European Banking Pre- and Post Crisis:
Mapping, Restructuring and Business Models
2006-2013

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Ayadi, R. and W.P. De Groen (2014 forthcoming), ***Monitoring banking business models in Europe***, **CEPS Publications**
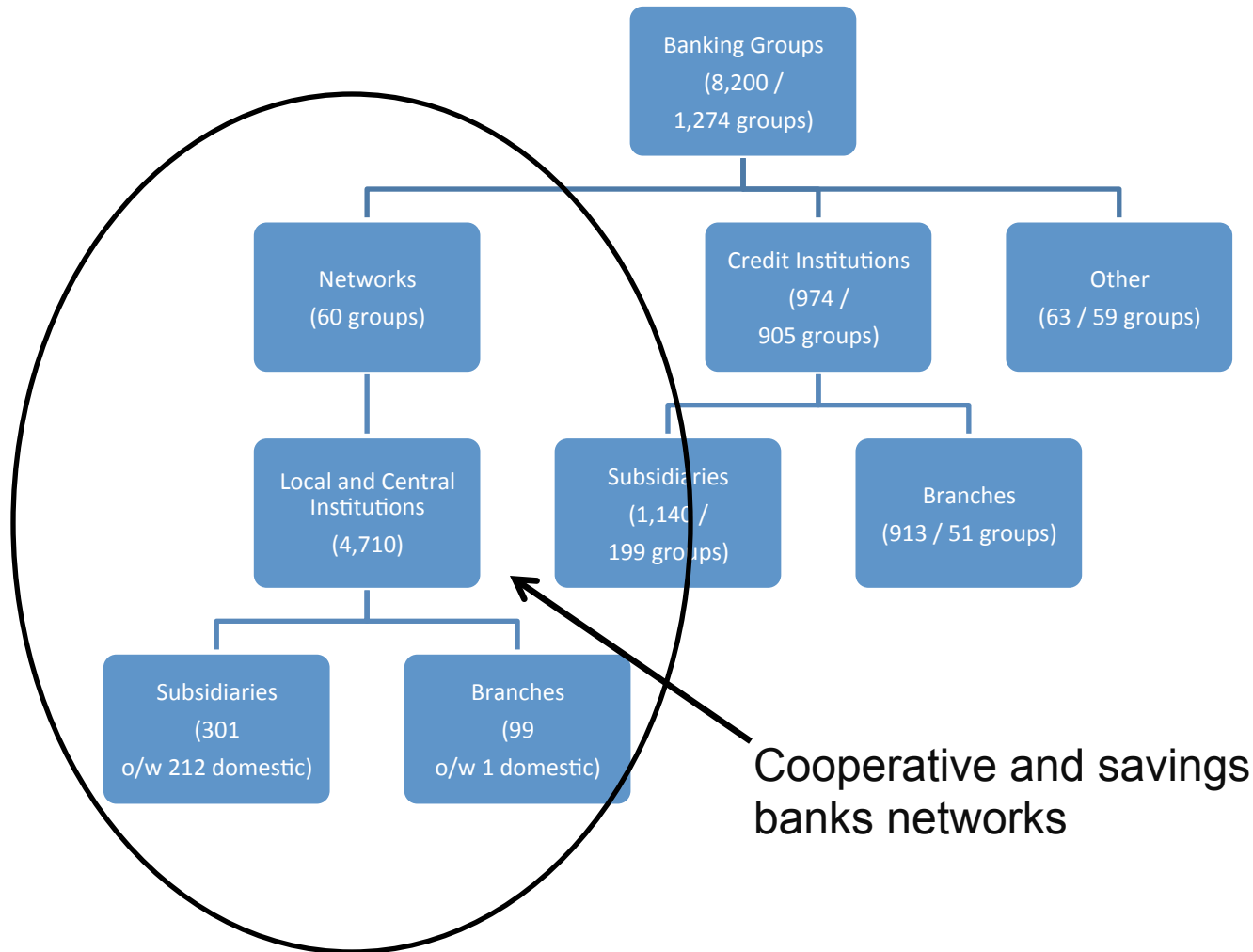**Ayadi, R. and W.P. De Groen (2014 forthcoming),** ***State aid to banks and SMEs financing: Is there a need for conditionality?*** **, European Parliament**

See also previous business model studies:

