

# The Conservative Monotone Approach: An Update

- A risk model for Investors and Originators
- Calibrating the Pool Capital Multiplier Approach

**Presentation to Global ABS 2015:**

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# Objectives

We will talk about:

- 1) Flaws in the regulatory framework: Issues with reliance on ratings; Issues with formulae cliff effect in SFA, overcorrection in the SSFA resulting in excessive capital;
- 2) What it means in terms of capital for Europe, with a Quantitative Impact Study
- 3) The AFA initiative as an alternative to regulatory framework: correction of cliff effect with rho star, reminder of key features of CMA (granularity, maturity effects..), no longer reliance on ratings;
- 4) From the CMA to PCMA: CMA evolution to European SSFA, and in its latest non-formulaic format, the PCMA
- 5) Concrete proposal to implement the PCMA for European STS

# Agenda

## 1. Current Basel securitisation framework

- Creates a ratings dependency in Europe, main source of the problem
- Is ignored in the US, leading to a revival of the market
- Is the future Basel framework the way forward?

## 2. A Quantitative Impact Study for European Securitisation

## 3. An alternative model: the CMA

## 4. From the CMA to the PCMA

- The European SSFA
- The PCMA: Pool Capital Multiplier Approach

## 5. The PCMA: our Solution for European SST

# The current Basel capital rules for Securitisation

## TOP OF HIERARCHY=MAPPING TO EXTERNAL RATINGS

RBA for IRB banks

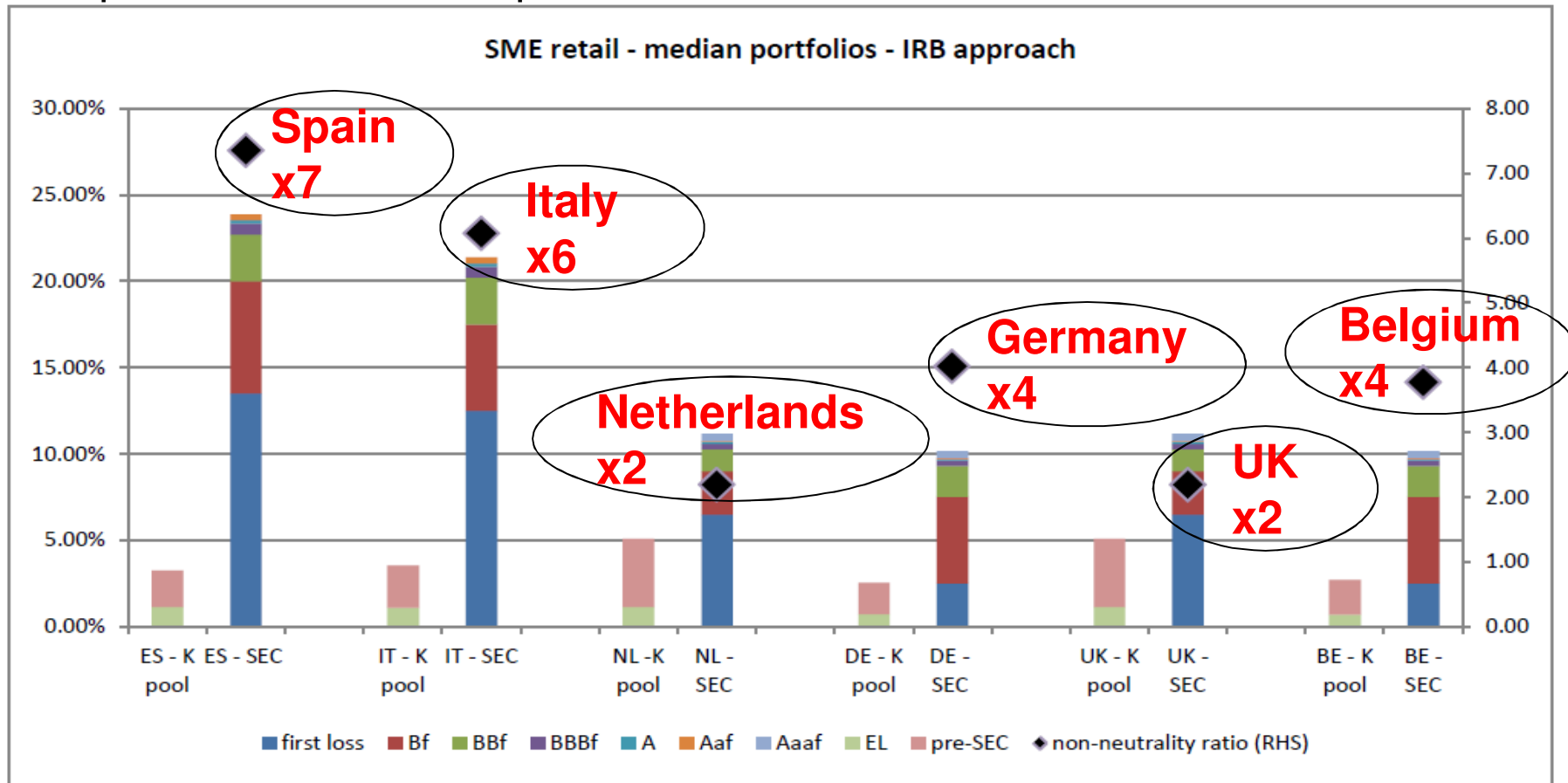
CRR 575/2013, Article 261, IRB - Ratings Based Method				
Credit Quality Steps	Mapping to External Ratings	Credit Quality Step Risk Weight		
		Senior	Non-Senior and Granular	Non Granular
1	AAA	7%	12%	20%
2	AA+ / AA / AA-	8%	15%	25%
3	A+	10%	18%	35%
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5	A-	20%	35%	
6	BBB+	35%	50%	
7	BBB	60%	75%	
8	BBB-	100%		
9	BB+	250%		
10	BB	425%		
11	BB-	650%		
All other and unrated	B+ / B / B-	1250%		
	Below B- or unrated			

SA (Ratings-Based) for SA banks

CRR 575/2013, Article 251, Standardised Approach		
Credit Quality Steps	Mapping to External Ratings	Credit Quality Step Risk Weight
1	AAA / AA+ / AA / AA-	20%
2	A+ / A / A-	50%
3	BBB+ / BBB / BBB-	100%
4	BB+ / BB / BB-	350%
All other	B+ / B / B-	1250%
	Below B- or unrated	

# Issues with the **current Basel** capital rules in Europe

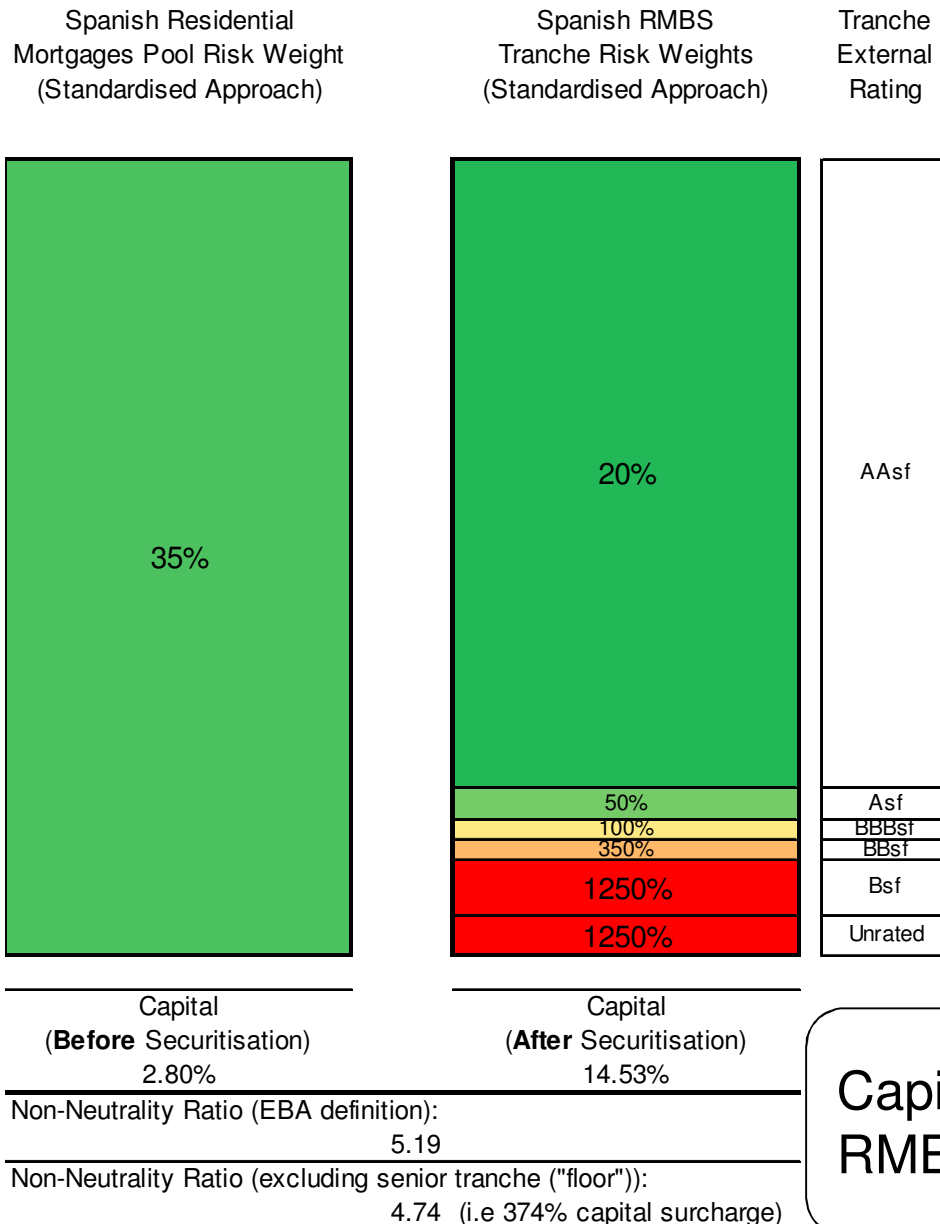
- The current RBA for IRB banks is pre-crisis and ignores changes in rating agencies methodologies and sovereign caps
- This leads to a massive capital increase in the banking system compared to pre-securitisation capital



