ACRA
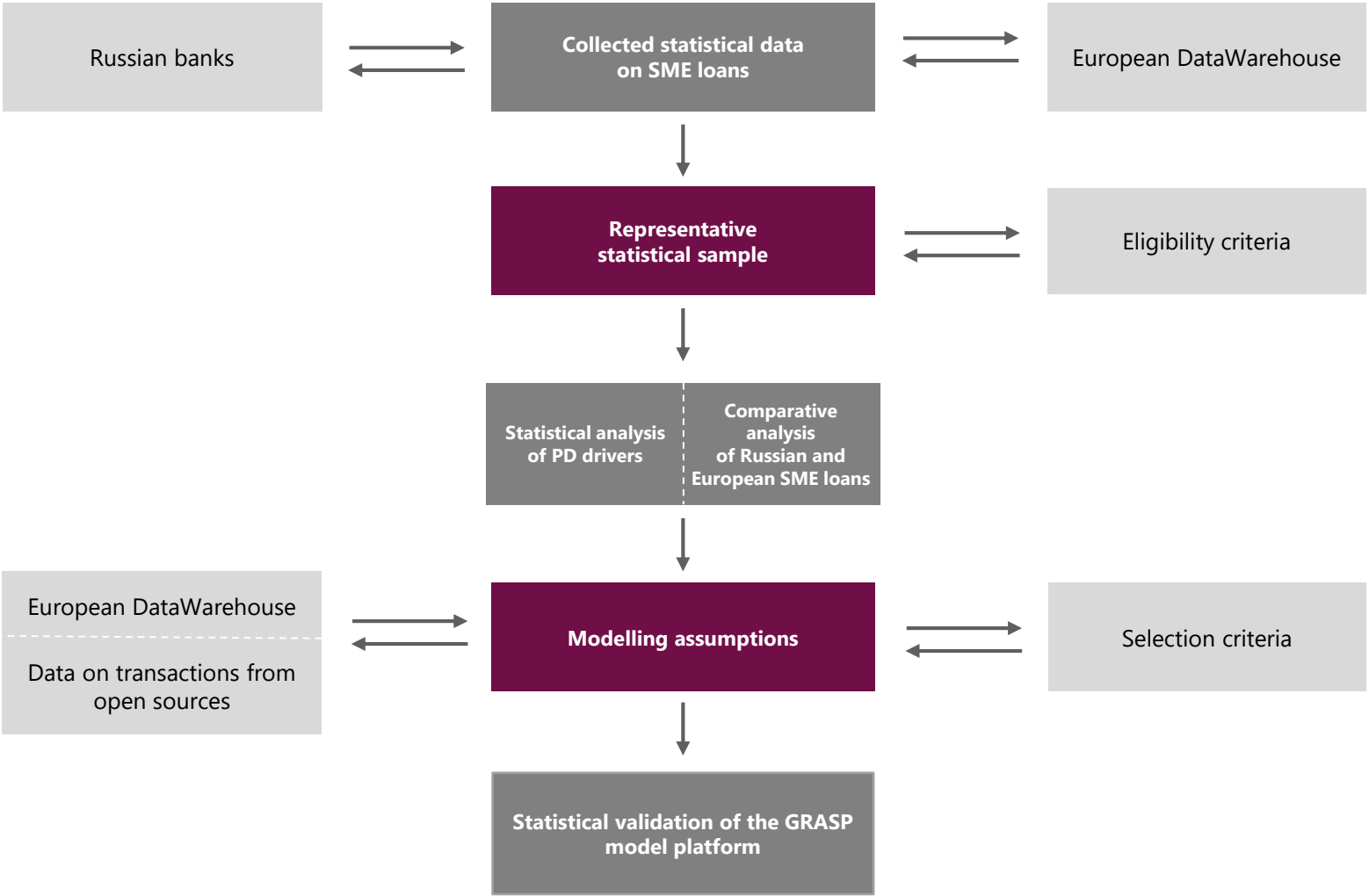
▸ A comparative cross-border statistical analysis of factors affecting SME loan delinquencies and its use for the validation of ACRA rating models

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▶ Statistical analysis of factors driving SME loan delinquencies

ACRA

- In 2016, ACRA launched a project to collect and analyse historical performance data on various asset classes in the Russian and European lending markets

- The SME data sample:
  - represents approximately 35% of the overall Russian market (as of January 1, 2018)
  - includes loans issued in 83 regions of the Russian Federation (from 2001 to 2017)
  - reflects the majority of product and borrower types

- Data was provided to ACRA (on a loan-by-loan basis) according to ACRA's transaction template for the collection of information on the debt portfolios of loans issued to SMEs.

The project goal was to 1) create a federal level analytical platform taking into account the national and regional characteristics of the Russian and European markets, and 2) identify and quantify the main risks drivers in securitized portfolios of retail and corporate loans.

ACRA

ACRA has developed a series of digital templates to "correctly" collect and monitor transaction portfolio data for various types of loans (on a loan-by-loan level).
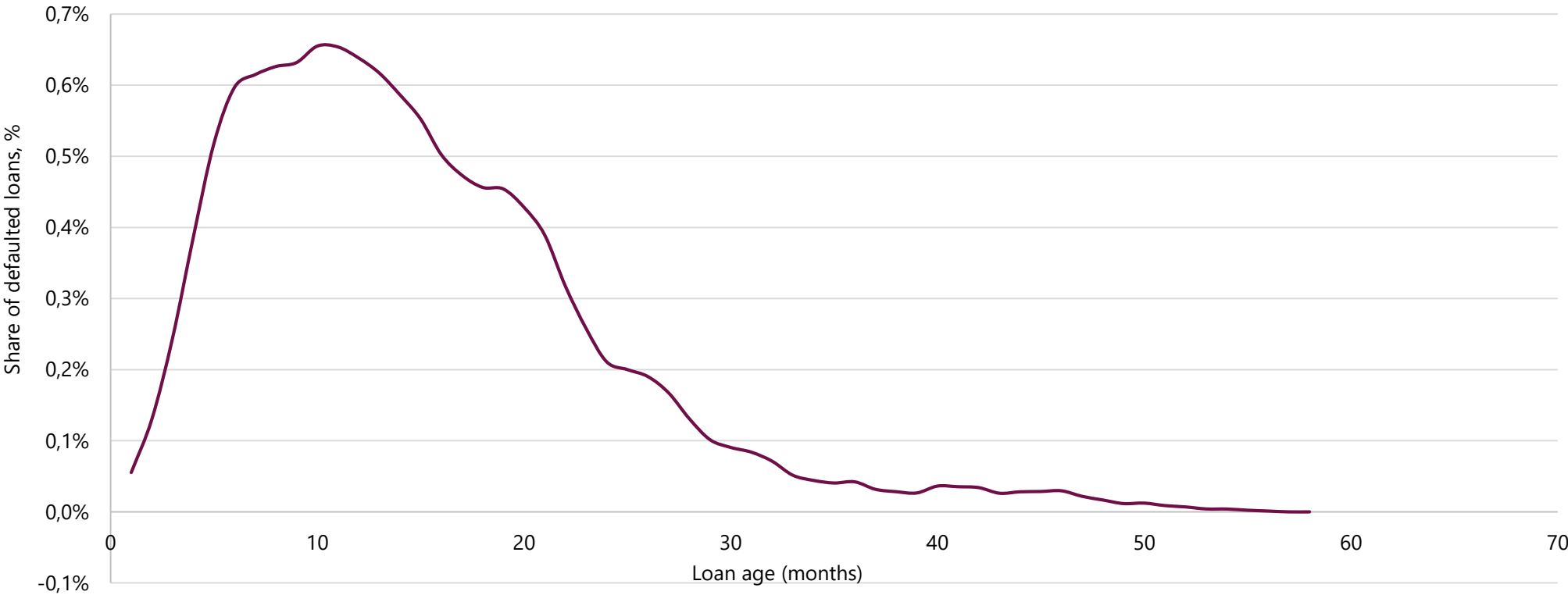
Data Template Sections

| Product characteristics	Borrower characteristics	(pledged) Property characteristics	Insurance type	Historical delinquencies

