



Credit
Rating
Agency

Procedures and Methodologies

Exhibit 2

TABLE OF CONTENTS

1. Procedures
2. Ratings Scales
3. Methodologies



1. PROCEDURES

A. Initiation of Credit Ratings

The credit rating process begins following an initial contact from the Business Development Department with the entity or the issuer by sending sales materials, which include a corporate presentation and general datasheet. HR Ratings then sends an economic proposal, engagement letter or proposed service agreement, with the list of information required as part of the rating process.

A service agreement or the appropriate legal instrument is then finalized and sent to the entity or issuer, together with the Code of Conduct. The entity or issuer and the HR Ratings Business Development Director executes the service agreement or appropriate legal instrument, and the contractual legal relationship with the entity or issuer is formalized.

HR Ratings may issue unsolicited ratings, for which HR Ratings does not receive any payment and may or not may sign a service agreement, engagement letter or legal instrument. Where applicable, an NDA will be signed. Unsolicited ratings will be prepared according to the same methodologies as requested ratings and will follow the same rating process, accordingly. HR Ratings will also do the surveillance of unsolicited ratings and may withdraw an unsolicited rating at any time.

The Business Development Director and the entity or issuer designate the individuals authorized to send and receive information throughout the course of the rating process. The initial contact information is entered in HR's internal electronic system.

HR Ratings' internal control procedures determine the sufficiency of the information to be used to assign the rating. This information must be generated and provided by trustworthy sources.

Public and private information from parties other than the issuer is also used as part of the credit rating process. Depending on the reliability of the source, HR Ratings reserves the right to evaluate third party information. Information derived from official governmental sources is presumed to be valid. HR Ratings uses all information available at the time of analysis, including available public information that is relevant to the specific rating, as well as non-public information, consistent with regulatory norms.

B. Rating Process

HR Ratings' analysis begins with the assignment of the Area Director or the Lead Analyst by the Operations Department. The other analysts, who are secondarily responsible for the project, assist in the rating process. The Lead Analyst, together with any secondary analysts, comprise the "analysis team." The Operations Department will consider the log of potential conflicts of interest maintained on HR Ratings' internal electronic system for the assignment.

The Area Director and / or Lead Analyst, and any secondary analysts, are responsible for conducting the entire analysis, as well as the presentation to the Credit Analysis Committee, including preparation of all supporting documents such as the: (i) analysis report (or press release when there is no analysis report), (ii) if applicable, the rating letter, technical note, legal opinion, datasheet for the influential rating, Information Disclosure Form (17g-7 Form); (iii) number and type of model use and minutes of the previous Credit Analysis Committee regarding the entity, issuer or operation in question. These documents are referred to jointly as the Credit Analysis Committee Package.

When the rating considers influential ratings assigned by other rating agencies, the analysis team monitors these influential ratings weekly. For the purposes of the above, each area of the Credit Analysis Department maintains the current datasheet corresponding to the information for the influential rating in question by the last business day of each week.

In the event of any questions or issues regarding the operation of the analysis team, a meeting is arranged with the Chief Credit Officer and Area Director to clarify any questions before the presentation of the Credit Analysis Committee packet to

the Credit Analysis Committee. The Credit Analysis Committee Package is then distributed to all committee members at least twelve (12) hours in advance of the Credit Analysis Committee review, and can be distributed, if necessary, in a shorter period when so required by the analysis team.

The following steps are followed for each rating by the assigned analyst:

1. The analyst receives the assignment to begin the rating process and proceeds to gather available public and private information on the issuer and/or offering.
2. The analyst sends the issuer an email request for information covering the following topics:
 - Financial information
 - Business, market and general relevant economic information
 - Institutional framework
 - Characteristics of the offering (if applicable)
3. If applicable and in accordance with the methodology, the analyst schedules a visit, videocall or virtual meeting, with the entity or issuer to understand the specific characteristics of the issuer, operation and/or offering. The analyst may request further information depending on the complexity of the entity or operation.
4. Based on this information, model and methodology, the analyst prepares an evaluation and analysis of the credit strengths and payment capacities of both the issuer and/or offering; and,
5. The analyst prepares the presentation for the Credit Analysis Committee including all supporting documents in the Credit Analysis Committee Package.

C. Credit Analysis Committee Structure and Voting Process

i. Quorum

In accordance with the HR Ratings General Operations Plan, the Credit Analysis Committee will meet whenever:

- When a rating action is required;
- When any relevant event occurs that could impact a current rating; or
- When an opinion is to be issued on any industry sector, the meeting of the Credit Analysis Committee will be optional, provided the Chief Credit Officer has given his approval.