Source: EBA Discussion Paper, October 2014

# Issues with the **current Basel** capital rules in Europe

CASE STUDY: SPANISH RMBS (Source: EBA Discussion Paper, October 2014)

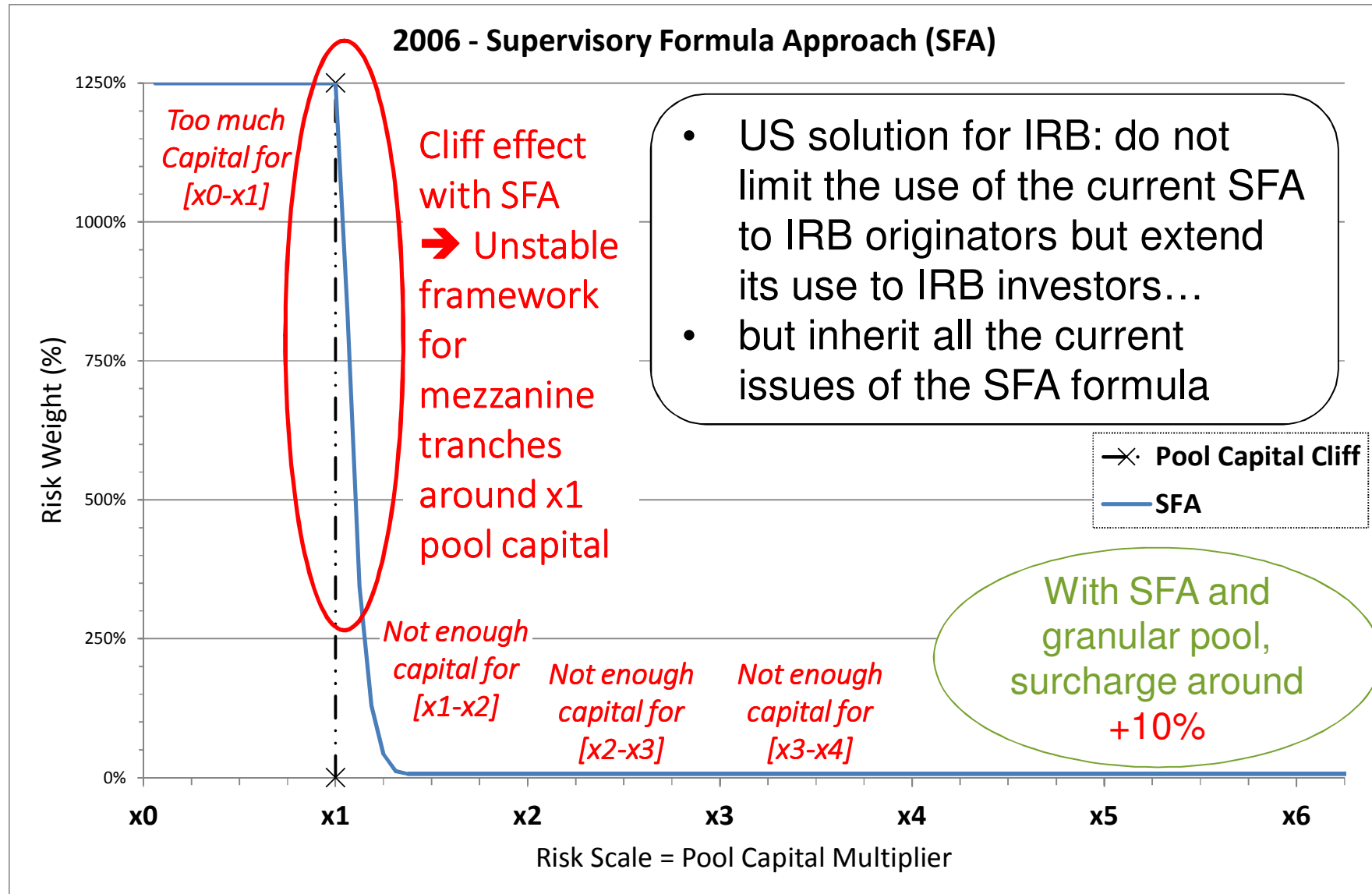


- The Standardised Approach (Ratings-Based) for SA banks suffers of the same problem as the RBA for IRB banks
- As a result, SA banks will tend to avoid securitisation that are not fully retained

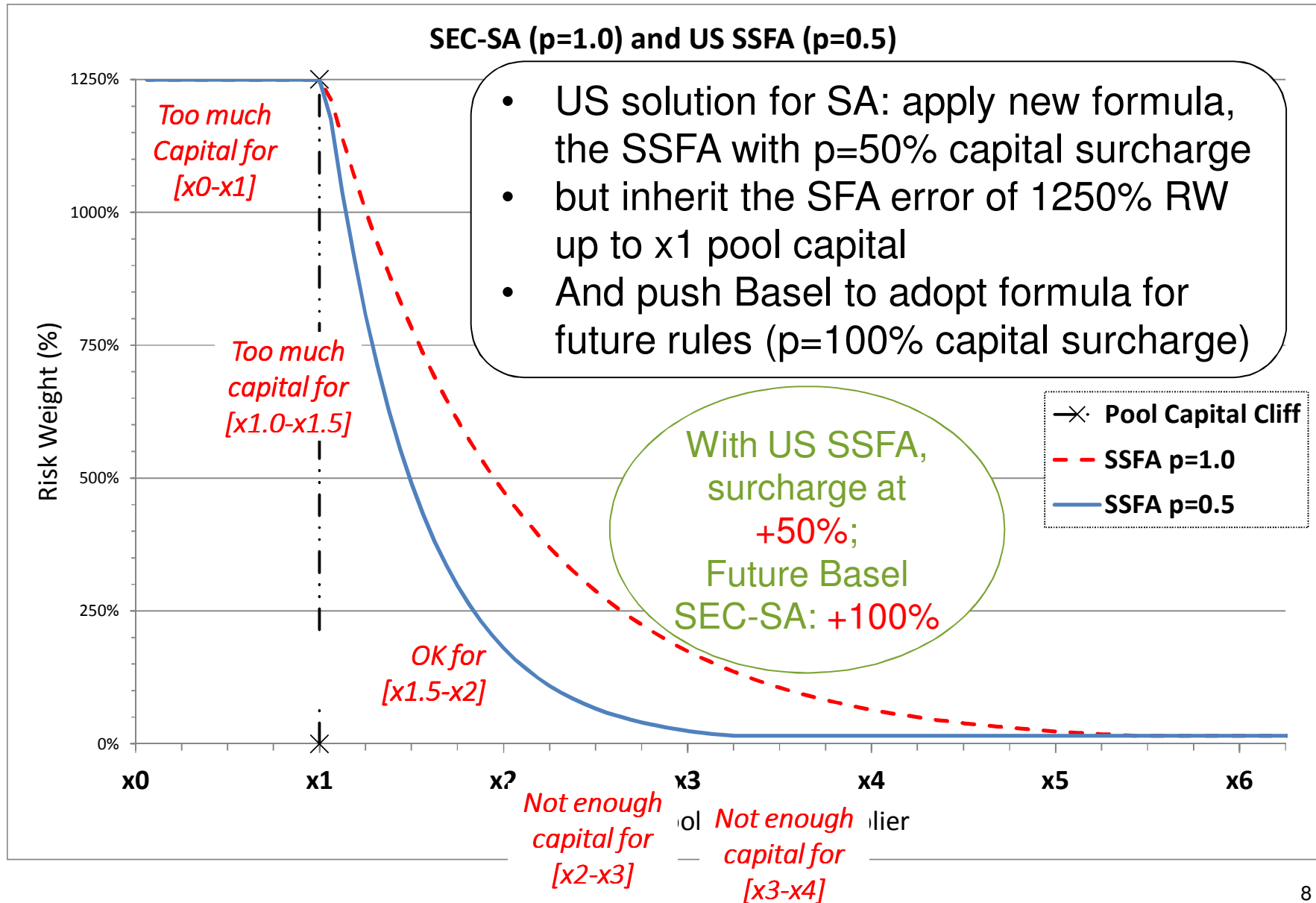
**The ratings dependency in the current Basel rules applied in Europe is the main contributory factor as to why the securitisation market has not seen a revival**

