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Mapping of Creditreform Rating AG's credit assessments under the Standardised Approach

1. Executive summary

1. This report describes the mapping exercise carried out by the Joint Committee to determine the 'mapping'¹ of the credit assessments of Creditreform Ratings AG (Creditreform).
2. The methodology applied to produce the mapping is the one specified in the Implementing Technical Standards on the mapping of ECAIs' credit assessments under Article 136(1) and (3) of Regulation (EU) No 575/2013 (Capital Requirements Regulation – CRR). These ITS employ a combination of the provisions laid down in Article 136(2) of Regulation (EU) No 575/2013.
3. The mapping neither constitutes the one which ESMA shall report on in accordance with Article 21(4b) of Regulation (EC) No 1060/2009 (Credit Rating Agencies Regulation - CRA) with the objective of allowing investors to easily compare all credit ratings that exist with regard to a specific rated entity² nor should be understood as a comparison of the rating methodologies of Creditreform with those of other ECAIs. This mapping should however be interpreted as the correspondence of the rating categories of Creditreform with a regulatory scale which has been defined for prudential purposes. This implies that an appropriate degree of prudence may have been applied wherever not sufficient evidence has been found with regard to the degree of risk underlying the credit assessments.
4. As described in Recital 12 of the Implementing Technical Standards on the mapping of ECAIs' credit assessments under Article 136(1) and (3) of Regulation (EU) No 575/2013, in order to avoid causing undue material disadvantage on those ECAIs which, due to their more recent entrance in the market, present limited quantitative information, with the view to balancing prudential with market concerns, two mappings apply for these ECAIs, with the first mapping for a limited period of three years. Both mappings should take into account quantitative and qualitative factors. Compared to the second mapping, the quantitative factors for deriving the first mapping should be relaxed. This solution would allow ECAIs which present limited

¹ According to Article 136(1), the 'mapping' is the correspondence between the credit assessments of and ECAI and the credit quality steps set out in Regulation (EU) No 575/2013 (Capital Requirements Regulation – CRR).

² In this regard please consider http://www.esma.europa.eu/system/files/esma__2015-1473_report_on_the_possibility_of_establishing_one_or_more_mapping....pdf.

quantitative information to enter the market and would positively stimulate them to collect a sufficient number of quantitative information.

5. In accordance with the previous paragraph for a subset of ECAs two mappings are applicable, one applicable until 31.12.2018 and one applicable from 01.01.2019. Creditreform belongs to the subset of ECAs that are provided two mappings. Updates to the mapping should be made whenever this becomes necessary, including in relation to the mapping to be applied after the three years, to reflect quantitative information collected during the three year-period. Nevertheless, in the absence of such a review, for the ECAs that are provided two mappings the one applicable from 01.01.2019 shall operate after the three years phase-in period.
6. The resulting mapping tables have been specified in Annex III of the Implementing Technical Standards on the mapping of ECAs' credit assessments under Article 136(1) and (3) of Regulation (EU) No 575/2013. Figure 1 below shows the result for the main Creditreform rating scale, displaying the mapping applicable until 31.12.2018 and the one applicable starting from 01.01.2019.

Figure 1: Mapping of Creditreform's Long-term rating scale

Credit assessment	Credit quality step Applicable until 31.12.2018	Credit quality step Applicable from 01.01.2019
AAA	1	2
AA	1	2
A	2	2
BBB	3	3
BB	4	4
B	5	5
C	6	6
D	6	6