Ayadi R., E. Arbak, and W.P De Groen (2012), *Regulation of European Banks and Business Models: Towards a New Paradigm*, CEPS Paperbacks, June.
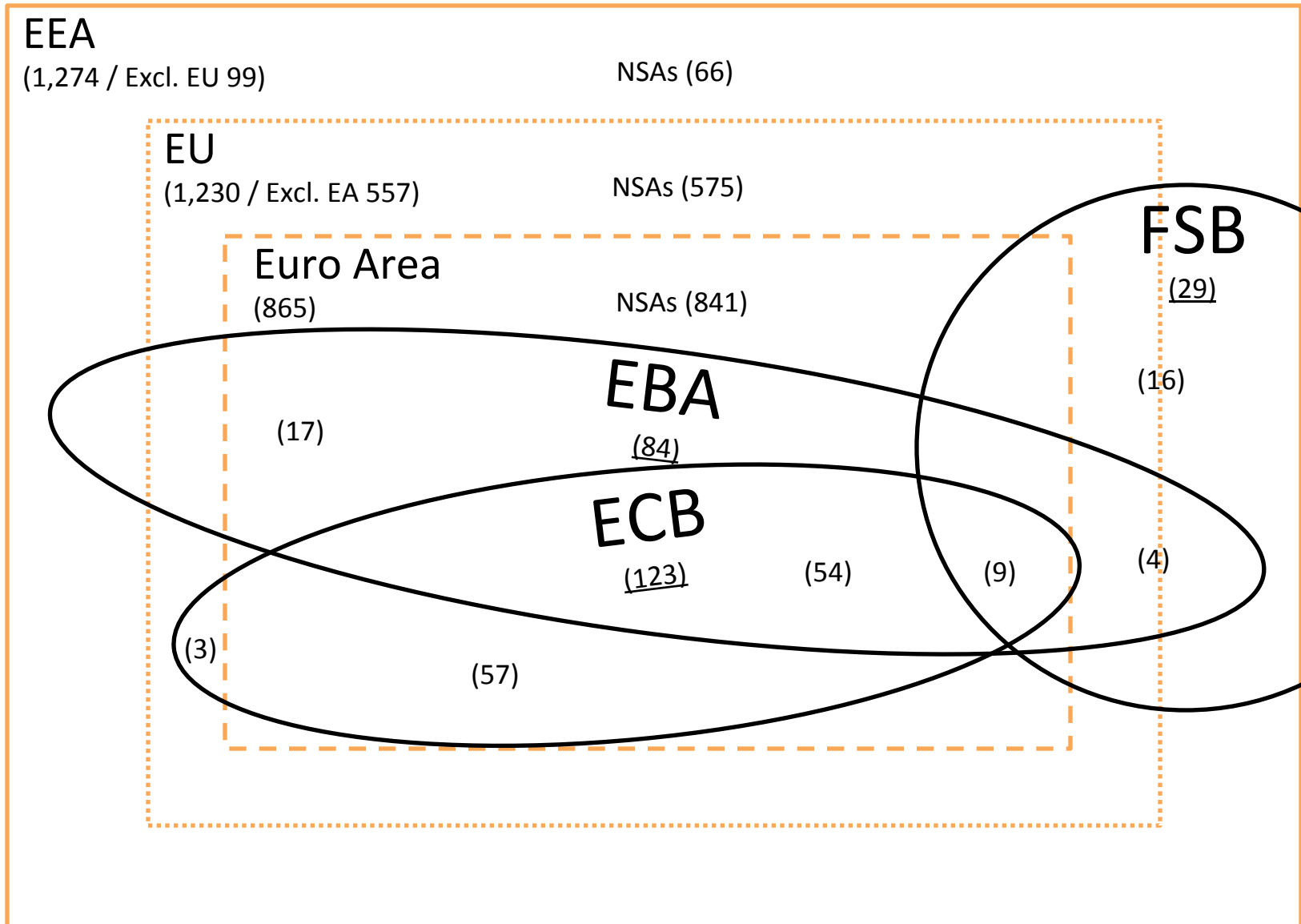
Ayadi R., E. Arbak, and W.P. De Groen (2011), *Business Models in European Banking: A pre- and post-crisis screening*, CEPS Paperbacks, June.
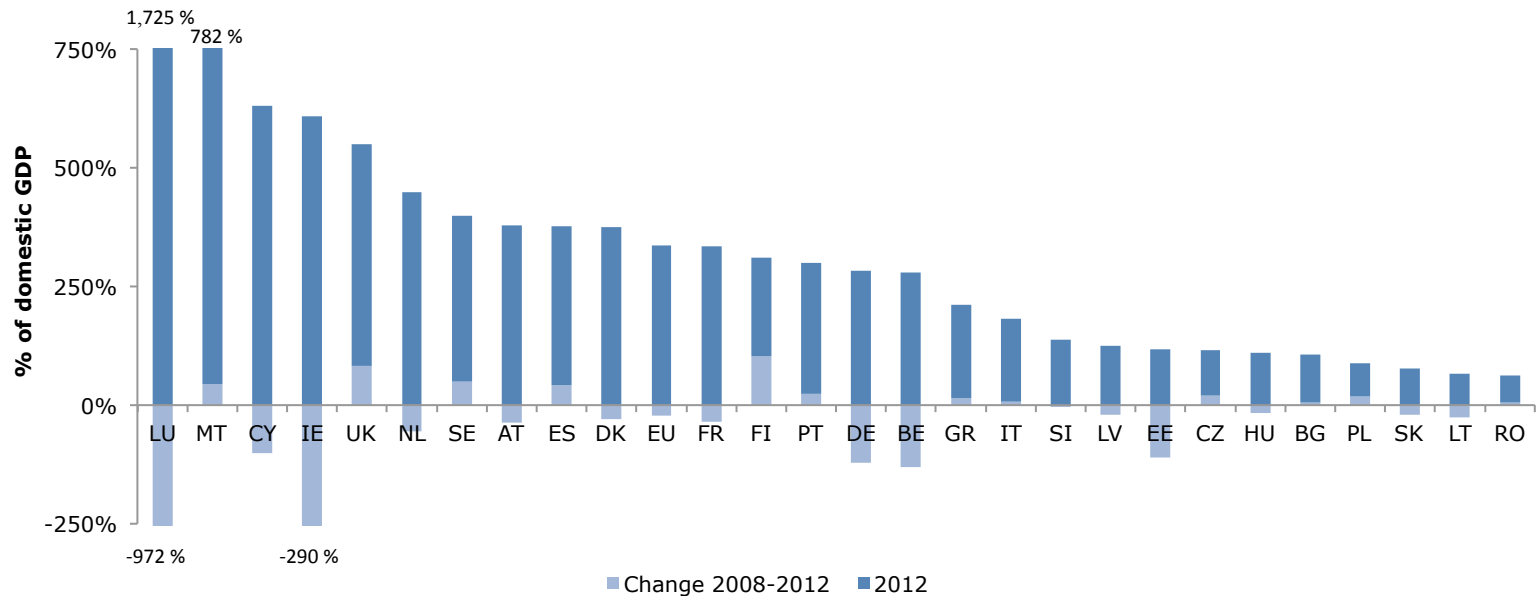
June 2014

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Mapping of the EU banking sector

Cooperative and savings
banks networks

Note: Data as of 31 December 2012

Mapping of the EU banking sector

EEA
(1,274 / Excl. EU 99)   NSAs (66)

EU
(1,230 / Excl. EA 557)   NSAs (575)

Euro Area
(865)   NSAs (841)

FSB
(29)

(16)

EBA
(84)

(17)

ECB
(123)   (54)   (9)   (4)

(3)

(57)

Restructuring of EU banking sector

- There are large differences in the size of national banking sectors in the EU ranging from 17 times of GDP in LU to 0.6 of GDP in RO.

- The total assets of the EU banking sector are over 300 % of EU GDP.

- The size of the EU banking sector has declined 20 % of GDP since the fall of Lehman Brothers in 2008.
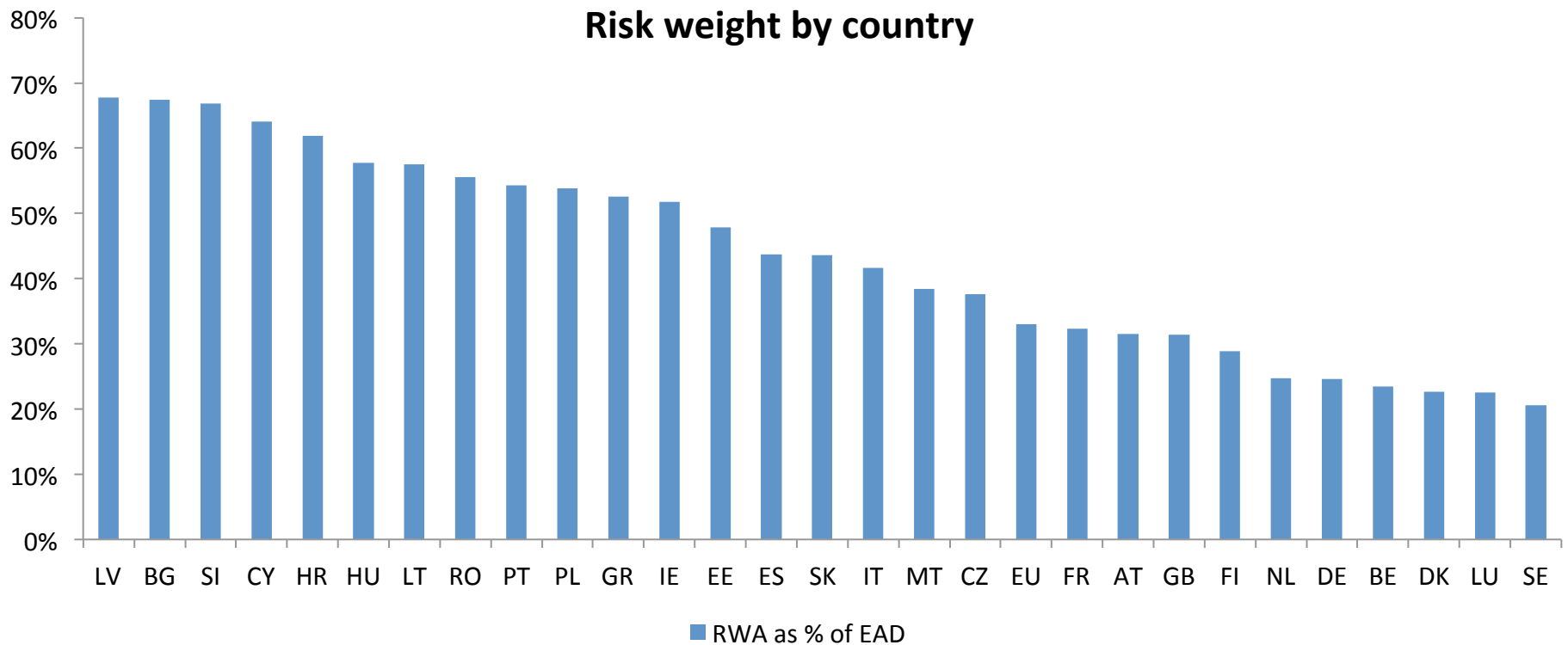
Restructuring of EU banking sector