Capital Multiplier for Spanish RMBS with SA (RB): x5

# How the US solved the ratings-dependency (IRB)

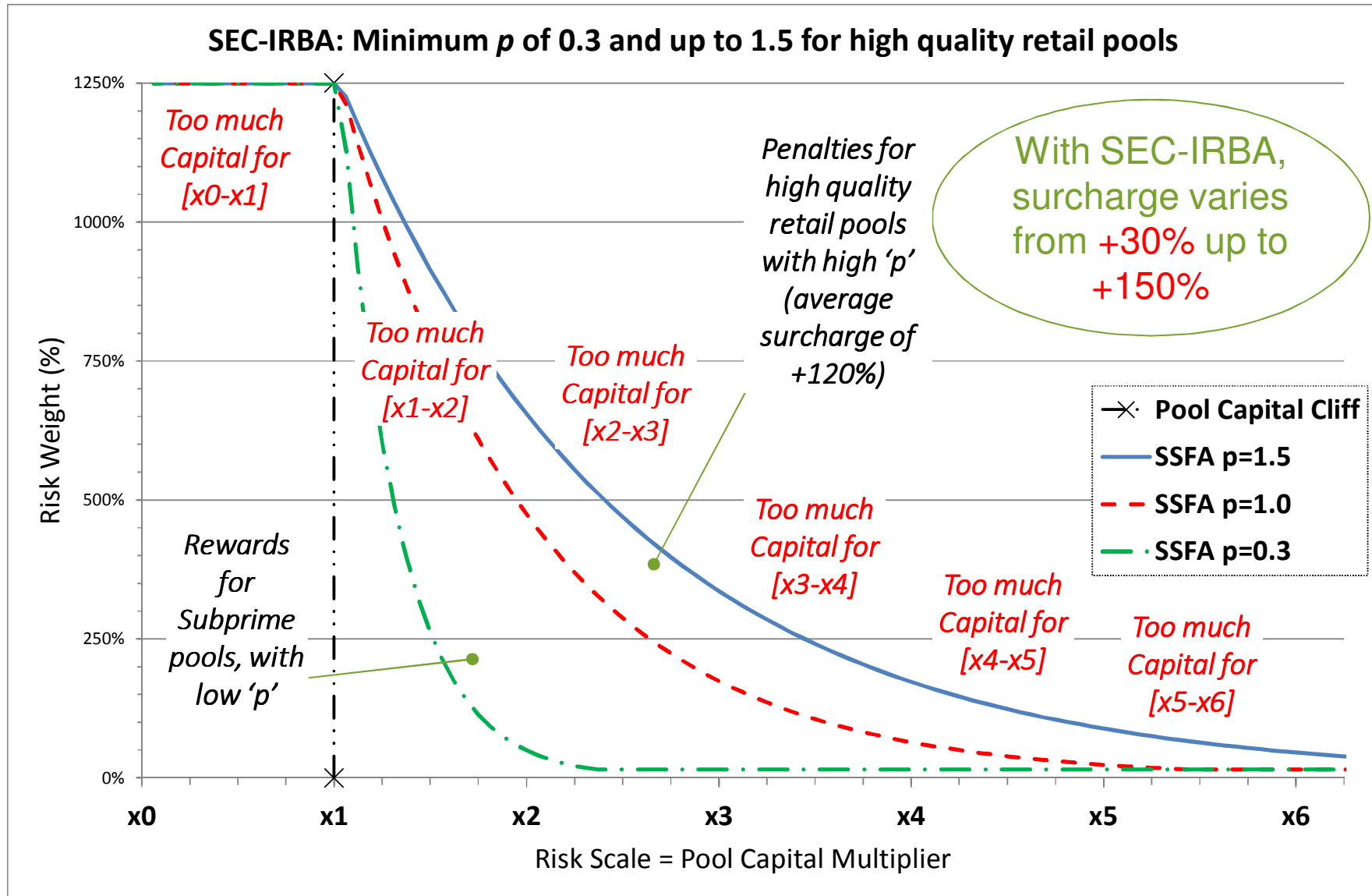


# How the US solved the ratings-dependency (SA)



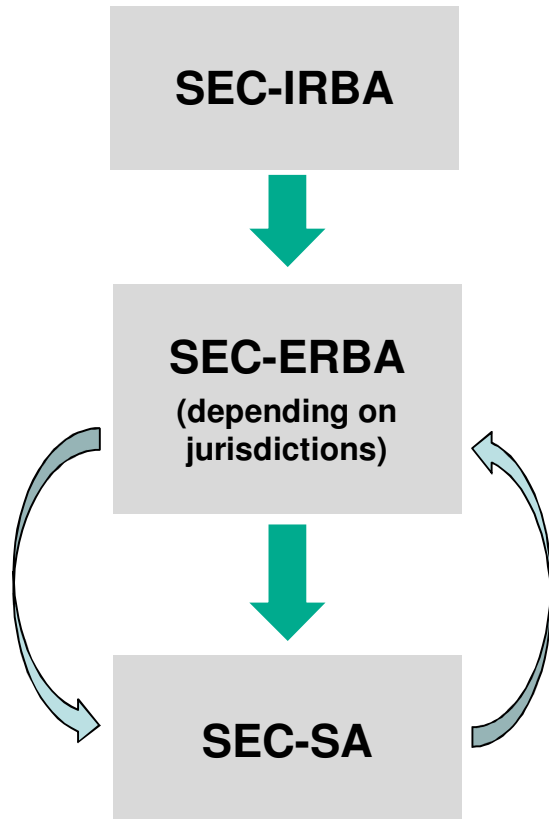


# Future Basel IRB: replace the SFA by SSFA, but...



# Issues with the **future Basel** capital rules: Reliance on external ratings will be reinforced in Europe

BCBS303 (Final Rules) streamlines the securitisation framework to a single hierarchy based on 3 approaches:



## Securitisation Internal Ratings Based Approach:

**SSFA-based formula** using

- IRB asset inputs ( $K_{IRB}$ , LGD, granularity, asset category)
- tranche inputs (A and D as attachment and detachment points and tranche maturity M, seniority)

Operational constraints in Europe means this approach will hardly be used by investors. Thus, European investors will use the next approach in the hierarchy: SEC-ERBA

## Securitisation External Ratings Based Approach:

Using a **risk weight mapping** based on:

- External ratings agencies tranche rating
- Seniority and tranche maturity, and tranche thickness (for non-senior)

## Securitisation Standardised Approach:

Using an **SSFA-based formula** based on

- Standardised Approach asset inputs ( $K_{SA}$ ) and delinquency ratio W
- tranche inputs (A and D as attachment)

The future Basel hierarchy places external ratings above the SA. It should be below

The US will have a competitive advantage: it will not apply ERBA, but the SA instead

# Issues with the **future Basel** capital rules: Reliance on external ratings will be reinforced in Europe

External Ratings	RBA (Granular Mezzanine)	ERBA (Non-Senior 5-year)
AAA	12%	70%
AA+	15%	90%
AA	15%	120%
AA-	15%	140%
A+	18%	160%
A	20%	180%
A-	35%	210%
BBB+	50%	260%
BBB	75%	310%
BBB-	100%	420%
BB+	250%	580%
BB	425%	760%
BB-	650%	860%
B+	1250%	950%
B	1250%	1050%
B-	1250%	1130%
CCC-or below	1250%	1250%

## SEC-ERBA calibration is an issue for European high quality pools:

Unless Europe

- (a) urgently develops its own framework for current rules (as the US did), calibrated on European assets, and
  - (b) pushes for more appropriate rules to be adopted at Basel level,
- the European securitisation market will not see a revival

## SEC-ERBA improvement: the RBA rating cliff has been addressed:

- The old RBA required 1250% RW up to BB-
- This has been removed and more risk-sensitivity introduced
- No such improvement has been implemented on the formula based methods with 1250% RW still required up to x1 pool capital

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## 4. From the CMA to the PCMA

- The European SSFA
- The PCMA: Pool Capital Multiplier Approach

## 5. The PCMA: our Solution for European SST

# Our QIS shows Inconsistencies in **Current Framework**

- QIS performed on 1,771 European tranches.
- **Inconsistencies within ratings-based approaches**
- **Inconsistencies between approaches**
- The current **SFA undercapitalises mezzanines** (the bulk of “Other Tranches”) compared to an appropriate risk model such as the CMA

	Mean						
	RBA	SA (RB)	SFA	CMA (IRBA)	CMA (SA)	US SSFA (p = 0.5)	Adjusted US SSFA (p = 0.5)
	<b>Most Senior Tranches</b>						
RMBS	67%	90%	7%	15%	15%	15%	15%
SME	21%	51%	7%	15%	15%	15%	15%
Other Retail	10%	26%	7%	15%	15%	15%	15%
	<b>Other Tranches</b>						
RMBS	502%	499%	182%	331%	345%	396%	358%
SME	555%	555%	205%	290%	251%	339%	286%
Other Retail	196%	211%	90%	159%	236%	309%	272%

## Our QIS shows Inconsistencies in Future Framework

- Our analysis demonstrates the inconsistency of the 3 Basel approaches (IRBA, ERBA and SA)
- The proposed ERBA has the same inconsistencies between asset classes as the current RBA
- Formula-based approaches (IRBA and SA) are inconsistent for non-senior tranches

	Mean				
	IRBA	ERBA	SA	CMA (IRBA)	CMA (SA)
<b>Most Senior Tranches</b>					
RMBS	16%	79%	16%	15%	15%
SME	15%	84%	16%	15%	15%
Other Retail	15%	37%	20%	15%	15%
<b>Other Tranches</b>					
RMBS	412%	564%	497%	331%	345%
SME	285%	539%	443%	290%	251%
Other Retail	206%	269%	396%	159%	236%

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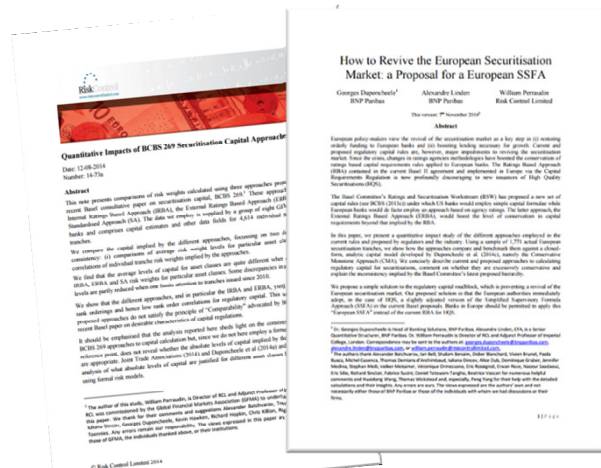
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# Regulatory and Research Background

## Research on risk and capital for securitisations:

- This talk draws on an extensive program of research on the risks and appropriate capital treatment of securitisations performed by a group of bank securitisation risk specialists known as the AFA Quant group.
- Comprising securitisation risk experts from more than 20 major international banks, this group has engaged in a series of discussions and exchanges with regulators and central bank officials on the appropriate development of prudential rules for securitisation capital and liquidity.
- This research program was a response to BCBS (2012) issued in December 2012. This document was the first proposal by the Ratings and Securitisation Workstream (RSW) of the Basel Committee on how capital for securitisations held in the banking book should be treated under Basel III.