The following people sit in the Analysis Committee, given in voting order:

- Analysis Manager
- Analysis Director
- Analysis Executive Director
- Chief Credit Officer (“CCO”)
- Where appropriate, the Chief Officer of Economic Analysis

Prior to each Credit Analysis Committee meeting, the members of the Committee will certify, through the Company’s internal electronic system, that they have no conflict of interest with the entity or issuer. The internal electronic system will also copy the Compliance Officer if there is a conflict of interest reported on the system.

The Committee will meet with a quorum of at least 4 members, and committees may meet simultaneously with different agendas.

A member of the Credit Analysis Committee may not participate in more than 4 (four) committee meetings on the same



day for unsecured or structured initial ratings or annual reviews, unless they participate as Lead Analysts and/or Area Directors, or in the case of Committee meetings to determine ratings for entities belonging to the same control group, consortium and/or related entities.

ii. Voting Process

Decisions are taken by an absolute majority, meaning, by the vote in the same direction of half of the Credit Analysis Committee, plus one, present at the meeting. Unless the lead analyst is a member of the Credit Analysis Committee, the Lead Analyst only has a “voice”, but no vote.

The Credit Analysis Committee reviews and discusses the proposed rating and upon reaching a conclusion, the Credit Analysis Committee issues a rating and once the rating has been given, the Lead Analyst notifies the issuer of the decision reached by the Credit Analysis Committee, the same day as the rating was assigned. Under no circumstance will the entity or issuer receive any prior notice as to the possible outcome of the rating process. Rather, the entity or issuer will receive notification only when the Credit Analysis Committee has issued its official opinion.

If the issuer agrees, then HR Ratings proceeds with the publication of the rating. The issuer has up to two (2) business days after receiving the rating report to state what it deems appropriate regarding the report and, if applicable, deliver any additional relevant documentation to be analyzed and evaluated by the Credit Analysis Committee. If there is no response from the issuer within these two (2) business days, HR Ratings will publish the rating the next business day.

During this time, the entity or issuer may indicate whether the rating will be held private or made public. The ratings on securities registered or intended to be registered in the National Securities Register in Mexico will always be made public, as well as any modifications, ratifications or withdrawals of these ratings.

D. Rotation policy for the participants in the rating procedures and Credit Analysis Committee

The Lead Analyst responsible for the development and, where appropriate, monitoring of the rating process, cannot be involved with an entity or companies within the group to which that client belongs, for more than a five (5) year period since its first participation in the initial rating or monitoring with respect to that entity. Such analysts may resume these functions only after a minimum one (1) year period. A substitute analyst will be used, if necessary, in the fourth year.

Moreover, the analyst responsible for the development and, where appropriate, monitoring of the rating process, cannot be involved with an entity or companies within the group to which that client belongs, for more than a five (5) year period, since its first participation in the initial rating or monitoring with respect to that client. Such analysts may resume these functions only after a minimum one (1) year period.

In the case of the member of the Credit Analysis Committee responsible for the approval of the credit rating with respect to an entity or companies within the group to which that client belongs, such committee should rotate at least on a seven (7) year basis, returning after a minimum one-year break. To this end, HR Ratings rotates at least half of the members of each committee during this timeframe.

E. Surveillance and Monitoring

Monitoring refers to periodical internal rating reviews, depending on the entity, issuer, operation, or instrument that may or may not result in a rating action. The monitoring review will be monthly, quarterly, or semi-annually depending upon the availability of information, or any other frequency required by HR.

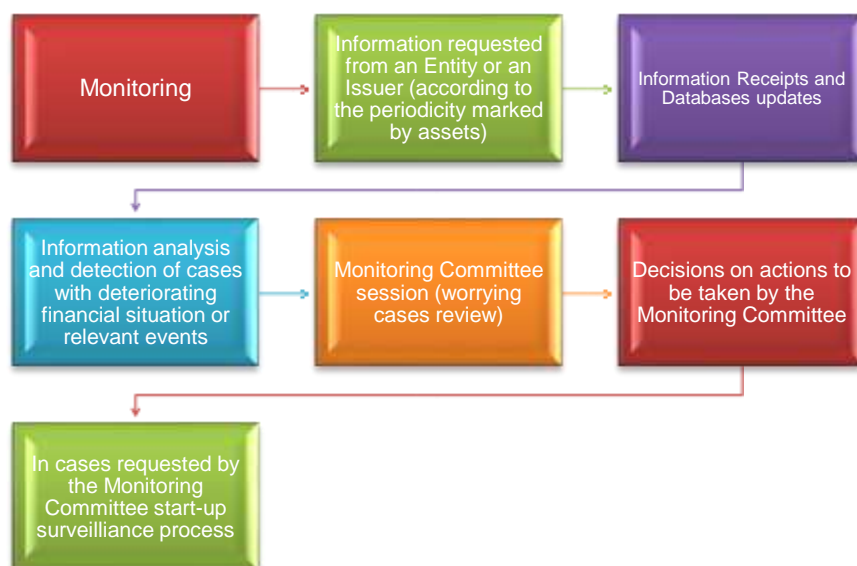
Surveillance refers to the periodical annual review HR performs on all ratings, independent of internal monitoring, the results of which are reported to the public through a rating action.

