

ADVOCACY STRATEGY INTERNAL MODELS

EIFR CONFERENCE

GROUP PRUDENTIAL AFFAIRS
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BNP PARIBAS

The bank for a changing world

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SUMMARY

- “Good” vs “bad” RW variability : internal models should be harmonized, not discarded
- An overview on the Targeted Review of Internal Models (TRIM)
- Risk sensibility also requires a better LGD calibration
- Back-testing & data pooling for Corporate LGD



Credit Risk : Internal Models should be harmonized, not discarded

- IRB-A models are viewed by some regulators as unreliable due to excessive risk variability
- Actually, EBA and BCBS own studies show that 75% of the RW variability is explained by different risk profiles
 - *“Within the Banking Book, much of the variability (**up to three quarters**) in risk weights for credit risk is driven by **differences in underlying risk** arising from banks’ asset composition, ie variation across banks in the relative share of different asset classes and differences in asset composition within asset classes. **RWA variation of this type is consistent with the greater risk sensitivity intended by the Basel framework.**” **
- As for the remaining 25% not explained, harmonization of models should be envisaged first before removing modelling possibilities
 - Capitalise on SSM, EBA’s and other regulators’ ongoing work (TRIM)
 - Interim adjustments, if needed, are a natural part of Pillar 2



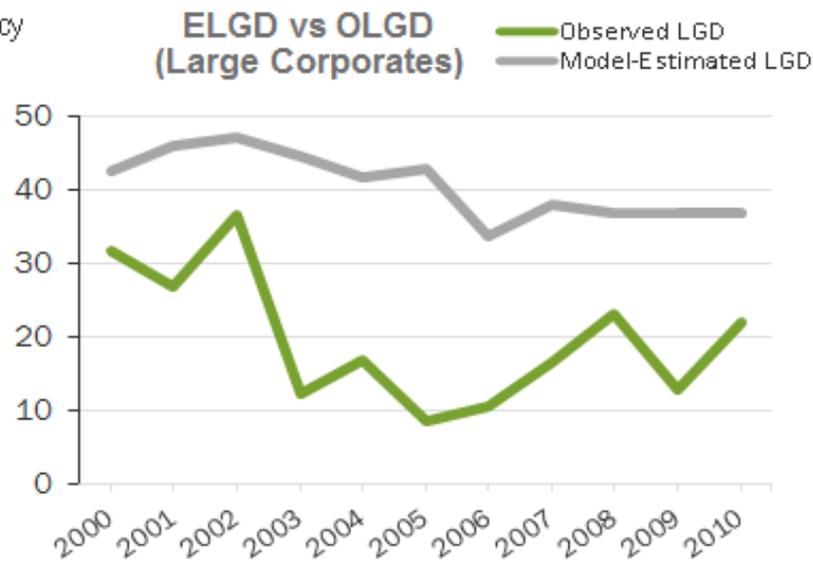
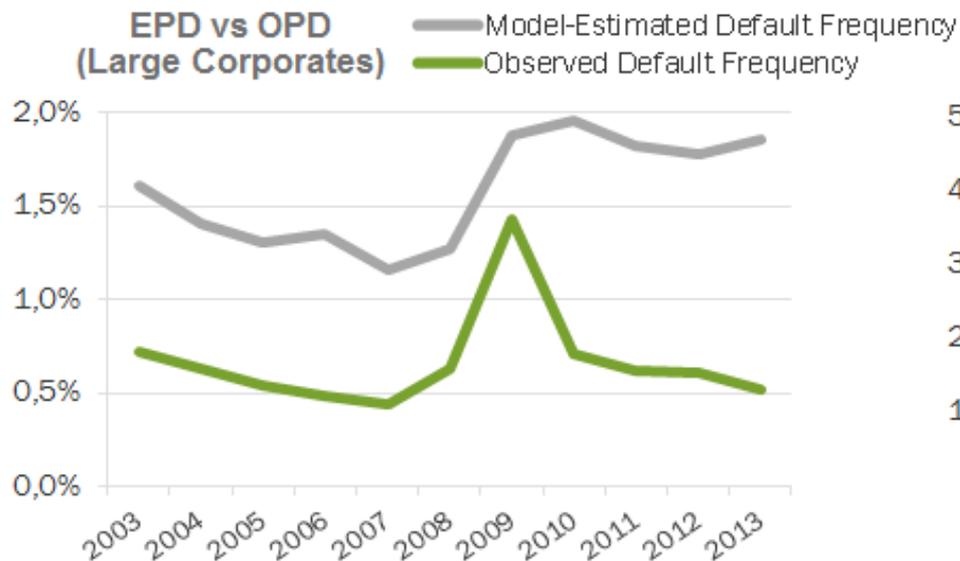
The variability of RWs is not *per se* an argument against the robustness of internal models