- Between 2008 and 2012 the tangible equity (as % of tangible assets) of EU banks has increased (40 %) from 3.4 % to 4.8 %.
- Tangible equity ratio only decreased in Greece, Finland, Cyprus and Spain.

Legend: ■ Change 2008-2012   ■ 2012
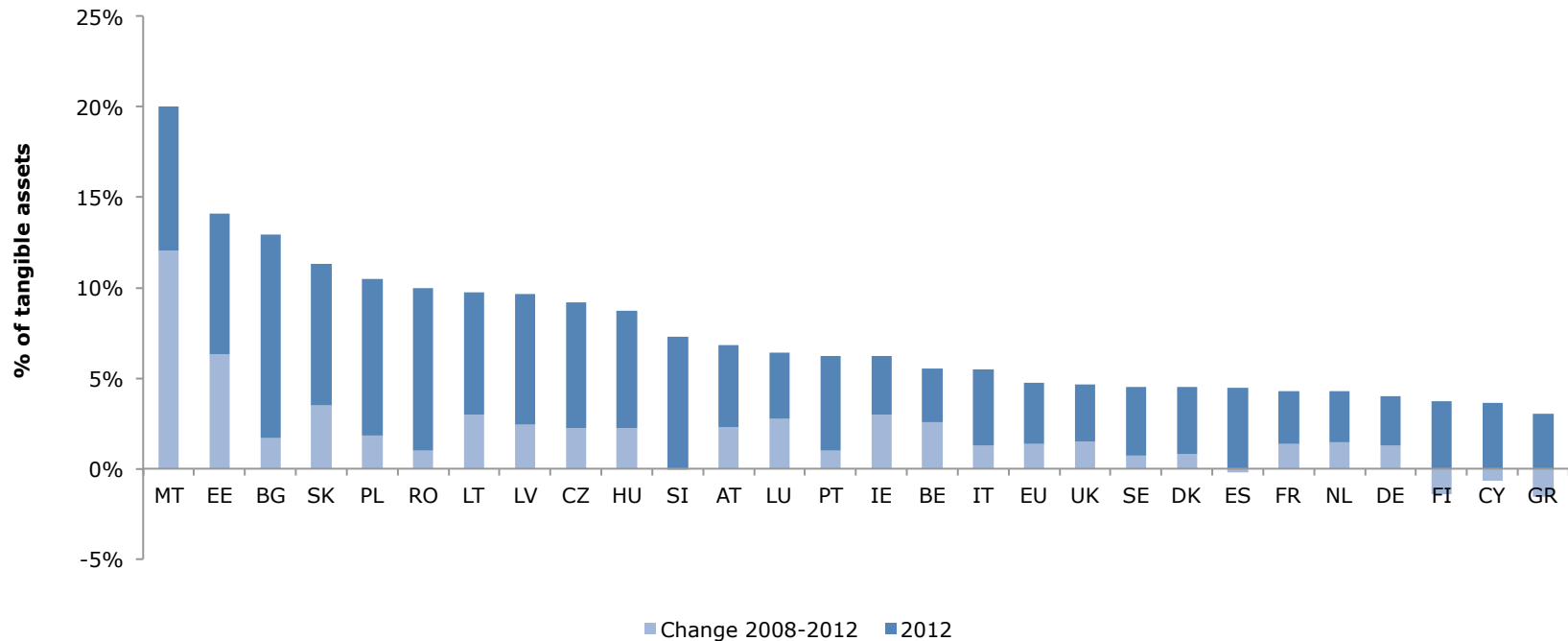
Restructuring of EU banking sector

- Yet large differences on risk weights between EU countries which vary between circa 70% (e.g. LV, BG) to 20% (e.g. DE, BE, LU and SE).

Risk weight by country

RWA as % of EAD

Note: Data as of 31 December 2012

Restructuring of EU banking sector

- Between 2008 and 2012 the EU banking sector has benefited from large amounts of State aid (e.g. capital and liquidity measures) to keep the sector afloat.

- DG Competition has approved more than 100 cases in the financial sector.

- Majority of banks had to restructure, which would potentially impact business models and the European banking industry as a whole.

in EUR billion (% of EU 2012 GDP)	Committed aid	Effectively used	Committed aid Effectively used
Capital measures			
Re-capitalisation	777.3 (6.01 %)	413.2 (3.20 %)	53.16 %
Support for bad asset schemes	445.7 (3.45 %)	178.7 (1.38 %)	40.10 %
Liquidity measures			
Debt guarantee schemes	3,646.6 (28.21 %)	835.8 (7.08 %)	22.92 %
Liquidity support other than guarantees	216.3 (1.67 %)	70.1 (0.59 %)	32.41 %
Total	5,085.9 (39.34 %)	1,497.8 (12.25 %)	29.45 %

Note: The liquidity measures used are for 2009, the year in which most liquidity support was tapped.

Business models in EU banking

2006 – 2012 (end-year)

