

When IFRS 9 Meets The P&L: Credit Risk Implications For Banks

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Agenda

- **Executive summary**
- **The main requirements of IFRS 9**
 - Interaction between IFRS 9 and IFRS 13
 - Implications for listed firms
- **Key features of IFRS 9 credit provisions**
 - How to calculate IFRS 9 loss provisions
 - Issues for banks
- **Interplay of Basel capital requirements and IFRS 9**
- **An example of Expected Credit Loss (ECL) calculation under IFRS 9**
 - An approach to recalibrate Probability of Defaults (PDs) from Through-The-Cycle (TTC) to Point-In-Time (PIT) using default rates and Credit Default Swaps (CDS) proxy spreads
 - A worked example of stages 1, 2 and 3 provisions
- **Wrap-up on our IFRS 9 offering and final remarks**
- **Further reading**

Executive Summary

- **During the financial crisis, the G20 tasked global accounting standard setters to work towards the objective of creating a single set of high-quality global standards**
- **In response to this request, the International Accounting Standards Board (IASB) and Financial Accounting Standards Board (FASB) began to work together on the development of new financial instruments standards, such as IFRS 9 and IFRS 13**
- **IFRS 9, focused on Expected Credit Losses (ECL), will replace the current IAS 39 starting from January 1, 2018. Global accounting standards are mandatory for listed companies**
- **IFRS 9 will be implemented in several jurisdictions (including Europe), but not in the USA, where GAAP standards are currently in force. In fact, although IASB and FASB started working together to have a convergent standard, FASB still has to finalize the new CECL (Current Expected Credit Loss) rules. FASB announced the final text of the rules will be released at the end of June 2016**
- **IFRS 9 will have a significant impact on entities with sizeable financial assets and, in particular, on financial institutions (banks, insurance firms, asset managers, etc.,)**

Overview Of IFRS 9

The Main Requirements Of IFRS9

- Classifications of Financial Instruments (this is an irrevocable election at recognition)
 - *At Amortized Cost*: loans, trade receivables, etc.,
 - *At Fair Value through Other Comprehensive Income (FVOCI)*: This is the old “Available for Sale” asset category
 - Debt investments held to capture yields, but with the possibility of selling them to rebalance the portfolio in terms of, for example, risk, duration, liquidity
 - *At Fair Value through Profit & Loss (FVTPL)*: This is the so-called Trading Book
 - Debt instruments held for trading purposes, where the goal is not to collect cash flows over time, but to maximize advantageous pricing conditions over a short-time frame
- Impairment: This is the most important change versus IAS 39 (the previous incurred loss model). Expected losses have to be calculated on performing assets as well, with direct impact on P&L
- Derivatives and Hedge Accounting: Requirements on how to recognize bespoke derivatives hedging. Limitations on macro hedging policies

Interaction Between IFRS 9 And IFRS 13

Fair value pricing and credit risk impairment differ according to the asset class category

Table 1 – Accounting Treatment of each category of Financial Assets

ASSET CATEGORY	FAIR VALUE ADJUSTMENT (IFRS 13)	CREDIT IMPAIRMENT (IFRS 9)
At Amortised Cost	No	Yes, recorded in P&L
At FVOCI	Yes, recorded in P&L	<ul style="list-style-type: none"> • Debt Investments: Yes, recorded in P&L • Equity investments: No credit impairment
At FVTPL	Yes, recorded in P&L	No credit impairment recorded

Source: Our elaborations on IASB, "IFRS 9 Financial Instruments", July 2014.

Implications For Listed Firms On Specific Asset Classes

Major impact is expected for financial institutions, although large non-financial companies with sizeable investment portfolios will be affected as well

- Particularly:
 - Banks: Loans and other asset classes in the Banking Book + Debt Investments at FVOCI
 - Other Financial Institutions (Insurance Companies, Asset Managers): Debt Investments at FVOCI
 - Non-Financial Companies: Trade Receivables + Debt Investments at FVOCI
 - However, for trade receivables, non-financial companies could opt for a simplified look-up table approach that significantly reduces the implementation challenges related to this new accounting standard
- As mentioned before, any assets in the trading books and equities held in the FVOCI categories will be excluded from the credit impairment test

Key Features Of IFRS 9 Credit Provisions

In July 2014, the International Accounting Standard Board (IASB) published the final text of the IFRS 9 rules, which also includes the new “Expected Loss” impairment model

	STAGE 1	STAGE 2	STAGE 3
Impairment Criteria	No significant deterioration in credit risk since initial recognition, or low credit risk at reporting date	Significant deterioration in credit risk since initial recognition, but no evidence of impairment	Objective evidence of impairment at reporting date
Probability of Default	Expected over a 12-month horizon	Expected up to Contractual Maturity	PD = 100% (“absorbing state”)
Expected Loss Allowance	12-month Expected Credit Loss	Life-time Expected Credit Loss	Life-time Expected Credit Loss, only Loss Given Default (LGD) to be estimated



Note: Exposures can move back from stage 2 to stage 1. Since default is an “absorbing” state, it is rare for exposures in stage 3 to move back to stage 2 or 1.

Source: IASB, July 2014.

Focus On Credit Impairment: A Three-Stage Approach

IFRS 9 proposes a three-stage approach for the recognition of impairment losses for financial instruments:

- Performing: Low credit risk at initial recognition (first time in the book). Usually meant as asset at the “Investment Grade” rating level
 - Accounting recognition: **12-month** expected credit losses

 ***New credit loss provision – Material Impact***

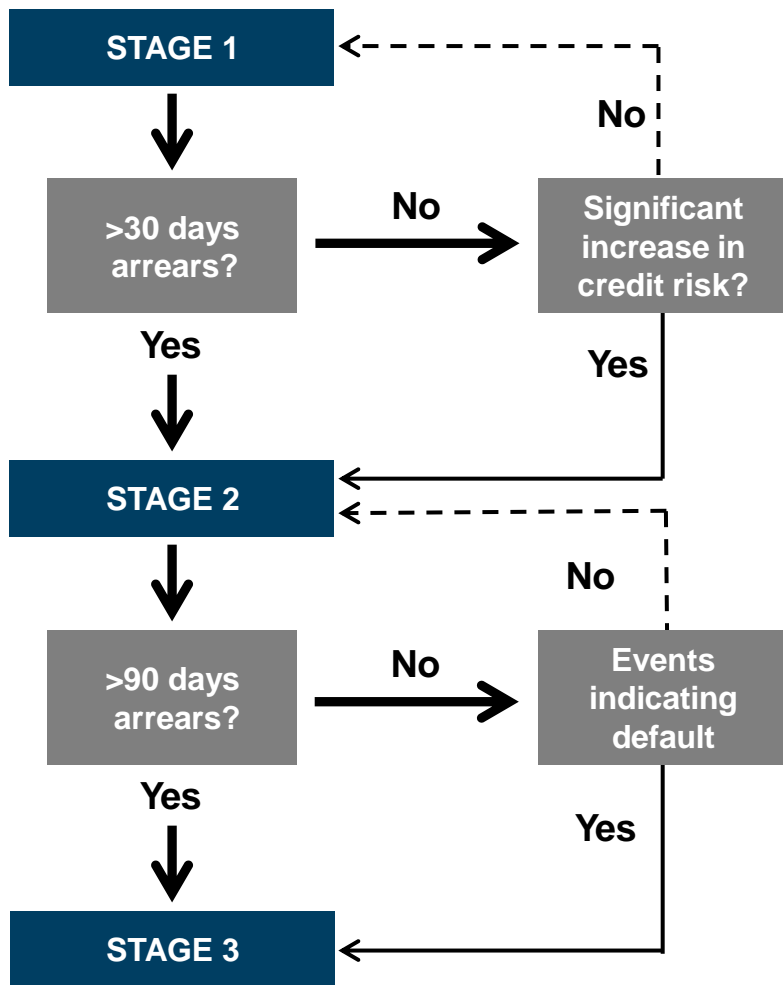
- Underperforming: Significant deterioration of credit risk versus the initial recognition phase, such as 30-day past due for loans and trade receivables, or asset at “speculative grade” level, or asset moving from the “investment” to the “speculative grade” area
 - Accounting recognition: **Lifetime** expected credit losses