*BCBS - RCAP Analysis of risk-weighted assets for credit risk in the banking book, July 2013



“Good” or “bad” RWA variability ?

Are internal PDs and LGDs too optimistic ?



Source: Global Credit Data (GCD).
 Scope : 14 large and internationally active banks, over 11 years (2003-2013).

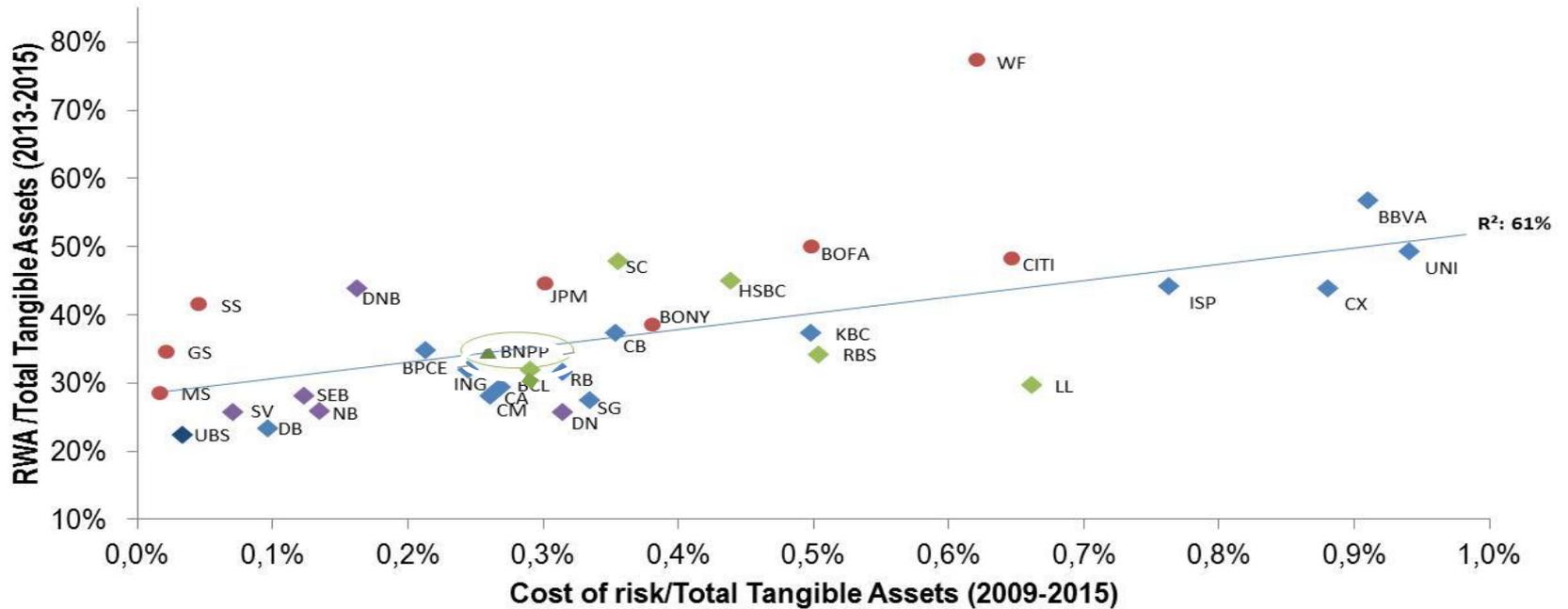
On average, expected PDs and LGDs are prudent compared with observed data



“Good” or “bad” RWA variability ?