Standardized scores
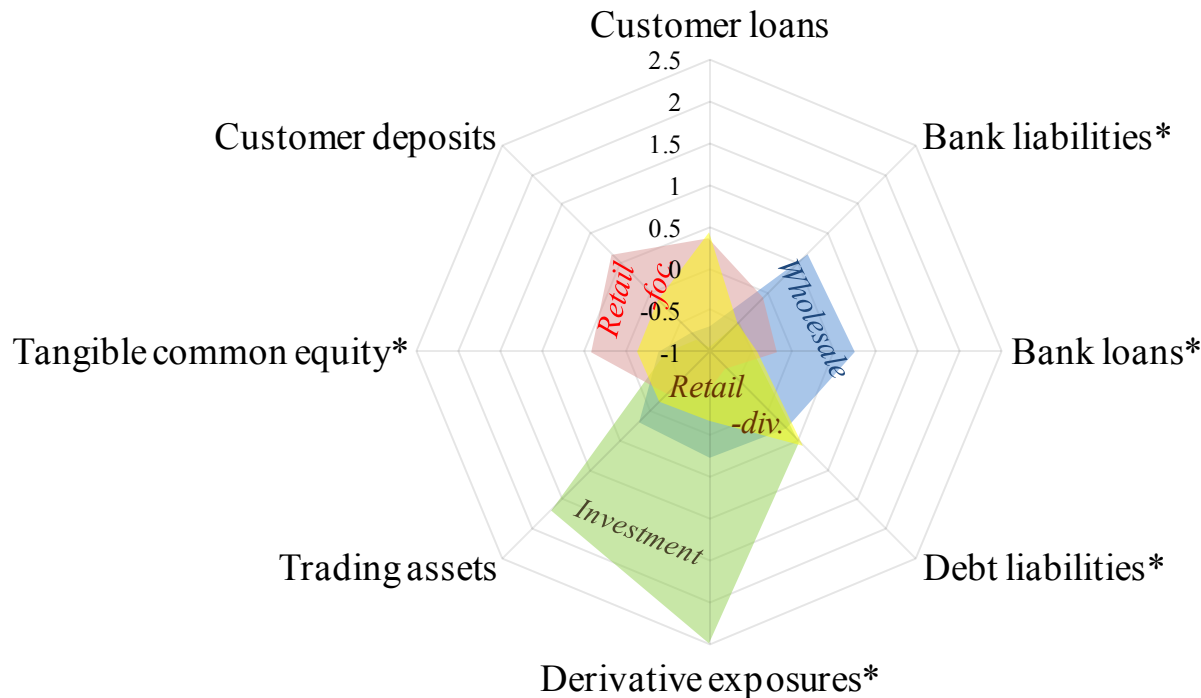
Cluster analysis yields 4 distinct models:

- Wholesale

- Investment

- Focused retail

- Diversified 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.

Performance - Tail losses

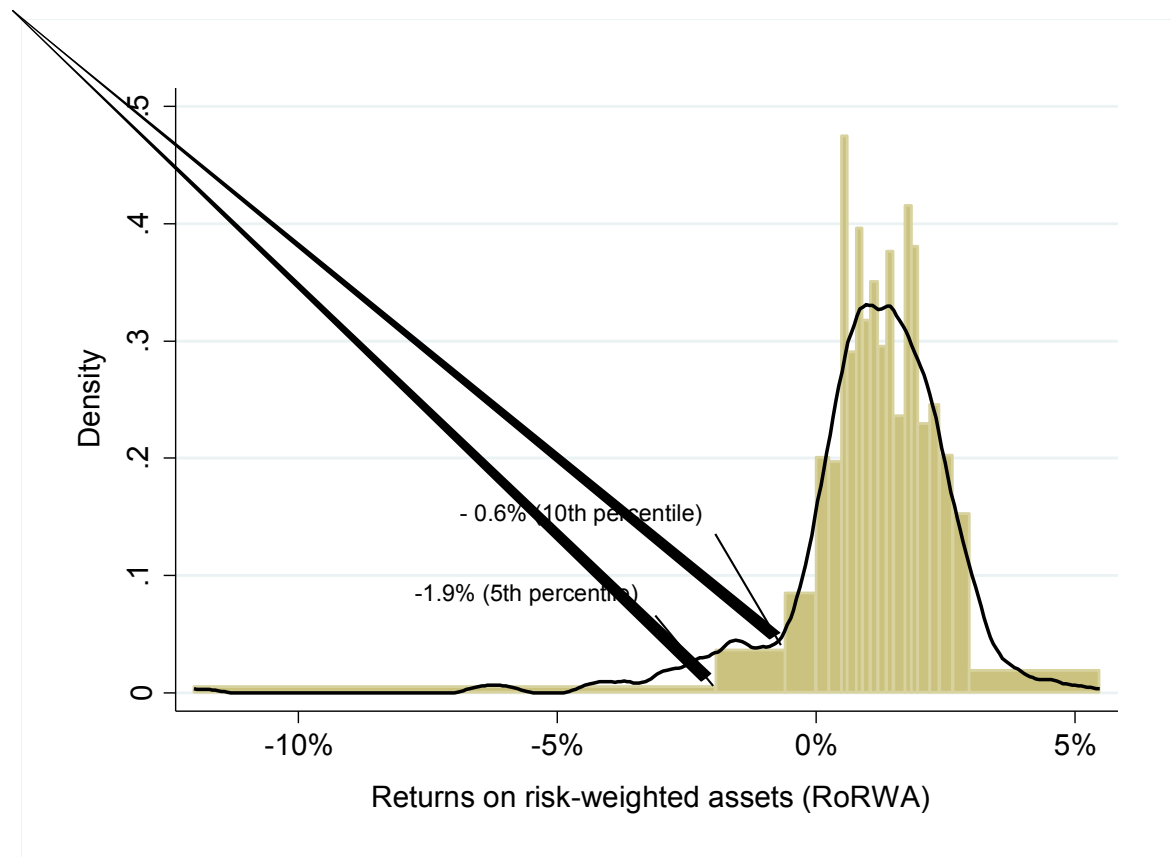**Distribution of return on RWA (RoRWA), 2006-2012**
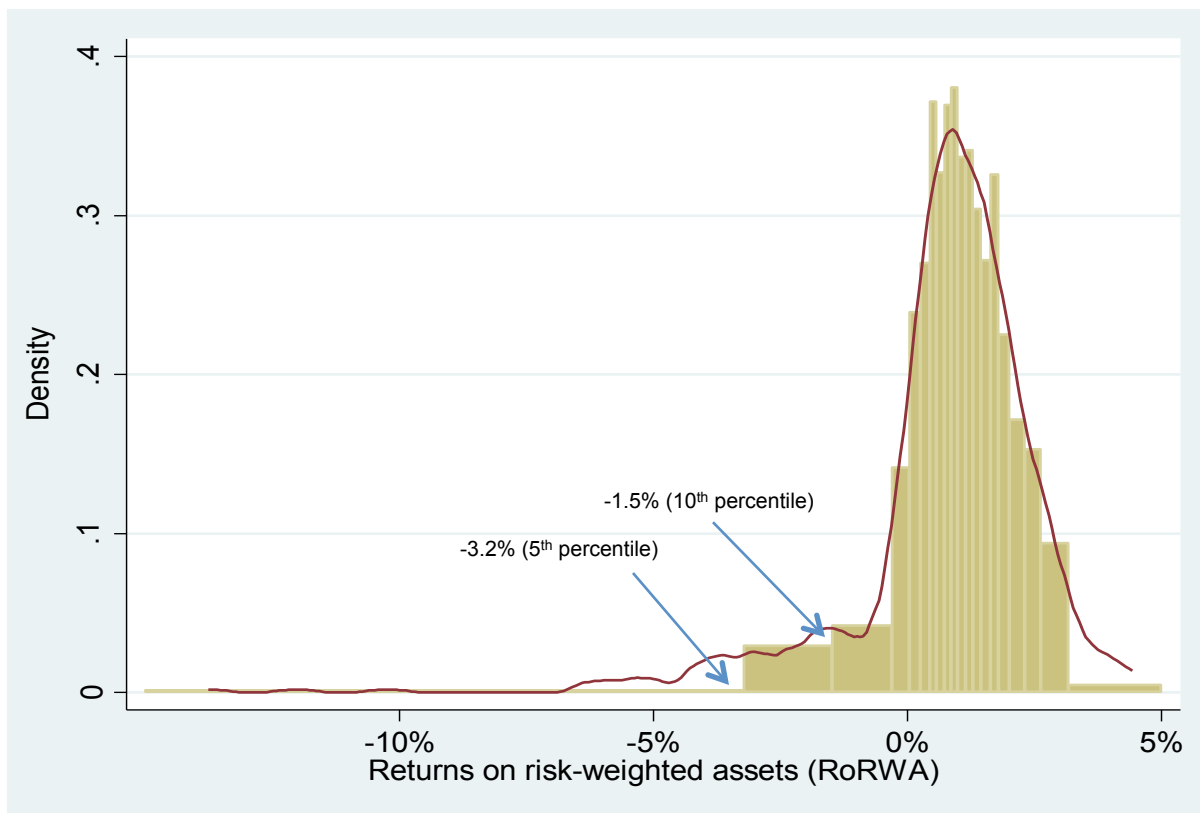
- Distribution of RoRWA
  - Long-tail for losses