 ***New credit loss provision – Material Impact***

- Non-performing: assets with objective evidence of declared credit impairment at the reporting date (official default by a rating agency, bankruptcy, 90-day past due Basel default definition, etc.,)
 - Accounting recognition: **Lifetime** expected credit losses

 ***Not materially different from IAS 39***

How To Calculate IFRS 9 Credit Loss Provisions



STAGE 2
Indicators of a significant increase in credit risk

- A downgrade of a borrower by a recognised credit rating agency, or within a bank's internal credit risk system
- An increase larger than a specified threshold in the average lifetime Probability of Default (PD) over the remaining life of the financial instrument
- Credit measures such as warning signals and watch lists result in a reassessment of the credit rating
- For retail, delinquency on obligations with the bank or on bureau profiles will trigger stage transition

...With 30 days past due rebuttable presumption

STAGE 3
Events indicating default

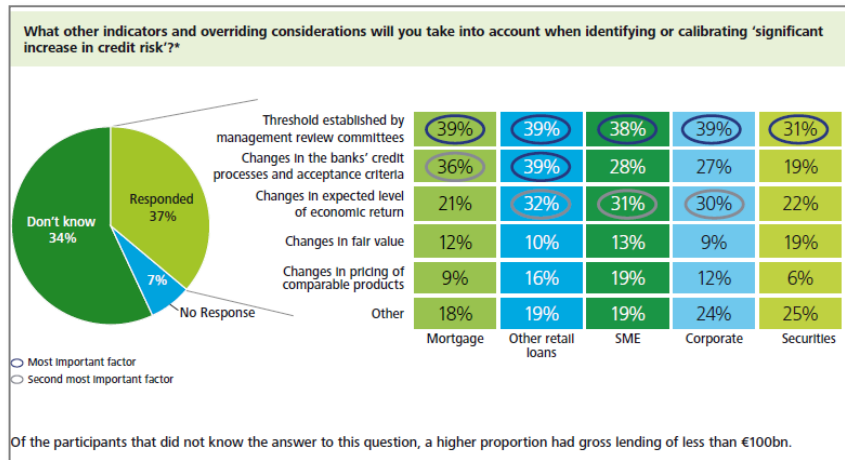
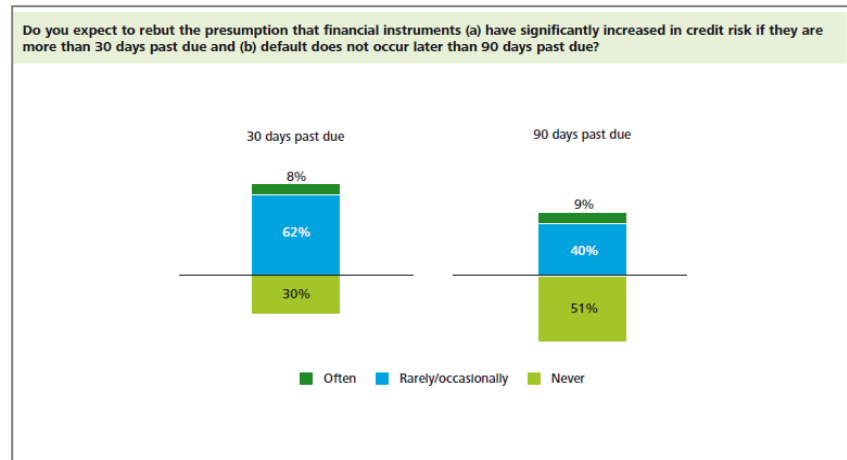
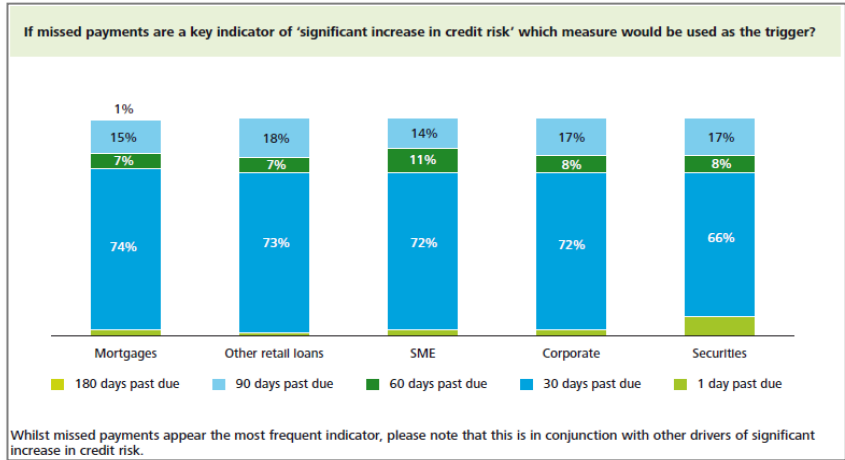
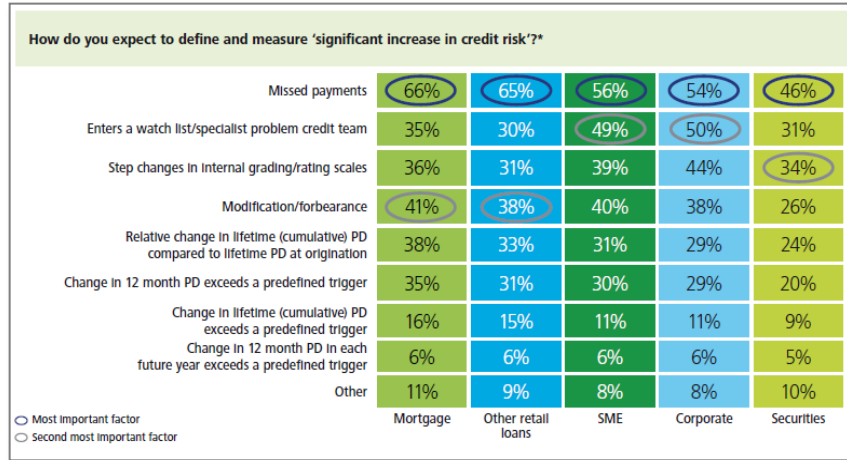
- Bankruptcy of financial reorganisation
- Breach of contract (past due / default)
- Borrower in significant financial difficulty
- Disappearance of active market for financial asset
- Purchase of financial asset at deep discount reflecting incurred credit losses

...With 90 days past due rebuttable presumption

Source: Our Elaborations on IASB (2014).

How Do Banks Define A “Significant Increase In Credit Risk”?

“Past due” information is Key to Stages 2 and 3



Source: Deloitte (May 2016), "Sixth Global IFRS Banking Survey."