Does Cost of Risk correlate with RW density ?

Chart 1: Major Banks - Cost of Risk (Average 2009-2015) and RWA (Average 2013-2015) / Total Tangible Assets (by bank) - IFRS



Source: Financial information from Bankscope; Annual Reports for *fully-loaded RWA (2013-2015)*; FDIC (Global Capital Index¹ by Thomas M. Hoenig, FDIC Vice Chairman) for IFRS estimation on US Banks - Total tangible assets. Calculations: BNP Paribas. RWA fully-loaded according to Basel III rules from 2013 to 2015, except for certain banks for which fully-loaded RWAs were not published. Total tangible assets are total assets disregarding goodwill, DTAs and other intangibles. Cost of risk is the amount of impairment charges on loans and securities.

➤ **Various RW densities correlate with actual losses**

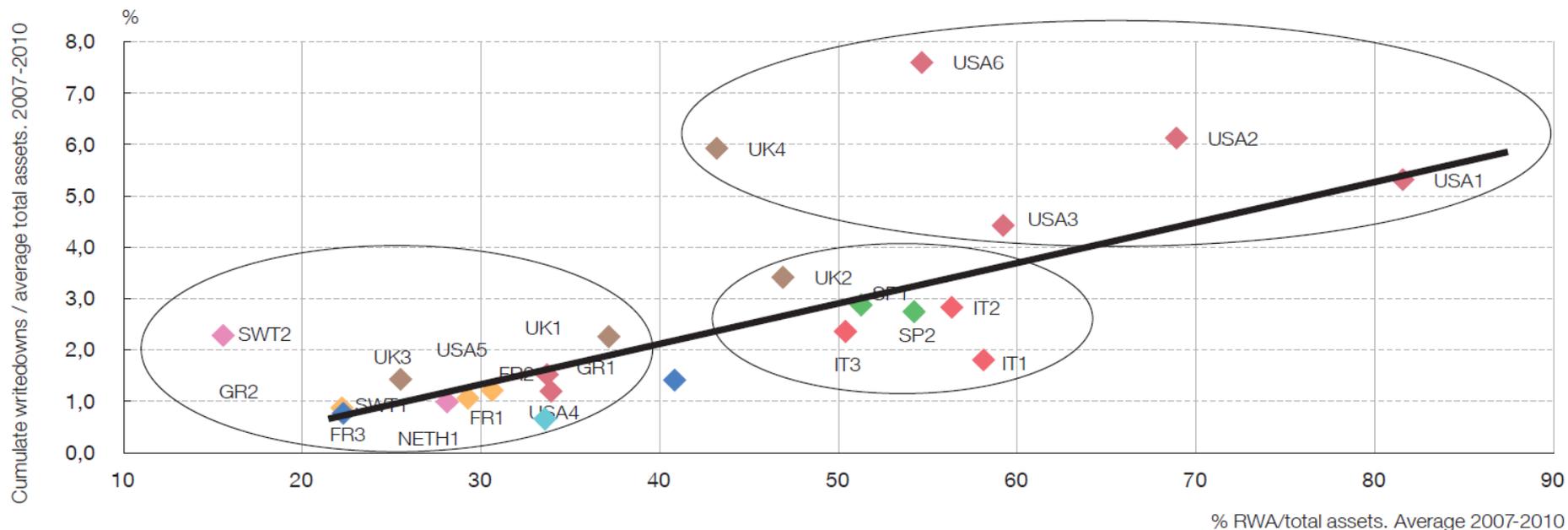


“Good” or “bad” RWA variability ?

Comparing RW density & cumulated write-downs

WRITE-DOWNS AND RWA IN PERCENTAGE OF TOTAL ASSETS FOR THE PERIOD 2007-2010 FOR A SAMPLE OF EUROPEAN BANKS

CHART



% RWA/total assets. Average 2007-2010

SOURCE: Financial reports by individual banks.