+ transactional information

Breakdown of securitization transactions in the EDW database by asset class
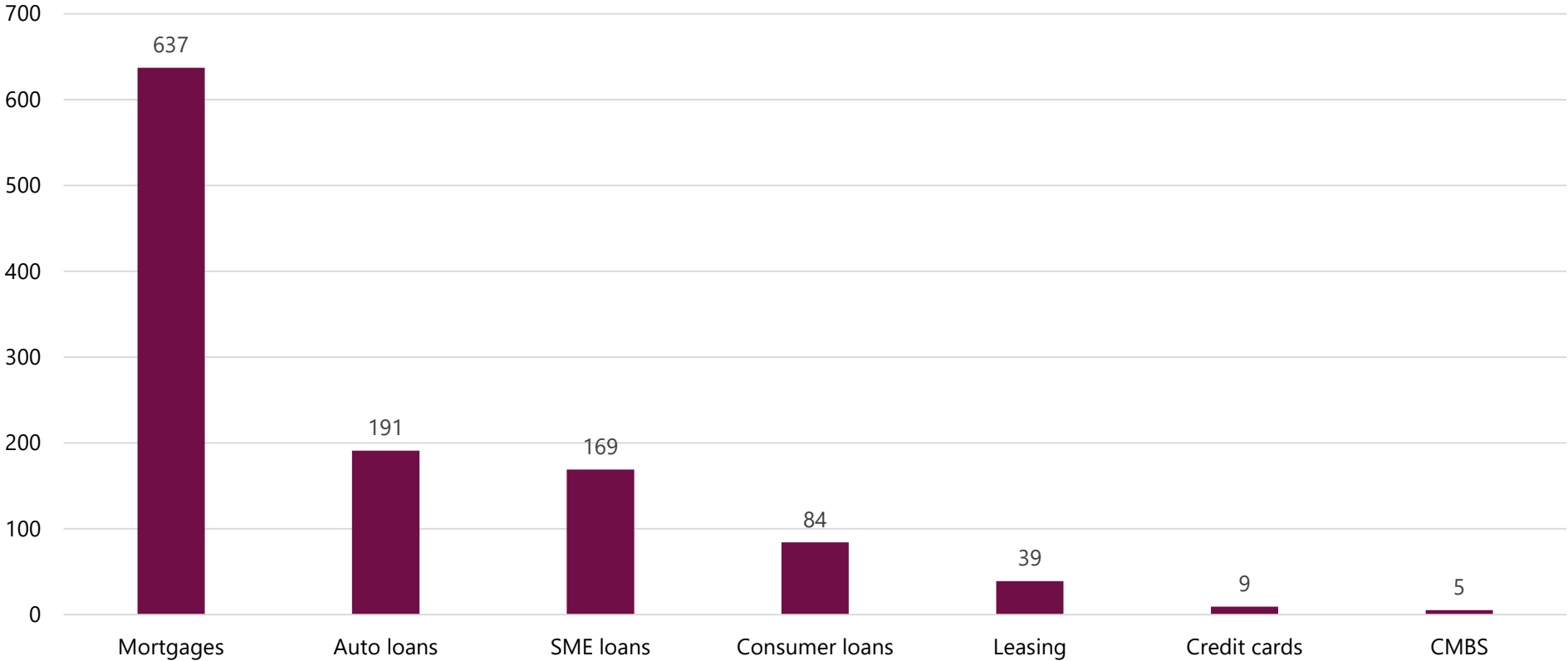
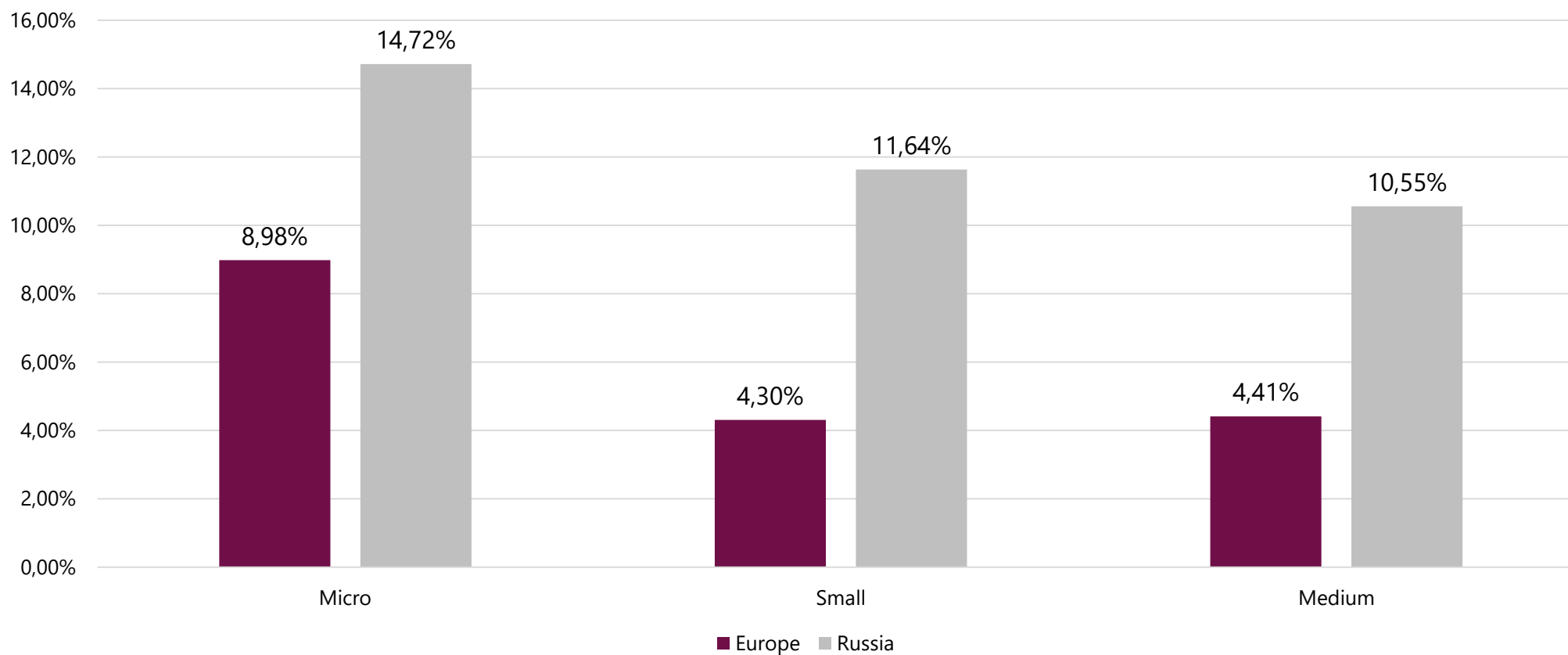**Default timing curve for SME loans in Russia**