IFRS 9 Versus Basel III

Issues For Banks When Implementing IFRS 9

There is a significant interaction between IFRS 9 and the Basel Accord

- Banks need to adjust their internal ratings-based models (PD and LGD) to comply with IFRS 9 (however, Internal Ratings Based (IRB) models used as a starting point)
- Here are some differences between the two modelling approaches:
 - IFRS 9 Point-In-Time (PIT) versus IRB Through-The-Cycle (TTC) PD
 - 1 year PD under Basel, 1 year and multi-year PDs under IFRS 9
 - Point-In-Time (Loss Given Default) LGD under IFRS 9 versus a downturn LGD under Basel
 - Migration risk to be explicitly monitored and modelled under IFRS 9; migration risk in Basel proxied by residual maturity in the IRB formula (with an average 2.5-year maturity under foundation IRB)
 - 30-day past due trigger to underperform category for loans and trade receivables
 - Incorporation of 12-month macroeconomic forecasts for PD purposes under IFRS 9: both positive and negative developments considered (different from stress testing, where only worst case macroeconomic scenario considered)
 - Use of PDs and LGDs for all exposures required under IFRS 9, irrespective of the regulatory credit modelling approach (standardized or internal). Therefore, standardized exposures require PD and LGD estimates under this new accounting standard

Source: Our elaborations on IASB (July 2014), "IFRS 9 Financial Instruments".

Methodological Differences Between Basel III And IFRS 9

Banks will have to parameterize their “Expected Credit Loss Model” somewhat differently under IFRS 9 and Basel III for IRB approaches:

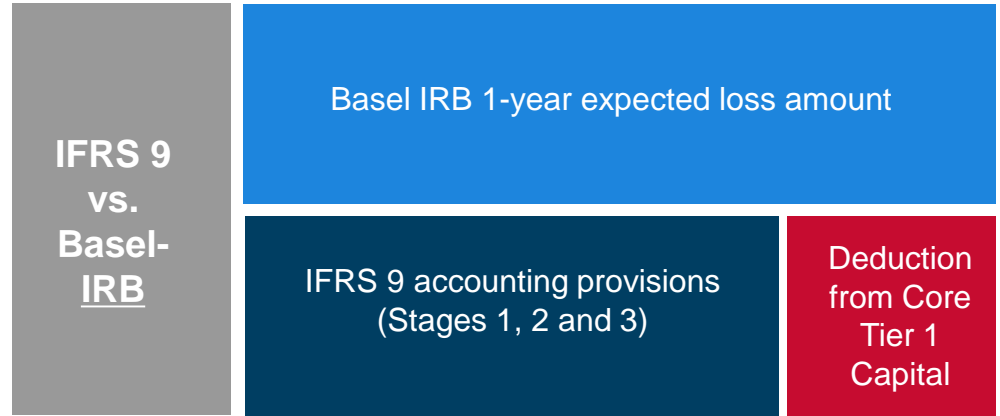
	IFRS 9	BASEL III
Probability of Default (PD)	<i>“Point in Time”</i> . Expected over the next 12 months for stage 1 exposure and over the lifetime of stage 2/3 exposures	<i>“Through the cycle”</i> . Expected over 12 months
Loss Given Default (LGD)	Present value of observed loss	Downturn scenario
Exposure At Default (EAD)	Under IFRS, it is the loan amount outstanding at the balance sheet date that is considered in the calculation and not any future movements and draw downs	On a financial asset with a limit facility (e.g., an overdraft) the EAD will take in consideration an expectation of future draw downs until the default event has occurred by using credit conversion factors

Source: Our elaborations on IASB (July 2014), “IFRS 9 Financial Instruments”.

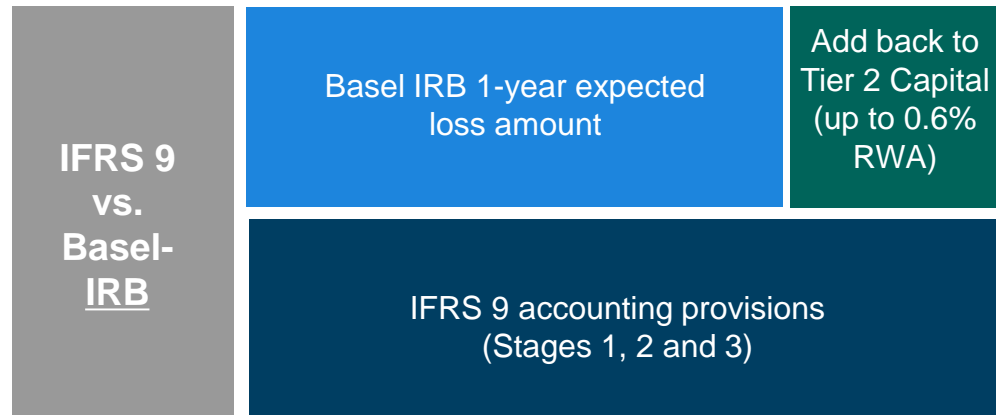
Interplay Of Basel Capital Requirements And IFRS 9

- The “Regulatory 12-month Expected Loss” for IRB exposures: Banks are already recognizing provisions on “expected losses” on the loan book based on a 12-month basis
 - This requirement was introduced by Basel II in 2006 for IRB portfolios:
 - a. If the IRB expected losses, calculated as $EAD \cdot PD \cdot LGD$, are higher than the level of IAS 39 provisions (specific + generic), the difference is deducted from CET 1 (Common Equity Tier 1 Ratio)
 - b. If the IRB expected losses are lower than the level of IAS 39 provisions, the surplus is added back to Tier 2 (not CET 1) with a cap at 0.60% of IRB Risk Weighted Assets
- “Under IFRS 9, banks will also have to recognize “lifetime” expected loss provisions for stage 2 exposures (significant increase in credit risk), i.e., beyond 12-month

a. - Shortfall



b. – Surplus

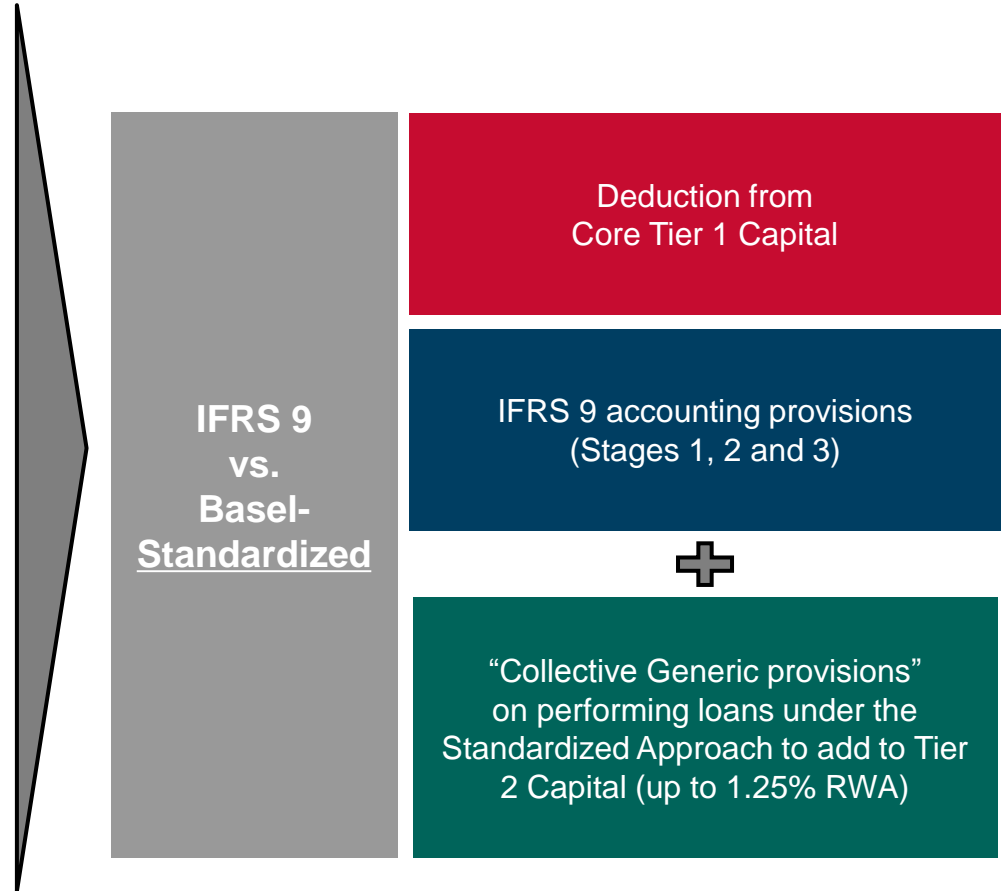


Source: Our elaborations on European Parliament (2015).

