



G-RiskPar

*Scenario based generator for
credit risk parameters*

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Introduction

A new regulatory regime: forward looking accounting principles

Starting January 2018 banks should adopt the new accounting standards known as IFRS 9. This will have significant impacts on institutions and it will represent a serious challenge for the middle and small ones, with a less structured and developed technical infrastructures and data sets.

The new regulatory regime, starting January 2018, is meant to stimulate banks into a more complete evaluation of risks, anticipating forthcoming events and, above all, in a forward looking framework: i.e. considering economic scenarios.

In contrast with the present approach, where losses are triggered by a credit event, in the new framework banks are encouraged to evaluate expected losses starting from the moment the asset enters the bank portfolio and update those estimates regularly afterwards, as events effectively appear.

Asset that did not show a substantial increase in the level of risk, will be evaluated with the existing approach, over a 12 month horizon, while for those that have deteriorated significantly, will be evaluated over their residual lifetime, based on a set of totally new models.

These models include variables linked to the economic cycle, thus anticipate the future loss events. Clearly this will have a relevant impact both on economics as well as the bank reputation.

Certainly the calibration of the new models required by the Regulator and the new classification process will be key in determining the overall impact on the loan portfolio.

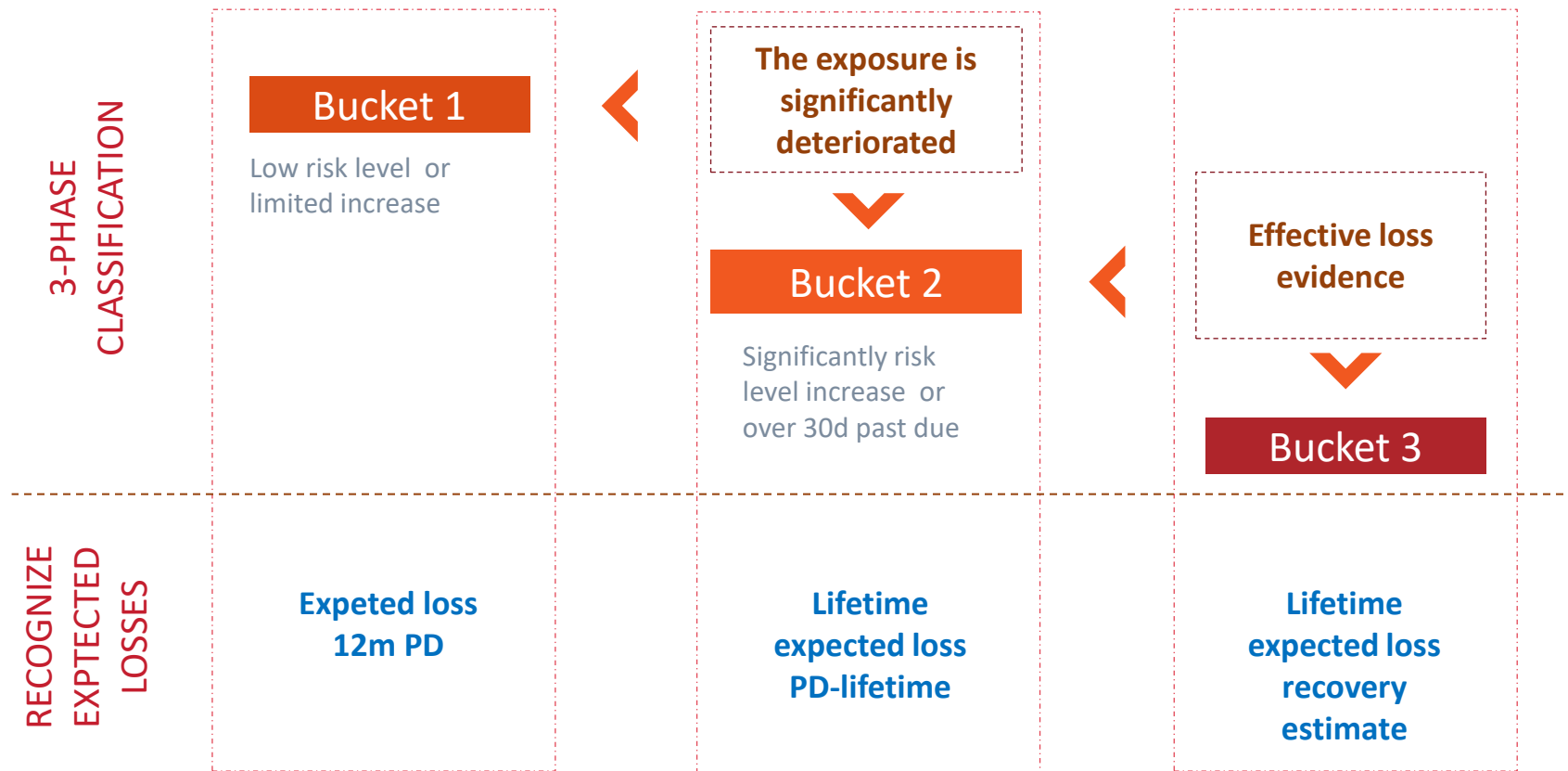
However, adopting these guidelines is a must for all banks, in spite of their size, but it will be particularly burdensome for the middle and small ones, which do not possess the necessary skills nor the infrastructure and, often, not even all the necessary information to autonomously develop internal IFRS 9 models and processes.

