



**MONTE  
DEI PASCHI  
DI SIENA**  
BANCA DAL 1472

# Risk Management Report

Shanghai Branch September 2018

Direzione Chief Risk Officer

### **Regulatory RWA and Internal RWA**

**Credit Risk Analysis of the Lending Portfolio**

**Interest Rate Risk Analysis of the Banking Book Portfolio**

**Operational Risk Management**

**Monitoring of credit risk by internally implemented portfolio model**



## Shanghai Branch – Regulatory RWA and Internal RWA as at 30-09-2018

		(Eur mln)	SHANGHAI						
P I L L A R  1	Regulatory / Internal RWA		set-17	dic-17	mar-18	giu-18	set-18	ΔQ	ΔQ%
	Credit and Counterparty Risk		64,49	50,33	47,70	44,46	34,00	-10,47	-23,5%
		Credit Risk	64,49	50,33	47,70	44,46	34,00	-10,47	-23,5%
		Standard	64,49	50,33	47,70	44,46	34,00	-10,47	-23,5%
	Operational Risk		4,95	5,41	4,26	4,36	4,22	-0,14	-3,2%
	REGULATORY RWA		69,44	55,74	51,96	48,82	38,22	-10,61	-21,7%



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## Credit Loans Portfolio – Regulatory measures

		Credit Risk									
Values in €/mln		dec-16	mar-17	jun-17	sep-17	dec-17	mar-18	jun-18	sep-18	ΔQtD	ΔYtD
RWA	TOTAL	70,5	61,0	69,1	64,5	50,3	60,6	55,1	62,4	13,4%	24,0%
	Standard	70,5	61,0	69,1	64,5	50,3	60,6	55,1	62,4	13,4%	24,0%
	- of which Bonis	70,5	61,0	67,4	64,5	50,3	60,6	55,1	62,4	13,4%	24,0%
	- of which Default	0,0	0,0	1,7	0,0	0,0	0,0	0,0	0,0	0,0%	0,0%
	AIRB	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0%	0,0%
	- of which Bonis	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0%	0,0%
	- of which Default	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0%	0,0%
Values in €/mln		dec-16	mar-17	jun-17	sep-17	dec-17	mar-18	jun-18	sep-18	ΔQtD	ΔYtD
EAD	TOTAL	122,0	100,3	111,3	109,5	106,7	100,2	98,9	108,6	9,8%	1,7%
	of which Intragroup	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0%	0,0%
	of which no Intragroup	122,0	100,3	111,3	109,5	106,7	100,2	98,9	108,6	9,8%	1,7%
	Standard	122,0	100,3	111,3	109,5	106,7	100,2	98,9	108,6	9,8%	1,7%
	- of which Bonis	122,0	100,3	110,2	109,5	106,7	100,2	98,9	108,6	9,8%	1,7%
	- of which Default	0,0	0,0	1,1	0,0	0,0	0,0	0,0	0,0	0,0%	0,0%
	AIRB	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0%	0,0%
	- of which Bonis	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0%	0,0%
	- of which Default	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0%	0,0%

- RWA increase from the previous quarter (+13,4%, +€7 mln) due to the standard Corporate segment.
- The increase in Credit EAD (+9,8%, +€10 mln) is mainly due to the increase of EAD above mentioned.