Interplay Of Basel Capital Requirements And IFRS 9

For standardised exposures, Basel III doesn't provide for Expected Loss (EL) provisions; however, "Collective Generic provisions" can be included in Tier 2 Capital to cover EL.

- For standardised exposures, Basel provides for recognition of generic (collective) provisions on the performing portfolio – Albeit there is no requirement to calculate a "Regulatory EL" under this approach
 - Banks can add these generic provisions to tier 2 capital, with a cap of 1.25% of standardized risk weighted assets
- Under IFRS 9, banks will have to calculate Expected Credit Loss provisions on standardized exposures as well. These provisions will be entirely deducted from CET 1.

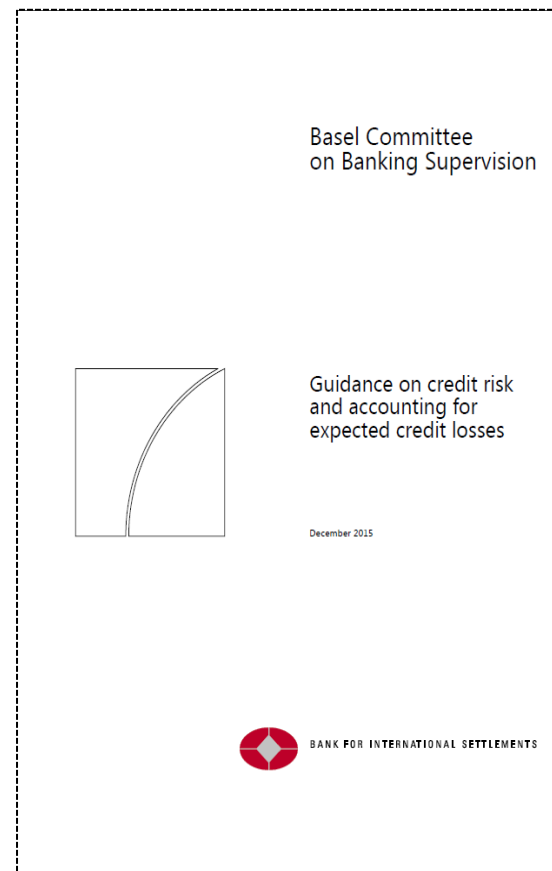


Source: Our elaborations on European Parliament (2015).

The Basel Committee Principles On Expected Credit Losses

In December 2015, the Basel Committee proposed a set of principles aimed at guiding banks in the appropriate application of ECL accounting standards

1	A bank's board of directors and senior management are responsible for appropriate credit risk practices , including internal controls to consistently determine allowances
2	A bank should have methodologies for assessing and measuring the level of credit risk on all exposures, with timely measurement of allowances built upon them
3	A bank should have a process in place to appropriately group lending exposures on the basis of shared credit risk characteristics
4	A bank's aggregate amount of allowances, should be adequate as defined by the Basel Core Principles, which is consistent with the objectives of IRFS9
5	A bank should have policies and procedures in place to appropriately validate its internal credit risk assessment models
6	A bank's use of experienced credit judgment , especially in the consideration of forward-looking information and macro-economic factors , is essential to ECL measurement
7	A bank should have, via its credit risk process, a strong basis for common systems, tools and data to assess and price credit risk, and account for ECL
8	A bank's public reporting should promote transparency and comparability by providing timely, relevant and decision-useful information

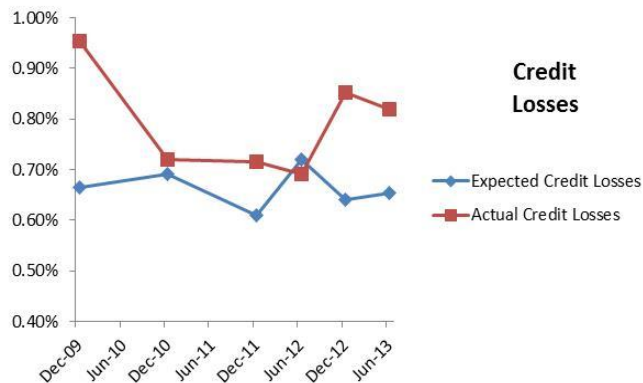


Source: Basel Committee on Banking Supervision (December 2015).

Through-The-Cycle vs Point-In-Time Risk Parameters

Basel III Expected PD (TTC) and LGD (Downturn) vs Actual Default and Recovery rates (PIT): Evidence from European Banks

CORPORATE - Euro Area						
	Probability of Default (PD)		Loss Given Default (LGD)		Credit Losses	
	Expected (TTC)	Actual (PIT)	Expected (Downturn)	Actual (PIT)	Expected	Actual
Dec-09	1.87%	2.87%	35.50%	33.26%	0.66%	0.95%
Dec-10	1.91%	2.37%	36.18%	30.38%	0.69%	0.72%
Dec-11	1.63%	2.47%	37.39%	28.95%	0.61%	0.72%
Jun-12	2.03%	2.68%	35.44%	25.82%	0.72%	0.69%
Dec-12	2.14%	3.53%	29.98%	24.15%	0.64%	0.85%



Source: Based on the data from the EBA (2014), "Annex to EBA Risk Dashboard: Q1 2014. Risk Parameter disclosure of EU Banks" (www.eba.europa.eu).

- In 2014, the EBA disclosed average levels of expected PDs and LGDs for a group of European Banks' IRB exposures, together with the related actual levels
- Banks should adjust their "Through-The-Cycle" risk parameters to reflect the current and future conditions of the credit cycle
- Banks's internal rating systems will be based on a "dual calibration" approach, in order to ensure greater consistency between Basel capital requirements and IFRS 9 accounting standards

An Example Of Expected Credit Loss Calculation Under IFRS 9

Recalibration Of PDs: From TTC To PIT Using CDS Proxies

A simple PD recalibration proposal:

- Banks usually calibrate internal ratings on a TTC basis, therefore the resulting PDs don't reflect the current and future conditions of the credit cycle
- The CDS market provides forecasts on counterparty default risk. This information can be used to calibrate forward looking PDs for IFRS 9 purposes

1

Assess Credit Quality of Counterparty

- Internal Rating Model
- External rating if available
- External vendor model

2

Map Counterparty to CDs Proxy Spread

- Internal model
- CDS quote if available
- External vendor model

3

SCALE PDs Up or Down

- Based on % change of CDS proxy spreads between reporting dates (or since initial recognition)

Macroeconomic forward looking forecast overlay

- Use of experienced credit judgement
- Macro-econometric model (*albeit the Basel Committee recognises it may not always be possible to demonstrate a strong link in formal statistical terms between macroeconomic factors and credit risk of some exposures*)