Yet even major banks, authorized in the A-IRB regime, may hold loan portfolios managed within the standardized approach and would likely profit as well of such a service.

Introduction

A new asses classification and management process

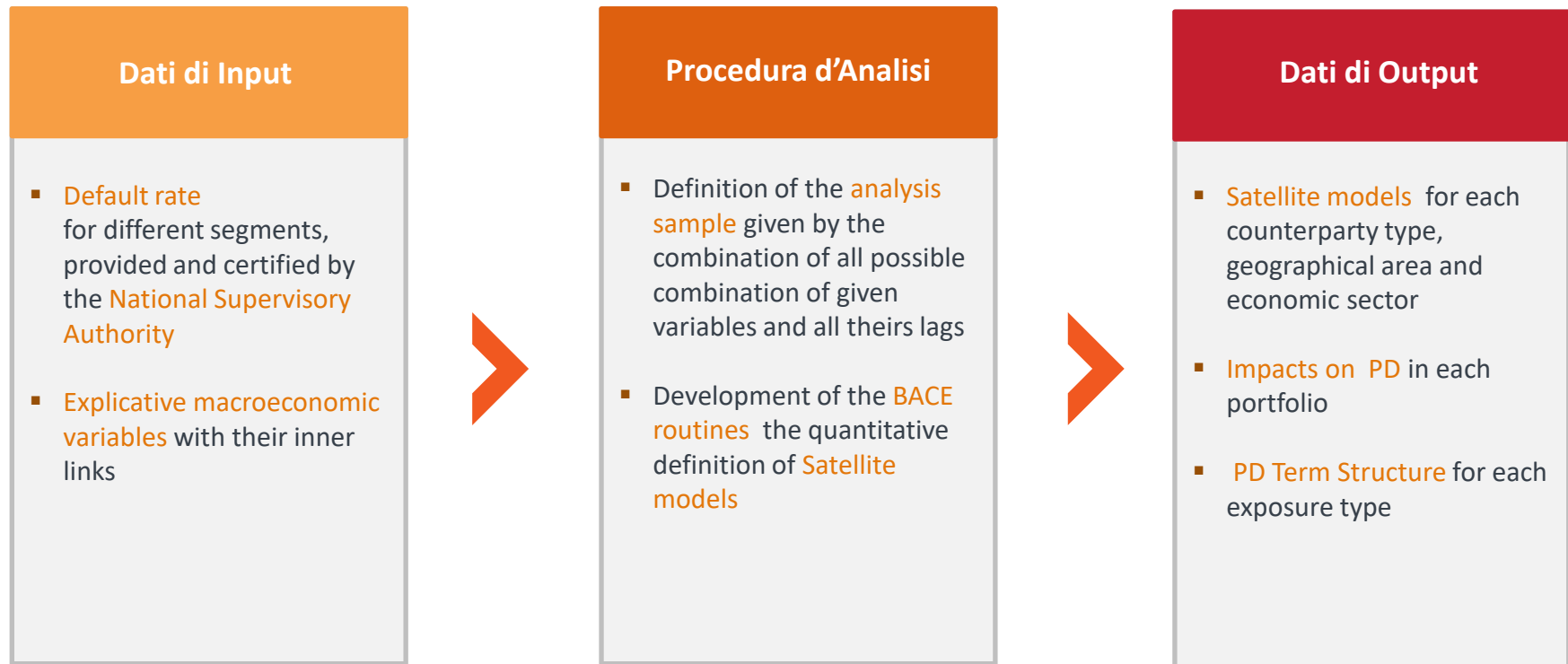
The new accounting rules present classify assets into three classes, on the basis of the risk level and of its evolution since the exposure entered the portfolio. In order to determine the asset value and calculate the relative provisions, a specific rule is assigned to each.