BBVA study by Mayte Ledo : « Towards more consistent, albeit diverse, risk-weighted assets across banks », *Estabilidad Financiera* n°21, 2011



Positive correlation with various groups of banks emerging



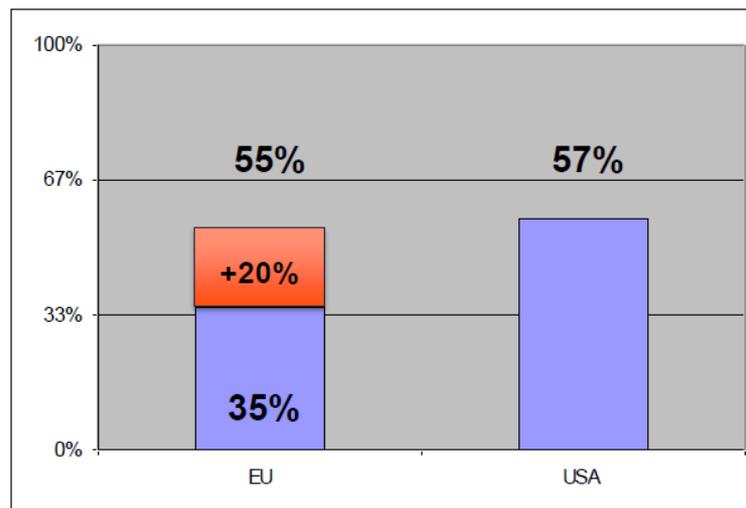
“Good” or “bad” RWA variability ?

Comparing the RW density between US and EU banks is misleading

- Most of the gap between US and EU banks RW density is explained by :
 - Accounting standards (derivatives netting rules)
 - Transfer to GSEs of (generally) low risk mortgage loans (USD 8 trillion), whereas in the EU high quality mortgages remain on balance sheet and tend to reduce overall average RW
 - Pillar 2: Additional capital pressure on EU banks (from 2% to 8%)
 - Operational risk (not counted in the RW density metric)
 - Software investment deduction (US: 100% ; EU: 0%)

These factors altogether are equivalent to about 20% of additional risk weight density* for EU banks

Adjusted RWA density is almost equivalent between EU and the USA



Source: EBF estimates

* Risk weight density is the quotient between risk-weighted assets (RWA) and total assets



“Good” or “bad” RWA variability ?

Comparing RW density of BNP Paribas and JP Morgan

Adjusting RWA/total assets ratio

| | BNPP Total assets | BNPP RWA | BNPP RWA/total assets | JPM Total assets | JPM RWA | JPM RWA/total assets |
|--|----------------------|-------------|--------------------------|---------------------|--------------|-------------------------|
| Q4 2010 data | 1,998 | 601 | 30% | 2,118 | 1,175 | 55% |
| Remove derivatives netting (90%) | (312) | | | | | |
| Remove repos netting (4%) | (10) | | | | | |
| Remove pending settlements netting (20%) | (64) | | | | | |
| Remove life insurance assets | (148) | | | | | |
| Add loans sold to GSEs with repurchase liability | | | | 380 | 11 | |
| Add loans securitised with repurchase liability: performing | | | | 69 | 2 | |
| Add loans securitised with repurchase liability: >60 days past due | | | | 41 | 31 | |
| Remove credit cards book | | | | (128) | (163) | |
| Restated Q4 2010 data | 1,464 | 601 | 41% | 2,480 | 1,057 | 43% |