1. Assessing Credit Quality Of Exposures

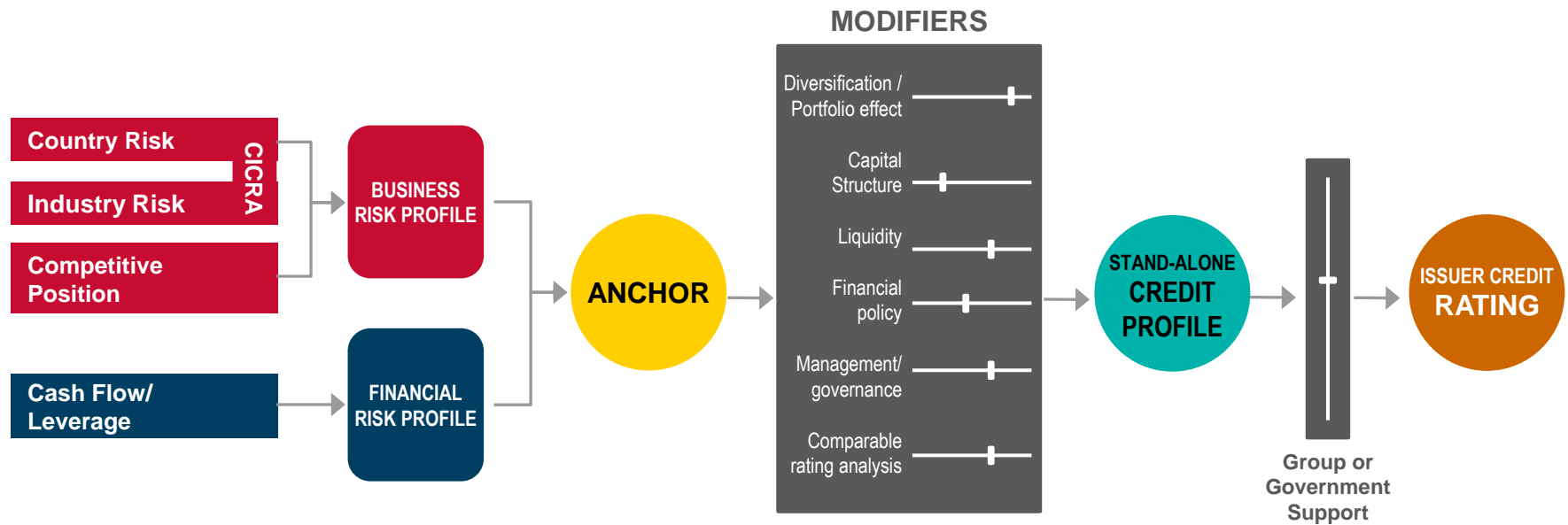
Offering for assessing the Probability of Default (PD)

	Expert Judgement		Quantitative Fundamentals-Based Models			Quantitative Market Signals Models	
	Public Ratings	Scoring Template (Fundamental)	Scoring Model (Fundamental)	Probability of Default (Fundamental)	Peer Analysis Model	Market Signals CDS spreads	Market Signals Stock Price (Volatility & Returns)
Product	S&P Global Ratings	Scorecards	CreditModel™	PD Model Fundamentals	Credit Health Panel	Market Derived Signals (MDS)*	PD Model Market Signals
Primary Measure	Credit ratings*	Credit Score - Mapped to "bucketed" PD percentage	Credit Score - Mapped to "bucketed" PD percentage	Continuous PD percentage - Mapped to credit score	Relative score Custom score	Credit Score - Mapped to PD percentage	PD percentage - Mapped to credit score
Design	Analyst, committee driven & credit methodology driven	<ul style="list-style-type: none"> Segment-focus expert judgment modeling Calibrated on ratings 	<ul style="list-style-type: none"> Segment-focus quantitative modeling Calibrated on ratings 	<ul style="list-style-type: none"> Segment-focus quantitative modeling Calibrated on empirical defaults 	<ul style="list-style-type: none"> Fundamental-based scores and ratios for peer group assessment 	<ul style="list-style-type: none"> Market derived signals based on credit default swaps Calibrated on empirical defaults 	<ul style="list-style-type: none"> Market derived signals based on stock price volatility and returns Calibrated on empirical defaults
DNA	Medium/Long-term	Medium/Long-term	Medium/Long-term	Medium-term	Medium-term	Short-term (Point-in-time)	Short-term (Point-in-time)
Coverage	<ul style="list-style-type: none"> Global Coverage Daily monitored 6k companies 	<ul style="list-style-type: none"> Global Coverage No pre-scores 	<ul style="list-style-type: none"> Global Coverage Weekly pre-scored 56k+ companies 	<ul style="list-style-type: none"> Global Coverage Weekly pre-scored 540k+ companies 	<ul style="list-style-type: none"> Global Coverage Daily pre-scored 210k companies 	<ul style="list-style-type: none"> Rated Companies w/ CDS coverage Daily pre-scored >1k companies 	<ul style="list-style-type: none"> Listed Companies Daily pre-scored 38k companies
Inputs	Rigorous analysis of any relevant qualitative and quantitative inputs	<ul style="list-style-type: none"> Qualitative and quantitative inputs Country risk Industry risk Economic risk Sovereign risk 	<ul style="list-style-type: none"> Financial statements + quantifiable inputs Country risk Industry risk Economic risk Sovereign risk 	<ul style="list-style-type: none"> Financial statements + quantifiable inputs Country risk Industry risk Economic risk Sovereign risk 	<ul style="list-style-type: none"> Financial Statements Operational Solvency Liquidity 	<ul style="list-style-type: none"> CDS spreads Industry risk Economic risk Sovereign risk 	<ul style="list-style-type: none"> Equity, Financials Country risk Industry risk Economic risk Sovereign risk

*From S&P Global Ratings. S&P Global Market Intelligence, as well as its products and services are analytically and editorially separate and independent from other analytical areas at S&P Global, including S&P Global Ratings.

Example: Corporate Scorecards

Replicating S&P Global Ratings Criteria



Each corporate sector-specific scorecard:

- Uses risk factors tailored to that sector
- Uses a different algorithm (e.g., weights) that combines the risk dimensions and the risk factors to arrive at the stand-alone credit profile. The support overlay scorecards are always the same.
- Uses tailored financial benchmarks (i.e., look-up tables) for the quantitative factors (e.g., ratios) derived from data pertaining to the sector
- Is accompanied with a sector-specific user handbook, including objective scoring guidelines tailored to each of the qualitative factors
- Comes with Global Risk Services' recommended Corporate Industry and Country Risk Assessments

The Term Structure Of Default Rates For Rated Entities

PD Calibration based on actual default rates

IFRS (2014), B5.5.17, (e):

“[...] Internal credit ratings and internal behavioural scoring are more reliable when they are mapped to external ratings or supported by default studies.”

- Banks usually map their internal credit grades to external ratings
- Actual default rates are used as “anchor points” for PD levels of low-default portfolios

