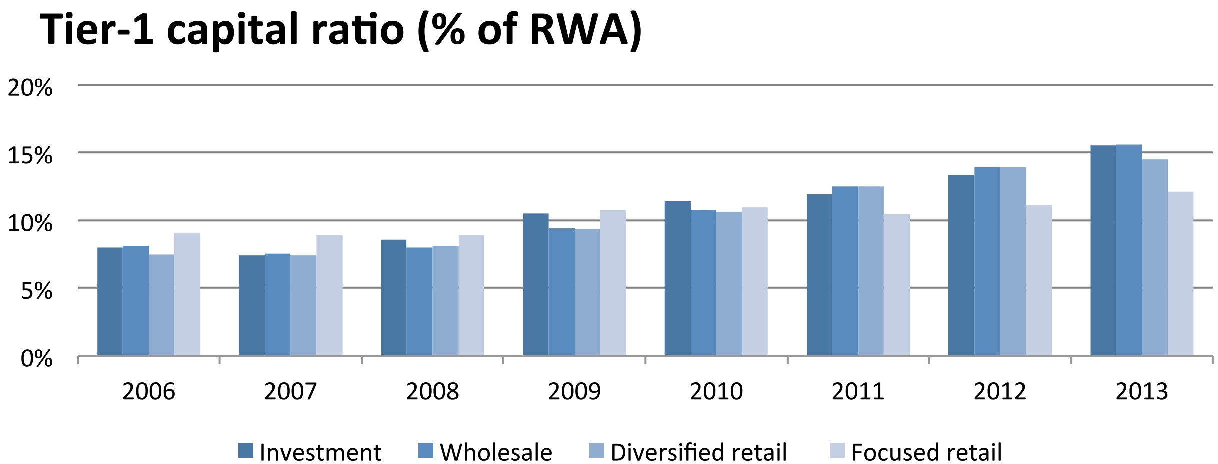
Notes: Figures provide the Harrell-Davis percentile estimates for the distribution of return on RWA. CET1 (i.e. 4.5%) and Tier-1 (i.e. 6.0%) stand for CRD IV minimum requirements for common equity and Tier-1 ratios.

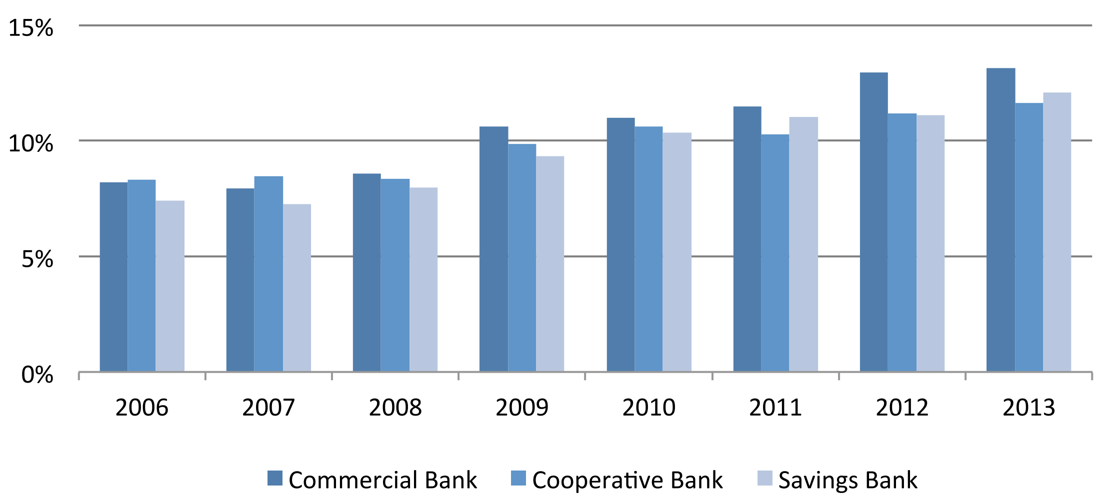
- Comparison across ownership types
- Losses are high for:
  - Public/Nationalised banks
  - For all models, except cooperative banks, high losses under rarer events!