2. Introduction

7. This report describes the mapping exercise carried out by the Joint Committee (JC) to determine the 'mapping' of the credit assessments of Creditreform Ratings AG (Creditreform).
8. Creditreform is a credit rating agency that has been registered with ESMA in 18 May 2011 and therefore meets the conditions to be an eligible credit assessment institution (ECAI)³. Creditreform group (founded in 1879) is a provider of b2b business information in Germany and Europe.⁴
9. The methodology applied to produce the mapping is the one specified in the Implementing Technical Standards on the mapping of ECAIs' credit assessments under Article 136(1) and (3) of Regulation (EU) No 575/2013 (Capital Requirements Regulation – CRR). These ITS employ a combination of the provisions laid down in Article 136(2) of Regulation (EU) No 575/2013. The information base used to produce the mapping is the same that has been employed when performing the first mapping proposal which was disclosed during the consultation period to these ITS. Two sources of information have been used. Firstly, the quantitative and qualitative information available in ESMA Central Repository (CEREP⁵) has been used to obtain an overview of the main characteristics of this ECAI and an initial estimate of the default rates of its credit assessments. Secondly, since the available data in CEREP for Creditreform is scarce, specific information has also been directly requested to the ECAI for the purpose of the mapping, especially the list of relevant credit assessments and detailed information regarding the default definition.
10. The following sections describe the rationale underlying the mapping exercise carried out by the Joint Committee (JC) to determine the mappings for both the applicable time periods. With respect to the quantitative requirements used to perform the mappings, in case of ECAIs for which limited quantitative information is available the same methodology has been applied across the two applicable time periods, although with two different levels of prudence. Section 3 describes the Creditreform rating scale for the purpose of the mapping. Section 4 contains the methodology applied to derive the mapping of Creditreform's ratings scale. The mapping table is shown in Appendix 4 of this document and have been specified in Annex III of the Implementing Technical Standards on the mapping of ECAIs' credit assessments under Article 136(1) and (3) of Regulation (EU) No 575/2013.

³ It is important to note that the mapping does not contain any assessment of the registration process of Creditreform carried out by ESMA.

⁴ Creditreform

⁵ CEREP is the central repository owned by ESMA to which all registered/certified CRAs have to report their credit assessments. <http://cerp.esma.europa.eu/cerp-web/>.

3. Creditreform credit ratings and rating scales

11. Creditreform produces two types of credit ratings, which may be used by institutions for the calculation of risk weights under the Standardised Approach (SA)⁶, as shown in column 2 of Figure 2 in Appendix 1:

- **Corporate long-term rating**, defined as an evaluation of the creditworthiness of a corporate. The rating is an opinion of the probability of the comprehensive and timely servicing of outstanding debt.
- **Covered bond long-term rating**, defined as the assessment of covered bonds. The rating is based on the corporate rating of the issuer. In addition, the specific issuing terms are considered.

12. Creditreform assigns these credit ratings to one single rating scale as illustrated in column 3 of Figure 2 in Appendix 1. The specification of this rating scale is described in Figure 3 of Appendix 1. Therefore, a specific mapping has been prepared for the Creditreform Long-term rating scales.

13. The mapping of the Creditreform Long-term rating scale is explained in Section 4 and it has been derived in accordance with the quantitative factors, qualitative factors and benchmarks specified in the ITS.

4. Mapping of Creditreform's Long-term rating scale

14. The mapping of the Long-term rating scale has consisted of two differentiated stages where the quantitative and qualitative factors as well as the benchmarks specified in Article 136(2) CRR have been taken into account.

15. In the first stage, the quantitative factors referred to in Article 1 of the ITS have been taken into account to differentiate between the levels of risk of each rating category. The *long run default rate* of a rating category has been calculated in accordance with Article 6 of the ITS, as the number of credit ratings cannot be considered to be sufficient.

16. In a second stage, the qualitative factors proposed in Article 7 of the ITS have been considered to challenge the result of the previous stage, especially in those ratings categories where less default data has been available.

4.1. Initial mapping based on the quantitative factors

4.1.1. Calculation of the long-run default rates

⁶ As explained in recital 4 ITS, Article 4(1) CRA allows the use of the credit assessments for the determination of the risk-weighted exposure amounts as specified in Article 113(1) CRR as long as they meet the definition of credit rating in Article 3(1)(a) CRA.

17. The information contained in CEREP on public ratings and default data, shown in Figure 4 and Figure 5 in Appendix 3, cannot be considered sufficient for the calculation of the short and long run default rates specified in the Articles 3 – 5 of the ITS since the number of rated items is below the required minimum. As a result, the allocation of the CQS has been made in accordance with Article 6 of the ITS, as shown in Figure 6 and Figure 7 of Appendix 3.
18. The long run default rate benchmark associated with the equivalent category in the international rating scale is a key qualitative factor that has been used for the mapping proposal.
19. For D rating category, no allocation has been made based on this methodology since it already reflects a 'default' situation.
20. As default information is available also after withdrawal, the ratings were weighted at 100%. Ratings for which no data was available for certain periods (gaps in the timeseries) were treated as withdrawn ratings and have been weighted by 50% as indicated in Article 4(3) of the ITS.
21. The default definition applied by Creditreform, described in Appendix 2, has been used for the calculation of default rates. Further details on the definition of default are provided in section 4.2.2 where qualitative factors are analyzed.