New requirements

The process to estimate forward looking PDs

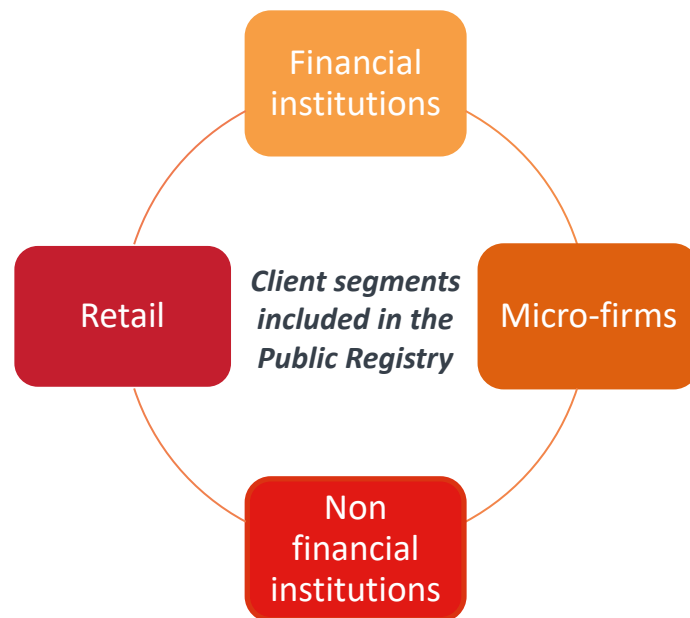
The analysis of the credit portfolio, as specified in the IFRS 9 guidelines, is based on variables linked to the credit quality, modelled with the BACE approach as suggest by the EBC, in a detailed and documented process.



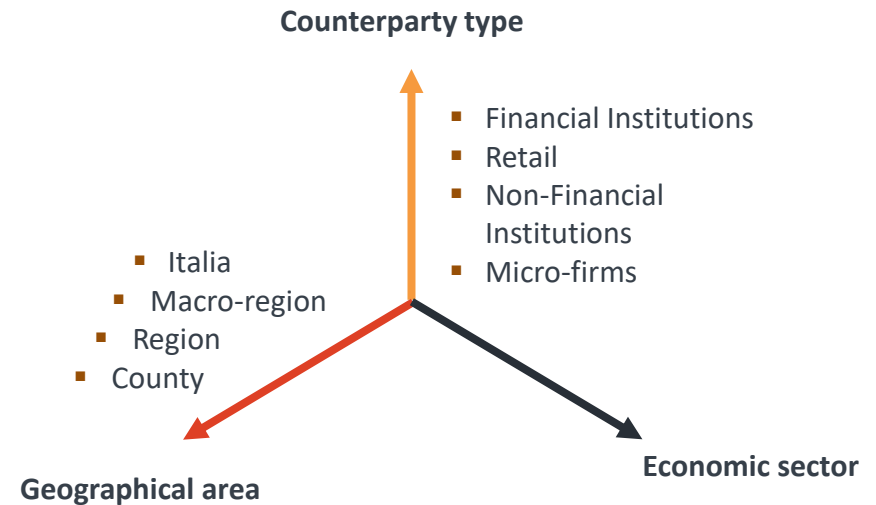
Default data source

Counterparty segmentation

Default rates are taken from the public registry managed by the Italian Regulator including a high number of events for each client segment and classified by geographical area and economic sector.



Counterparty segmentation



Risk models are developed on system data provided by the National Supervision Authority and classified along the main identification characteristics, i.e. counterparty type, economic sector and geographical area

Estimate of Satellite models

The BACE approach

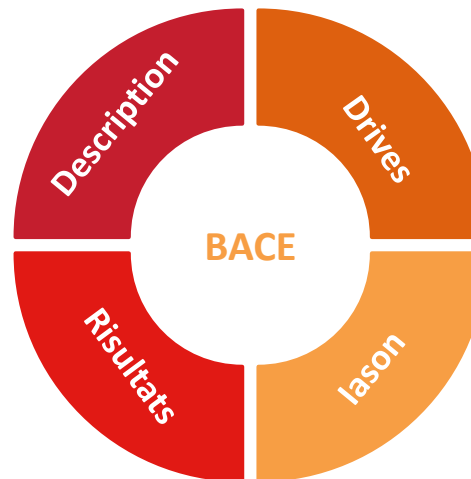
The estimate of satellite models adopted is based on a Bayesian approach (Bayesian Average of Classical Estimates): every statistically significant variable identified is selected into the model