ACRA

Distribution of European SME loans in the statistical sample by country of issue
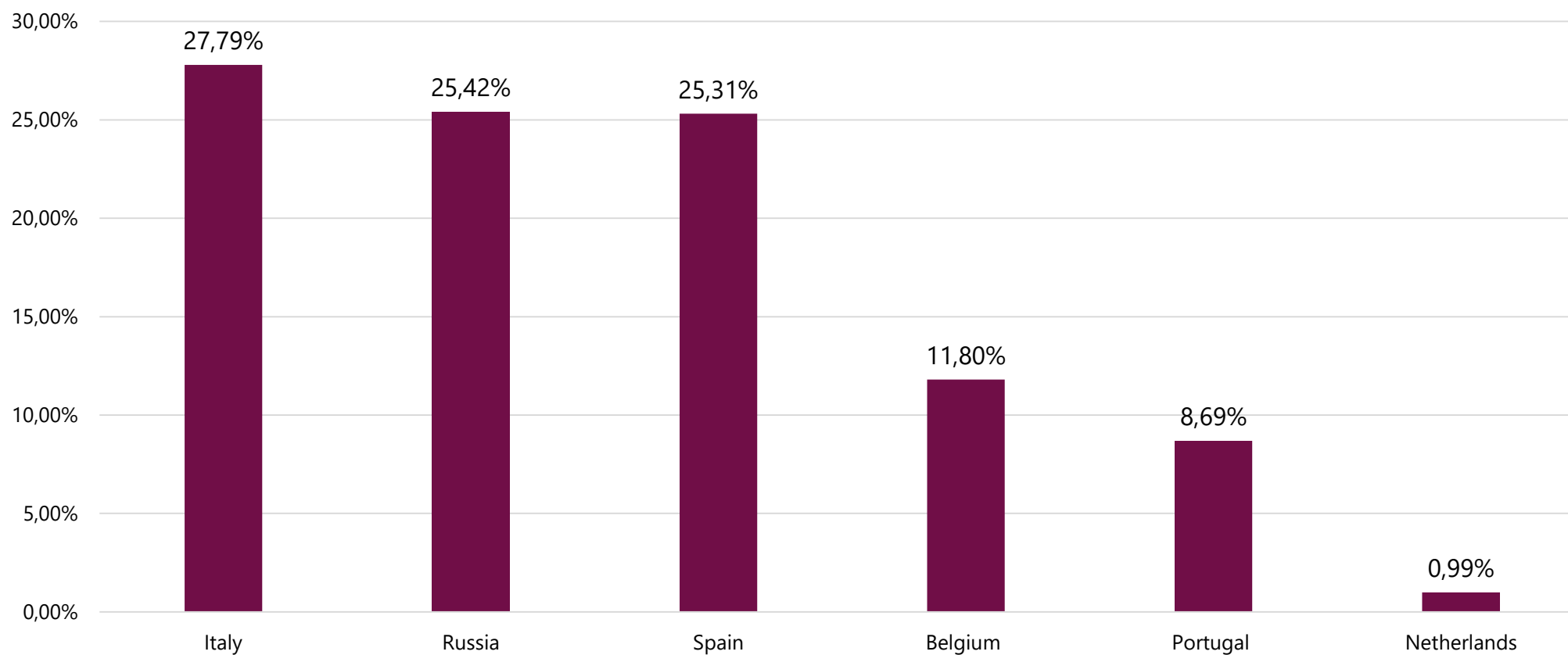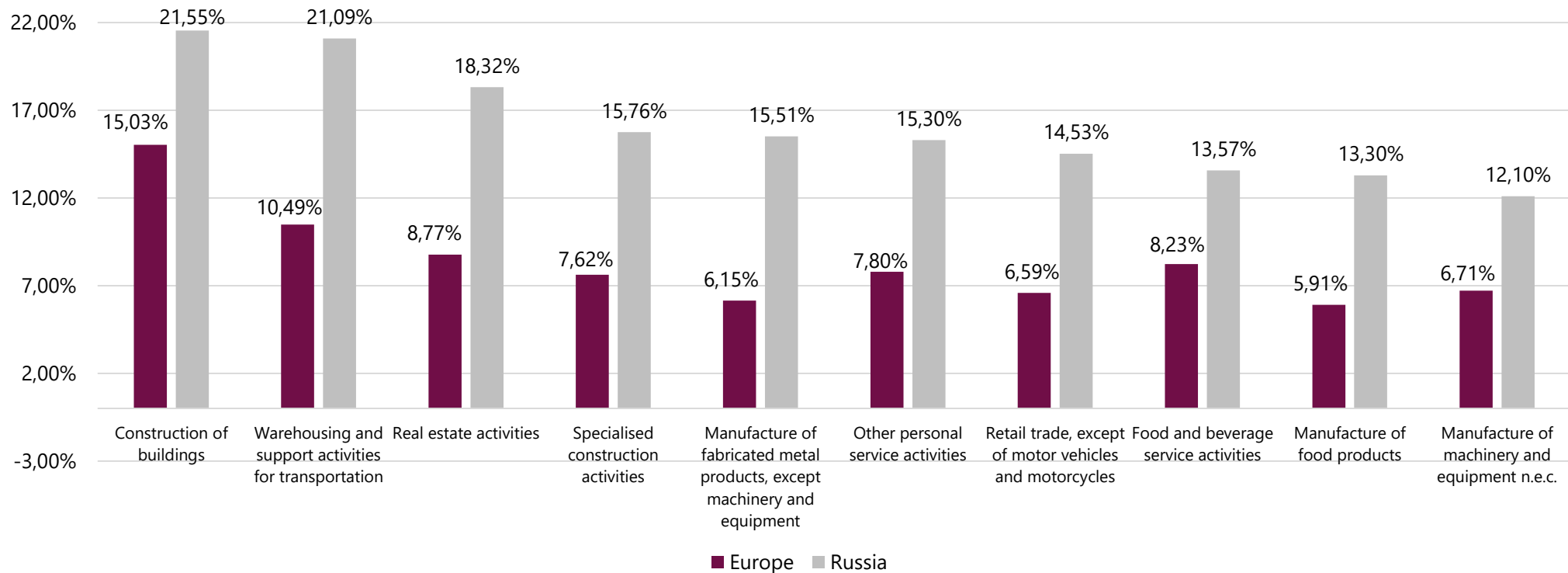
The results of ACRA's research lead to several conclusions

- The SME segment is extremely heterogeneous, both in terms of the types of borrowers and in terms of the range of lending products present in the market

- SME loan portfolios can be both granular (similar to pools of retail loans) as well as concentrated (combining large and medium-sized companies as well as microenterprises) and vary widely depending on the originator