4.1.2. Mapping proposal based on the long run default rate

22. As illustrated in the second column of Figure 14 and Figure 15 in Appendix 4, the assignment of the rating categories to credit quality steps has been initially made in accordance with Article 6 of the ITS. Therefore, the numbers of defaulted and non-defaulted rated items have been used together with the prior expectation of the equivalent rating category of the international rating scale. The results are specified in Figure 6 and Figure 7 of Appendix 3.

Mapping Tables applicable until 31.12.2018:

- **AAA/AA/A/BBB/BB/B:** the number of rated items in each of these categories is equal or larger than the respective minimum required number of observed items given the number of defaulted items in the rating category. Thus the credit quality steps associated with the AAA/AA, A, BBB, BB, B rating categories in the international rating scale (CQS 1, CQS 2, CQS 3, CQS 4 and CQS 5 respectively) can be assigned.
- **C:** since the CQS associated with the equivalent rating category of the international rating scale is 6, the proposed mapping for these rating categories is also CQS 6.

Mapping Tables applicable starting from 01.01.2019:

- **AAA/AA/B:** the number of rated items in these categories is below the minimum required number of observed items so that the credit quality step associated with the AAA/AA and B rating categories in the international rating scale (CQS 1 and CQS 5 respectively) cannot

be assigned. Therefore, the proposed credit quality steps for these rating categories are CQS 2 and CQS 6 respectively.

- **A/BBB/BB:** the number of rated items in each of these categories is equal or larger than the respective minimum required number of observed items given the number of defaulted items in the rating category. Thus the credit quality steps associated with the A, BBB and BB rating categories in the international rating scale (CQS 2, CQS 3 and CQS 4 respectively) can be assigned.
- **C:** since the CQS associated with the equivalent rating category of the international rating scale is 6, the proposed mapping for these rating categories is also CQS 6.

4.2. Final mapping after review of the qualitative factors

23. The qualitative factors specified in Article 7 of the ITS have been used to challenge the mapping proposed by the default rate calculation. Qualitative factors acquire more importance in the rating categories where quantitative evidence is not sufficient to test the default behavior⁷, as it is the case for all rating categories of Creditreform's Long-term rating scale.

4.2.1. Public and private ratings

24. Creditreform assigns also **private ratings**, which cannot be used for the mapping based on quantitative factors. However private ratings can represent a different measure of creditworthiness that can be used for mapping purposes as a qualitative factor to provide further guidance on the default behavior of the Creditreform rated items in accordance with Article 11(2) of the ITS.

25. Figure 8 and Figure 9 of Annex 2 show the number of rated items and defaulted items for the combined private and public ratings. The weighted 3-year default rate has been calculated for each rating category based on the combined private and public ratings. The results are shown in Figure 10 and Figure 11 in Appendix 3.

Mapping Tables applicable until 31.12.2018:

- **AAA/AA/A/BBB/BB/B:** The default rates of the combined private and public ratings sample confirms the mapping for AAA/AA, A, BBB, BB and B suggested by the quantitative factors (CQS 1, CQS 2, CQS 3, CQS 4 and CQS 5 respectively).
- **C:** Since the CQS associated with the equivalent rating category of the international rating scale is 6, the proposed mapping for these rating categories is also CQS 6.

Mapping Tables applicable starting from 01.01.2019:

⁷ The default behavior of a rating category is considered to be properly tested if the quantitative factors for that rating category are calculated under Articles 3 – 5 ITS.

- **AAA/AA/A/BBB/BB:** The default rates of the combined private and public ratings sample confirms the mapping for AAA/AA, A, BBB and BB suggested by the quantitative factors (CQS 2, CQS 2, CQS 3 and CQS 4 respectively).
- **B:** The default rates of the combined private and public ratings sample suggest a more favourable mapping for B (CQS 5 instead of CQS 6).
- **C:** Since the CQS associated with the equivalent rating category of the international rating scale is 6, the proposed mapping for these rating categories is also CQS 6.