## AFA Quant Work



[www.riskcontrollimited.com/insight-category/afa-capital](http://www.riskcontrollimited.com/insight-category/afa-capital)

## Response to BCBS Proposals



<http://www.bis.org/bcbs>



# This Research May be Found At:

[www.riskcontrollimited.com/insight-category/afa-capital](http://www.riskcontrollimited.com/insight-category/afa-capital)

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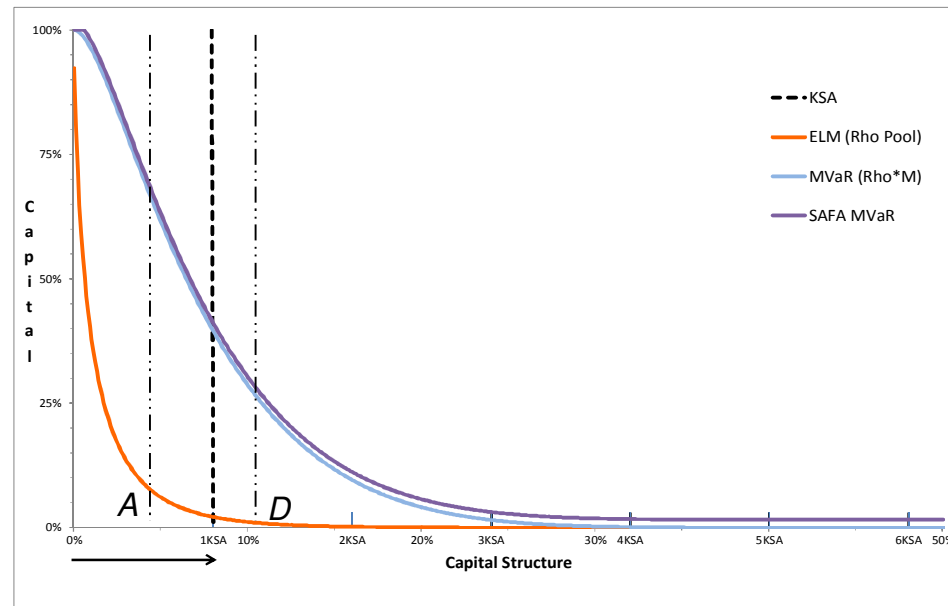
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**Category: AFA Capital**

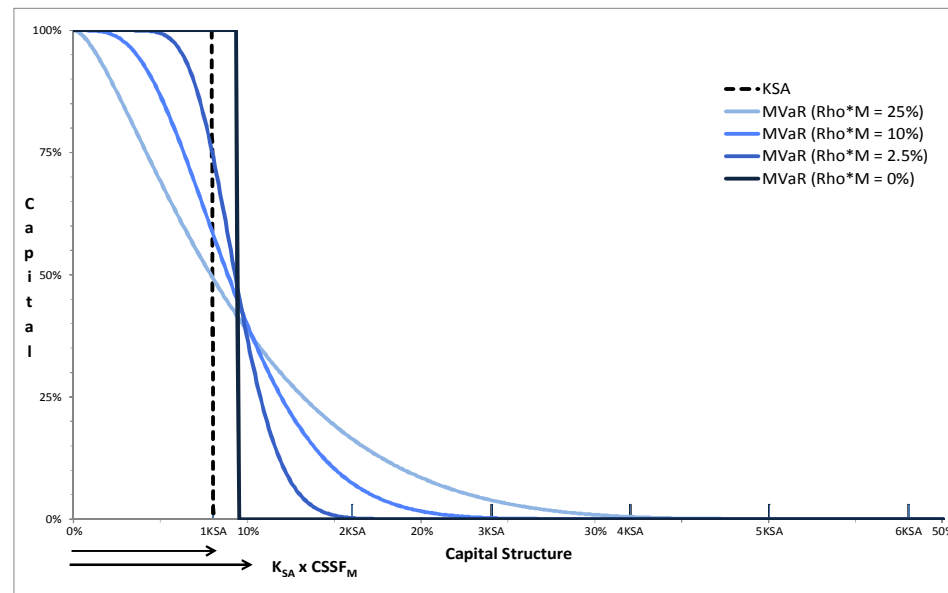
<p>April 2015</p> <p><b>Default Probability Risk and Securitisation Capital</b></p>  <p><a href="#">Read the full article</a> </p>	<p>February 2015</p> <p><b>Response to BCBS-IOSCO Consultation</b></p>  <p><a href="#">Read the full article</a> </p>	<p>February 2015</p> <p><b>Comment on Antoniadou and Tarashev</b></p>  <p><a href="#">Read the full article</a> </p>	<p>December 2014</p> <p><b>How to Revive the European Securitisation Market: a Proposal for a European SSFA</b></p>  <p><a href="#">Read the full article</a> </p>	<p>December 2014</p> <p><b>AFA Capital – An Introduction</b></p>  <p><a href="#">Read the full article</a> </p>
<p>September 2014</p> <p><b>Securitisation Purchases by the ECB – What is “Senior Enough”?</b></p>	<p>August 2014</p> <p><b>Quantitative Impacts of BCBS 269 Securitisation Capital Approaches</b></p>	<p>July 2014</p> <p><b>High Quality Securitisation: An Empirical Analysis of the PCS Definition</b></p>	<p>April 2014</p> <p><b>Calibration of the CMA and Regulatory Capital for Securitisations</b></p>	<p>March 2014</p> <p><b>Calibration of the Simplified Supervisory Formula Approach</b></p>

# The Original AFA

- The diagram shows the tranche level UL-based capital as the area between blue and red curves between attachment point *A* and detachment point *D*. The AFA was presented as an alternative to the Basel MSFA



- The diagram on the right shows the effect of the conditional pool correlation  $\rho^*_M$  on the cliff-effect: as it increases, more MVaR (UL+EL) is allocated towards the senior mezzanines

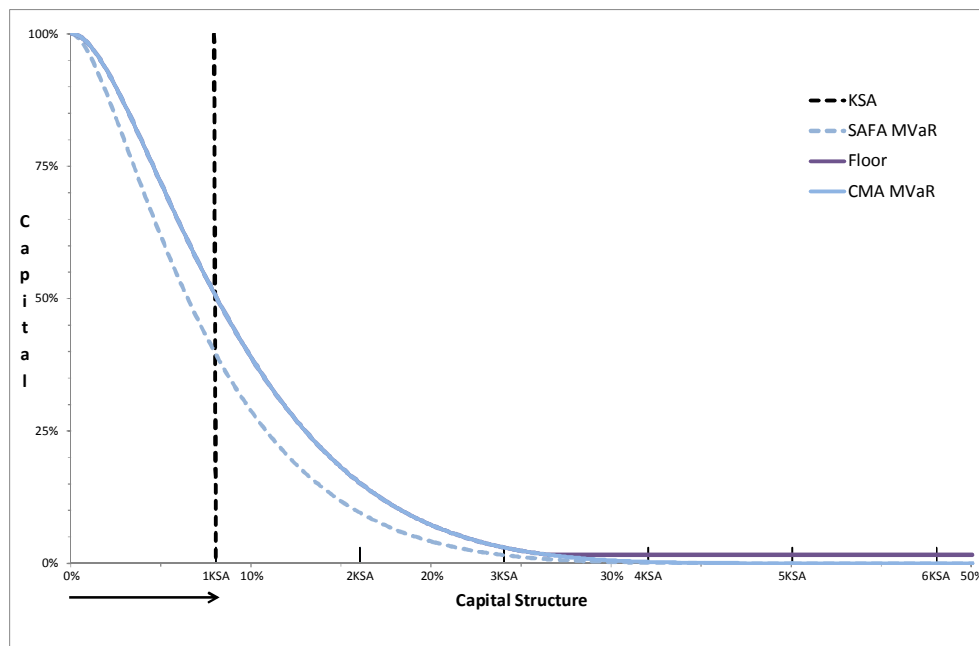


Apr  
2013

# The Conservative Monotone Approach (CMA)

- Calculating securitisation capital based on pool risk weights alone, one obtains a Simplified AFA (SAFA)
- Modifying the AFA to include expected losses with a risk premium, we obtain a “Monotone” version of the model (regulators’ requirement)
- Removing a technical factor (model risk scaling factor) enforcing capital neutrality in the SAFA, and adding a floor, one obtain a “Conservative” version of the model

Jun  
2013



Taking into account asset maturity effects in the expected loss in the conditional correlation, and granularity in the conditional correlation, one increases the level of conservatism

Sep  
2013

# Risk Sensitive Calibration

1. We have carefully calibrated with a group of large banks capital for representative deals using a version of the AFA model but inclusive of conservative Expected Losses as in the BCBS papers
2. Important in getting a sensible calibration is to differentiate between different parts of the market
3. This shows transparently how much additional capital (compared to on balance sheet capital) is merited for different sections of the market
4. Compare to the SSFA-SA general 100% add-on

Nov 2013 to March 2014

	Securitisation Regulatory Asset Class	LGD (can be replaced by IRB values)	$\rho^*_M$	CSSF <sub>M</sub>	
				Senior	Non-Senior
Wholesale	Granular Short Term Bank/Corporate	46%	8%	1.00	1.05
	Granular Low RW Medium to Long Term Bank/Corporate	46%	22%	1.05	1.18
	Granular High RW Medium to Long Term Bank/Corporate	46%	16%	1.10	1.36
	Granular Small- and Medium-sized Entities	45%	15%	1.05	1.17
	Specialised Lending (Commodities Finance)	27%	13%	1.00	1.18
	Specialised Lending (Project Finance)	27%	33%	1.10	1.33
	Specialised Lending (Object Finance)	27%	27%	1.16	1.52
	Specialised Lending (Income Producing Real Estate)	47%	36%	1.06	1.19
	Specialised Lending (High Volatility Commercial Real Estate)	47%	34%	1.08	1.24
	Other Granular Wholesale	76%	30%	1.07	1.23
	Other Non-Granular Wholesale	53%	40%	1.08	1.26
Retail	Low RW Residential Mortgages	25%	11%	1.14	1.47
	High RW Residential Mortgages	45%	12%	1.22	1.73
	Revolving Qualifying Retail	75%	3%	1.06	1.39
	Other Retail	75%	12%	1.10	1.35

Maturity Effect

Maturity Effect

Quality Effect

Maturity Effect

Quality Effect

Granularity Effect

Academic paper on CMA Calibration

## CMA Benefits

**With the Conservative Monotone Approach (or CMA), we obtain desirable benefits:**

- A simple closed-form capital formula
  - Based on a rigorous underlying credit model
  - Monotone in seniority
  - Risk sensitivity
  - Conservative capital requirements
  - Transparent calibration enabling regulatory control
  - Consistent calibration under both the SA and IRBA enabling to treat mixed pools
- 
- The CMA enables to have an appropriate calibration of the SSFA by deriving the value of the SSFA parameter “ $p$ ” by individual asset class
  
  - A much better fit between the SSFA and the CMA may be achieved if a single additional parameter is introduced in the SSFA

# Very Simple and Transparent Excel Implementation of the CMA(\*)

## CMA CAPITAL MODEL

Inputs should be entered only in the bright yellow cells.