**Regulatory RWA and Internal RWA**

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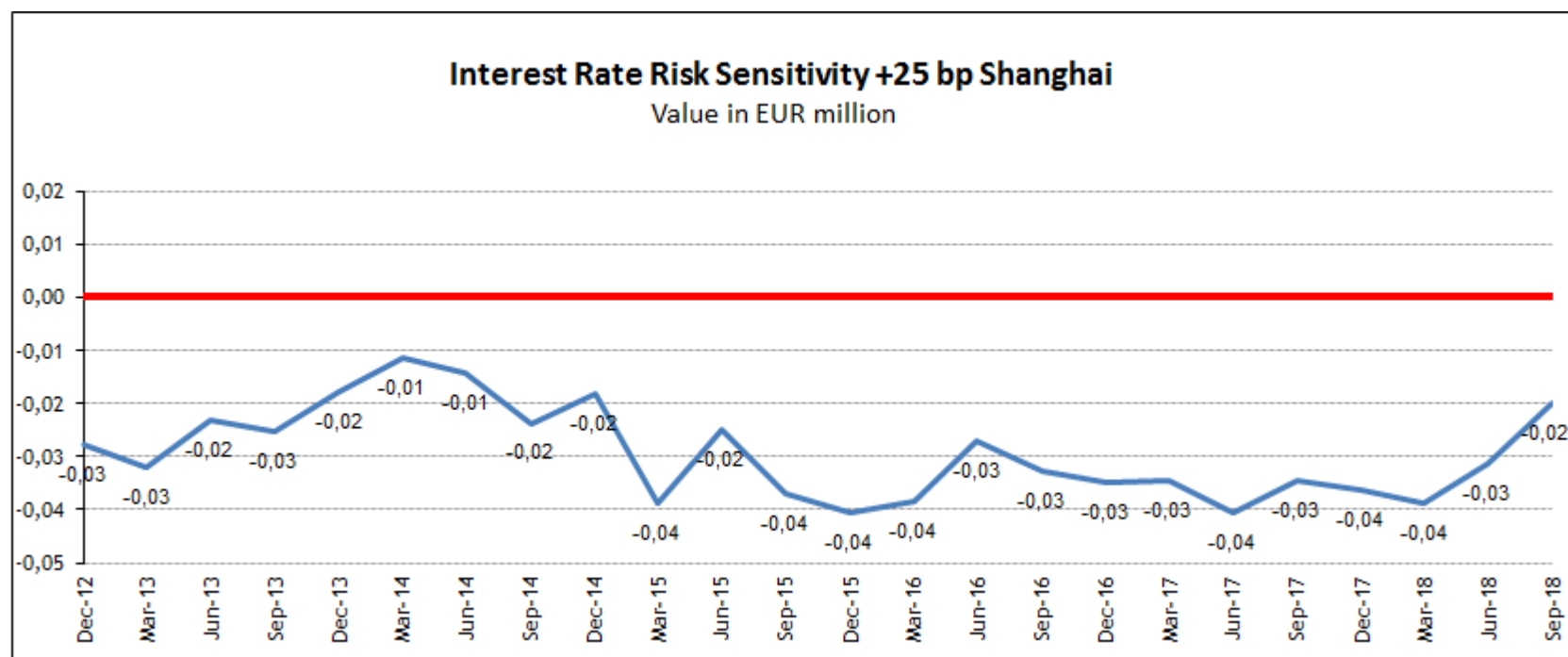
**Operational Risk Management**

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# Interest Rate Sensitivity

Interest rate sensitivity September 2018						Value in €/ mln
	shock+25bp	shock-25bp	shock +100 bp	shock -100 bp	shock +200 bp	shock -200 bp
Shanghai Branch	-0,02	0,01	-0,08	0,04	-0,16	0,10



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## Operational Risk Management – Loss Data Collection overview

The process of Loss Data Collection (LDC) consists of searching and registering loss data, triggered by operational risk events, and analytically examining them in order to fully understand loss causes and their implications as far as mitigation is concerned.

The Shanghai Branch collects operational losses data from 2008; its operational losses are generally of a low amount (averagely less than 1,000 USD/year) and are related to errors/delays in executing operations. There are no relevant operational losses.

Concerning the period under investigation, no operational risk event occurred in **Q3 2018**.



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## Credit Loans Portfolio - Bonis portfolio

Credit risk information, included from the current slide to ahead, are based on managerial measurements.

### September 30, 2018 - Shanghai - €/mln

Portfolio	Drawn	EAD	EL	Ecap	EL / EAD (bp)	Ecap / EAD %	AVG PD %
<i>Institutional</i>	74,74	74,98	0,15	0,65	20	0,86%	0,45%
<i>Corporate</i>	14,48	14,84	0,06	0,68	38	4,58%	1,02%
<b>Total</b>	<b>89,22</b>	<b>89,82</b>	<b>0,21</b>	<b>1,32</b>	<b>23</b>	<b>1,47%</b>	<b>0,54%</b>

Loans\* exposures – at September 2018 – amount to 89,82 €/mln. Expected Loss (EL) and Economic Capital (Ecap\*\*) are respectively 0,21 €/mln and 1,32 €/mln.