4.2.2. Other qualitative factors

26.The **definition of default** applied by Creditreform and used for the calculation of the quantitative factors has been analysed:

- The types of default events considered are shown in Appendix 2 and are the ones specified in Article 4(4) of the ITS. According to the definition, rating category D is consistent with letters (a), (b), (c) and (d) of the benchmark definition.
- Only defaults relating to bankruptcies have been observed in Creditreform's rating history.

27.Since only defaults relating to bankruptcies have been observed in Creditreform's rating history, the mapping has been reviewed. In order to account for other types of default in addition to bankruptcies, monitoring data provided by Creditreform was used. The monitoring data identifies the risk level of each observation using the following classes: very low risk and low risk (no negative information), medium risk level (first indicators for worsening of the payment behavior), high risk level (indicators for negative payment behaviour and default), Default (hard default). Based on this classification a new extended default definition could be constructed that includes both hard defaults and the high risk level category, which corresponds to the Basel II definition of default, which is stricter than the definition of default applied in the ITS.⁸

28.In case of the Mapping Tables applicable until 31.12.2018, by using the extended default definition, when public ratings are considered, the results confirm the ones based on the quantitative factors for rating categories AAA/AA, A, BBB, B and C as shown in Figure 12. For BB rating category, this suggests a worse mapping compared to the mapping based on the quantitative factor (CQS 5 instead of CQS 4), as this rating category has only 10 observed rated items, well below the 38 required. However, when the combined public and private ratings are

⁸ A company is included in high risk level class if it is in delay of more than 90 days and/or it is expected that receivables will not be collected. The payment behaviour indicators is one of the following: delays of more than 90 days and/or expectation that receivables will not be collected Significant delays in payment (46 to 90 days) and expectation for further delays; significant delays in payment, attempts to negotiate a settlement; significant delays in payment, massive payment difficulties (more than 90 days); significant delays in payment, (repeated) involvement of debt collection service (source: Creditreform)

considered, the results confirm the mapping based on the quantitative factors for all rating categories, thus reinforcing the proposed mapping.

29. In case of the Mapping Tables applicable starting from 01.01.2019, by using the extended default definition, when public ratings are considered, the results confirm the ones based on the quantitative factors for rating categories AAA/AA, A, BBB, B and C as shown in Figure 13. For BB rating category, this suggests a worse mapping compared to the mapping based on the quantitative factor (CQS 5 instead of CQS 4), as this rating category has only 10 observed rated items, well below the 43 required. However, when the combined public and private ratings are considered, the results confirm the ones based on the quantitative factors for rating categories AAA/AA, A, BBB, BB and C. For B rating category, this factor suggests a better mapping compared to the mapping suggested by quantitative factors (CQS 5 instead of CQS 6), since the number of rated items is 45, which is above 42 required.
30. Overall, in case of the Mapping Tables applicable starting from 01.01.2019, after reviewing the mapping based on the adjusted and extended definitions of default, the following changes to the initial mapping are proposed:
- For **BB** rating category, CQS4 is suggested when the pool of both public and private ratings are used, as the pool of rated items is 116, above the required minimum, even when the extended more conservative definition of default is applied. Therefore, keeping the CQS 4 suggested by the initial quantitative mapping is proposed.
 - For **B** rating category, there are no public ratings in this category, which would normally suggest CQS 6. However, when the combined public and private ratings are considered, the suggested mapping is still representative of CQS 5 even with the stricter extended default definition.
31. Regarding the **meaning and relative position** of the credit assessments, in case of the Mapping Tables applicable starting from 01.01.2019, it suggests a more favourable mapping for AAA and AA rating categories. However, the absence of empirical evidence does not allow a significant use of this factor to modify any of the proposed mappings. In the case of BB and B rating categories, where the mapping was less clear, the meaning and relative position confirms the initial mapping of BB to CQS 4 and suggest a more favourable step for B (CQS 5 instead of CQS 6). In the case of the D rating category, its meaning is consistent with the one of CQS 6 stated in Annex II ITS.
32. Regarding the **time horizon** reflected by the rating category, Creditreform's rating methodology focuses on the long-term. Although this cannot be further supported by transition probabilities due to the low number of ratings, no change is proposed to the mapping.
33. Finally, it should be highlighted the use of the long run default rate benchmark associated with the equivalent category in the international rating scale as the **estimate of the long run**

default rate for the calculation of the quantitative factor of all rating categories under Article 6 of the ITS.