Source: JP Morgan, BNP Paribas, Exane BNP Paribas estimates

BNPP and JPM have comparable levels of RWA to total assets

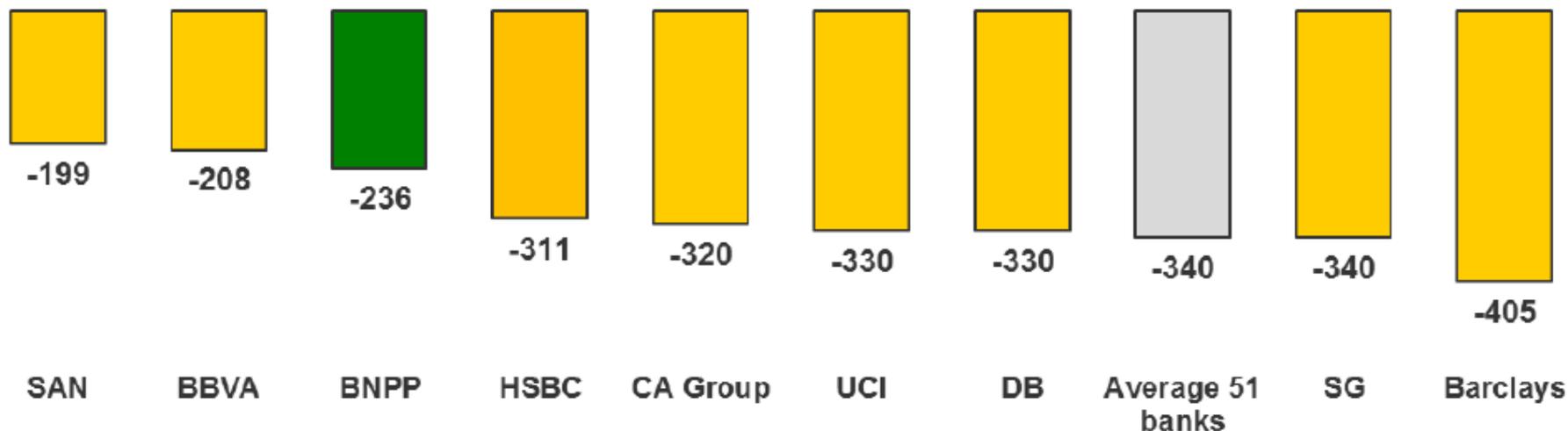


“Good” or “bad” RWA variability ?

Are bank risk profiles similar ? The EU stress test example

2016 European Stress Tests Impact of Adverse scenario on CET1 ratio - peer group*

In bp



Different risk profiles justify different RW densities

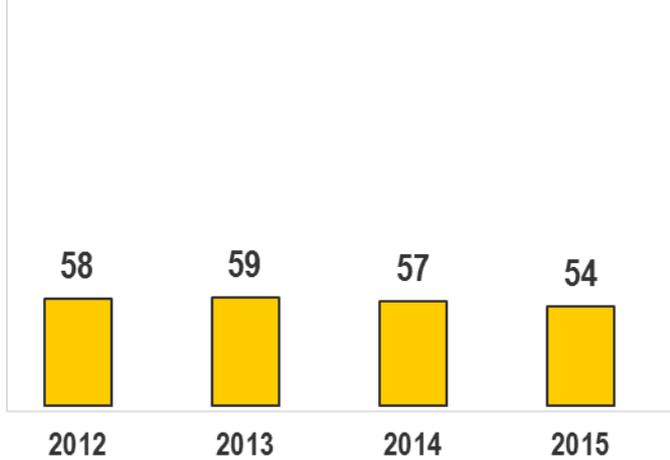


“Good” or “bad” RWA variability ?