- 1-in-20-year event could wipe out 3.2% of risk-adj. capital

Note: Figure depicts the quantile distribution (in 5-percentile bars) and the estimated kernel density (dark line) for all banks covered in the study for the years 2006 to 2012. *(Ayadi , R. and W.P. De Groen (2014 Forthcoming)*

Performance - Tail losses

Distribution of return on RWA (RoRWA), 2006-2010

- Density
- 0.6% (10th percentile)
- -1.9% (5th percentile)

Returns on risk-weighted assets (RoRWA)

- Distribution of RoRWA
  - Long-tail for losses

- 1-in-20-year bad event to wipe out 1.9% of risk-adj. capital on avg.

Note: Figure depicts the quantile distribution (in 5-percentile bars) and the estimated kernel density (dark line) for all banks covered in the study for the years 2006 to 2010. *(Ayadi et al (2012))*

Performance - Tail losses

Return on RWA, tail loss estimates (2006-2012)
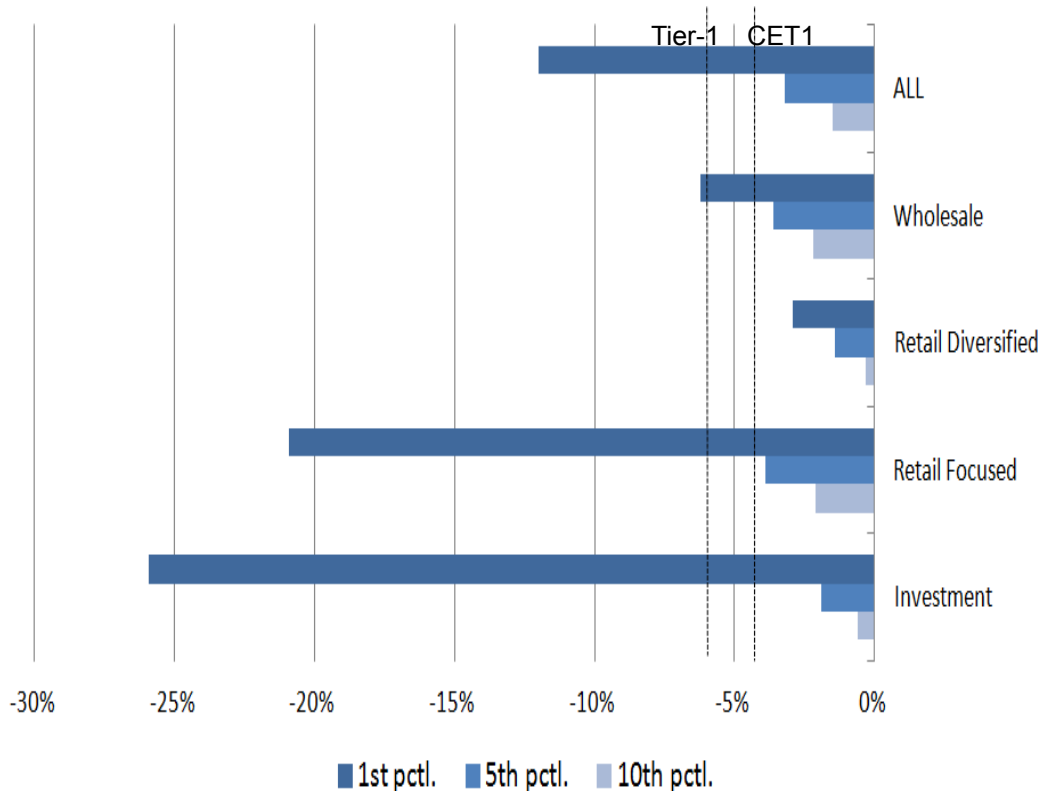
Notes: Figures provide the Harrell-Davis percentile estimates for the distribution of return on RWA. CET1 and Tier-1 stand for CRD IV minimum requirements for common equity and Tier-1 ratios. *Ayadi , R. and W.P. De Groen (2014 Forthcoming)*

- Can rare shocks wipe out regulatory capital?

- Losses are high for:
  - Investment & focused retail models

- For wholesale and retail focused banks, high losses even under rarer events!

Performance - Tail losses

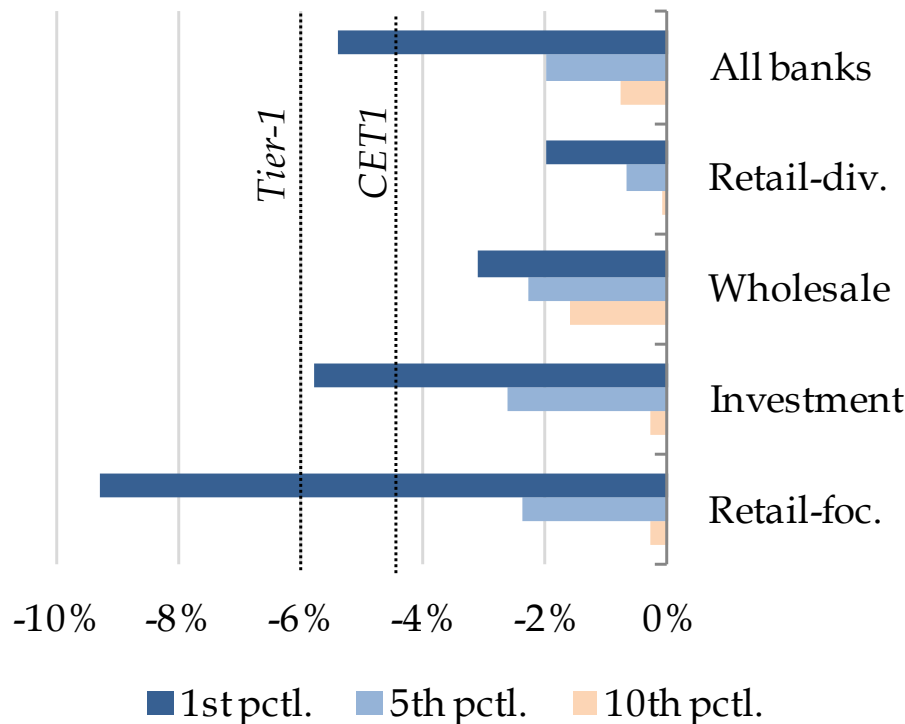**Return on RWA, tail loss estimates (2006-2010)**