Global Corporate Average Cumulative Default Rates By Rating Modifier (1981-2015) (%)															
Rating	--Time horizon (years)--														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
AAA	0.00	0.03	0.13	0.24	0.35	0.46	0.52	0.61	0.66	0.72	0.76	0.79	0.82	0.89	0.96
AA+	0.00	0.05	0.05	0.11	0.17	0.22	0.28	0.34	0.40	0.47	0.53	0.60	0.67	0.74	0.82
AA	0.02	0.03	0.09	0.23	0.37	0.50	0.63	0.75	0.85	0.95	1.04	1.11	1.23	1.30	1.37
AA-	0.03	0.09	0.19	0.27	0.36	0.47	0.54	0.60	0.66	0.73	0.80	0.87	0.90	0.95	1.01
A+	0.06	0.10	0.22	0.37	0.48	0.59	0.72	0.86	1.01	1.18	1.33	1.50	1.69	1.93	2.11
A	0.06	0.16	0.25	0.39	0.53	0.73	0.93	1.12	1.34	1.60	1.81	1.97	2.10	2.19	2.38
A-	0.07	0.19	0.31	0.44	0.63	0.82	1.09	1.29	1.45	1.59	1.73	1.88	2.02	2.16	2.28
BBB+	0.12	0.34	0.60	0.86	1.15	1.47	1.72	1.99	2.30	2.59	2.88	3.08	3.35	3.69	4.08
BBB	0.18	0.46	0.72	1.11	1.51	1.93	2.31	2.68	3.08	3.49	3.92	4.32	4.65	4.78	5.01
BBB-	0.28	0.85	1.53	2.31	3.08	3.78	4.41	5.00	5.49	5.97	6.52	6.98	7.41	8.03	8.50
BB+	0.37	1.12	2.10	3.08	4.07	5.05	5.88	6.48	7.22	7.93	8.41	8.99	9.54	10.00	10.61
BB	0.62	1.87	3.68	5.38	7.06	8.41	9.62	10.61	11.54	12.33	13.12	13.80	14.14	14.37	14.71
BB-	1.05	3.27	5.60	7.96	9.99	11.97	13.64	15.24	16.54	17.69	18.56	19.22	19.92	20.62	21.22
B+	2.20	5.97	9.64	12.77	15.19	17.09	18.82	20.33	21.72	23.00	24.00	24.76	25.50	26.16	26.78
B	4.04	9.14	13.32	16.35	18.63	20.77	22.23	23.27	24.13	24.98	25.70	26.35	26.96	27.53	28.23
B-	7.21	14.17	19.31	22.89	25.78	27.84	29.52	30.61	31.30	31.89	32.71	33.34	33.62	33.94	34.29
CCC/C	26.36	35.54	40.83	44.05	46.43	47.28	48.24	49.05	49.95	50.60	51.09	51.73	52.57	53.25	53.25
Investment grade	0.10	0.28	0.48	0.73	0.98	1.24	1.49	1.72	1.94	2.17	2.40	2.59	2.77	2.95	3.14
Speculative grade	3.80	7.44	10.60	13.16	15.24	16.94	18.38	19.58	20.65	21.61	22.41	23.08	23.69	24.23	24.75
All rated	1.49	2.94	4.21	5.27	6.17	6.92	7.57	8.12	8.62	9.09	9.49	9.83	10.13	10.41	10.70

Sources: Standard & Poor's Global Market Intelligence and S&P CreditPro®.

2. Map Exposures To CDS Proxy Spreads

Relevance of External Market Indicators of Credit Risk under IFRS 9

IFRS (2014), B5.5.17, (b):

“[...] significant changes in external market indicators of credit risk for a particular financial instruments or similar financial instruments [...]. Changes in market indicators of credit risk include, but are not limited to:

i) the credit spread;

ii) the credit default spread prices for the borrowers; [...].”

- **When considering market-based indicators of credit risk, firms might refer to IFRS 13 (“Fair Value Measurement”): it contemplates the use of external market credit risk proxies for counterparties of derivatives transactions, based on the following hierarchy:**
 - ✓ Entity CDS spread
 - ✓ CDS spread in same rating, industry sector and geography bucket (CDS “Proxy” Spread)
 - ✓ CDS spread of comparable company (Single-name “Proxy”)
 - ✓ Bond spreads: these are less preferable since the information can be outdated and may require an adjustment for illiquidity (not always possible to reference a recent issuance; gap between debt issue date and derivative valuation date). Additionally, some Corporate bonds are currently trading at negative yield in Europe (*Financial Times*, “*Corporate bonds join negative yield club*”, June 2nd 2016)
- **However, according to the *European Banking Authority (EBA)*, only few counterparties have CDS traded quotes, with about two thirds of the names of a typical Bank’s portfolio requiring a CDS proxy spread**

[https://www.eba.europa.eu/documents/10180/535344/EBA-RTS-2013-17+\(Final+draft+RTS+on+CVA\).pdf](https://www.eba.europa.eu/documents/10180/535344/EBA-RTS-2013-17+(Final+draft+RTS+on+CVA).pdf)

S&P Global Ratings CDS Market Derived Signals Model

- This model, initially proposed by S&P Global Ratings in 2009 and then updated in 2013, estimates several CDS-based signals for financials, non-financials, and Sovereigns
- The model is made up of single regression equations (for non-financials, financials and sovereigns) that can be used in three different ways:
 1. To calculate a proxy spread for each company based on its rating, industry sector, region, and CDS document type (this is exactly in line with the EBA requirements for the proxy CDS spreads under Basel III)
 2. To calculate a specific expected spread for each firm based on the above factors, in order to compare it with its traded spread to put in place, for example., trading strategies on a specific name
 3. To imply a score related to the observed CDS spread (Market Implied Ratings)
- CDS proxies are currently available on our S&P Global Market Intelligence Global Credit Portal and RatingsDirect® platforms:
 - <https://www.globalcreditportal.com>
 - <http://www.spglobal.com/>

S&P Global Ratings' CDS Proxy Spreads

Sound and Robust Regression-based Model

- Statistical relationship updated at the end of every day
- Input Data also validated on a daily basis

INDUSTRIALS: S&P MARKET INDICATORS

CDS Equity

EU Euro Exchange Rates

CDS Benchmarks by Rating Level

Ratings	Today	1 Day	7 Days	30 Days	90 Days	365 Days	2 Yrs	3 Yrs
AAA	19.50	19.36	19.82	19.98	28.15	15.77	22.74	26.46
AA+	26.23	26.02	26.51	26.66	35.38	21.37	27.87	34.51
AA	35.27	34.98	35.46	35.57	44.46	28.95	34.17	45.02
AA-	38.98	38.78	39.03	39.67	48.64	32.01	37.47	49.06
A+	43.08	42.98	42.96	44.24	53.21	35.39	41.10	53.46
A	47.62	47.64	47.29	49.34	58.22	39.13	45.08	58.26
A-	58.22	58.21	57.79	60.80	70.60	48.74	54.13	71.84
BBB+	71.20	71.12	70.63	74.94	85.63	60.71	65.00	88.58
BBB	87.06	86.89	86.32	92.35	103.85	75.63	78.05	109.23
BBB-	117.50	117.58	116.54	125.27	139.14	106.84	107.34	149.53
BB+	158.59	159.11	157.34	169.93	186.43	150.94	147.63	204.71
BB	214.04	215.31	212.43	230.50	249.79	213.24	203.03	280.24
BB-	282.38	282.52	280.21	299.97	317.03	246.51	225.40	328.16
B+	372.55	370.70	369.62	390.38	402.36	284.97	250.25	384.27
B	491.50	486.42	487.55	508.03	510.66	329.42	277.83	449.97
B-	707.45	706.86	710.88	748.48	792.50	611.21	448.69	583.83
CCC+	1,018.26	1,027.20	1,036.50	1,102.74	1,229.87	1,134.05	724.64	757.51
CCC	1,465.63	1,492.71	1,511.26	1,624.69	1,908.63	2,104.14	1,170.29	982.86

Sources: S&P Global Ratings, S&P Global Market Intelligence RatingsDirect®, data as of June 3, 2016.