Securitisation Regulatory Asset Class				
Granular SME				
		SA and IRBA	SA	IRBA
Delinquency Ratio	W	2.00%		
Loss Given Default on delinquent	LGD_W		0.50	35%
			K_SA	K in IRBA
			6.000%	5.200%
Non-Delinquent subpool Risk Weight	RW_P		75%	69%
Average Pool Risk Weight	RW_Pool		86.0%	76.3%
Loss Given Default	LGD_P		45%	30%

SA: Standardised Approach	IRBA: Internal Ratings Based Approach
Effective capital surcharge <b>16%</b>	Effective capital surcharge <b>16%</b>
Calibrated CMA	Calibrated CMA
<b>TRANCHE RW%</b>	<b>TRANCHE RW%</b>
<b>0%</b>	<b>0%</b>
<b>28%</b>	<b>6%</b>
<b>190%</b>	<b>112%</b>
<b>446%</b>	<b>356%</b>
<b>733%</b>	<b>670%</b>
<b>1062%</b>	<b>1039%</b>
<b>1241%</b>	<b>1238%</b>
<b>1250%</b>	<b>1250%</b>

Capital Structure (Tranche Number)	Tranche Name	Attachment Point (A)	Detachment Point (D)	Thickness	Category
1	Class A	25.00%	100.00%	75.00%	Senior
2	Class B	15.00%	25.00%	10.00%	Non-Senior
3	Class C	10.00%	15.00%	5.00%	Non-Senior
4	Class D	7.50%	10.00%	2.50%	Non-Senior
5	Class E	5.00%	7.50%	2.50%	Non-Senior
6	Class F	2.50%	5.00%	2.50%	Non-Senior
7	Class G	0.00%	2.50%	2.50%	Non-Senior
8	Class H	0.00%	0.00%	0.00%	Non-Senior

(\*) Available upon Request from the authors

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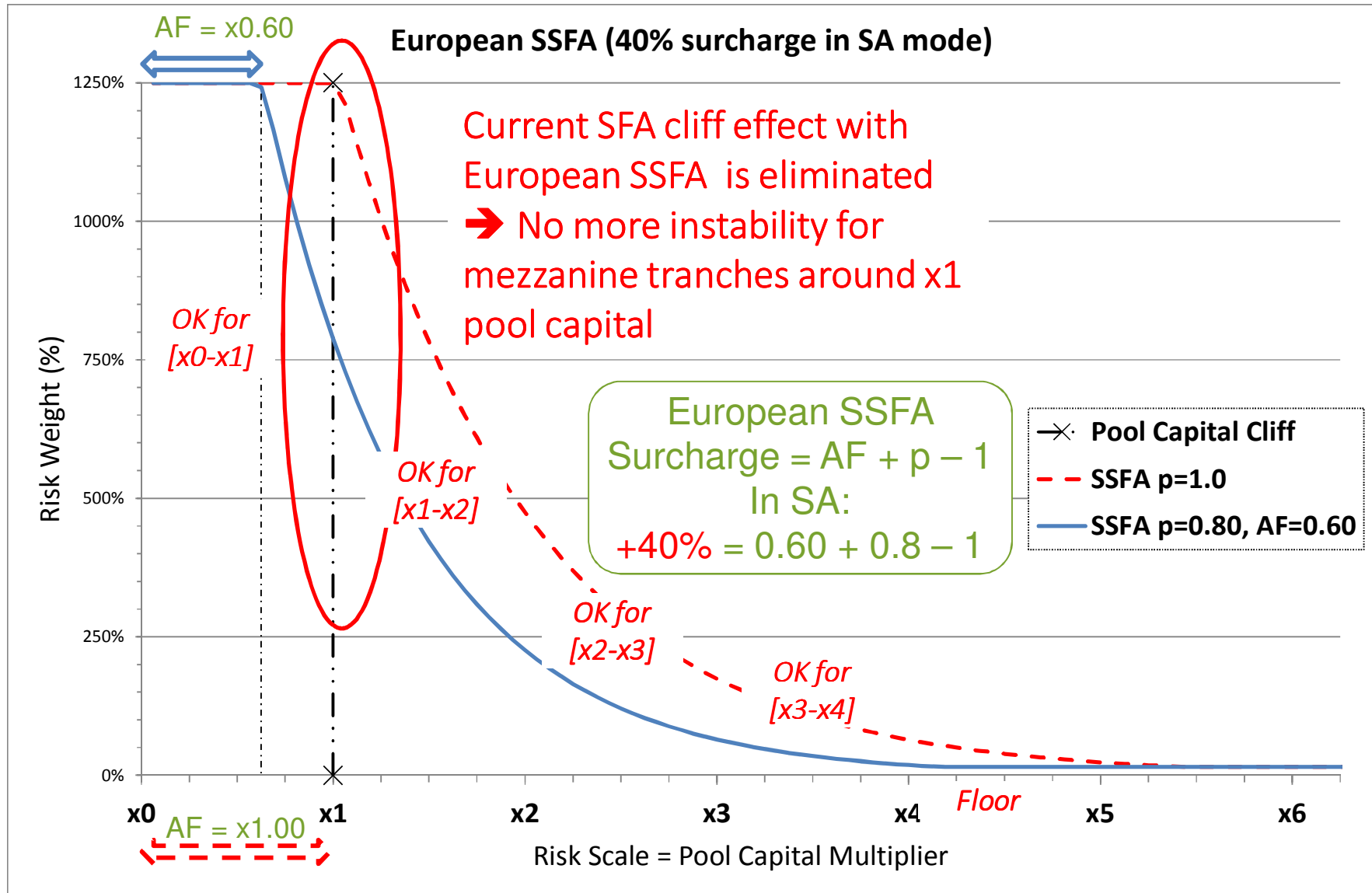
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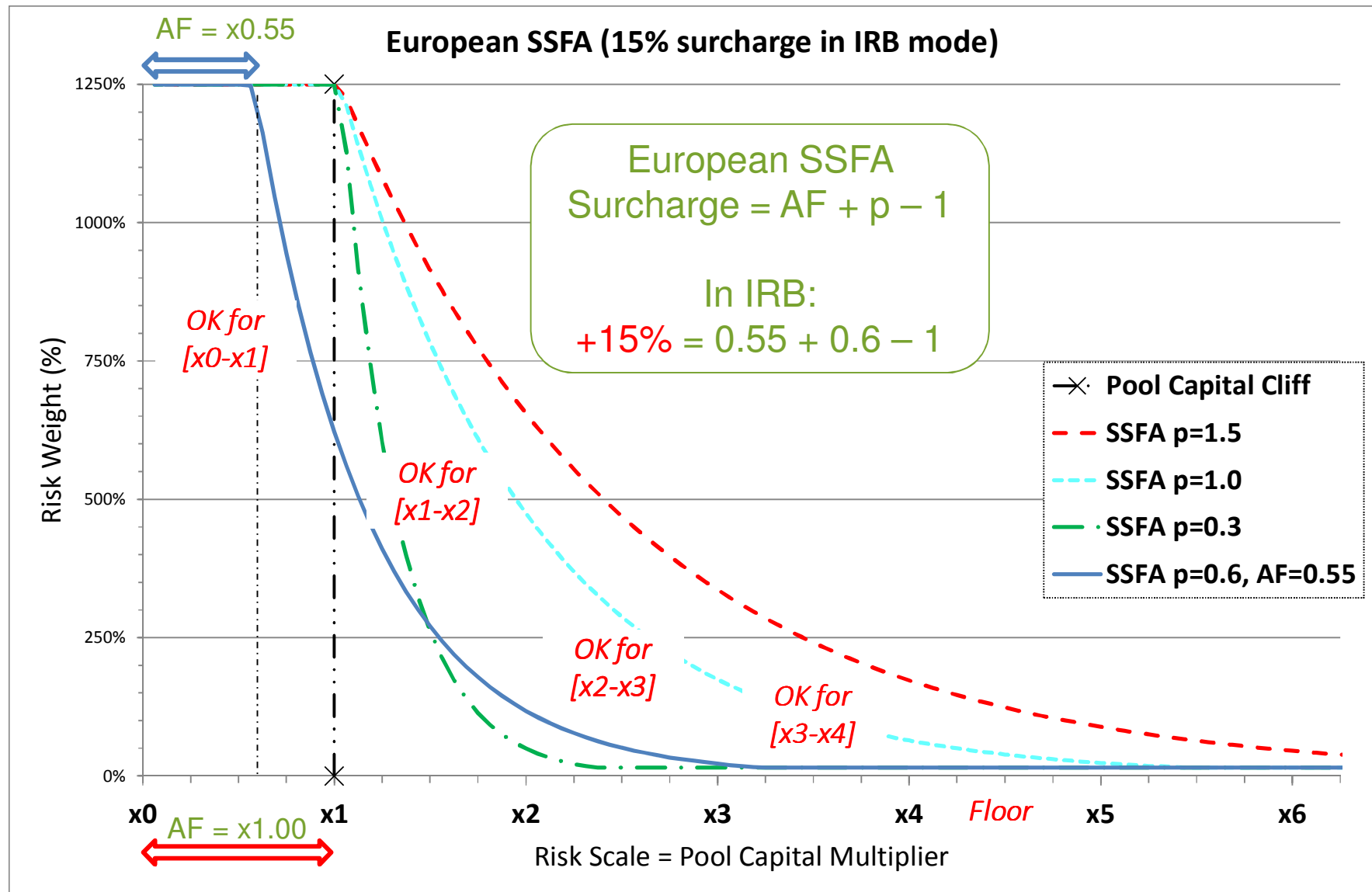
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# European SSFA (SA: AF=0.60 and p=0.8)