Notes: Figures provide the Harrell-Davis percentile estimates for the distribution of return on RWA. CET1 and Tier-1 stand for CRD IV minimum requirements for common equity and Tier-1 ratios. *Ayadi et al (2014 Forthcoming)*

- 1-in-100 year event to wipe out reg. capital for
  - Focused retail
  - Investment
- For wholesale banks, losses remain high even under more likely events

Capital & leverage

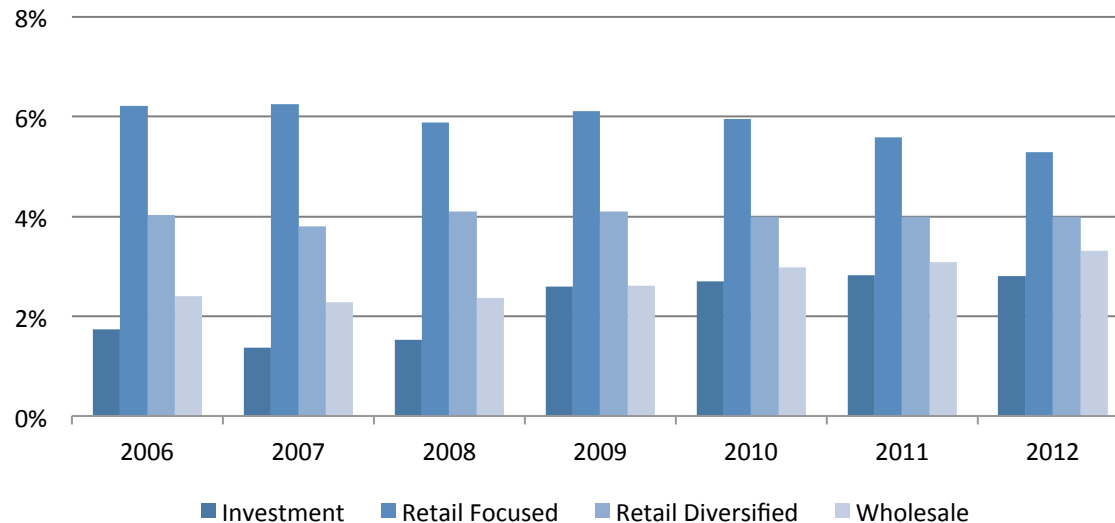**Tier-1 capital ratio (% of RWA)**
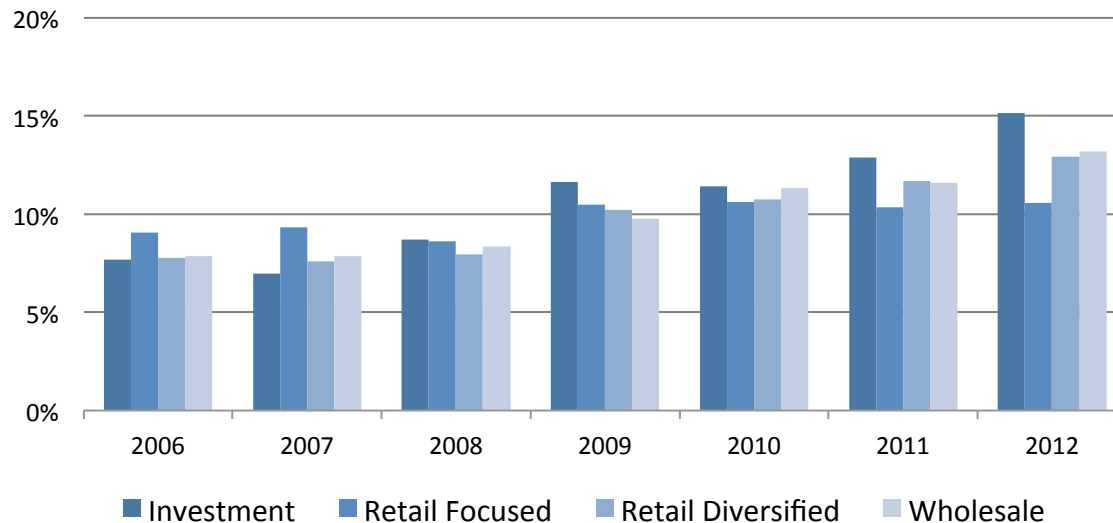
- Banks across the four BMs increased Tier-1 capital ratios

- Differences are most cases not significant

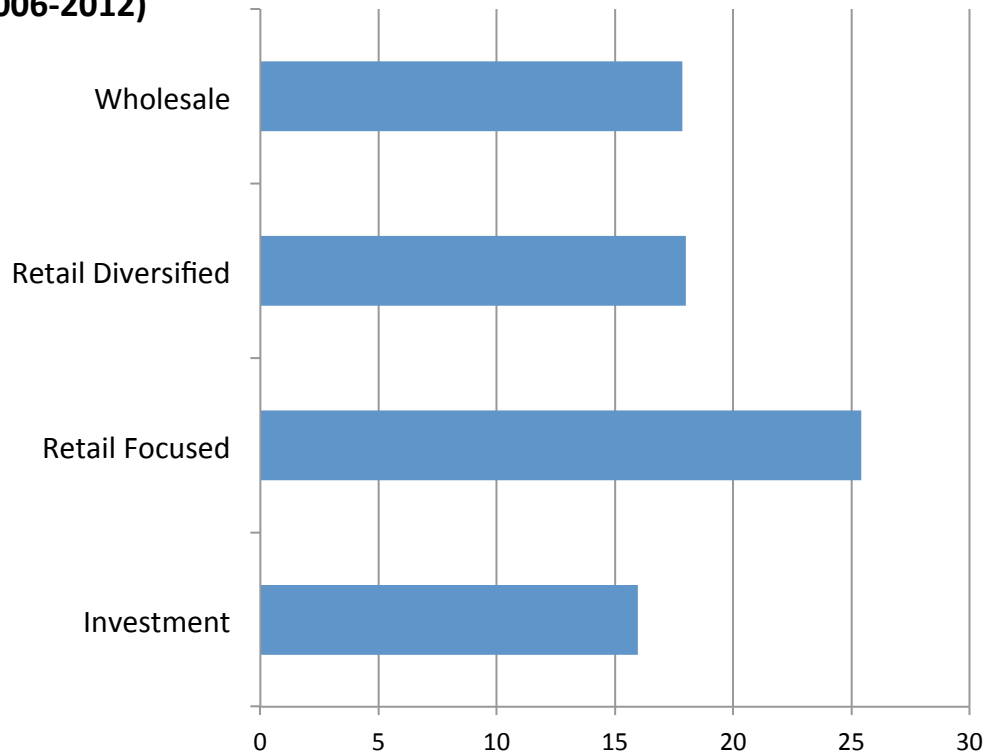# Capital & leverage

Leverage ratio (Common tangible eq./tangible assets)

- Leverage ratio also increased
- Differences <u>are</u> statistically significant
  - Investment banks have lowest ratios
  - Wholesale banks also low despite improvement