Appendix 1: Credit ratings and rating scales

Figure 2: Creditreform's relevant credit ratings and rating scales

SA exposure classes	Name of credit rating	Credit rating scale
Long-term ratings		
Corporates	Corporate long-term rating	Long-term rating scale
	Covered bond long-term rating	Long-term rating scale
Covered bonds	Covered bond long-term rating	Long-term rating scale

Source: Creditreform

Figure 3: Long-term rating scale

Credit assessment	Meaning of the credit assessment
AAA	Best rating, lowest risk for investors
AA	Very good rating, very low risk for investors
A	Good rating, low risk for investors
BBB	Highly satisfactory rating, low to medium risk for investors
BB	Satisfactory rating, medium risk for investors
B	Adequate rating, higher risk for investors
C	Barely adequate rating, high to very high risk for investors
D	Insufficient rating, insolvency, negative characteristics

Source: Creditreform

Appendix 2: Definition of default

A default event for a certain enterprise or issuer is given when at least one of the following has occurred:

- Creditreform Rating AG assumes that the enterprise / issuer will, with a high degree of probability, no longer be able to meet his payment obligations without the investors / banks having to use the collateral provided.
- At least one major payment obligation of the enterprise / issuer to the investors / banks has been overdue for more than 90 days. Obligations become overdue when the enterprise / issuer has reached and breached the payment limit.

Indications of impending insolvency include (but are not limited to) the following:

- Investors / banks defer interest payments.
- Investors / banks are selling the loan obligations at a price significantly below their nominal value.
- Investors / banks agree to an inevitable debt restructuring plan that results in a reduction of the payable amount (through write-offs or deferrals).
- Investors / banks have filed for the opening of insolvency proceedings or taken a similar step (in reference to the credit obligation).
- The entrepreneur / the issuer himself has filed for insolvency.
- According to a Creditreform credit report, the Index of Financial Standing of the company / the issuer in question has been marked down to 600 (= insolvency).

Source: Creditreform

Appendix 3: Default rates of each rating category

Figure 4: Number of rated items

Date	AAA	AA	A	BBB	BB	B	C
01/01/2001		1					
01/07/2001		2	1				
01/01/2002		1	1				
01/07/2002							
01/01/2003			2		1		
01/07/2003			2		1		
01/01/2004			2	1	1		
01/07/2004			2	1	1		
01/01/2005			1	3			
01/07/2005			2	3			
01/01/2006			2	1			
01/07/2006			1	1			
01/01/2007			2	1			
01/07/2007			2	1			
01/01/2008			3	2	2		
01/07/2008			5	2	2		
01/01/2009			4	2	1		
01/07/2009			3	2	1		
01/01/2010			2				
01/07/2010			2				

Source: Joint Committee calculations based on CEREP data and data provided by CreditReform

Figure 5: Number of defaulted rated items

Date	AAA	AA	A	BBB	BB	B	C
01/01/2001		0					
01/07/2001		0	0				
01/01/2002		0	0				
01/07/2002							
01/01/2003			0		0		
01/07/2003			0		0		
01/01/2004			0	0	0		
01/07/2004			0	0	0		
01/01/2005			0	0			
01/07/2005			0	0			
01/01/2006			0	0			
01/07/2006			0	0			
01/01/2007			0	0			
01/07/2007			0	0			
01/01/2008			0	0	0		
01/07/2008			0	0	0		
01/01/2009			0	0	0		
01/07/2009			0	0	0		
01/01/2010			0				
01/07/2010			0				

Source: Joint Committee calculations based on CEREP data and data provided by CreditReform

Figure 6: Mapping proposal for rating categories with a non-sufficient number of credit ratings, applicable until 31.12.2018

	AAA/AA	A	BBB	BB	B	C
CQS of equivalent international rating category	CQS 1	CQS 2	CQS 3	CQS 4	CQS5	CQS 6
N. observed defaulted items	0	0	0	0	0	0
Minimum N. rated items	0	0	0	0	0	n.a.
Observed N. rated items	4	39	20	10	0	0
Mapping proposal	CQS 1	CQS 2	CQS 3	CQS 4	CQS 5	CQS 6