It is important to note that HR Ratings makes no difference regarding the qualitative and quantitative factors under the initial

or surveillance rating. Thus, an initial and a surveillance rating consider the same weight for each of the factors given.

HR Ratings adheres to the view that surveillance ratings can be even more important than the initial rating during the life of the issue until maturity. For this reason, the surveillance for tracking and monitoring all of the ratings assigned by HR Ratings is a vital ongoing activity.

i. Monitoring chart



F. Procedures to Withdraw or Suspend a Rating

The Credit Analysis Committee may withdraw the rating given to an entity, issuer, and/or operation on the occurrence of any of the following:

1. For a debt instrument or a credit, when the issuer confirms that the entire amount of the credit or debt security has been repaid in full of no outstanding amount to be rated.
2. For a debt instrument or a credit, when the issuer confirms that the rating assigned has not been used for an issuance or specific credit, and, in consequence, that no funds have been mobilized for said issue or credit, nor for any outstanding current amount.
3. For a debt instrument, when HR Ratings receives the consent of all debtholders of a given issuance to withdraw the rating, by means of an assembly of said debtholders during which the motion to withdraw is unanimously passed.
4. For a debt instrument or a credit, when the period of validity of the initial rating of 1 year passes and the debt instrument has not been placed in the market or the funding from the credit obtained, the rating is automatically withdrawn.
5. When a restructuring of a credit or issuance has been finalized and the Credit Analysis Committee determines that the changes have been substantial, provided another structure is in place.
6. When the entity or issuer has gone into bankruptcy and the rating issued by HR Ratings is no longer necessary.
7. When requested by the entity or issuer to HR Ratings.
8. When the lack of cooperation from the entity or issuer or the lack of information makes assigning a reliable rating impossible. In this event, and if the rating is already public, the reasons for suspension will be communicated to the market. However, before determining the suspension of the rating, HR Ratings will attempt to complete its review based on the information available, making public the results of the review.

Additional information regarding the rating procedure can be found in HR Ratings' Internet website, at the following location: https://www.hrratings.com/regulatory_disclosure/monitoring.xhtml.



G. Methodology Committee

HR Ratings has a Methodology Committee, with the responsibility of reviewing, discussing, and approving the Company's rating methodologies and any modifications thereof, and also the quantitative models incorporated into said methodologies and the criteria for their application, prior to submitting these to the Board of Directors for final approval.

The Methodology Committee meets at least once a year to review the process and terms established for each rating methodology, or when any of the circumstances established in HR Ratings' Code of Conduct are met.

In addition, the Methodology Committee will assess and validate the qualitative models to be incorporated into any rating methodology and any changes to these models. Similarly, the committee will conduct periodical reviews of the quantitative models incorporated into the rating methodologies.

The Methodology Committee meets on the agreed date to review, discuss and approve a new methodology or changes to a current methodology. In the event the modification of a methodology is agreed to, the Committee proceeds to analyze whether the ratings previously assigned under earlier methodologies need to be reviewed. This analysis must be documented in the minutes of the corresponding Methodology Committee meeting.

When the Methodology Committee agrees to a rating methodology or changes to an already existing methodology, the Operations Department takes the necessary steps so that, before the end of the next business day following the Committee meeting, the methodology or its modifications are uploaded to HR Ratings' website for the consultation and comments of market participants. The term for receiving comments from the public will be at least ten (10) calendar days. HR Ratings will maintain publicly available during this time any comments received through its website and will consider those deemed relevant.

At the end of the time given, the Chief Credit Officer will request the incorporation, when such is the case, of the relevant comments within the following 5 (five) business days and once incorporated, they will ask the Compliance Officer to immediately take the actions necessary for said methodology or modification to be submitted for the formal approval of the Board of Directors.

The Compliance Officer will send the methodology corresponding to the members of the Board of Directors for review and will request the Board to formally approve the methodology or its modifications.