- Unlike retail portfolios, SME portfolios (in Europe as well as in Russia) can have various credit products such as loans with individual/bespoke repayment schedules, revolving credit lines, bullet/balloon loans, second lien loans, etc.
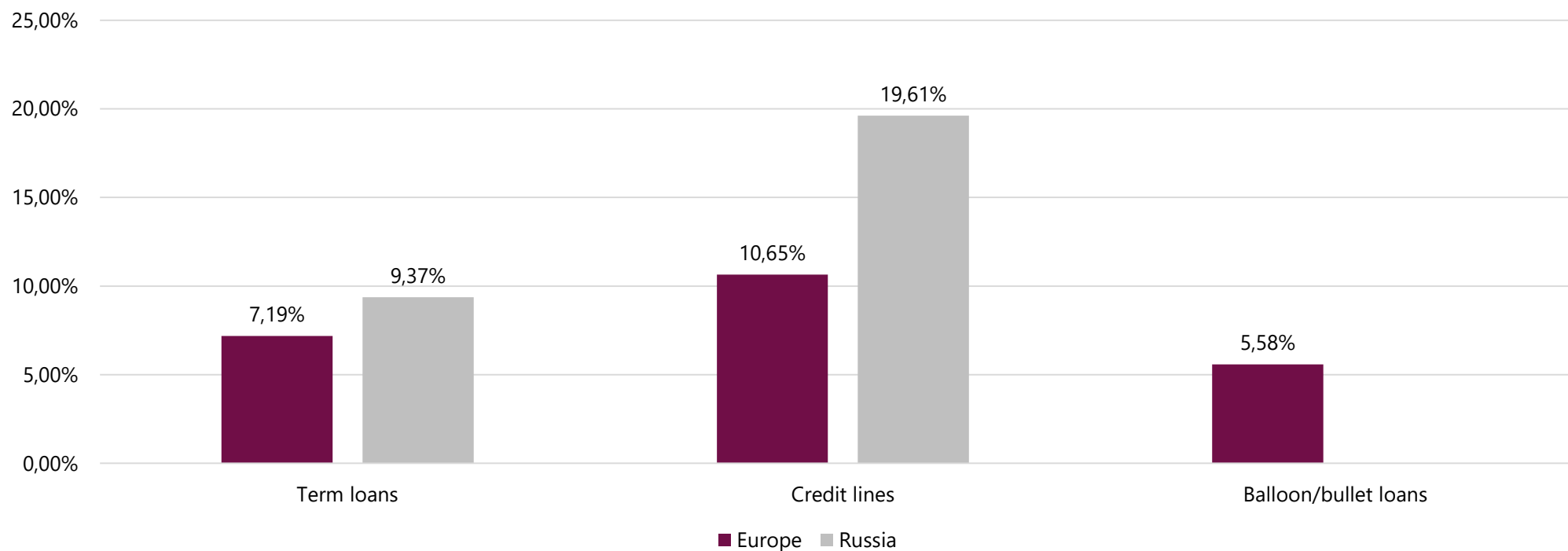
Robust credit assessment of SME portfolios that adequately takes into account the multitude of specific features and heterogeneity of the SME loans demands in-depth analytical expertise and a world-class statistical databases ensuring a competent and objective approach to data collection.

ACRA

Distribution of defaults (90+ day delinquencies) by borrower segment

Distribution of defaults (90+ day delinquencies) by borrower industry

	Construction of buildings	Warehousing and support activities for transportation	Real estate activities	Specialised construction activities	Manufacture of fabricated metal products, except machinery and equipment	Other personal service activities	Retail trade, except of motor vehicles and motorcycles	Food and beverage service activities	Manufacture of food products	Manufacture of machinery and equipment n.e.c.
Europe	15,03%	10,49%	8,77%	7,62%	6,15%	7,80%	6,59%	8,23%	5,91%	6,71%
Russia	21,55%	21,09%	18,32%	15,76%	15,51%	15,30%	14,53%	13,57%	13,30%	12,10%

■ Europe ■ Russia

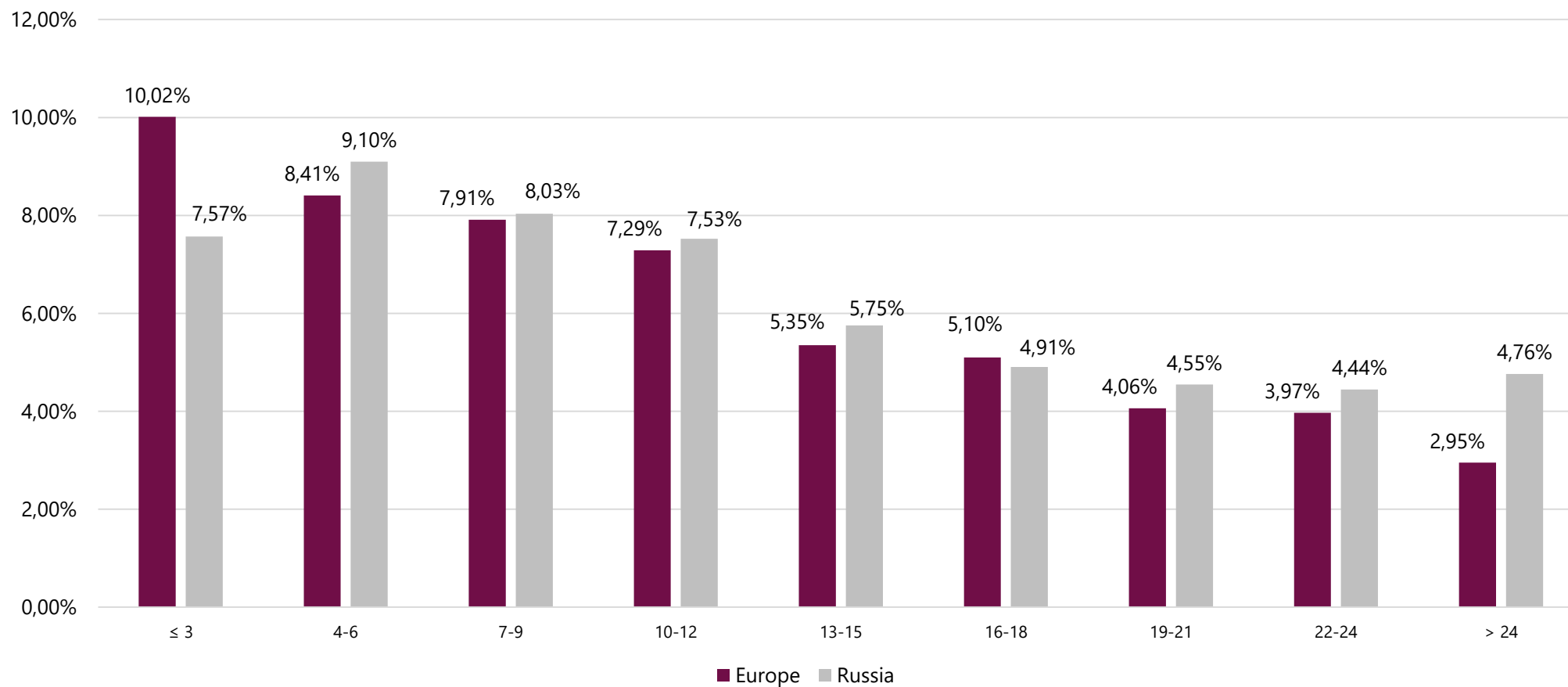**Distribution of defaults (90+ day delinquencies) by credit product type***

*The share of balloon/bullet loans in the sample of Russian banks is relatively small, which is due, in particular, to the specifics of the analyzed portfolios and individual gaps/errors in the data provided. The small sample size causes corruption (overestimation) in the default rates on such loans, and therefore they were not included in the final graph.