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 <u>more data</u> for better estimates

Robustness- Capital & leverage

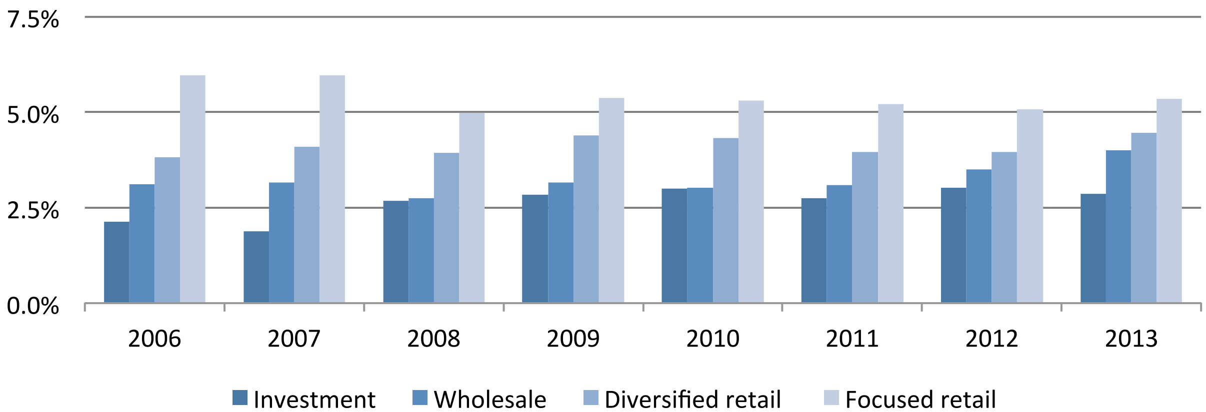


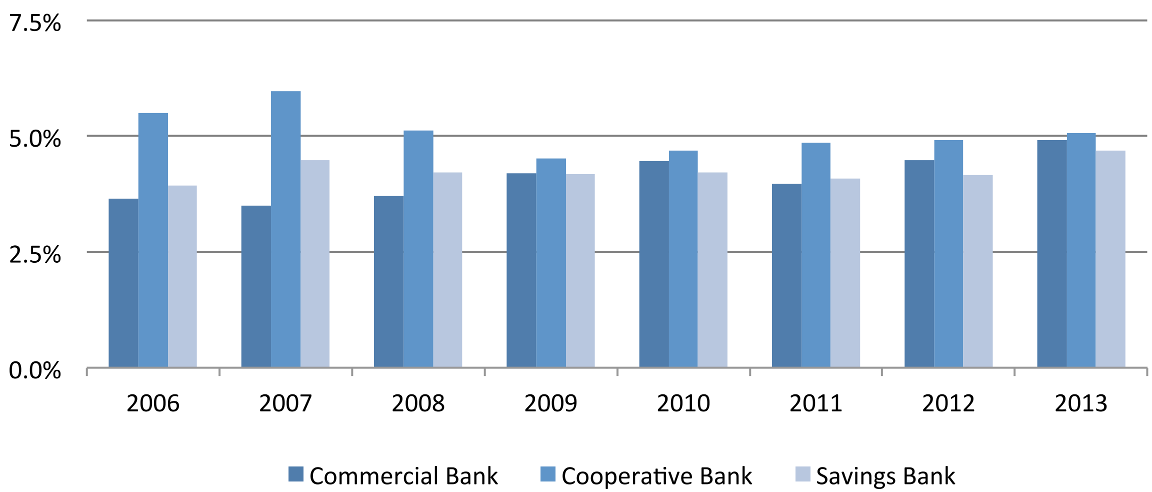


- Banks across the four BMs increased Tier-1 capital ratios
- Differences are most cases not significant

Robustness -Capital & leverage

Leverage ratio (Common tangible eq./tangible assets)