74,74 €/mln of exposure, almost 84% of whole portfolio, is represented by Institutional counterparts.

In terms of relative credit risk ratios, EL/EAD ratio is equal to 23 bps while Ecap/EAD is 1,47%.

At September 2018, in credit loans portfolio there are not defaulted positions.

The table below shows the recalculation of risk measures on EL and Ecap of bonis portfolio after application of the rates of pd and lgd stressed according to the approach used by the Group MPS.

### September 30, 2018 - Shanghai - €/mln

Portfolio	Drawn	EAD_Stress	EL_Stress	Ecap_Stress	EL / EAD (bp)	Ecap / EAD %	AVG PD %_Stress
<i>Institutional</i>	74,74	74,98	0,18	0,70	24	0,93%	0,54%
<i>Corporate</i>	14,48	14,84	0,09	0,88	58	5,96%	1,45%
<b>Total</b>	<b>89,22</b>	<b>89,82</b>	<b>0,27</b>	<b>1,58</b>	<b>30</b>	<b>1,76%</b>	<b>0,69%</b>

\* The Portfolio considered, in line with the analysis made at Bank and Group level, does not include the defaulted positions according to the international Regulatory framework for the validated AIRB approach.

\*\* Ecap is calculated taking into account the diversification effect at the entire Group Portfolio level



## Credit Loans Portfolio – Top 20 – Bonis portfolio

Top 20

September 30, 2018 - Shanghai - €/mln

Counterparty Name	Drawn	EAD	EL	Ecap	EL / EAD (bp)	Ecap / EAD %
INDUSTRIAL & COMMERCIAL BANK OF C	17,54	17,54	0,01	0,06	6	0,32%
BANK OF CHINA LIMITED	17,22	17,29	0,01	0,06	6	0,32%
SHANGHAI PUDONG DEVELOPMENT BANK	6,91	6,91	0,01	0,04	14	0,62%
CHONGQING RED DRAGONFLY OIL CO.,	3,11	3,17	0,01	0,15	41	4,86%
MARPOSS NANJING AUTOMATION CO. L	2,98	2,98	0,01	0,15	42	4,96%
COMMERZBANK AG	2,60	2,60	0,00	0,04	9	1,45%
SWEDBANK AB	2,27	2,27	0,00	0,02	21	0,85%
SIAD MACCHINE IMPIANTI TRADING S	1,88	1,88	0,01	0,07	32	3,87%
TECTUBI TIANJIN FITTINGS CO.,LTD	1,77	1,77	0,01	0,09	42	4,96%
BANK LEUMI USA	1,39	1,39	0,00	0,01	21	0,85%
QNB FINANSBANK ANONIM SIRKETI	1,27	1,27	0,01	0,03	72	2,07%
ALBARAKA TURK KATILIM BANKASI AS	1,03	1,03	0,01	0,02	72	2,07%
BANCO RENDIMENTO SA	1,01	1,01	0,00	0,01	21	0,85%
TURKIYE IS BANKASI A.S.	0,96	0,96	0,01	0,02	72	2,07%
SECURITY BANK COMPANY	0,93	0,93	0,00	0,01	21	0,83%
JPMORGAN CHASE BANK NA	0,92	0,92	0,00	0,00	2	0,16%
ARAB BANK PLC	0,88	0,88	0,02	0,03	180	3,77%
KOTAK MAHINDRA BANK LIMITED	0,88	0,89	0,00	0,01	21	0,85%
BANCO BPM SOCIETA' PER AZIONI	0,87	0,87	0,00	0,03	47	3,47%
LAFERT SUZHOU CO. LTD NO.3 IND.P	0,85	0,85	0,00	0,02	9	1,92%
<b>Total</b>	<b>67,25</b>	<b>67,39</b>	<b>0,13</b>	<b>0,86</b>	<b>19</b>	<b>1,27%</b>

\* Counterparties highlighted represent new entries in portfolio compared with the previous quarter