ACRA

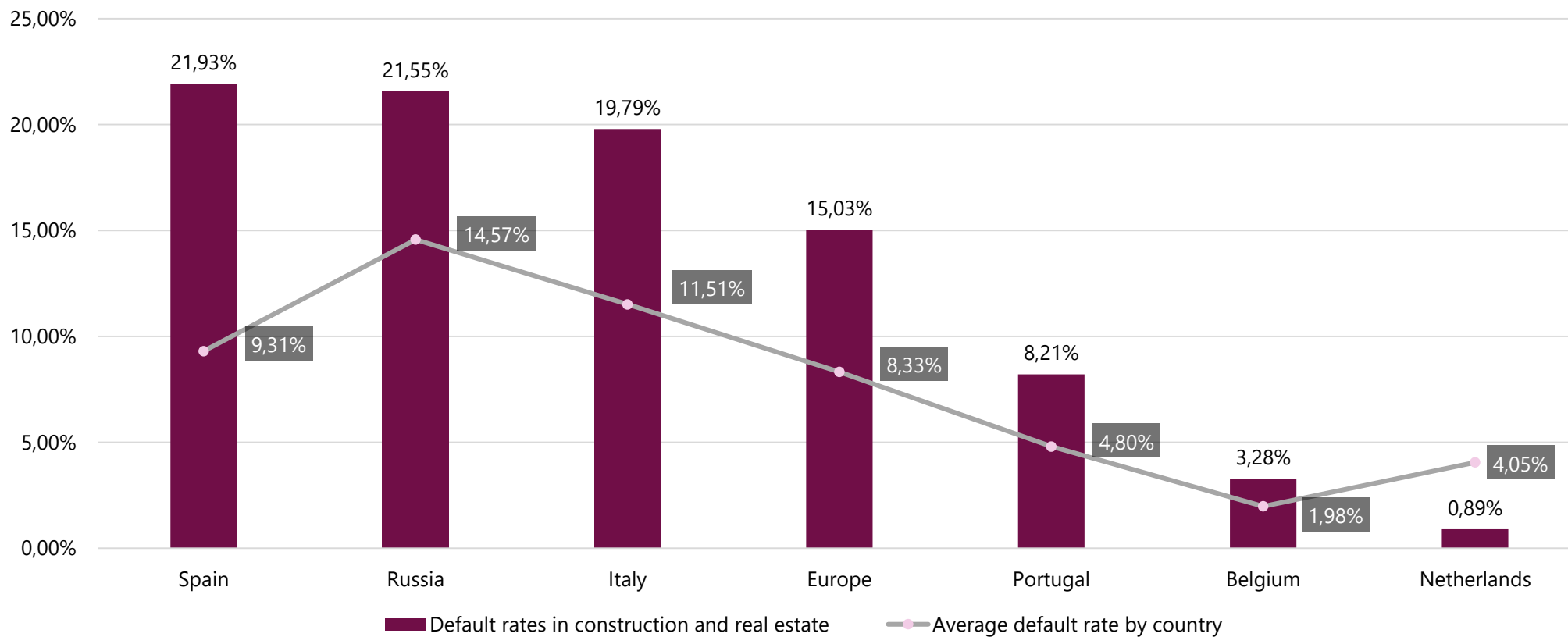ACRA considers balloon/bullet loans to be riskier - **refinancing risk**

The credit quality of balloon/bullet loans can be highly correlated to **the credit quality of the originator bank**

The credit quality of **revolving credit lines** is closely related to the credit quality of the originator bank

When analyzing the credit quality of portfolios containing these types of loans, ACRA considers the aspects that increase the credit risk of the portfolios and applies the appropriate adjustments to the PD.

Distribution of defaults by company age (years)

ACRA

Comparative analysis of construction industry default rates by country

Legend:
- Default rates in construction and real estate
- Average default rate by country

Data points:
- Spain: 21,93% (bar), 9,31% (average)
- Russia: 21,55% (bar), 14,57% (average)
- Italy: 19,79% (bar), 11,51% (average)
- Europe: 15,03% (bar), 8,33% (average)
- Portugal: 8,21% (bar), 4,80% (average)
- Belgium: 3,28% (bar), 1,98% (average)
- Netherlands: 0,89% (bar), 4,05% (average)

ACRA

▶ Statistical validation of the structured finance model platform using international statistical data

ACRA

When selecting transactions, ACRA assessed the **integrity and adequacy of data**

A significant factor that influenced the final size of the sample was the availability of historic data for the portfolio in the EDW database as of the **securities issue date**
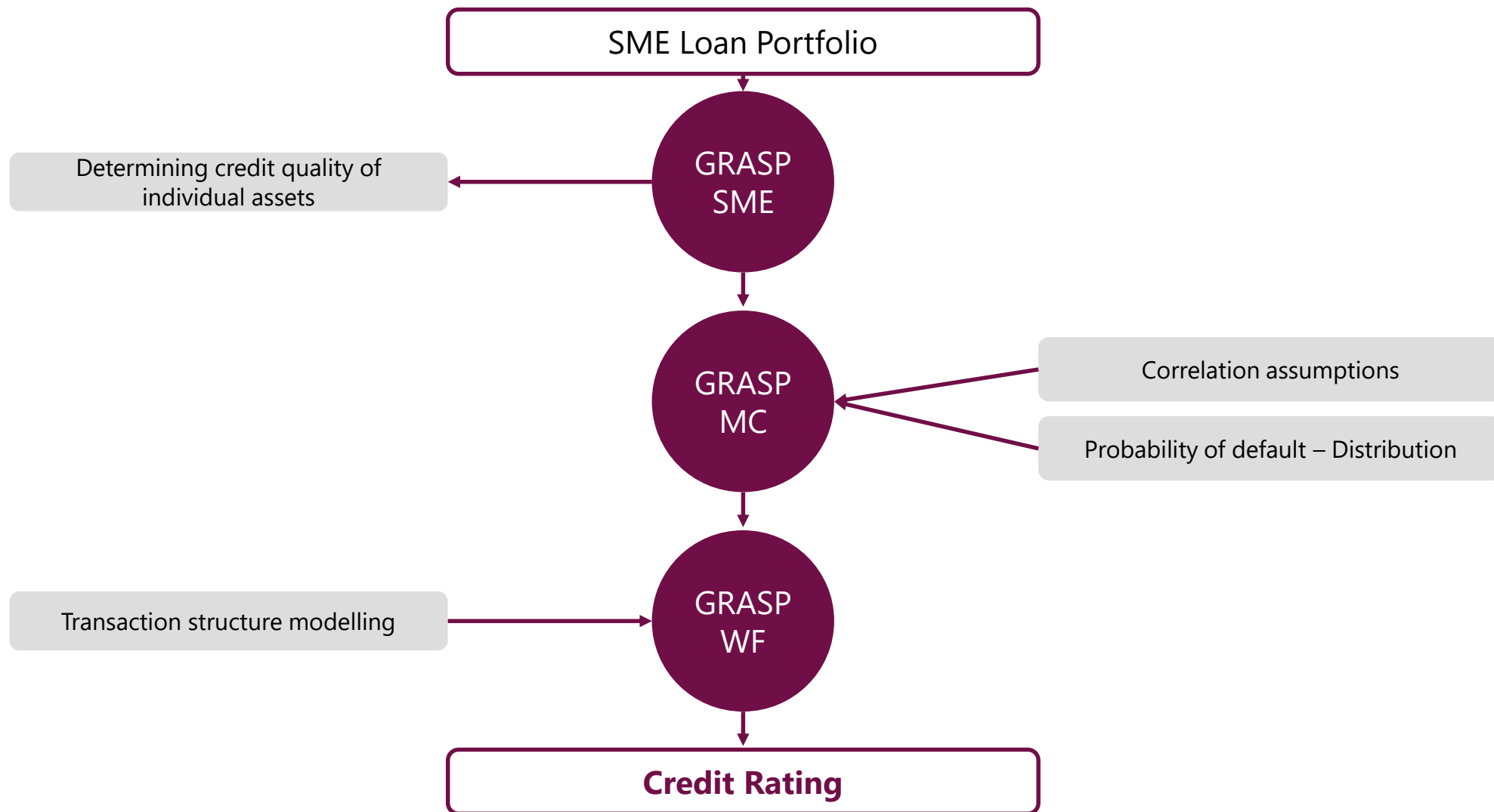
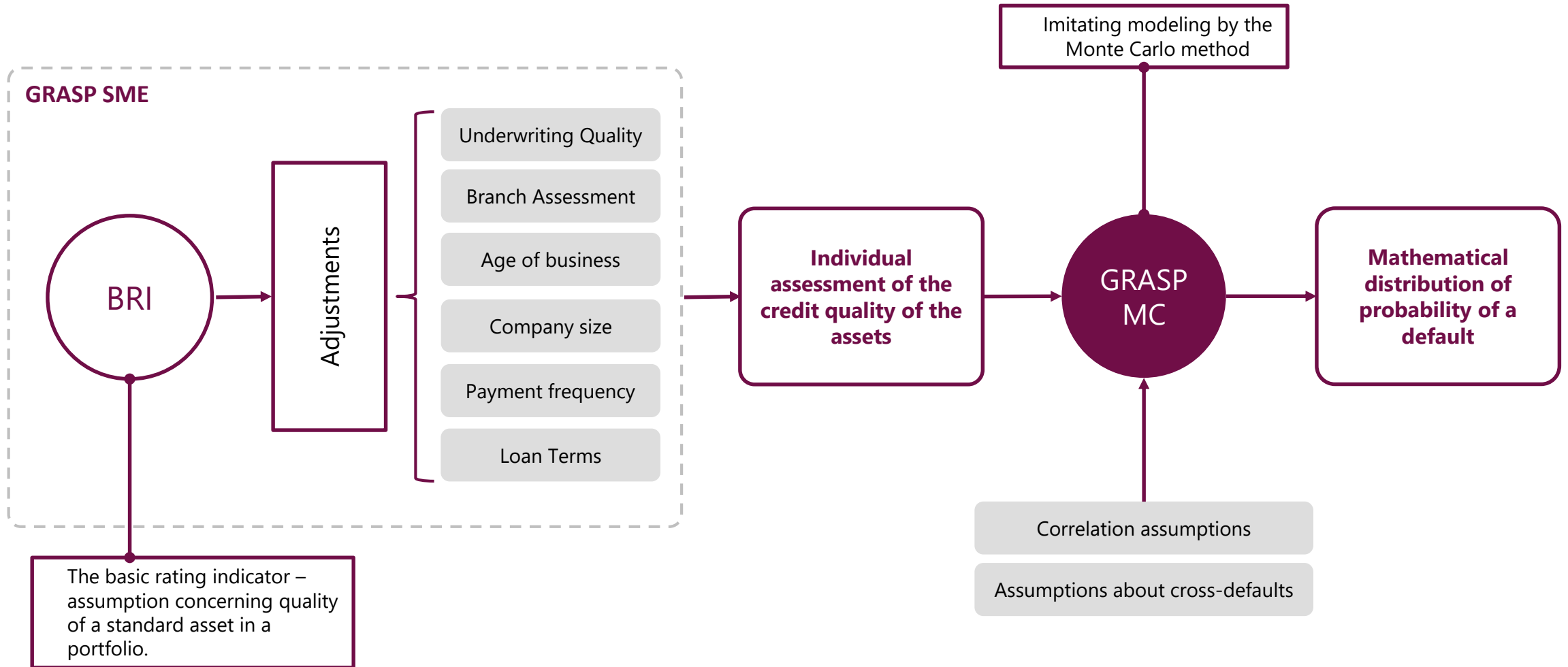A selection criterion was the compliance of loans in asset portfolios with **typical characteristics of SME loans**