Source: Joint Committee calculations based on CEREP data and data provided by CreditReform

Figure 7: Mapping proposal for rating categories with a non-sufficient number of credit ratings, applicable starting from 01.01.2019

	AAA/AA	A	BBB	BB	B	C
CQS of equivalent international rating category	CQS 1	CQS 2	CQS 3	CQS 4	CQS5	CQS 6
N. observed defaulted items	0	0	0	0	0	0
Minimum N. rated items	496	0	0	10	5	n.a.
Observed N. rated items	4	39	20	10	0	0
Mapping proposal	CQS 2	CQS 2	CQS 3	CQS 4	CQS 6	CQS 6

Source: Joint Committee calculations based on CEREP data and data provided by CreditReform

Figure 8: Public and private ratings: Number of rated items

Date	AAA	AA	A	BBB	BB	B	C
01/01/2001		1	1	3		2	
01/07/2001		2	2	11	2	2	
01/01/2002		1	2	14	5	4	3
01/07/2002			2	10	7	6	3
01/01/2003			5	7	12	6	2
01/07/2003			4	5	13	5	3
01/01/2004			5	7	14	6	1
01/07/2004			8	8	10	4	
01/01/2005		1	7	9	4	1	
01/07/2005		1	6	10	5	1	
01/01/2006			3	7	4		
01/07/2006			2	6	5		
01/01/2007			3	5	6	1	
01/07/2007			4	6	4	2	
01/01/2008			6	11	5	2	
01/07/2008			7	9	6	1	
01/01/2009			6	3	5	1	
01/07/2009			6	4	6	1	
01/01/2010			3	2	3		
01/07/2010			2				

Source: Joint Committee calculations based on CEREP data and data provided by CreditReform

Figure 9: Public and private ratings: Number of defaulted rated items

Date	AAA	AA	A	BBB	BB	B	C
01/01/2001		0	0	0		1	
01/07/2001		0	0	1	0	1	
01/01/2002		0	0	1	0	1	0
01/07/2002			0	0	0	2	0
01/01/2003			0	0	0	1	1
01/07/2003			0	0	0	0	1
01/01/2004			0	0	1	1	0
01/07/2004			0	0	1	1	
01/01/2005	0	0	0	0	0	0	
01/07/2005	0	0	0	0	0	0	
01/01/2006			0	0	1		
01/07/2006			0	0	1		
01/01/2007			0	0	0	0	
01/07/2007			0	0	0	0	
01/01/2008			0	0	0	0	
01/07/2008			0	0	0	0	
01/01/2009			0	0	0	0	
01/07/2009			0	0	0	0	
01/01/2010			0	0	0		
01/07/2010			0				

Source: Joint Committee calculations based on CEREP data and data provided by CreditReform

Figure 10: Mapping proposal for rating categories of combined public and private ratings with a non-sufficient number of credit ratings, applicable until 31.12.2018

	AAA/AA	A	BBB	BB	B	C
CQS of equivalent international rating category	CQS 1	CQS 2	CQS 3	CQS 4	CQS5	CQS 6
N. observed defaulted items	0	0	2	4	8	2
Minimum N. rated items	0	0	0	38	32	n.a.
Observed N. rated items	6	84	137	116	45	12
Mapping proposal	CQS 1	CQS 2	CQS 3	CQS 4	CQS 5	CQS 6

Source: Joint Committee calculations based on CEREP data and data provided by CreditReform

Figure 11: Mapping proposal for rating categories of combined public and private ratings with a non-sufficient number of credit ratings, applicable starting from 01.01.2019

	AAA/AA	A	BBB	BB	B	C
CQS of equivalent international rating category	CQS 1	CQS 2	CQS 3	CQS 4	CQS5	CQS 6
N. observed defaulted items	0	0	2	4	8	2
Minimum N. rated items	496	0	29	43	33	n.a.
Observed N. rated items	6	84	137	116	45	12
Mapping proposal	CQS 2	CQS 2	CQS 3	CQS 4	CQS 5	CQS 6

Source: Joint Committee calculations based on CEREP data and data provided by CreditReform

Figure 12: Mapping proposal for rating categories with a non-sufficient number of credit ratings using the extended default definition, applicable until 31.12.2018