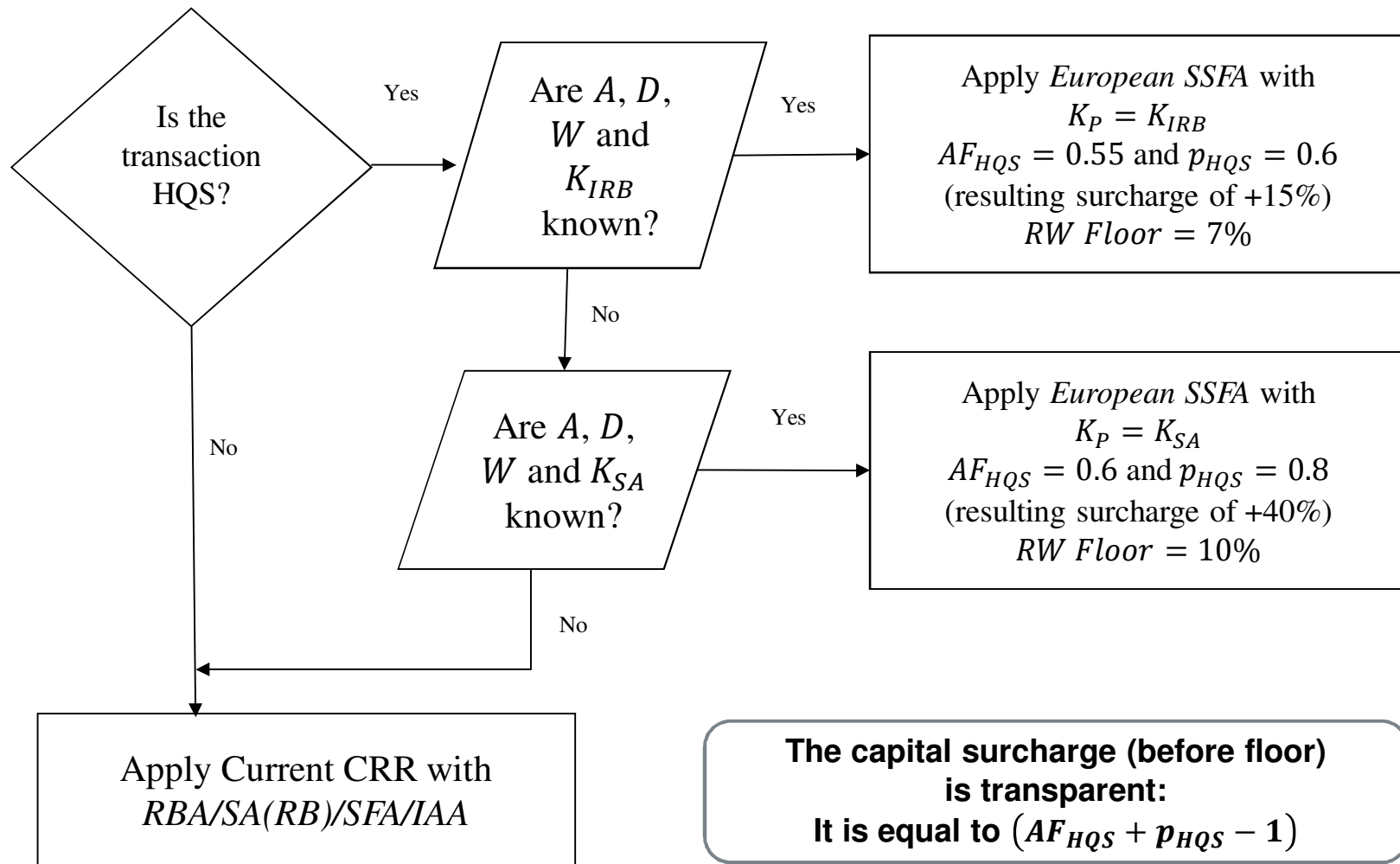
# European SSFA (IRB: AF=0.55 and p=0.6)



# The Decision Tree of the European SSFA

Nov 2014

A Bank's Decision Rule Under the Proposed HQS European SSFA:



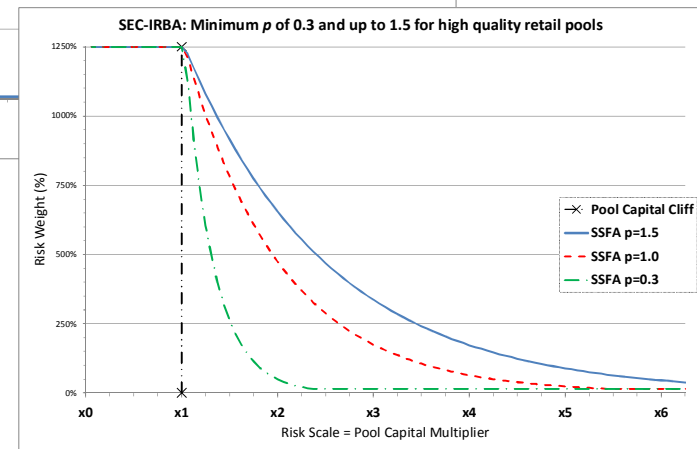
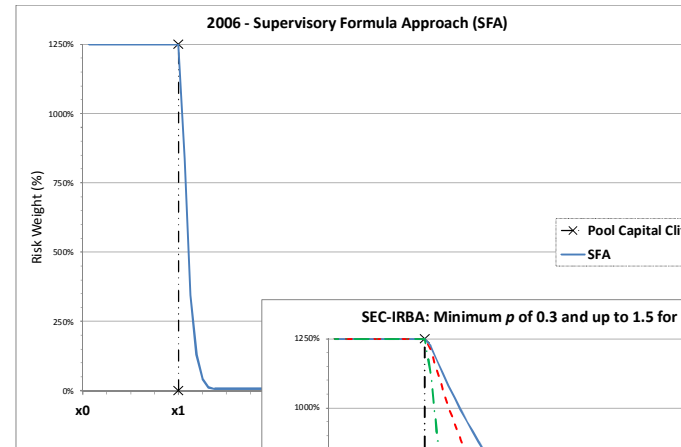
# Securitisation framework: 2 routes

Mapping  
based on  
External Ratings

Formula  
based on  
Pool Capital

CRR 575/2013, Article 251, Standardised Approach		
Credit Quality Steps	Mapping to External Ratings	Credit Quality Step Risk Weight
1	AAA / AA+ / AA / AA-	20%
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3	BBB+ / BBB / BBB-	100%
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All other	B+ / B / B- Below B- or unrated	1250%

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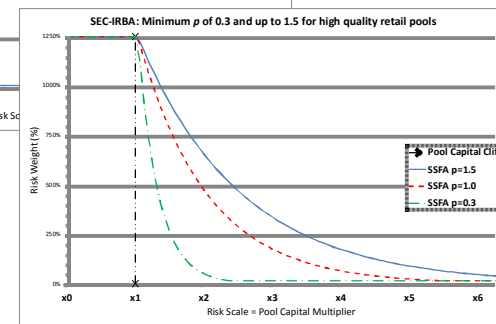
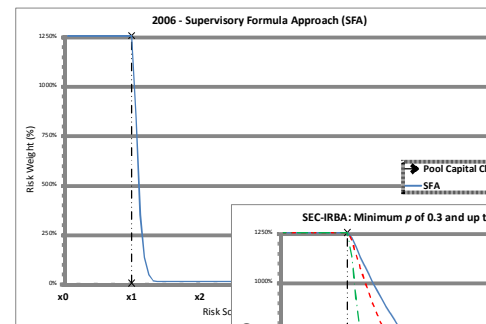


# 2 routes, but who is really in charge?

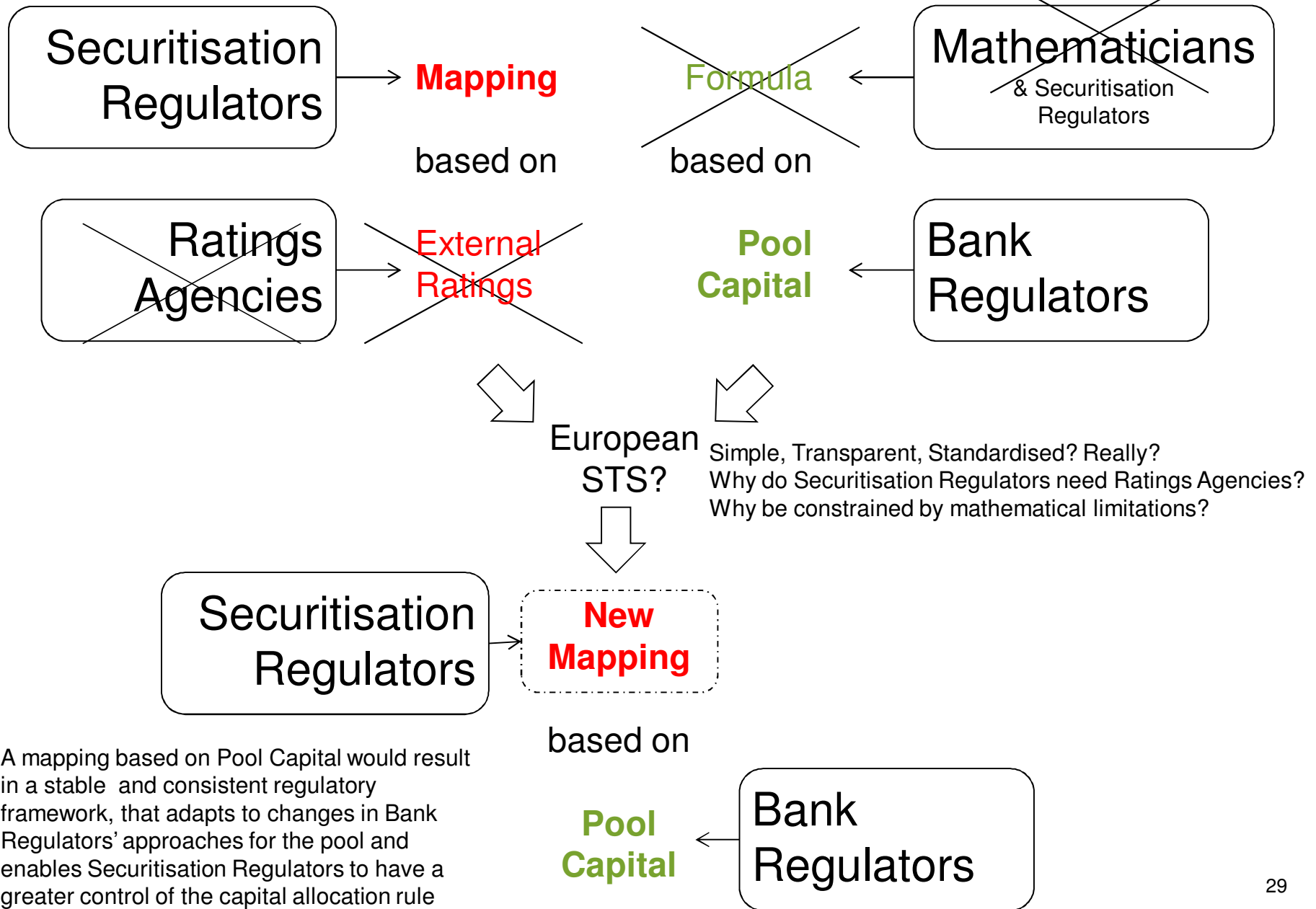


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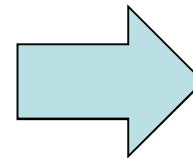
# Who should be in charge for European SST?