Risks – Distance to default

Distance to default estimates (Z-score, average) (2006-2012)

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

- Retail focused banks are far from default

- Investment banks face highest default likelihood

- Retail diversified and wholesale banks are in-between

Risks – Distance to default

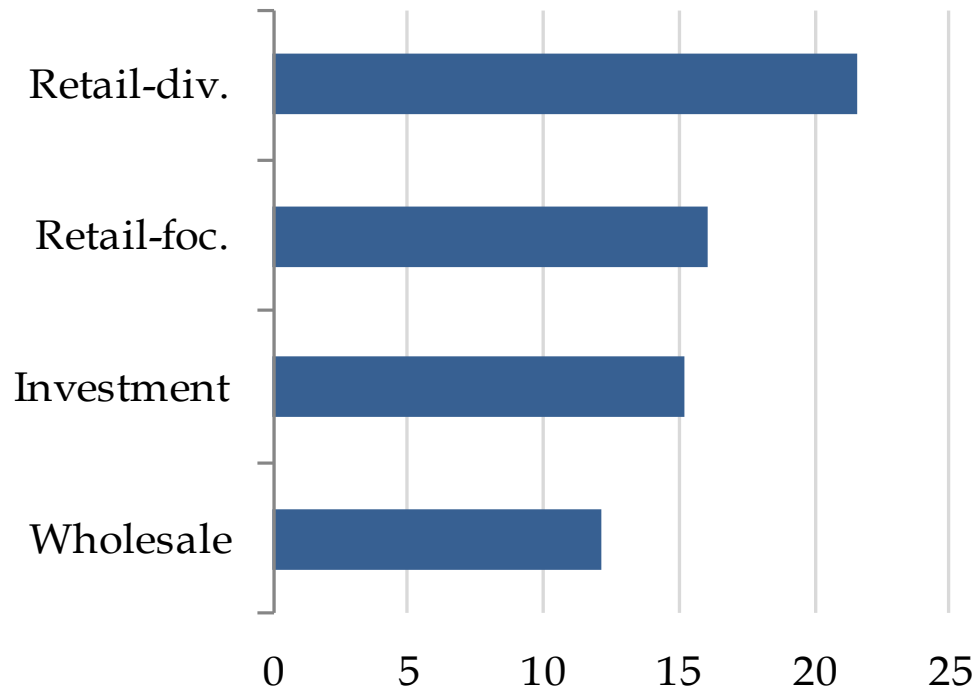**Distance to default estimates (Z-score, average) (2006-2010)**

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

- Both retail models are far from default

- Wholesale banks face highest default likelihood

- Investment banks are in-between two extremes

Risks – RWA vs. Z-score

Relationship between Z-score and RWA

	Investment	Retail Focused	Retail Diversified	Wholesale	All banks
RWA/TA	2.0	-25.8***	-25.7***	-3.4	-20.7***
	-20.8	-7.4	-5.4	-6	-3.2
TCE	330.3**	264.0***	155.7*	-60.5	206.4***
	-125.3	-34.2	-88.1	-93.3	-26.2
Cons.	7.7	17.0***	24.3***	19.5***	18.3***
	-5.0	-5.7	-4.3	-5.7	-2.4
Obs.	57	267	205	209	738
Log L.	-217.3	-1145	-866.2	-997.4	-3293
F statistic	3.947	38.92	11.64	0.278	49.61
p-value	0.025	0	1.64E-05	0.758	0

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 banks
  - Potential for positive relationship!
  - Banks with lower RWA may be <u>closer</u> to default!
  - More data needed

Transparency – EBA Exercises

Cumulative Average Abnormal Returns (from t-1 to t+1)
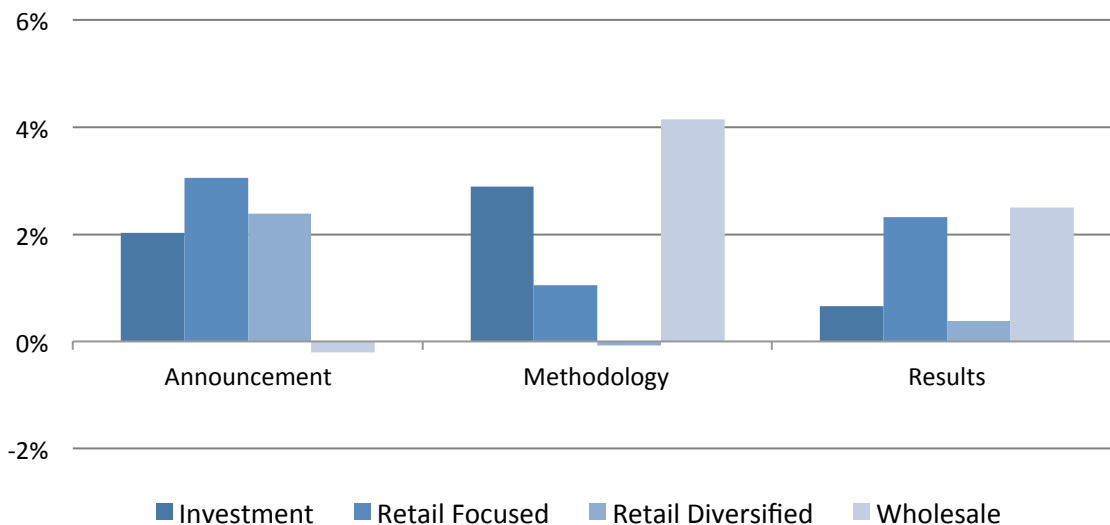
Note: Even-study on the impact on the EBA exercises (i.e. Stress tests, (follow-up) capital exercises and transparency exercise) on stock returns.

- Difference in response, mostly insignificant
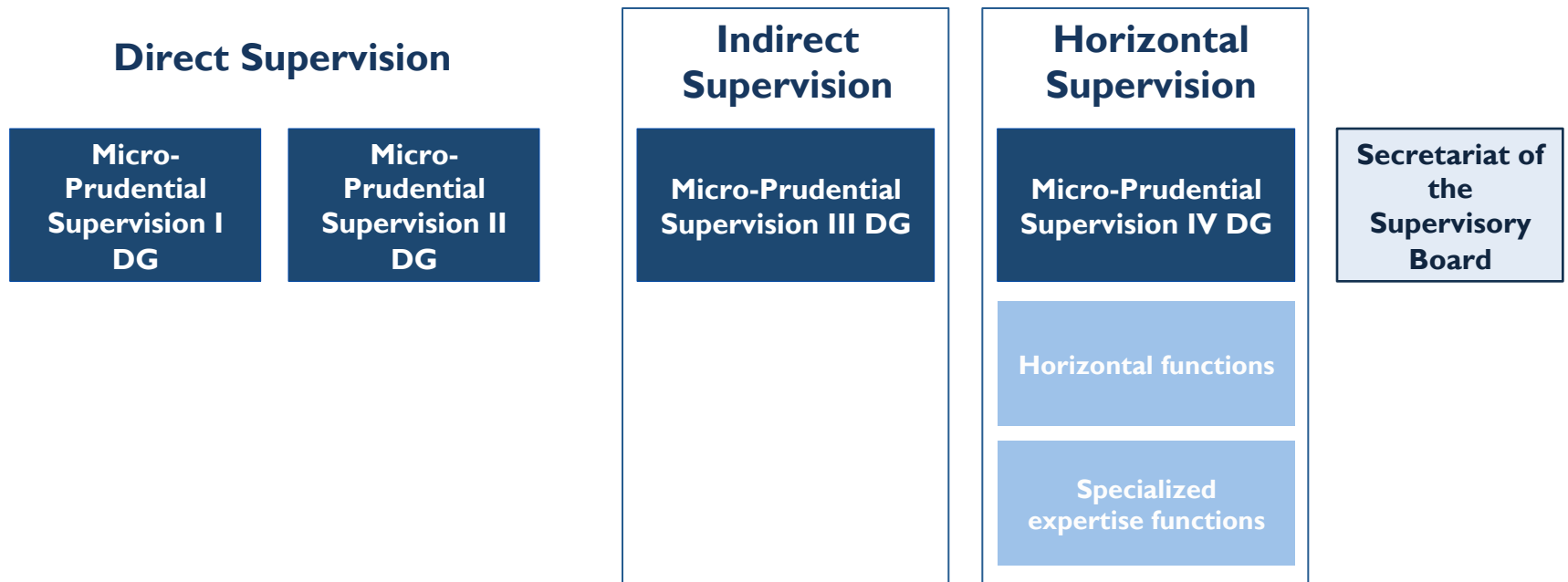- Retail div. significantly less responsive than investment banks to discl. of methodology and than retail foc. to disclosure of results.