It includes

- The estimate approach provides an evaluation of all possible variables to include into the satellite model
- The final choice is based on the probability given to the relevant variable by the BACE approach

Risultats

- The estimate procedure yields a linear combination of macroeconomic variables
- The model projects the Default Probabilities into the future in line with the economic scenarios provided as input



Choice drivers

The choice of a Bayesian approach depends on:

- Explicit Supervisory guidelines (EBC) in the definition of satellite models
- It allows to build robust models even without knowledge of the underlying dynamic

Iason contributions

- Nearly 2000 models are estimated within the approach relative to different counterparty types and characteristics
- The granularity granted by the high number of models provided, covers all customer segments, geographic areas and economic sector allowing to serve any credit portfolio.

Estimated PD models

Models estimate within the BACE approach

The approach considered, allows to analyse different counterparty types, grouping them according to their common characteristics. A higher number of models is dedicated to the cluster with a higher number of cases.

Counterparty type	Number of models	Segmentation Economic sector		Segmentation Geographic Area		
		Sector Macro-Region	Sector Region/County	Italia	Macro-Region	Region/County
		Financial Institutions	11	X	X	√
Micro firms	932	√	√	√	√	√
Corporates	919	√	√	√	√	√
Retail	130	X	X	√	√	√
TOTAL	1992					

X: missing
√: covered

Satellite models link macroeconomic scenarios to the risk dynamics of the credit portfolios.

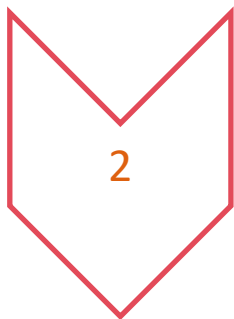
Use of the solution

Assign models to economic scenarios and bank portfolios

For each identified cluster in the credit portfolio, the solution activate the necessary models providing the risk parameter term structures, along each given scenarios.



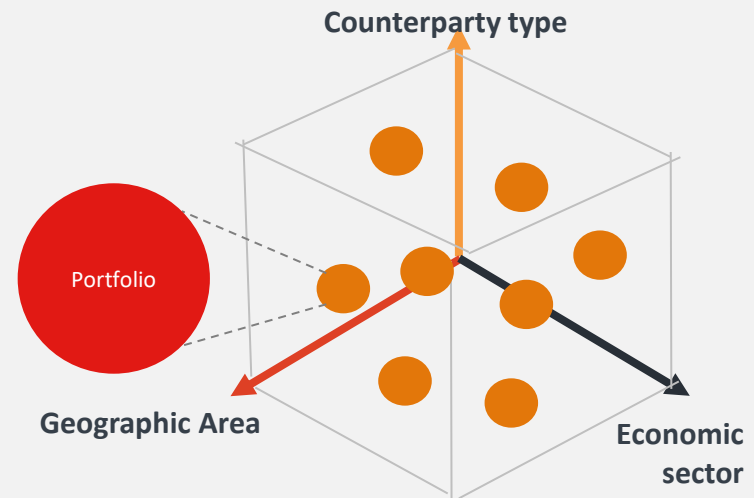
For a correct assignment, credit exposures should be clustered along the same drivers used to identify the selected satellite models.



Macroeconomic scenarios should be defined in terms of:

- Period covered by the scenario
- A number or all of the specifying macroeconomic variables

The link among economic variables is estimated with a Vector Autoregressive approach, hence the scenario can be defined even providing a limited number of variables.

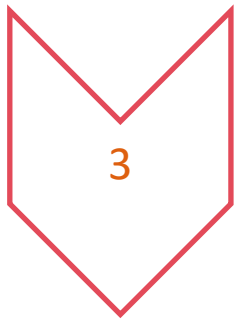


Pesi Scenari		Variabili				
Scenario 1	0.70%	Δ% YoY Italian GDP	Scenario 1	1.00%	2.00%	3.00%
Scenario 2	0.30%		Scenario 2	-0.50%	0.00%	0.20%
		Italian Unemployment %	Scenario 1	10.00%	9.00%	8.00%
			Scenario 2	11.50%	11.00%	10.50%
		Δ% YoY Italian House Price Index	Scenario 1	5.00%	10.00%	10.00%
			Scenario 2	-10.0%	-15.00%	0.00%