# Practical solution to remove external ratings in securitisation capital regulation

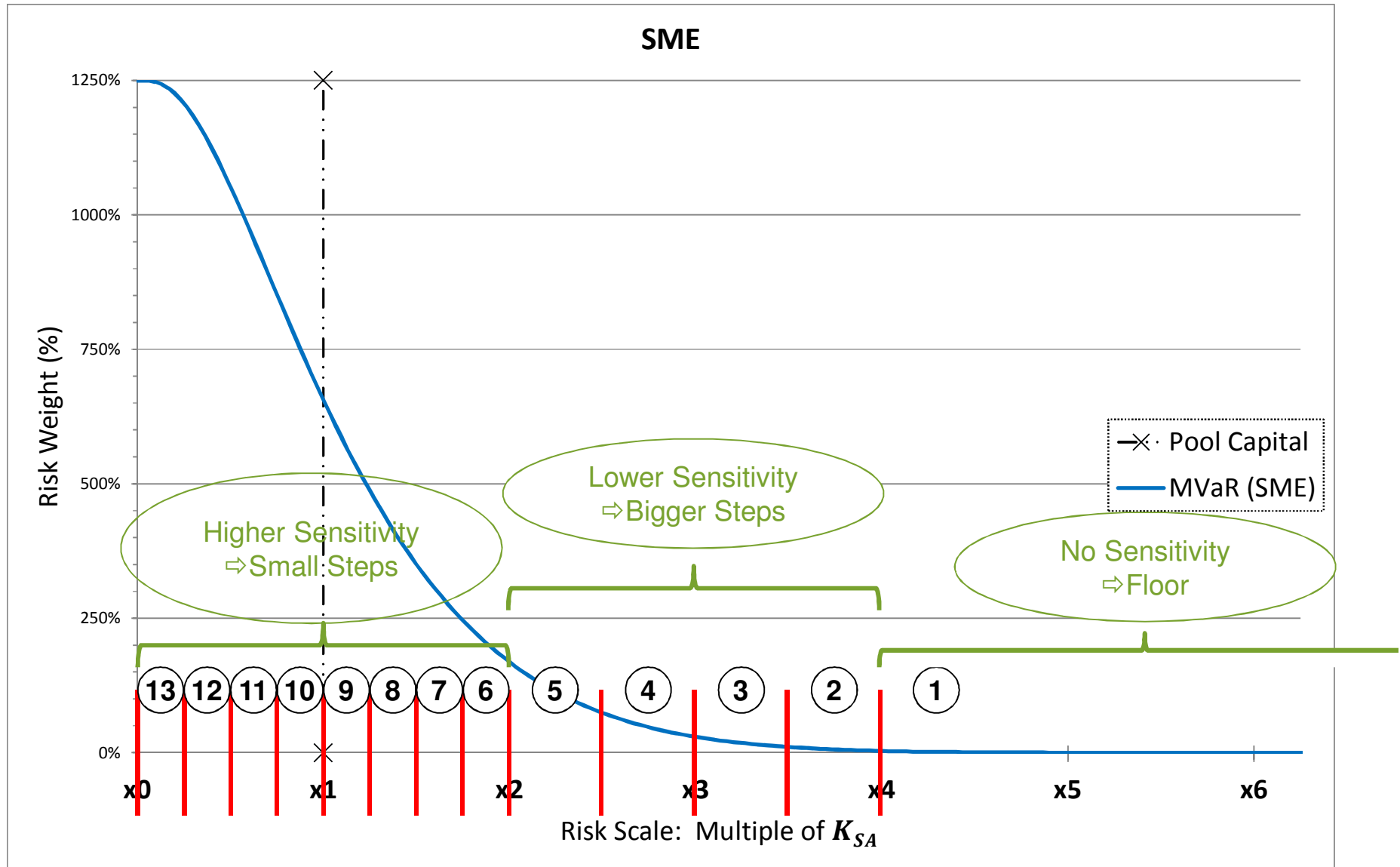
Mapping to tranche external ratings can be replaced with a mapping based on the risk of the tranche, when a tranche is expressed as pool capital multiple

Credit Quality Steps: External Ratings	Step Risk Weight		
	Senior	Non-Senior and Granular	Non Granular
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A+	10%	18%	35%
A	12%	20%	
A-	20%	35%	
BBB+	35%	50%	
BBB	60%	75%	
BBB-	100%		
BB+	250%		
BB	425%		
BB-	650%		
Below BB- or unrated	1250%		

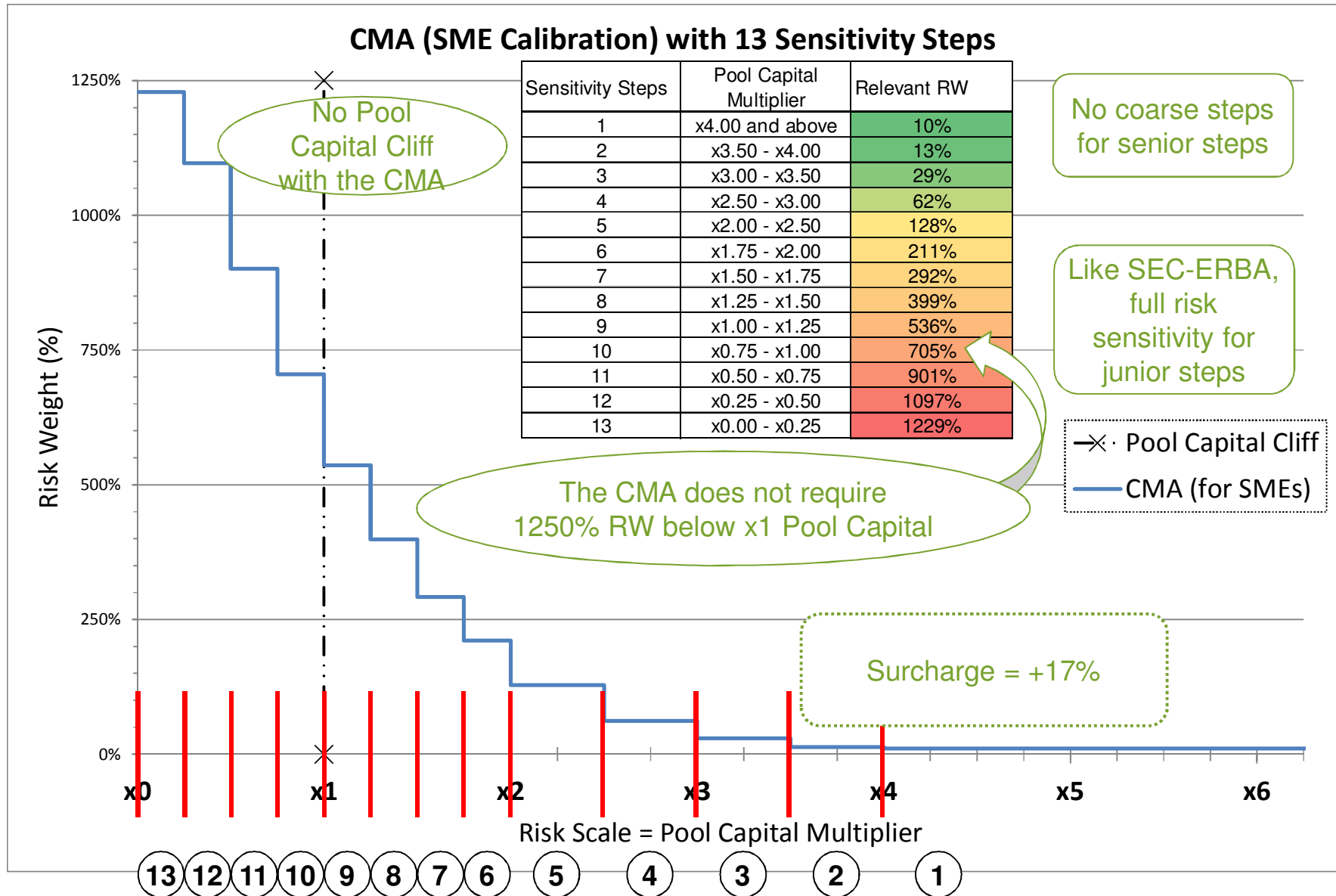


Sensitivity Steps	Pool Capital Multiplier	Step Risk Weight
1 (Floor)	x4.00 and above	7%
2	x3.50 - x4.00	12%
3	x3.00 - x3.50	25%
4	x2.50 - x3.00	55%
5	x2.00 - x2.50	115%
6	x1.75 - x2.00	185%
7	x1.50 - x1.75	280%
8	x1.25 - x1.50	400%
9	x1.00 - x1.25	525%
10	x0.75 - x1.00	700%
11	x0.50 - x0.75	900%
12	x0.25 - x0.50	1100%
13	x0.00 - x0.25	1250%

# First: Creating 13 Sensitivity Steps



# Second: Converting an appropriate risk model (CMA) into a step function, as a guidance for proper calibration





# Agenda

## 1. Current Basel securitisation framework

- Creates a ratings dependency in Europe, main source of the problem
- Is ignored in the US, leading to a revival of the market
- Is the Future Basel framework the way forward?