Are bank risk profiles similar ? Cost of risk vs Gross Operating Income

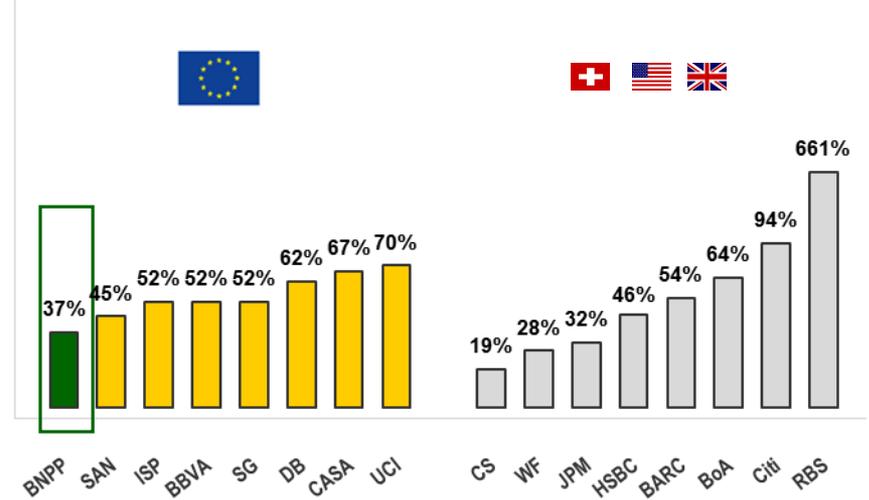
➤ Group Cost of Risk

Net provisions/Customer loans (in annualised bp)



- Overall stability of the cost of risk over the past 4 years

➤ Cost of Risk/Gross Operating Income 2008-2015



- Low risk appetite and strong diversification lead to low cost of risk
- CoR/GOI through the cycle measures the consistency between risk and return

➤ Different business models and risk appetites lead to different overall risk profiles



“Good” or “bad” RWA variability ?

Within BNP Paribas, different divisions have different risk profiles

2015 data. Net provisions/Customer loans (in annualised bp)



Should the new prudential framework make those businesses more “comparable” in RW density ?

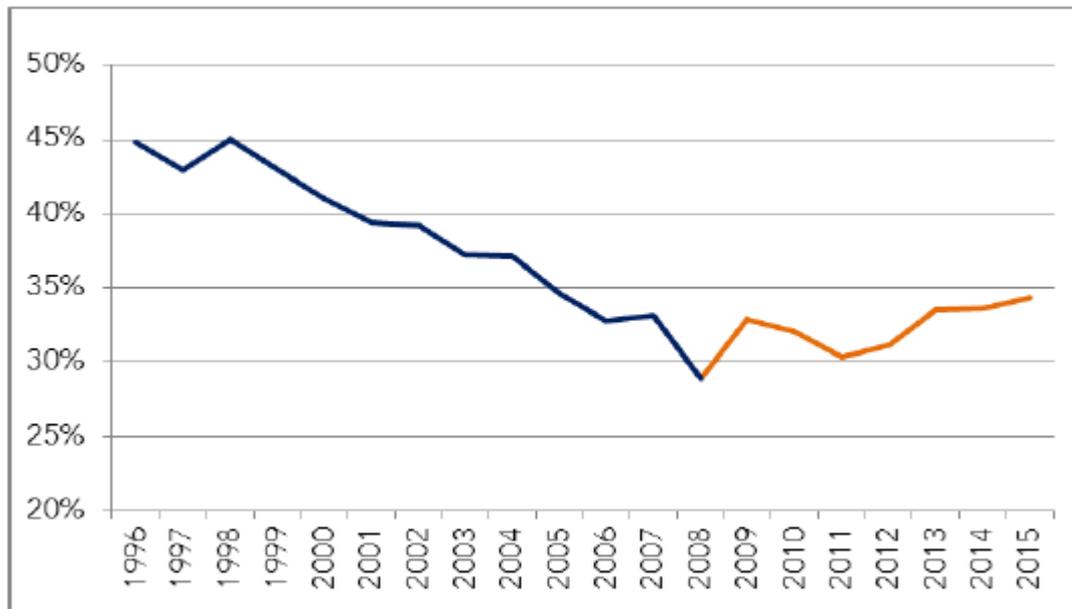


“Good” or “bad” RWA variability ?

IRB models did not allow European banks to reduce capital requirements

Average RWA fell consistently through the period when Basel I prevailed, adopting a **more stable trend since the first banks were approved to use their IRB models** in 2008.

Figure 1: Average RWA, European GSIBs, 1996-2015
Basel I in blue, Basel II in orange



Source: banks' Annual Reports and Pillar 3 disclosures, Bloomberg¹²
IIF study *Basel's evolution: a retrospective*, April 2016, p.5



Introduction of IRB models correlated with a stabilisation in RWAs



An Overview of the Targeted Review of Internal Models (TRIM)

On 16.12.2015, the ECB Supervisory Board approved the launch of TRIM...