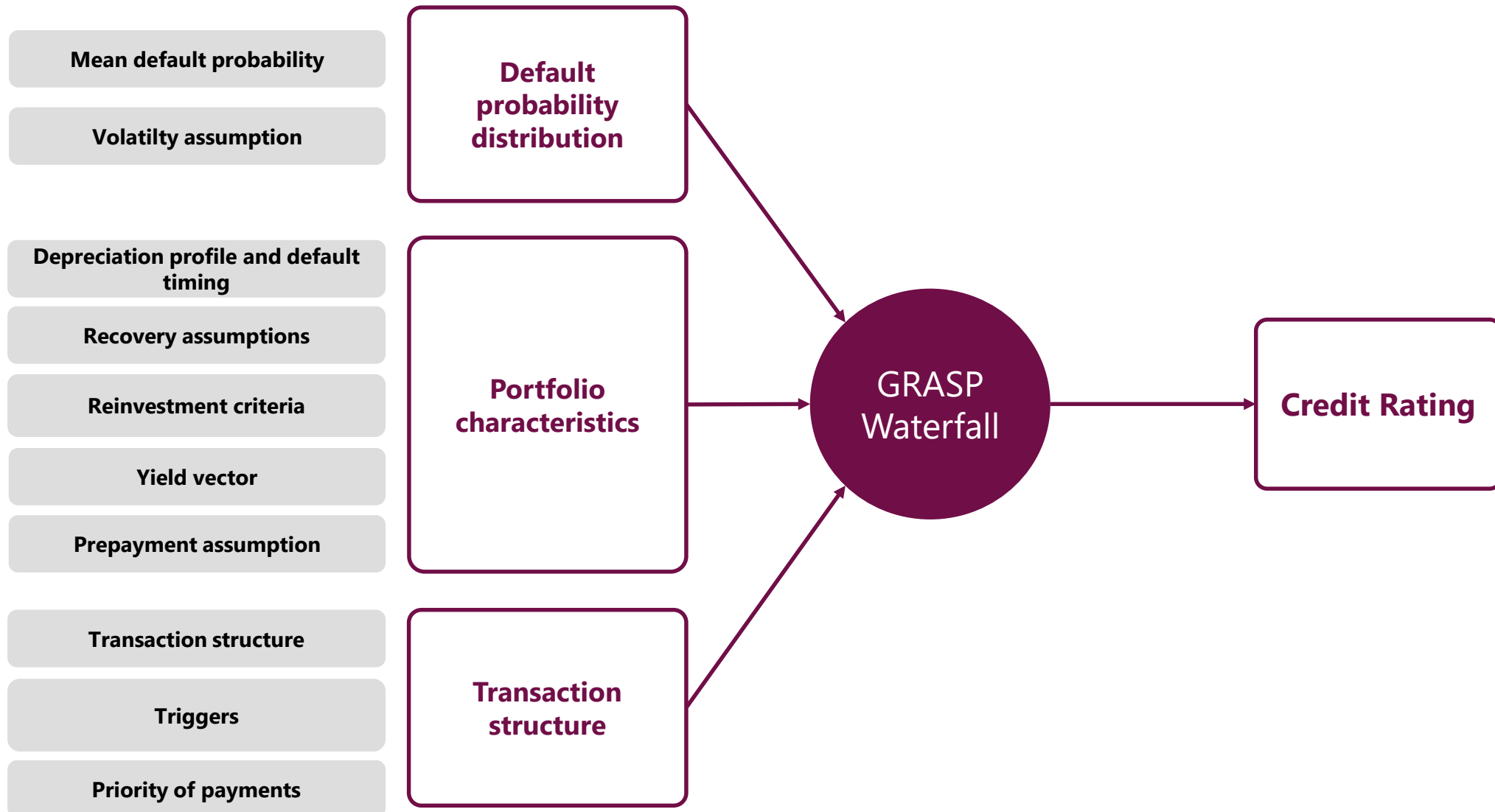**The transaction has a rating** from one of the large, international rating agencies

ACRA believes the final pool of selected transactions to be highly representative for further analysis, validation of the GRASP model platform, and confirmation of assumptions and adjustments to the level of PD for SME loans.

ACRA

ACRA assessed the integrity and adequacy of data using the following key metrics:

- Borrower industry (using NACE classification);

- SME entity category classified as per the European Commission's criteria (micro, small, and medium-sized enterprises);

- Loan purpose (investments, working capital, fixed assets purchase, etc.);

- Principal debt amortization type (annuity, differential, bullet, etc.);

- Loan product (one-time loans, credit line with a limit (revolving), credit line with a limit (non-revolving), overdraft, bank guarantee, etc.);

- Interest basis (fixed, floating, hybrid/conditional variable);

- Country of incorporation;

- Region of incorporation;

- Incorporation date;

- Default characteristics (according to the Basel III definition);

- Days in delinquency;

- Loan origination date;

- Initial loan repayment date;

- Grace period for interest or principal payments.