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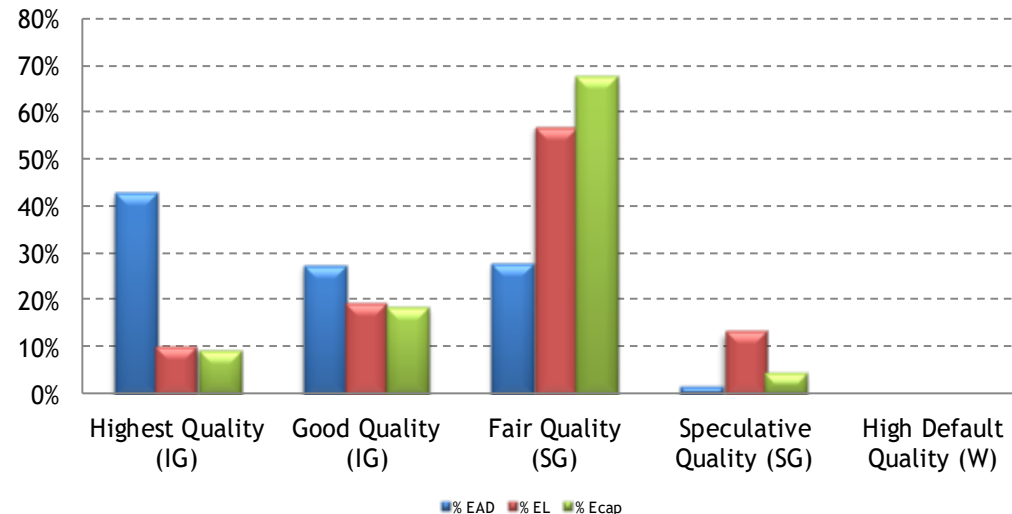
## Credit Loans Portfolio – quality distribution – Bonis portfolio

Master Scale	Basis point from to		S&P's Rating	Description
Highest Quality (IG)	-	16	AAA / A-	Investment
Good Quality (IG)	16	56	BBB+ / BBB-	
Fair Quality (SG)	56	298	BB+ / BB-	Speculative
Speculative Quality (SG)	298	1.774	B+ / B-	
Hight Default Quality (W)	1.774	10.000	CCC+ / D	Watch

On September 2018, the measurement of Exposures At Risk (EAD), in terms of internal-external ratings (according to the MPS Master Scale), results in the following counterparties distribution (as also represented in the graph below):

- Investment Grade about 70% (in graph corresponding to Highest-Good classes);
- Speculative Grade Class about 30% (see Fair and Speculative classes).