Objective

- To **restore credibility, adequacy and appropriateness** of approved Pillar 1 internal models used by SIs in the SSM, TRIM will:

Comply with regulatory standards

- Assess the reliability and comparability of internal rating systems and models permitted for capital requirements with a view to ensure compliance with regulatory requirements and harmonise supervisory practices, thus reducing non-risk-based variability of their outcomes and promoting level playing field within the SSM

Define supervisory guidelines

- Make recommendations to institutions and publish supervisory guidelines which ensure that internal models give consistent results across institutions

Improve internal models' supervision

- Contribute to improve the future supervisory work on internal models, enhancing the internal models expertise available within the SSM

Calculate adequately capital needs

- Verify whether risks are modelled correctly and hence capital needs are calculated adequately

Source : ECB, April 2016



Risk sensibility also requires a better LGD calibration

Main issues with proposed F-IRB:

- Only 2 fixed LGD categories in FIRB: Senior = 45% / Subordinated = 75%
- Very limited recognition of collateral => improper business incentives

Present discussions:

- IRBA maintained for low-default portfolios
- F-IRB with the following adjustments under discussion:
 - *Corporates and Specialized Lending*
 - Improve Senior unsecured LGD to recognize better recovery experience for loans vs bonds.
Based on BNP Paribas' internal defaults database , the current average Senior unsecured LGD is 38.5%.
 - Enlarge eligibility criteria of collateral to include more categories of physical collateral
 - Reduce Haircuts on eligible collateral to workable levels
 - *Banks*
 - Recalibrate LGD to reflect the new hierarchy of claims : higher capital requirements and buffers, and TLAC/MREL bail-inable debt makes senior claims much less risky than before (including derivatives, repos, trade finance etc)
 - *Insurance companies*
 - LGD should take into account Solvency II implementation in Europe & differentiate between lender or policy holder status