S&P Global Ratings CDS MDS Model: Available Info

An illustration of S&P Global Ratings desktop-based delivery channel (datafeeds also available):

*CDS Data provided by CMA - part of S&P Capital IQ
**S&P Market Derived Signals White Paper

S&P Ratings Data as of 05-Jun-2015 11:06 AM EST
S&P Market Derived Signals Data as of 04-Jun-2015

INDUSTRIALS: S&P MARKET INDICATORS

CDS Equity

US Dollars Exchange Rates

CDS Benchmarks by Rating Level

Ratings	Today	1 Day	7 Days	30 Days	90 Days	365 Days	2 Yrs	3 Yrs
AAA	25.87	25.96	25.41	24.84	26.69	30.41	28.69	46.35
AA+	35.46	35.54	35.31	35.29	36.57	38.34	38.23	57.43
AA	48.61	48.66	49.06	50.12	50.11	48.33	50.93	71.17
AA-	54.38	54.40	54.66	55.49	55.52	54.51	56.77	83.40
A+	60.84	60.83	60.90	61.44	61.52	61.49	63.28	97.74
A	68.07	68.01	67.85	68.02	68.17	69.36	70.54	114.54
A-	85.79	85.65	85.41	85.98	85.87	85.65	88.74	141.02
BBB+	108.14	107.87	107.52	108.66	108.16	105.78	111.63	173.62
BBB	136.30	136.86	135.35	137.34	136.25	130.64	140.43	213.76
BBB-	194.85	193.74	192.67	197.69	196.16	184.78	197.01	298.13
BB+	278.54	276.29	274.27	284.55	282.42	261.35	276.39	415.79
BB	398.17	394.01	390.43	409.57	406.61	369.66	387.75	579.88
BB-	465.75	462.45	459.88	474.29	477.18	422.08	456.57	715.97
B+	544.79	542.77	541.69	549.24	559.99	481.93	561.41	883.99
B	637.25	637.04	638.05	636.02	657.18	550.28	675.54	1,091.44
B-	1,195.39	1,189.78	1,135.89	1,215.57	1,245.17	913.98	893.28	1,545.29
CCC+	2,246.12	2,222.09	2,022.17	2,323.22	2,359.26	1,518.08	1,181.21	2,187.87
CCC	4,216.90	4,150.12	3,599.99	4,440.17	4,470.16	2,521.46	1,561.94	3,097.65

All-Sector Benchmarks: Info available on our platform(s) as of today up to three years ago for all sectors (discrete intervals)

CDS Benchmarks by Rating Level and Sector

Ratings	Benchmark	Consumer Discretionary	Consumer Staples	Energy	Financials	Health Care	Industrials	Information Technology	Materials
AAA	25.87	22.15	19.63	38.78	36.54	20.63	24.32	26.96	23.91
AA+	35.46	30.44	26.98	53.30	48.97	28.35	33.43	37.05	32.81
AA	48.61	41.84	37.08	73.25	65.63	38.96	45.94	50.92	45.11
AA-	54.38	46.93	41.59	82.16	71.77	43.70	51.53	57.11	50.81
A+	60.84	52.63	46.64	92.15	78.49	49.01	57.79	64.06	56.81
A	68.07	59.03	52.32	103.35	85.84	54.97	64.82	71.84	63.71
A-	85.79	74.59	66.11	130.59	105.76	69.46	81.91	90.78	80.51
BBB+	108.14	94.26	83.53	165.02	130.32	87.77	103.50	114.72	101.81
BBB	136.30	119.10	105.56	208.53	160.57	110.90	130.79	144.96	128.61
BBB-	194.85	170.69	151.28	298.85	224.38	158.94	187.44	207.74	184.31
BB+	278.54	244.62	216.80	428.28	313.55	227.78	268.62	297.72	264.21
BB	398.17	350.58	310.70	613.79	438.15	326.44	384.97	426.67	378.61
BB-	465.75	411.11	364.35	719.77	501.01	382.81	451.44	500.35	444.01
B+	544.79	482.10	427.26	844.06	572.87	448.91	529.39	586.75	520.71
B	637.25	565.34	501.04	999.80	655.05	526.42	620.80	688.06	610.61
B-	1,195.39	1,064.07	943.03	1,862.97	1,202.18	990.81	1,168.45	1,295.04	1,149.31
CCC+	2,246.12	2,002.75	1,774.94	3,506.40	2,206.31	1,864.86	2,199.21	2,437.48	2,163.11
CCC	4,216.90	3,769.49	3,340.72	6,599.61	4,049.13	3,509.96	4,139.27	4,587.73	4,071.41

Last updated: 04-Jun-2015 05:00 AM GMT

Industry Sector Benchmarks: only “as of today” info available. Historical time series from 2005 available via Datafeeds

Sources: Standard & Poor's Global Market Intelligence, data as of June 3, 2016.

3. Re-calibration Of PDs: An Example Based On Actual Data

Global Corporate Average Cumulative Default Rates By Rating Modifier (1981-2015) (%)

Rating	--Time horizon (years)--														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
AAA	0.00	0.03	0.13	0.24	0.35	0.46	0.52	0.61	0.66	0.72	0.76	0.79	0.82	0.89	0.96
AA+	0.00	0.05	0.05	0.11	0.17	0.22	0.28	0.34	0.40	0.47	0.53	0.60	0.67	0.74	0.82
AA	0.02	0.03	0.09	0.23	0.37	0.50	0.63	0.75	0.85	0.95	1.04	1.11	1.23	1.30	1.37
AA-	0.03	0.09	0.19	0.27	0.36	0.47	0.54	0.60	0.66	0.73	0.80	0.87	0.90	0.95	1.01
A+	0.06	0.10	0.22	0.37	0.48	0.59	0.72	0.86	1.01	1.18	1.33	1.50	1.69	1.93	2.11
A	0.06	0.16	0.25	0.39	0.53	0.73	0.93	1.12	1.34	1.60	1.81	1.97	2.10	2.19	2.38
A-	0.07	0.19	0.31	0.44	0.63	0.82	1.09	1.29	1.45	1.59	1.73	1.88	2.02	2.16	2.28
BBB+	0.12	0.34	0.60	0.86	1.15	1.47	1.72	1.99	2.30	2.59	2.88	3.08	3.35	3.69	4.08
BBB	0.18	0.46	0.72	1.11	1.51	1.93	2.31	2.68	3.08	3.49	3.92	4.32	4.65	4.78	5.01
BBB-	0.28	0.85	1.53	2.31	3.08	3.78	4.41	5.00	5.49	5.97	6.52	6.98	7.41	8.03	8.50
BB+	0.37	1.12	2.10	3.08	4.07	5.05	5.88	6.48	7.22	7.93	8.41	8.99	9.54	10.00	10.61
BB	0.62	1.87	3.68	5.38	7.06	8.41	9.62	10.61	11.54	12.33	13.12	13.80	14.14	14.37	14.71
BB-	1.05	3.27	5.60	7.96	9.99	11.97	13.64	15.24	16.54	17.69	18.56	19.22	19.92	20.62	21.22
B+	2.20	5.97	9.64	12.77	15.19	17.09	18.82	20.33	21.72	23.00	24.00	24.76	25.50	26.16	26.78
B	4.04	9.14	13.32	16.35	18.63	20.77	22.23	23.27	24.13	24.98	25.70	26.35	26.96	27.53	28.23
B-	7.21	14.17	19.31	22.89	25.78	27.84	29.52	30.61	31.30	31.89	32.71	33.34	33.62	33.94	34.29
CCC/C	26.36	35.54	40.83	44.05	46.43	47.28	48.24	49.05	49.95	50.60	51.09	51.73	52.57	53.25	53.25
Investment grade	0.10	0.28	0.48	0.73	0.98	1.24	1.49	1.72	1.94	2.17	2.40	2.59	2.77	2.95	3.14
Speculative grade	3.80	7.44	10.60	13.16	15.24	16.94	18.38	19.58	20.65	21.61	22.41	23.08	23.69	24.23	24.75
All rated	1.49	2.94	4.21	5.27	6.17	6.92	7.57	8.12	8.62	9.09	9.49	9.83	10.13	10.41	10.70