Master scale distribution of borrowers

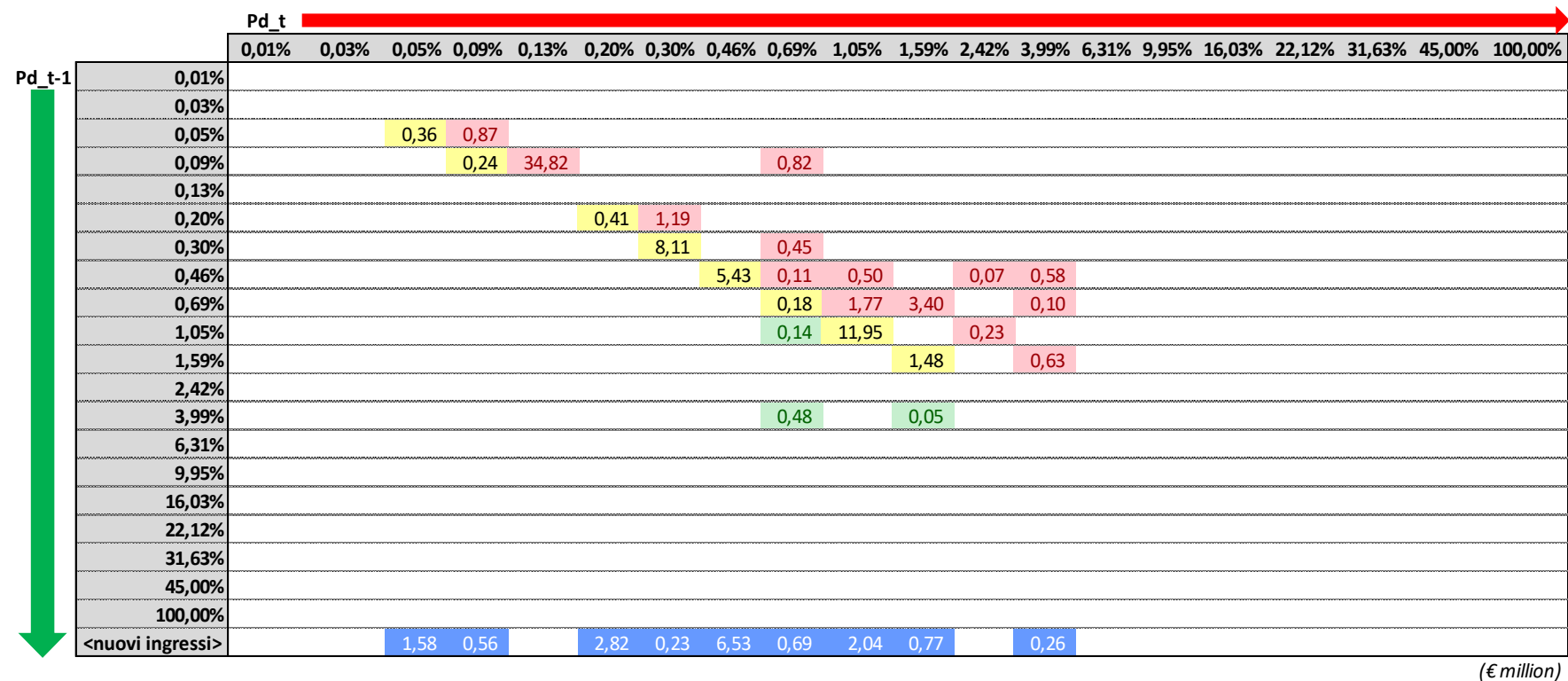


# Credit Loans Whole Portfolio – Transition Matrix

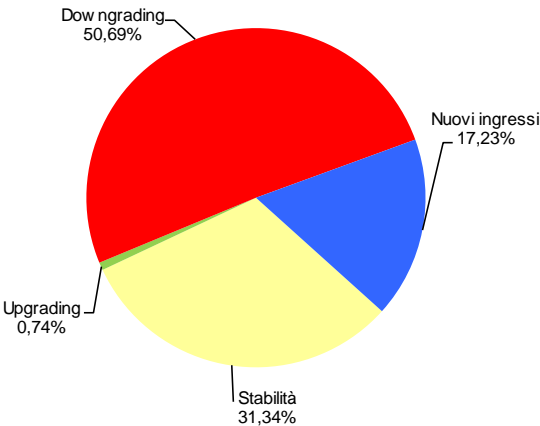
The table below shows the comparison between 30<sup>th</sup> September 2017 and 30<sup>th</sup> September 2018 risk ratings assigned to MPS Group Counterparties.

## Credit Loans Whole Portfolio Transition Matrix

- Banca Monte dei Paschi di Siena: Shanghai Branch -



Gruppo Montepaschi - Shanghai Branch  
Transition Matrix - 30.09.2018



Variazione	EAD (€)	EAD (%)
Stabilità	28,15	31,34%
Upgrading	0,66	0,74%
Downgrading	45,53	50,69%
Nuovi ingressi	15,48	17,23%
Totali =	89,82	100,00%