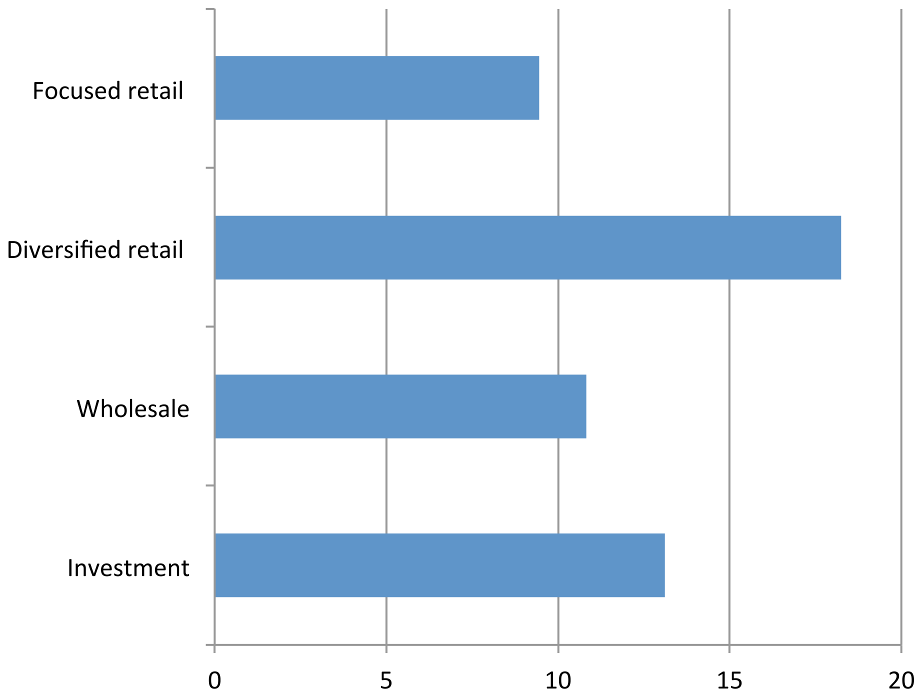
- Leverage ratio also increased
- Differences are statistically significant
    - Investment banks have lowest ratios
    - Wholesale banks also low despite improvement
- The STV banks (e.g. Cooperatives) started with the highest leverage ratio, but the leverage ratios have converged during the fin. 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 = Equity + Earnings
  - For those with high Z, default much less likely
  - If Z < 0, losses wipe out capital → 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

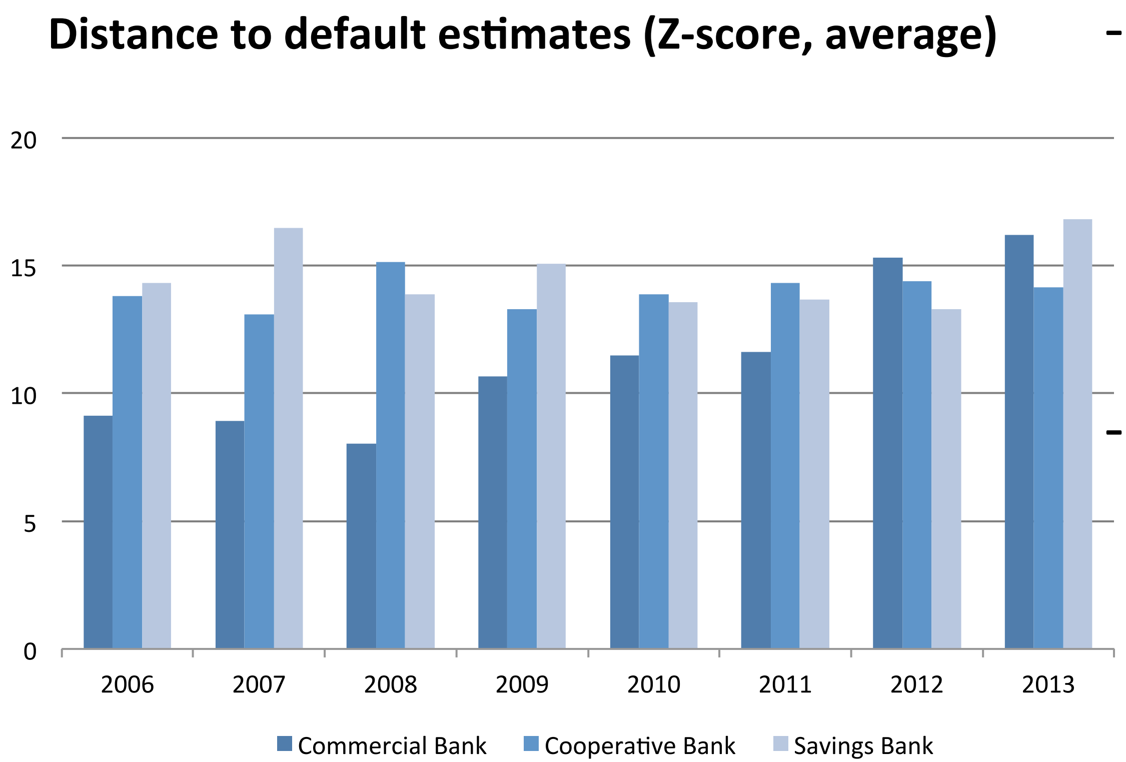
Distance to default estimates (Z-score, average)