Public ratings

	AAA/AA	A	BBB	BB	B	C
CQS of equivalent international rating category	CQS 1	CQS 2	CQS 3	CQS 4	CQS5	CQS 6
N. observed defaulted items	0	0	0	4	0	0
Minimum N. rated items	0	0	0	38	0	n.a.
Observed N. rated items	4	39	20	10	0	0
Mapping proposal	CQS 1	CQS 2	CQS 3	CQS 5	CQS 5	CQS 6

Source: Joint Committee calculations based on CEREP data and data provided by CreditReform

Combined public and private ratings

	AAA/AA	A	BBB	BB	B	C
CQS of equivalent international rating category	CQS 1	CQS 2	CQS 3	CQS 4	CQS5	CQS 6
N. observed defaulted items	0	0	2	12	11	2
Minimum N. rated items	0	0	0	107	42	n.a.
Observed N. rated items	6	84	137	116	45	12
Mapping proposal	CQS 1	CQS 2	CQS 3	CQS 4	CQS 5	CQS 6

Source: Joint Committee calculations based on CEREP data and data provided by CreditReform

Figure 13: Mapping proposal for rating categories with a non-sufficient number of credit ratings using the extended default definition, applicable starting from 01.01.2019

Public ratings

	AAA/AA	A	BBB	BB	B	C
CQS of equivalent international rating category	CQS 1	CQS 2	CQS 3	CQS 4	CQS5	CQS 6
N. observed defaulted items	0	0	0	4	0	0
Minimum N. rated items	496	0	0	43	5	n.a.
Observed N. rated items	4	39	20	10	0	0
Mapping proposal	CQS 2	CQS 2	CQS 3	CQS 5	CQS 6	CQS 6

Source: Joint Committee calculations based on CEREP data and data provided by CreditReform

Combined public and private ratings

	AAA/AA	A	BBB	BB	B	C
CQS of equivalent international rating category	CQS 1	CQS 2	CQS 3	CQS 4	CQS5	CQS 6
N. observed defaulted items	0	0	2	12	11	2
Minimum N. rated items	496	0	29	111	42	n.a.
Observed N. rated items	6	84	137	116	45	12
Mapping proposal	CQS 2	CQS 2	CQS 3	CQS 4	CQS 5	CQS 6

Source: Joint Committee calculations based on CEREP data and data provided by CreditReform

Appendix 4: Mappings of each rating scale

Figure 14: Mapping of Creditreform's Long-term rating scale, applicable until 31.12.2018

Credit assessment	Initial mapping <i>based on LR</i> <i>DR</i> (CQS)	Review <i>based on SR</i> <i>DR</i> (CQS)	Final review <i>based on</i> <i>qualitative</i> <i>factors</i> (CQS)	Main reason for the mapping
AAA	1	n.a.	1	The quantitative factors are representative of the final CQS.
AA	1	n.a.	1	
A	2	n.a.	2	The quantitative factors are representative of the final CQS.
BBB	3	n.a.	3	The quantitative factors are representative of the final CQS.
BB	4	n.a.	4	The quantitative factors are representative of the final CQS.
B	5	n.a.	5	The quantitative factors are representative of the final CQS.
C	6	n.a.	6	The quantitative factors are representative of the final CQS.
D	n.a.	n.a.	6	The meaning and relative position of the rating category is representative of the final CQS.

Figure 15: Mapping of Creditreform's Long-term rating scale, applicable starting from 01.01.2019

Credit assessment	Initial mapping based on LR DR (CQS)	Review based on SR DR (CQS)	Final review based on qualitative factors (CQS)	Main reason for the mapping
AAA	2	n.a.	2	The quantitative factors are representative of the final CQS.
AA	2	n.a.	2	
A	2	n.a.	2	The quantitative factors are representative of the final CQS.
BBB	3	n.a.	3	The quantitative factors are representative of the final CQS.
BB	4	n.a.	4	The quantitative factors are representative of the final CQS.
B	6	n.a.	5	The quantitative suggest CQS 6. Due to qualitative analysis of the combined public and private ratings and the definition of default, CQS 5 is assigned.
C	6	n.a.	6	The quantitative factors are representative of the final CQS.
D	n.a.	n.a.	6	The meaning and relative position of the rating category is representative of the final CQS.