Periodo t = 30th September 2018  
Periodo t-1 = 30th September 2017



## Credit Loans Portfolio – Concentration Exposure: drill down by Region

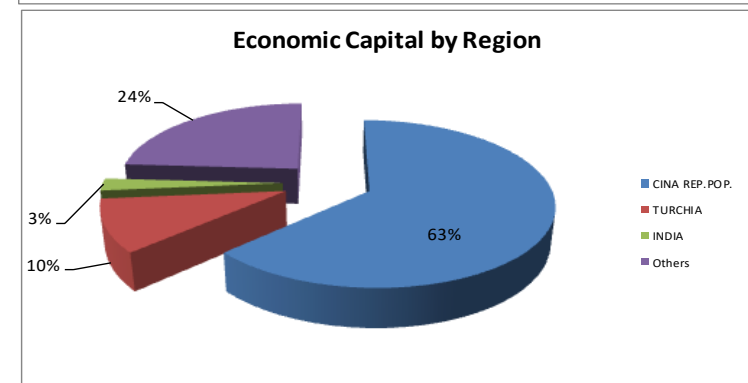
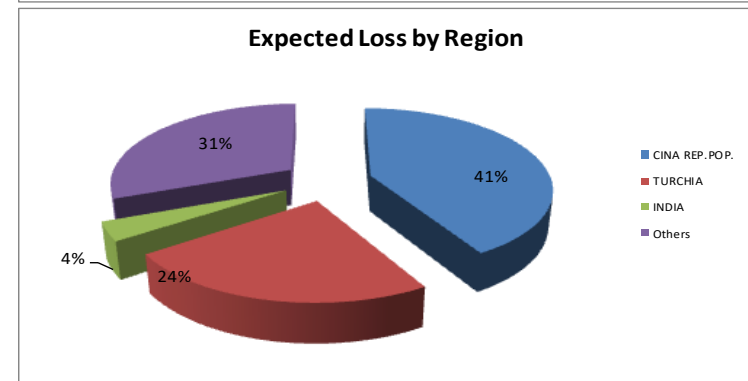
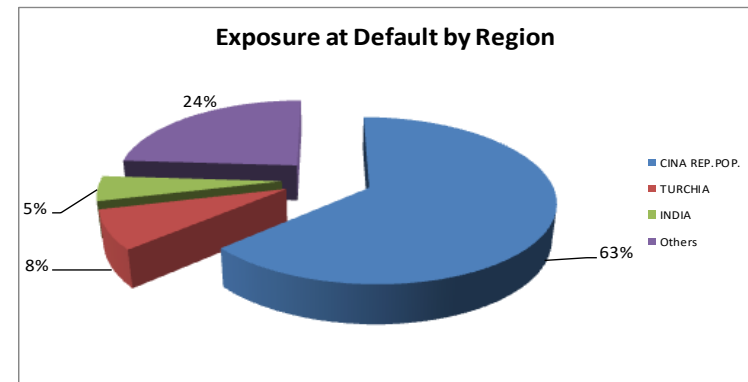
The overall concentration index level of the Shanghai Branch Bonis Portfolio (HH – Herfindhal Index) is 8,83%. The table below shows both the single-name concentration within each single country and the overall Regional concentration level. The next table shows both the single-name concentration within each industry and the overall Industry concentration level.

### Bonis portfolio

September 30, 2018 - Shanghai

ID_GEO	IM_EAD	IM_EL	IM_CE	AV_LGD	AV_PD	CAP_EAD	HH
CINA REP.POP.	56,95	0,09	0,84	43,00%	0,38%	1,47%	12,26%
TURCHIA	6,92	0,05	0,14	45,00%	1,59%	1,98%	3,93%
INDIA	4,43	0,01	0,03	45,00%	0,39%	0,72%	7,01%
ITALIA	3,77	0,01	0,11	45,00%	0,77%	2,81%	2,59%
GERMANIA	2,67	0,00	0,04	45,00%	0,20%	1,45%	90,38%
LITUANIA	2,27	0,00	0,02	45,00%	0,46%	0,85%	100,00%
STATI UNITI D'AMERICA	2,16	0,01	0,02	45,03%	0,67%	1,10%	17,45%
BRASILE	1,46	0,01	0,02	45,00%	0,81%	1,23%	13,72%
MAROCO	1,46	0,00	0,02	45,00%	0,62%	1,03%	10,22%
FILIPPINE	0,93	0,00	0,01	45,00%	0,46%	0,83%	42,23%
ARABIA SAUDITA	0,83	0,00	0,01	45,00%	0,38%	0,71%	25,84%
SPAGNA	0,79	0,00	0,02	45,00%	0,38%	2,05%	8,45%
COREA DEL SUD	0,75	0,00	0,00	45,00%	0,09%	0,24%	30,53%
GIORDANIA	0,63	0,01	0,02	45,00%	3,99%	3,77%	100,00%
MESSICO	0,54	0,00	0,00	45,00%	0,34%	0,64%	17,09%
FRANCIA	0,54	0,00	0,00	45,00%	0,07%	0,78%	17,93%
PERU'	0,52	0,00	0,00	45,00%	0,46%	0,83%	38,38%
SUDAFRICANA REP.	0,44	0,00	0,01	45,00%	0,69%	1,15%	44,50%
DUBAI	0,36	0,00	0,01	45,00%	2,90%	2,82%	36,50%
HONG KONG	0,36	0,00	0,01	45,00%	1,42%	1,88%	40,25%
REGNO UNITO	0,29	0,00	0,00	45,00%	0,14%	0,30%	41,67%
PORTOGALLO	0,20	0,00	0,00	45,00%	0,62%	2,41%	25,09%
POLONIA	0,16	0,00	0,00	45,01%	0,30%	0,58%	25,33%
INDONESIA	0,15	0,00	0,00	45,00%	0,46%	0,82%	100,00%
KUWAIT	0,11	0,00	0,00	45,00%	0,09%	0,24%	50,45%
SVIZZERA	0,09	0,00	0,00	45,00%	0,46%	0,82%	100,00%
SHARJAH	0,05	0,00	0,00	45,00%	0,30%	0,62%	100,00%
	<b>89,82</b>	<b>0,21</b>	<b>1,32</b>	<b>43,73%</b>	<b>0,54%</b>	<b>1,47%</b>	<b>41,54%</b>