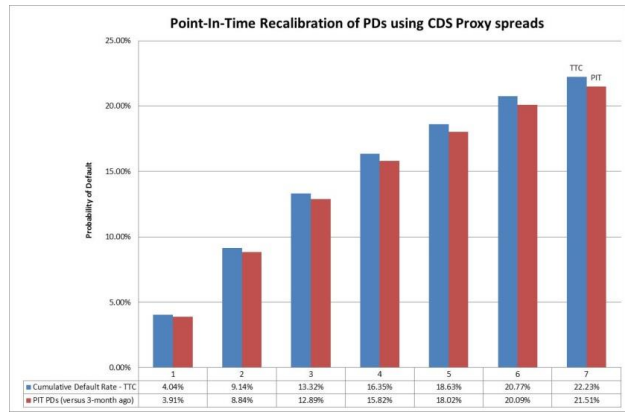
INDUSTRIALS: S&P MARKET INDICATORS

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AA-	38.98	38.78	39.03	39.67	48.64	32.01	37.47	49.06
A+	43.08	42.98	42.96	44.24	53.21	35.39	41.10	53.46
A	47.62	47.64	47.29	49.34	58.22	39.13	45.08	58.26
A-	58.22	58.21	57.79	60.80	70.60	48.74	54.13	71.84
BBB+	71.20	71.12	70.63	74.94	85.63	60.71	65.00	88.58
BBB	87.06	86.89	86.32	92.35	103.85	75.63	78.05	109.23
BBB-	117.50	117.58	116.54	125.27	139.14	106.84	107.34	149.53
BB+	158.59	159.11	157.34	169.93	186.43	160.94	147.63	204.71
BB	214.04	215.31	212.43	230.50	249.79	213.24	203.03	280.24
BB-	282.38	282.52	280.21	299.97	317.03	246.51	225.40	328.16
B+	372.55	370.70	369.62	390.38	402.36	284.97	250.25	384.27
B	491.50	486.42	487.55	508.03	510.66	329.42	277.83	449.97
B-	707.45	706.86	710.88	748.48	792.50	611.21	448.69	583.83
CCC+	1,018.26	1,027.20	1,036.50	1,102.74	1,229.87	1,134.05	724.64	757.51
CCC	1,465.63	1,492.71	1,511.26	1,624.69	1,908.63	2,104.14	1,170.29	962.86



CDS Proxy adjustment from previous quarter:

- Today: 491.50 bps
- 90 days ago: 510.66 bps
- Period-to-period % change: **-3.75%**

Sources: S&P Global, Standard & Poor's Global Market Intelligence and S&P CreditPro® data as of June 3, 2016.

Expected Loss Calculation From Stages 1,2, And 3

A Focus on the Probability of Default (PD)

Internal or vendor-based methodologies to assess credit quality of counterparty's exposures, or external ratings if available

- Stage 1: At recognition, if low credit risk (investment grade if rated), calculate 12-month expected credit loss

$$(EAD * PD * LGD) / (1 + \text{Effective Interest Rate})$$

- Stage 2: if significant increase in credit risk (30-day past due, transition to speculative grade, overlay by management based on idiosyncratic and macroeconomic conditions), calculate lifetime expected credit loss - Need to estimate the full term structure of PDs until maturity

$$(\sum_t EAD_t * \text{Marginal PD}_t * LGD_t) / (1 + \text{Effective Interest Rate})^t$$

- Stage 3: defaulted exposures (90-day past due, official default, overlay by management), calculate lifetime expected credit loss – No need to estimate PD, since this is equal to 100%

$$EAD * PD=100\% * LGD$$

Expected Loss From Stages 1, 2, And 3: A Worked Example

Provisioning from 12-month to lifetime expected credit loss

A bank originates a loan of €1M. (EAD) with a 5-year maturity. Risk parameters have been assessed as follows: Internal Rating = equivalent to an S&P Global Rating of B; LGD = 45%; Term structure of PDs = derived from the previous recalibration based on TTC Default Rates and CDS proxy spreads. No transaction costs, no optionalities.

Time (Years)	1	2	3	4	5
EAD	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Effective Interest Rate	5%	5%	5%	5%	5%
Discounting Factor (DF)	0.95	0.91	0.86	0.82	0.78
Cumulative Probability of Default (PD cum)	3.89%	8.80%	12.82%	15.74%	17.93%
Marginal Probability of Default (PD)	3.89%	4.91%	4.02%	2.92%	2.19%
LGD	45%	45%	45%	45%	45%
Expected Loss (EAD* PD * LGD)	17,498	22,089	18,104	13,123	9,875
Discounted Expected Loss (EAD* PD * LGD*DF)	16,665	20,035	15,639	10,797	7,737
12-month Expected Loss	16,665	-			
Lifetime Expected Loss	70,873	4.3x			
Lifetime Expected Loss	450,000				

Wrap-Up On S&P Global Market Intelligence's IFRS 9 Offering

	STAGE 1	STAGE 2	STAGE 3
Probability of Default (PD)	<ul style="list-style-type: none"> • External Ratings (at issuer and issue level) • Credit Scorecards (at counterparty and facility level) • CreditModel™ (at counterparty level) • PD Fundamental (at counterparty level) • CDS Proxy spreads (at counterparty level) • CreditPro® Database (actual default rates statistics) • <i>Macroeconometric model for Europe under development</i> 		No estimation required (PD = 100%)
Loss Given Default (LGD)	<ul style="list-style-type: none"> • Recovery Rate Scorecards (at counterparty and facility level) • CreditPro® Database (actual recovery rates statistics) • Top-down statistical model for Europe under development (LossStats Model for US assets available – Econometric forecasts of LGD Values) 		

MODEL COVERAGE

- **Scorecards:** Sovereigns, banks, insurance firms, other financial institutions, corporates, specialized lending, and commercial real estate
- **Quantitative Models:** Banks, insurance firms, corporates, and SME-corporates

Final Remarks: Challenges Ahead For Banks

- **IFRS 9 accounting standards are principle-based, while Basel III capital requirements are rule-based**
 - Banks need to ensure consistency between accounting rules and capital requirements
 - Auditors and regulators will have an important role in the implementation/interpretation of these new rules on expected credit losses
- **The model flexibility of IFRS 9 standards create challenges for banks**
 - Expected Credit Loss models need to be pragmatic and easy to understand for users of financial statements
 - Banks' use of experienced credit judgment is essential to estimate Expected Credit Losses, particularly to factor in future macroeconomic conditions
 - Banks using the “standardized” approach for credit risk under Basel III will have to put in place new systems and processes to model Expected Credit Losses over time
- **The attention of market participants to P&L impact is usually higher than to capital requirements: risk parameters will become key drivers of earnings volatility**

Further Reading

- **Basel Committee on Banking Supervision (2011)**, *“Basel III: A Global Regulatory Framework for more resilient Banks and Banking Systems”*, June (www.bis.org)
- **Basel Committee on Banking Supervision (2015)**, *“Guidance on Credit Risk and Accounting for Expected Credit Losses”*, December (www.bis.org)
- **Deloitte (2016)**, *“Sixth Global IFRS Banking Survey”*, May (www.deloitte.com)
- **European Banking Authority-EBA (2014)**, *“Annex to EBA Risk Dashboard: Q1 2014. Risk Parameter disclosure of EU Banks”*, April (www.eba.europa.eu)
- **European Parliament (2015)**, *“The Significance of IFRS 9 for Financial Stability and Supervisory Rules”*, Committee on Economic and Monetary Affairs, authored by Zoltán Novotny-Farkas, October (www.europarl.europa.eu)
- **International Accounting Standards Board- IASB (2014)**, *“IFRS 9 Financial Instruments”*, July (www.ifrs.org)
- **S&P Global Ratings (2013)**, *“How Standard & Poor’s Arrive At Credit Default Swap Market Derived Signals”*, co-authored by S. Bergman, M. Hampel, J. Wagner, Y. Zhou, and L. Taralli, September (www.spglobal.com)
- **S&P Global Ratings (2016)**, *“Default, Transition, and Recovery: 2015 Annual Global Corporate Default Study and Rating Transitions”*, May (www.spglobal.com)

Thank You

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