ACRA

Mean default probability

Volatilty assumption

Default probability distribution

Depreciation profile and default timing

Recovery assumptions

Reinvestment criteria

Yield vector

Prepayment assumption

Portfolio characteristics

Transaction structure

Triggers

Priority of payments

Transaction structure

GRASP Waterfall

Credit Rating

1. The maximum achievable rating ("rating ceiling")

2. Repayment levels and timing, taking into account the collection processes for loans to SMEs in the jurisdiction/transaction

3. Default definition (jurisdiction and transaction specific) taking into account transaction documentation, as well as the default timing over time

4. Portfolio depreciation vector (accounting for balloon/bullet loans, credit lines and amortising loans)

5. Hedging mechanisms (Interest Rate SWAP and Basis SWAP, FX)

6. Prepayment levels sized on historical data

ACRA

Transaction	Moody's expected default rate	ACRA's expected default rate	Difference	Observed default rate
Italy 1	21.2%	22.7%	-1.6%	3.9%
Italy 2	17.7%	17.8%	-0.1%	7.3%
Italy 3	17.6%	17.4%	0.2%	17.6%
Italy 4	18.8%	17.4%	1.4%	0.5%
Italy 5	16.5%	15.2%	1.2%	20.9%
Italy 6	20.8%	17.6%	3.2%	1.9%
Italy 7	15.0%	21.8%	-6.8%	0.9%
Italy 8	13.0%	19.4%	-6.4%	1.4%
Italy 9	15.9%	15.7%	0.2%	3.8%
Italy 10	17.3%	23.0%	-5.7%	3.4%
Italy 11	24.5%	21.2%	3.3%	0.0%
Italy 12	22.0%	17.0%	5.0%	14.3%
Italy 13	14.0%	19.7%	-5.7%	0.5%
Spain 1	16.9%	19.6%	-2.6%	0.8%
Spain 2	9.1%	11.1%	-2.0%	0.5%
Spain 3	9.1%	9.6%	-0.5%	0.8%
Spain 4	8.0%	10.2%	-2.3%	1.1%
Spain 5	12.4%	12.0%	0.4%	0.7%
Spain 6	13.0%	13.2%	-0.2%	0.7%
Spain 7	10.6%	14.7%	-4.1%	0.8%
Spain 8	7.1%	7.7%	-0.6%	0.1%
Spain 9	9.3%	9.7%	-0.4%	2.8%
Portugal 1	31.7%	17.0%	14.8%	15.0%
Portugal 2	16.0%	12.1%	3.9%	0.1%
Netherlands	12.0%	15.4%	-3.4%	4.0%
Germany	9.0%	9.1%	-0.1%	0.0%

Results of modeling showed the following:

- ACRA **modeled ratings are generally comparable** to the ratings of the international rating agencies.

- ACRA compared the estimated expected PD obtained through the GRASP-SME and GRASP-MC modules with the respective target PD calculated by international rating agencies. The average deviation of values compared was around -0.3 %.

- During the analysis of **Portuguese transactions** ACRA applied an additional stress versus stresses applied by the international rating agencies to account for the relatively low credit quality of banks/originators as well as the increased sovereign risk of Portugal. This results in a considerable deviation in the resulting estimates of DP between ACRA and Moody's on separate transactions (14.8%).

- The average observed deviation of DP estimates in **Spanish and Italian transactions** was -0.9% and -1.5% respectively. In most cases ACRA's estimates were more conservative.

Transaction	Moody's Ratings*		ACRA's Ratings**		Difference in notches	
	Tranche A	Tranche B***	Tranche A	Tranche B	Tranche A	Tranche B
Italy 1	Aaa		Aaa		0	
Italy 2	Aaa		Aaa		0	
Italy 3	Aaa	Baa2	Aaa	A3	0	2
Italy 4	Aaa	Aa2	Aaa	Aaa	0	2
Italy 5	Aaa	Aaa	Aaa	Aaa	0	0
Italy 6	A2		Aa3		2	
Italy 7	Aaa		Aa2		-2	
Italy 8	Aaa	Aa2	Aaa	Aaa	0	2
Italy 9	Aaa		Aaa		0	
Italy 10	A2		A2		0	
Italy 11	A2		A2		0	
Italy 12	A2		A3		-1	
Italy 13	A1		A3		-2	
Average absolute difference in notches for transactions in Italy					0.5	1.5

* Moody's ratings are given without country ceiling.
** ACRA's test ratings were assigned based on Moody's idealized table.
*** The absence of a rating in the table is due to the fact that that a rating was not assigned (was not solicited by the originator).

Transaction	Moody's Ratings*		ACRA's Ratings**		Difference in notches	
	Tranche A	Tranche B***	Tranche A	Tranche B	Tranche A	Tranche B
Spain 1	Aaa	Baa3	Aaa	Baa3	0	0
Spain 2	A1	Baa1	A1	Ba2	0	-4
Spain 3	A3	Ba1	A1	Ba3	2	-2
Spain 4	Aaa	Caa1	Aa2	Caa1	-2	0
Spain 5	A3	B1	A2	Caa1	1	-3
Spain 6	Aaa	Caa2	Aaa	Caa1	0	1
Spain 7	Aa3	B2	Aa3	Caa3	0	-4
Spain 8	Aaa	B2	Aaa	B3	0	-1
Spain 9	Aaa	Ba3	Aaa	B2	0	-2
Average absolute difference in notches for transactions in Spain					0.6	1.9
Portugal 1	A3	B1	Aa2	Caa1	4	-3
Portugal 2	A3	Baa3	Aa2	Baa3	4	0
Netherlands	Aaa		Aaa		0	
Germany	A2		Baa2		-3	
Average absolute difference in notches for all transactions					0.9	1.7

* Moody's ratings are given without country ceiling.
** ACRA's test ratings were assigned based on Moody's idealized table.
*** The absence of a rating in the table is due to the fact that that a rating was not assigned (was not solicited by the originator).

ACRA's International Rating Scale for Structured Finance

Transaction	ACRA's Ratings*		Total credit enhancement		Observed default rate	Year transaction was closed
	Tranche A	Tranche B	Tranche A	Tranche B		
Italy 1	AAA		40.33%		3.9%	2014
Italy 2	AAA		40.69%		7.3%	2014
Italy 3	AAA	A-	46.00%	31.00%	17.6%	2014
Italy 4**	AAA		47.20%		0.5%	2014
Italy 5	AAA	A-	61.30%***	48.30%	20.7%	2011
Italy 6	AA-		32.90%	3.90%	1.9%	2012
Italy 7	AA		42.10%		0.9%	2012
Italy 8**	AAA	A+	34.66%	23.38%	1.4%	2016
Italy 9	AAA		35.12%		3.8%	2014
Italy 10	A		28.30%		3.4%	2012
Italy 11	A		33.00%		0.0%	2012
Italy 12	A-		36.20%		14.3%	2012
Italy 13	A-		39.34%		0.5%	2016
Spain 1	AAA	BBB-	43.50%	20.00%	0.8%	2014
Spain 2	A+	BB	35.00%	20.00%	0.5%	2014
Spain 3	A+	BB-	40.00%	20.00%	0.8%	2013
Spain 4	AA	CCC	25.00%	3.00%	1.1%	2015
Spain 5	A	CCC	30.00%	10.00%	0.7%	2013
Spain 6	AAA	CCC	22.00%	4.00%	0.7%	2015
Spain 7	AA-	C	22.00%	4.75%	0.8%	2016
Spain 8	AAA	B-	22.00%	7.00%	0.1%	2014
Spain 9	AAA	B	35.00%	10.00%	2.8%	2013
Portugal 1	AA	CCC	46.60%	42.15%	15.0%	2015
Portugal 2	AA	BBB-	40.00%	30.00%	0.1%	2016
Netherlands	AAA		34.29%		4.0%	2014
Germany	BBB		22.88%		0.0%	2017

* ACRA's test ratings were assigned based on Moody's idealized table.