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

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

Robustness – Distance to default



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

- 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.)

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 w/ 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

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

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.

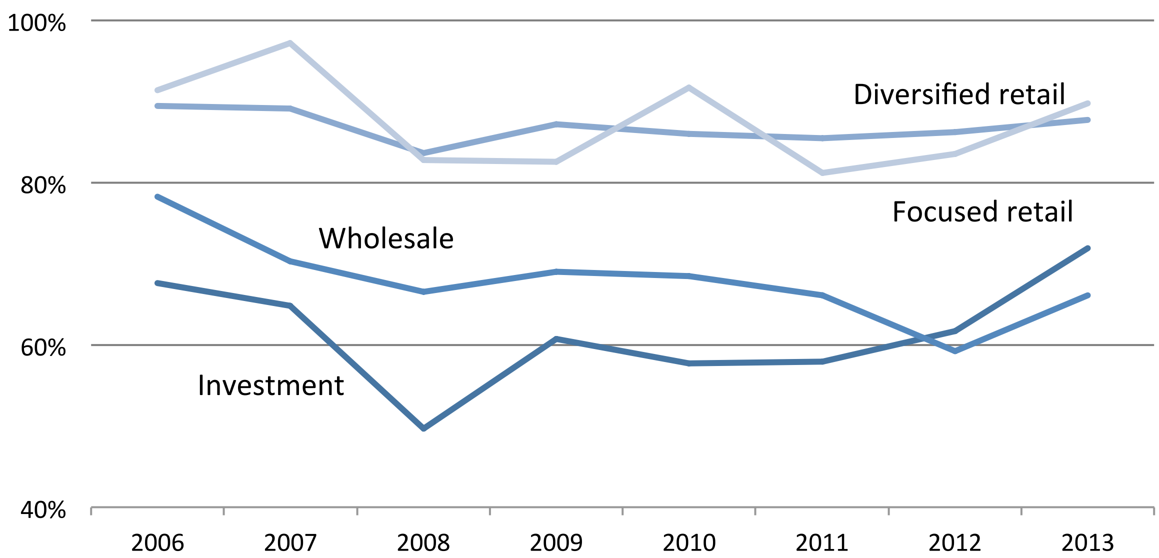
- Z-score should <u>decrease</u> with RWA
  - Higher risk-weight implies greater default risk (i.e. lower Z-score)
  - Holds for both types of retail banks
- For investment & wholesale banks
  - (Potential) positive relation
  - Banks with lower RWA may be <u>closer</u> to default!
  - More data needed

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)



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

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

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