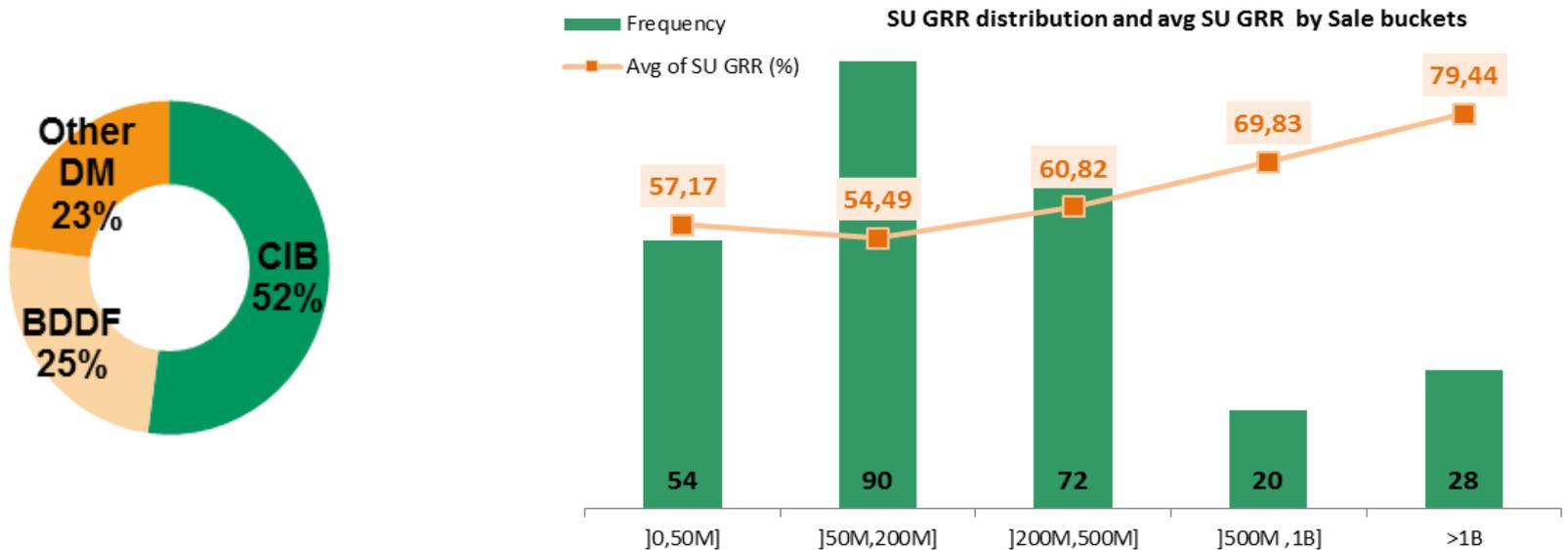


Back-testing & data pooling for corporates

Banks internal database

Instead of a standard LGD, several databases could be used to model Corporate LGDs while preserving risk sensitivity, including Banks internal databases

For example, BNP Paribas' models are calibrated based on an internal default database composed of 946 defaults, of which half in the Corporate and Investment Banking Division.



In 40% of cases, LGD is > 90%. In particular, there is a clear upward trend in recovery (GRR = 1-LGD), as the turnover of the corporate increases.



Applying a standard LGD across the whole corporate spectrum unduly penalizes the large corporates

Source : BNP Paribas 2016



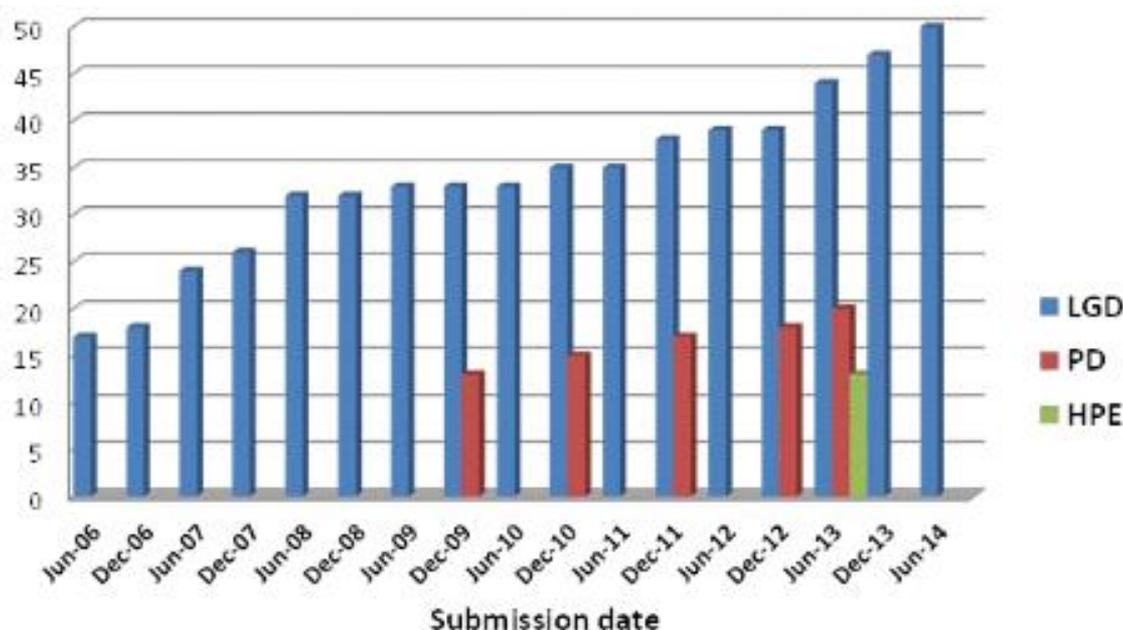
Back-testing & data pooling for corporates

International industry databases

At industry level, consortia such as Global Credit data* can also provide robust databases

Global Credit Data contains default records from over 50 000 obligors across 120 different countries, over 20 years. Nearly 50 banks portfolios are represented in the LGD database. This represents a real alternative to the more general statistics published by rating agencies and conforms with Risk Management best practices and Basel regulation.

Number of banks represented in data sets



LGD pooling through industry consortia could lead to efficient LGD calibration