(€ million)



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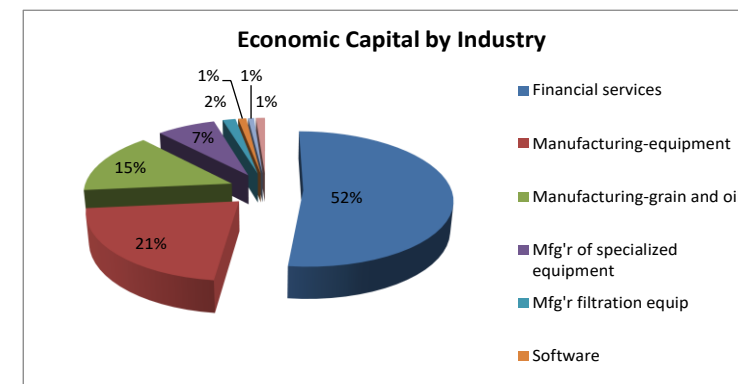
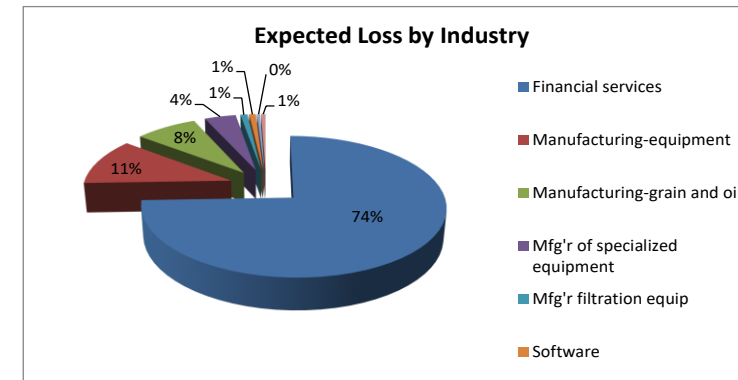
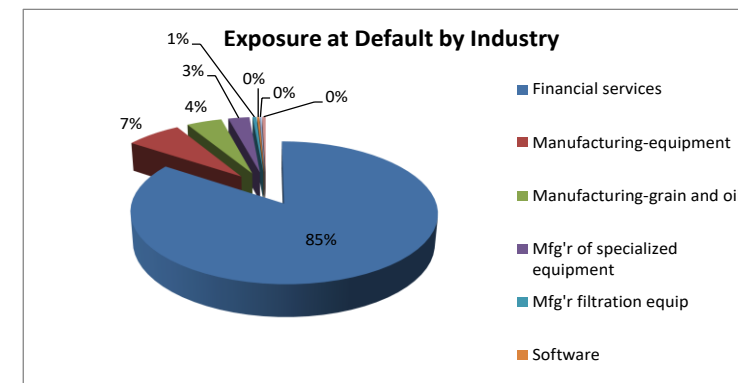
## Credit Loans Portfolio – Concentration Exposure: drill down by Industry