Source: Ayadi and De Groen (2014 forthcoming), "Stress Testing, Transparency and Uncertainty in European Banking: What impacts?", In *The Oxford Handbook of Economic and Institutional Transparency*, New York: Oxford University Press.
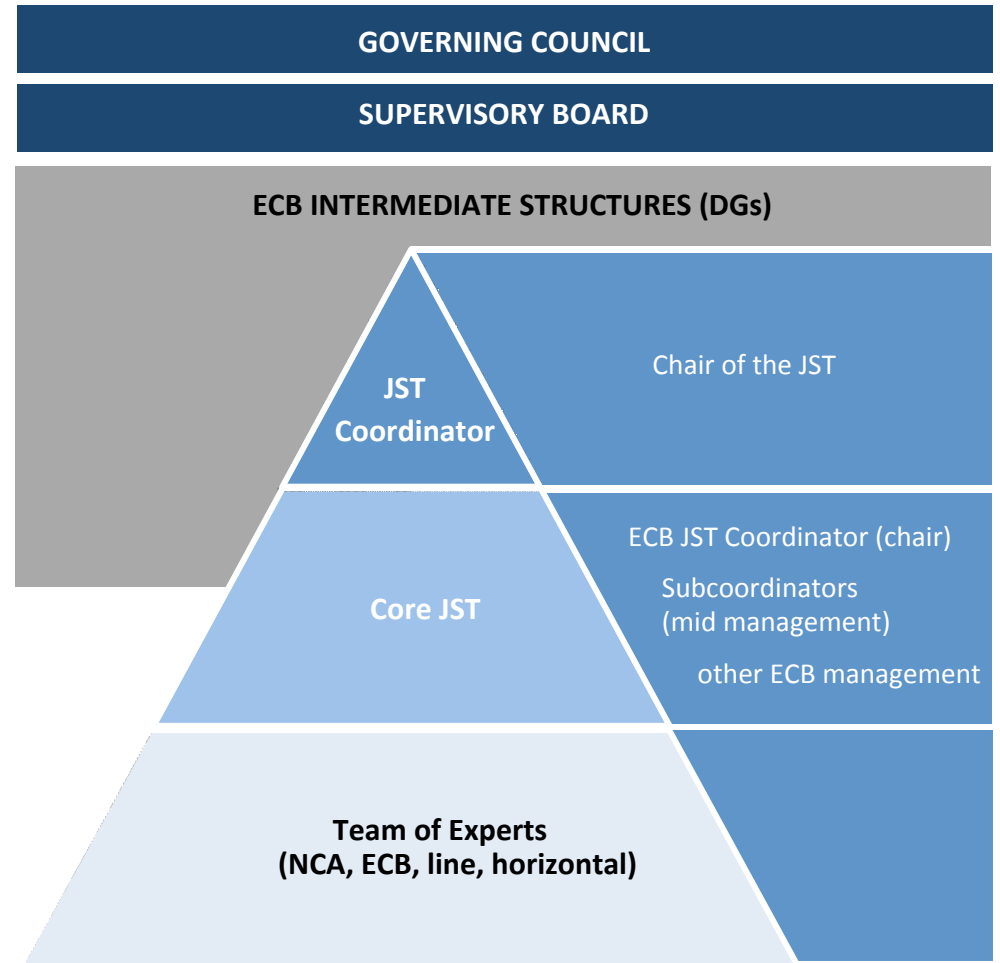
Preparatory work – SSM Exercises

SSM Preparations				
Mapping of the SSM Banking System	*Supervisory Legal Issues*	*Supervisory Model*	*Supervisory Reporting Framework*	*Comprehensive Assessment*
Mapping of banking group structures and collection of the data necessary for the identification of significant institutions	Development of the SSM Framework Regulation and legal advice on the preparatory work for setting up the SSM	Development of the SSM supervisory model and description of its key aspects in the Supervisory Manual	Review of the existing supervisory reporting models as a basis for the development and design of the SSM reporting framework	Asset quality review; stress test and supervisory risk assessment of potentially significant institutions

Preparatory work – SSM

Direct Supervision

| Micro-Prudential Supervision I DG | Micro-Prudential Supervision II DG |

Indirect Supervision

Micro-Prudential Supervision III DG

Horizontal Supervision

Micro-Prudential Supervision IV DG

Horizontal functions

Specialized expertise functions

Secretariat of the Supervisory Board

Preparatory work – SSM

- Established for every banking group, comprising staff from ECB and NCA

- Responsible for day-to-day supervision of individual significant institutions and for implementing the annual supervisory programme

- Responsible for implementing decisions of Supervisory Board/ Governing Council

- Size and composition of JSTs vary between institutions

GOVERNING COUNCIL

SUPERVISORY BOARD

ECB INTERMEDIATE STRUCTURES (DGs)

JST Coordinator — Chair of the JST

Core JST — ECB JST Coordinator (chair) / Subcoordinators (mid management) / other ECB management

Team of Experts (NCA, ECB, line, horizontal)

Preparatory work – SSM

Banks will be requested to submit capital plans detailing how the shortfalls will be covered

Time frame for covering shortfalls

Depending on the source of the shortfall:

> ➤ Six months for shortfalls identified in the AQR or the baseline stress test scenario

> ➤ Nine months for shortfalls identified in the adverse stress test scenario

• The periods of six or nine months will start from the release of the comprehensive assessment results in October 2014

Recapitalisation measures

• Capital plans should focus on private sources of funding:

> ➤ Retained earnings,

> ➤ Reduced bonus payments,

> ➤ New issuances of common equity

> ➤ Suitably strong contingent capital,

> ➤ Sales of selected assets at market prices

> ➤ Reductions of RWAs associated with restructuring plans agreed with the European Commission