## 2. A Quantitative Impact Study for European Securitisation

## 3. An alternative model: the CMA

## 4. From the CMA to the PCMA

- The European SSFA
- The PCMA: Pool Capital Multiplier Approach

## 5. The PCMA: our Solution for European STS

# Step 1: European legislators should decide the capital surcharge necessary for the revival of the market, in particular for STS

Sensitivity Steps	Mapping to Pool Capital Multiplier	Floor Target										
1 (Floor)	x4.00 and above	7%	7%	7%	7%	7%	7%	10%	10%	10%	10%	10%
Sensitivity Steps	Mapping to Pool Capital Multiplier	Capital Surcharge Target										
		No Surcharge	+5% Surcharge	+10% Surcharge	+15% Surcharge	+20% Surcharge	+25% Surcharge	+30% Surcharge	+35% Surcharge	+40% Surcharge	+45% Surcharge	+50% Surcharge
2	x3.50 - x4.00	8%	9%	10%	12%	15%	18%	20%	25%	30%	35%	40%
3	x3.00 - x3.50	15%	18%	20%	25%	30%	35%	40%	50%	60%	70%	80%
4	x2.50 - x3.00	35%	40%	45%	55%	65%	75%	85%	95%	110%	125%	140%
5	x2.00 - x2.50	80%	90%	100%	110%	120%	140%	160%	180%	200%	220%	240%
6	x1.75 - x2.00	140%	150%	165%	185%	205%	225%	250%	275%	300%	325%	350%
7	x1.50 - x1.75	220%	240%	260%	280%	300%	325%	350%	375%	400%	425%	450%
8	x1.25 - x1.50	310%	340%	370%	400%	430%	460%	490%	520%	550%	580%	610%
9	x1.00 - x1.25	405%	450%	495%	535%	575%	610%	645%	675%	700%	725%	750%
10	x0.75 - x1.00	560%	605%	650%	690%	730%	765%	795%	825%	850%	875%	900%
11	x0.50 - x0.75	790%	830%	870%	900%	930%	950%	970%	985%	1000%	1015%	1030%
12	x0.25 - x0.50	1050%	1070%	1090%	1105%	1120%	1130%	1140%	1145%	1150%	1155%	1160%
13	x0.00 - x0.25	1250%	1250%	1250%	1250%	1250%	1250%	1250%	1250%	1250%	1250%	1250%
Non-Neutrality Ratio (excluding Floor)		1.00	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50

Neutrality: 1.00

Same surcharge as current SFA

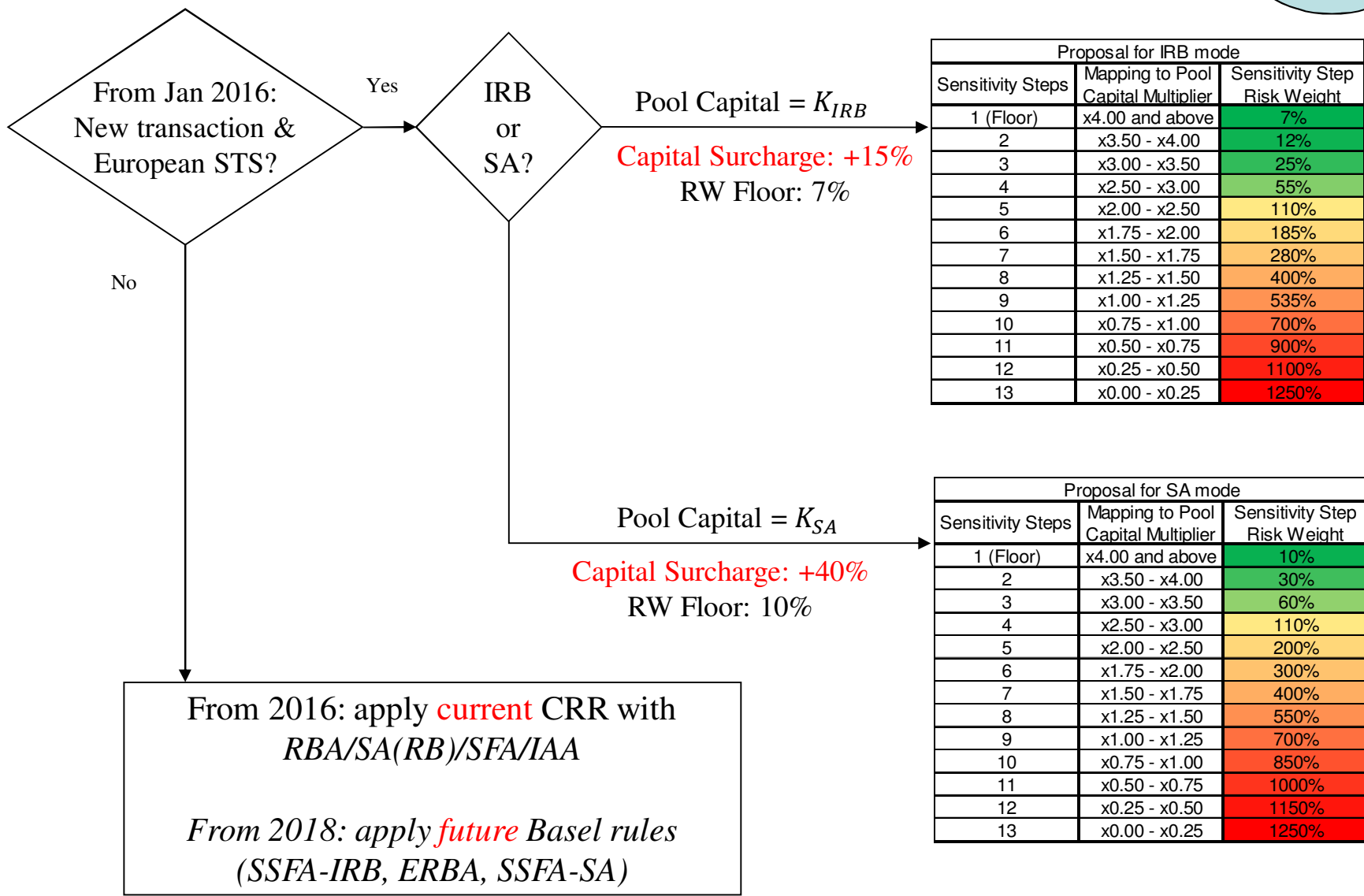
Same surcharge as European SSFA (IRB)

Same surcharge as European SSFA (SA)

Same surcharge as current US SSFA

# Step 2: Decision Tree for European STS

Mar 2015



# Impact of Ratings on a European RMBS → PCMA Solution

Current CRR

Solution without ratings and without formulae

CASE STUDY: SPANISH RMBS (Source: EBA Discussion Paper, October 2014)

Spanish Residential Mortgages Pool Risk Weight (Standardised Approach)

Spanish RMBS Tranche Risk Weights (Standardised Approach)

Tranche External Rating

Tranche Thickness

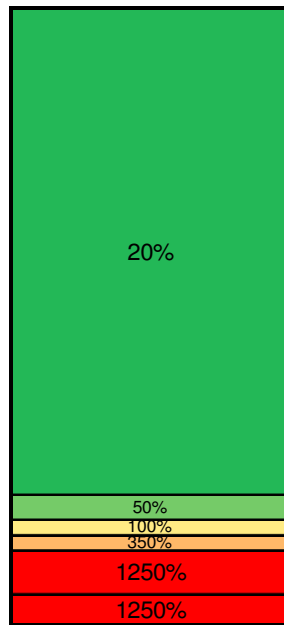
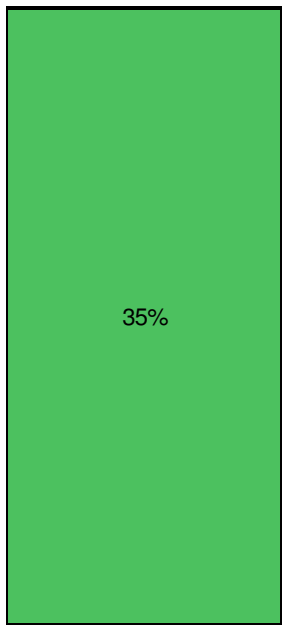
Tranche Attachment Point

as a Percentage of Structure

as a Multiple of Pool Capital

Residential Mortgages Pool Capital Multiples

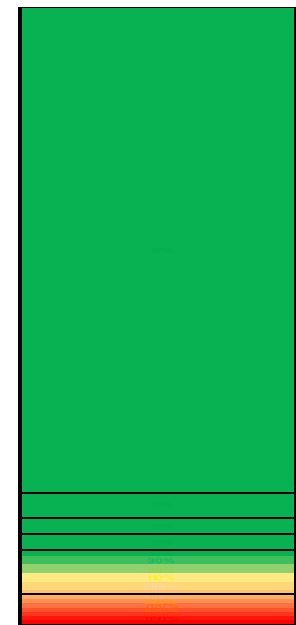
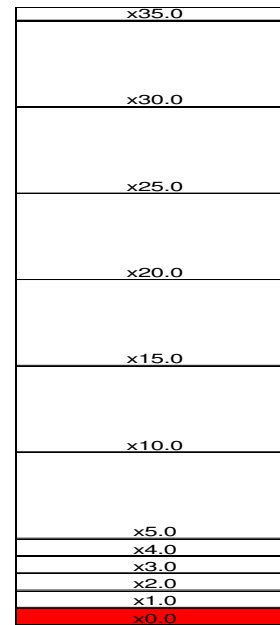
Tranche Risk Weights based on Pool Capital Multiplier Approach



AAsf	78.6%
Asf	4.0%
BBBsf	2.7%
BBsf	2.5%
Bsf	7.2%
Unrated	5.0%



100.0%	x35.71
21.4%	x7.64
17.4%	x6.21
14.7%	x5.25
12.2%	x4.36
5.0%	x1.79
0.0%	x0.00



Capital (Before Securitisation) 2.80%

Capital (After Securitisation) 14.53%

Non-Neutrality Ratio (EBA definition): 5.19  
 Non-Neutrality Ratio (excluding senior tranche ("floor")): 4.74 (i.e 374% capital surcharge)

Capital (Before Securitisation) 2.80%

Capital (After Securitisation) 4.63%

Non-Neutrality Ratio (EBA definition): 1.65  
 Non-Neutrality Ratio (excluding "floor"): 1.40 (i.e 40% capital surcharge)

Pool Capital 2.80% x1.00

Technical note: Capital = Risk Weight \* 8

# Conclusion

- Risk analysis: investors and originators could use the CMA model as their internal model for
  1. economic capital,
  2. risk management and
  3. risk return analysison securitisation tranches and portfolios
- Capital rules for Europe: banks should
  1. analyse the impact of the PCMA,
  2. see whether new issuances could occur under such a regulatory approach,and if the answer is yes:

support the PCMA in their interactions with regulators and EU authorities to ensure the revival of the securitisation market

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