Bonis portfolio

September 30, 2018 - Shanghai

ID_INDUSTRY	IM_EAD	IM_EL	IM_CE	AV_LGD	AV_PD	CAP_EAD	HH
Financial services	75,96	0,16	0,69	44,87%	0,46%	0,91%	6,97%
Manufacturing-equipment	6,24	0,02	0,28	38,54%	0,95%	4,56%	6,35%
Manufacturing-grain and oil	3,98	0,02	0,19	38,97%	1,05%	4,88%	63,68%
Mfg'r of specialized equipment	2,39	0,01	0,10	32,73%	1,05%	4,10%	21,41%
Mfg'r filtration equip	0,44	0,00	0,02	39,60%	1,05%	4,96%	12,16%
Software	0,23	0,00	0,01	30,90%	2,42%	5,80%	27,00%
Dispensing products	0,20	0,00	0,01	39,60%	1,05%	4,96%	14,50%
Engineering/constr	0,19	0,00	0,01	39,60%	1,05%	4,96%	11,95%
Importer, Wholesale and retail-food,wine,etc	0,17	0,00	0,00	31,11%	0,46%	2,48%	13,79%
Wholesale and retail-furniture	0,02	0,00	0,00	34,51%	1,05%	4,33%	33,90%
	<b>89,82</b>	<b>0,21</b>	<b>1,32</b>	<b>43,73%</b>	<b>0,54%</b>	<b>1,47%</b>	<b>72,27%</b>

(€ million)





## Credit Portfolio Measurement System – Methodological Notes

1. Measuring and monitoring of credit risk are made in Banca MPS by means of the internally implemented portfolio model.
2. The model, under the responsibility of the Risk Management Dept, takes into account:
  - a) probability of default (PD) derived from the internal rating system for AIRB portfolio counterparties and from External Rating (if available) or benchmark approach for Standard portfolio counterparties. Until September 2015 the pd benchmark was estimated by average default rate approach above whole group portfolio. Since December 2015 the pd benchmark was estimated by average default rate approach above foreign branch portfolio, improving approximately 70-80%;
  - b) loss given default (LGD) rates obtained from specific 7-year time series of recovering and costs relating to “close” defaulted position;
  - c) coefficients of exposure at default (EAD);
  - d) data relating to different types of guarantees supporting specific transactions.
3. The model takes into account the diversification effect by means of a structural and dynamic correlation matrix which considers the concentration and diversification effects of the risk, together with the marginal redistribution of risk at single counterparty level .
4. The results of the portfolio model at Group level are regularly presented to the Risk Committee of the Corporate Center.
5. The main measures regularly presented are:
  - a) expected loss, representing the annual average estimated loss;
  - b) unexpected loss, representing the difference between the loss - measured on a yearly holding period at 99,93% confidence interval - and the expected loss;
  - c) economic capital, measure of the capital requirement originated from the positions held in the portfolio;
  - d) stress testing measures calculated on specific variables (i.e., increase in PD, etc.), representing extreme but possibile scenarios.
6. LGD parameters are estimated according to the “workout LGD” concept. LGD is calculated on the basis of historical recoveries and costs relating to defaulted positions over several years, discounted at the proper rates and adjusted through “cure-rate” methodology.
7. The parameters utilized to compute economic capital are the same according to the international Regulatory framework for the validated AIRB approach.



## Credit Portfolio Measurement System – Methodological Notes

8. The Herfindahl index (also known as Herfindahl–Hirschman Index, or HHI) measures Credit Portfolio concentration. It is defined as market shares sum of squares, where the market shares are expressed as ratios. It can vary from 0 to 1.0, moving from a huge number of borrowers to a single monopolistic borrower. Herfindahl index increase generally indicates a diversification decrease and a lending portfolio concentration increase and vice-versa.

$$H = \sum_{i=1}^N s_i^2$$

Formula:

where  $s_i$  is the market share of borrower  $i$  in the lending portfolio, and  $N$  is the number of borrowers.

A HHI index below 0.15 indicates no concentration.

A HHI index between 0.15 to 0.25 indicates moderate concentration.

A HHI index above 0.25 indicates high concentration.