** In the mentioned transactions, ACRA considered senior tranches the ones that ranked on the top following the Interest waterfall.

*** The high level of total credit enhancement is due to portfolio credit quality and originator assessment.

The statistical validation carried out with the GRASP model platform showed the following:

- The model platform and ACRA's analytical approach can be applied to assign ratings to Russian and European issues of structured finance notes.

- Validation results prove the validity and reliability of ACRA's approach as well as its applicability to the European SME loan securitization market

- Levels of credit support, which are provided for by the transaction structure and confirmed by ACRA's calculations, provide the protection necessary to compensate for real recorded losses on all tranches of bonds, including subordinated

ACRA's model platform and analytical approach are valid. We are able to assign ratings to Russian and European SME securitization transactions.

- Securities issues secured by high-quality SME loans have equivalent (and often better) credit quality compared to unsecured issues, which translates into appropriate estimates of expected losses and rating levels.

- Funds of institutional investors (including pension funds) can be attracted to the real sector of the economy by investing in senior (most secure) tranches of structured bonds, while providing financing for the SME sector without attracting additional subsidies from the state.

- In Europe, the share of debt securitization of SMEs reached a maximum of 16% of the total volume of loans issued, which, according to ACRA, was directly translated into more affordable and cheaper financing for small and medium-sized businesses. The share of the Russian market for securitization of SMEs is less than 1/16 of the European market, or less than 1% of the total debt of SMEs in Russia.

- Further development of the multi-tranche securitization market in Russia will allow banks to achieve the same volumes of structured finance instruments secured by SME loans as in Europe (16%, or 800 billion rubles). The increase in the number of new issues of structured securities, in turn, will give banks the opportunity to reduce the burden on capital and significantly increase the amount of financing for small and micro enterprises.

Securitization will increase the availability of loans for SMEs, including by reducing the cost of funding, which will be possible thanks to a detailed analysis of the debt risk profile.

Average interest rate on SME loans by country

Italy — 2,52%
Portugal — 2,90%
Netherlands — 3,08%
Belgium — 3,18%
Spain — 3,96%
Russia — 14,00%
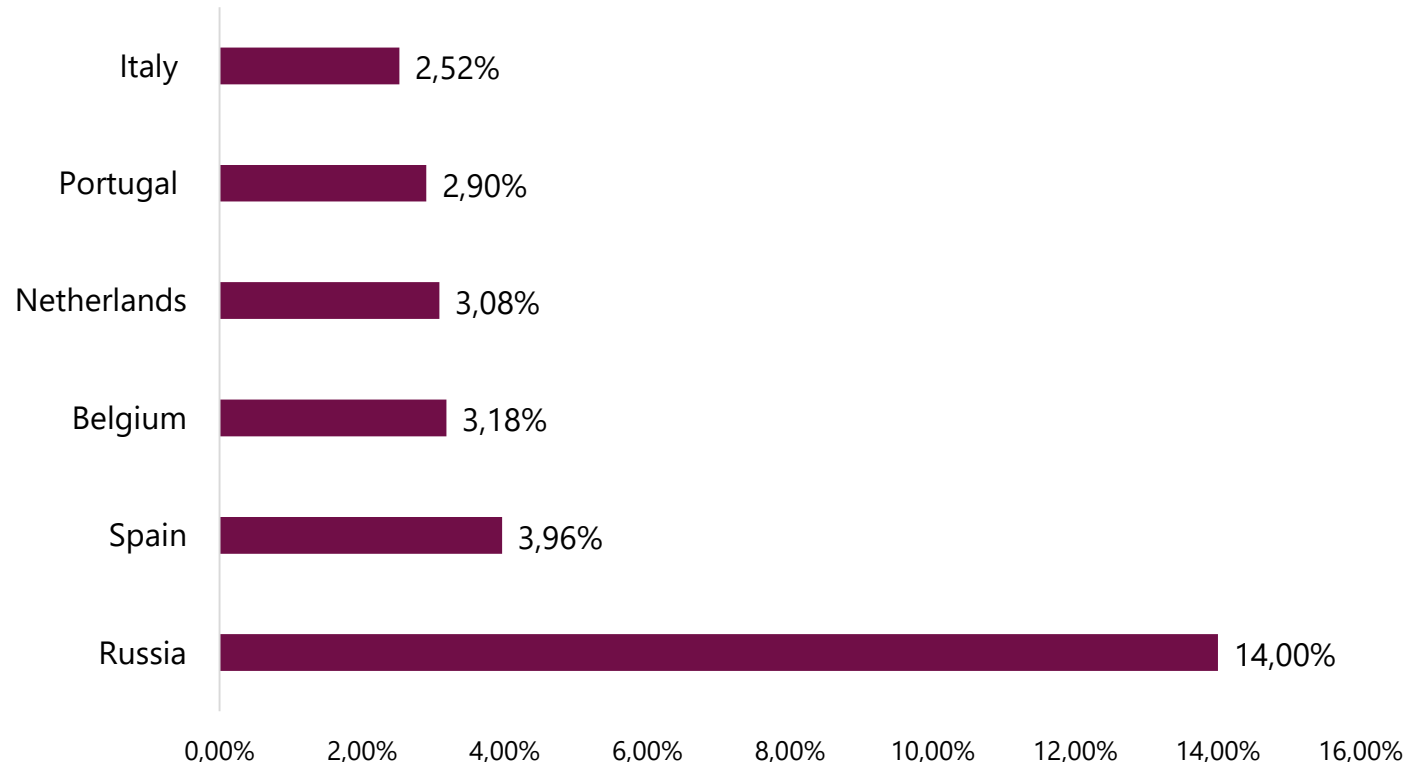
- A detailed analysis of the dependence of the quality of debt service on the parameters of the loan, borrower and collateral will allow banks to identify **borrower baskets with the best characteristics**, which in quality will not be inferior to European counterparts.

- Banks will be able to adapt the conditions for issuing and servicing loans for the most reliable and competitive SMEs through a selective approach, which will lead to selective **reduction in interest rates.**

- an increase in the volume of securitization of loans to SMEs using in-depth expertise and a wide statistical base will help **bring the percentage margin in Russia closer to the levels observed in Europe.**

Based on the assumptions about the average parameters of loans in the segments of micro, small and medium-sized businesses in terms of the amount and term of issue, the budget savings for the entire sample of "strong" SMEs may amount to about 63.8 billion rubles.

ACRA

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Additional information:

www.acra-ratings.com/trainings

- ✓ **Forecasting in credit analysis. Course 2: practical aspects of economic modeling**
  (Open for enrollment, April 7-8, 2020)

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  (Open for enrollment, April 23-24, 2020)

- ✓ **Fundamentals of structured finance deals analysis**
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- ✓ **Fundamentals of credit analysis of regional and municipal authorities**
  (Open for enrollment, October 12-13, 2020)

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  (Open for enrollment, October 14-15, 2020)

- ✓ **Fundamentals of credit analysis of banks and non-banking credit institutions**
  (Open for enrollment, November 12-13, 2020)

- ✓ ACRA's mission is to **develop the best practices in the Russian financial market**

- ✓ The Agency has **unique professional experience** and in-depth understanding of credit risk

- ✓ ACRA's training sessions are aimed at **enhancing the efficiency of the management and investment decisions** made by market participants

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