Use of the solution

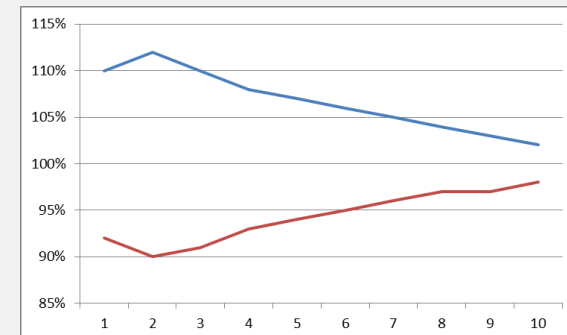
Outputs

The bank gets the risk parameter for each homogeneous cluster of exposures and assigns them to each single exposure, or group of them, on the basis of stage assigned and expiry date, then performs ECL calculation within its own systems.



The solutions activates the satellite models corresponding to the specific clusters identified in the bank portfolio and provides the PD for each year in the period requested (residual life of the product).
Beside multipliers of the existing internal PDs, the solutions also provides the absolute PD values on the basis of the historical default rate.

SCENARIO	Down	Up
2016	110,0%	92,0%
2017	112,0%	90,0%
2018	110,0%	91,0%
2019	108,0%	93,0%
2020	107,0%	94,0%
2021	106,0%	95,0%
2022	105,0%	96,0%
2023	104,0%	97,0%
2024	103,0%	97,0%
2025	102,0%	98,0%

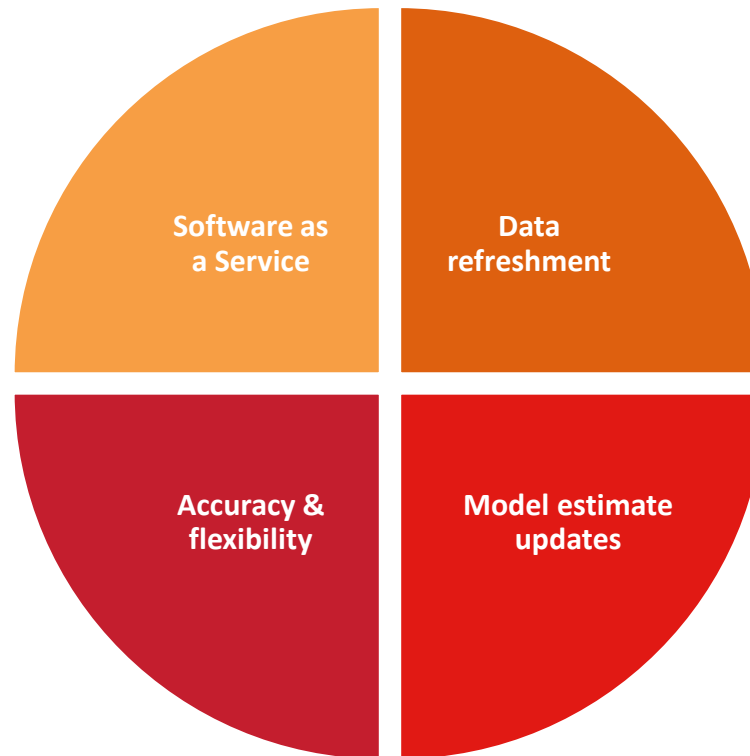


Service characteristics

Flexibility and robustness

- The solution is provided as a remote service (SaaS)
- No software setup is needed at the bank
- A secure connection will grant the integrity of the data flow provided

- The relevant number of model estimated grants the necessary granularity to represent any credit portfolio in national commercial bank
- On the other hand , sector segmentation grants the accuracy of forecasts
- Finally, the adoption of the methodology suggested by the ECB assures full the compliance of the service



- The set of default data and macroeconomic variables is refreshed regularly with those provided by National Institutions
- Models estimates are refreshed annually, to include all new data available, from default data to updated connexions among macroeconomic variables
- After each periodic estimates models are tested and validated

Service characteristics

Data certification & auditability

Transparent

- Full and detailed documentation on the methodology adopted for parameter estimate and their projection forward
- Details on the calculation of all intermediate and final risk parameters

Certified Public data

- Public data certified by the Bank of Italy are used to estimate risk parameters
- Data used to estimate the relationship among macroeconomic data is provided by Public Institutions (BIS, ISTAT, etc.)

Auditable

- Processing the same data with the procedures provided, every result can be obtained with alternative tools
- Data transformation and model estimates are fully auditable

Granted support

- The bank is supported in the setup phase to identify and activate the models required
- Full support is given to integrate the service outputs with the bank risk management and accounting system

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