Within the next 10 (ten) business days from when the methodology or its modifications are approved by the Board of Directors, HR Ratings will notify the Mexican Banking and Securities Commission ("CNBV") of the methodology or its modification, to meet compliance with the obligation established in the General provisions applicable to rating agencies in Mexico. If no comments are received from the Commission within twenty (20) business days, HR Ratings will publish the methodology or its modification in a visible location on the HR Ratings website indicating the reasons for the modifications, when such is the case, immediately at the end of said time and the methodology will be sent to HR Ratings' employees and website subscribers by email.

In the case of methodologies that only apply to ratings in the U.S., HR Ratings will publish the methodology or its modification the next business day after being formally approved by the Board of Directors, by the means indicated in the previous paragraph.

Rating methodologies and their modifications will take effect the same day as published. Once the modifications or additions to a methodology have been published, the Company will use the new methodology for subsequent ratings and, accordingly, will inform the public immediately of the possible effects on the ratings that could be impacted by the new methodology once these ratings have been reviewed.

Accordingly, HR Ratings will issue a new rating for the instruments in question, within six (6) months following the publication of the modification of a methodology.



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Procedures and Methodologies

Exhibit 2

Once a new NRSRO methodology has been published, HR Ratings will submit to the Securities and Exchange Commission ("SEC") an updated Form NRSRO. In addition, HR Ratings will submit an updated Form NRSRO when modifications are made to an NRSRO methodology. The Risk Officer will verify that these steps are covered.

In addition, HR Ratings will publish through its website, notice of any significant error identified in any process or methodology that could result in any change to a current rating.

The Methodological Criteria Director will report decisions made by the Methodology Committee to the Company's analysis team, with the corresponding documentation, the same day as said decisions take effect.

In addition, meetings will be held with the analysis team to explain the important decisions made by the Methodology Committee.



2. HR RATINGS' SCALES

2.1	Long Term Local Rating Scale.	https://www.hrratings.com/methodology/rating_scales.xhtml
2.2	Short Term Local Rating Scale.	https://www.hrratings.com/methodology/rating_scales.xhtml
2.3	Long Term Global Rating Scale.	https://www.hrratings.com/methodology/rating_scales.xhtml
2.4	Short Term Global Rating Scale.	https://www.hrratings.com/methodology/rating_scales.xhtml
2.5	Structured Finance Rating Scale.	https://www.hrratings.com/methodology/rating_scales.xhtml
2.6	Market Risk Rating Scale.	https://www.hrratings.com/methodology/rating_scales.xhtml

2.1. Long Term Local Rating Scale

Symbol	Definition of the Rating
HR AAA	The issuer or issue with this rating is considered to have the highest credit quality, offering high safety for timely payment of debt obligations. Maintains minimum credit risk.
HR AA	The issuer or issue with this rating is considered to have high credit quality and offers high safety for timely payment of debt obligations. Maintains very low credit risk under adverse economic scenarios.
HR A	The issuer or issue with this rating offers acceptable safety for timely payment of debt obligations. Maintains low credit risk.
HR BBB	The issuer or issue with this rating provides moderate safety for timely payment of debt obligations. Maintains moderate credit risk, with weakness in the ability to pay in adverse economic scenarios.
HR BB	The issuer or issue with this rating provides inadequate safety for timely payment of debt obligations. Maintains high credit risk.
HR B	The issuer or issue with this rating provides low safety for timely payment of debt obligations and maintains a high credit risk. The issue or issuer is susceptible to falling into default.
HR C	The issuer or issue with this rating exhibits high probability of falling into default in debt obligation payments.
HR D	The issuer or issue with this rating has the lowest rating. The issue is already in, or is highly likely to fall into, default in the short term.

**Our ratings range from HR AAA to HR D, a plus or minus sign may be included in the range from HR AA to HR C, to indicate strength or weakness within a general rating category.*

2.2. Short Term Local Rating Scale

Symbol	Definition of the Rating
HR1	The issuer or issue with this rating exhibits high capacity for timely payment of debt obligations in the short term and maintains the lowest credit risk. Within this category, debt instruments and or issuers with features showing relative superiority in terms of credit characteristics may be rated as HR+1.
HR2	The issuer or issue with this rating exhibits an acceptable capacity for timely payment of debt obligations in the short term and maintains a higher credit risk compared with higher credit rating debt instruments.
HR3	The issuer or issue with this rating exhibits a moderate capacity for timely payment of debt obligations in the short term and maintains a higher credit risk compared with higher credit rating debt instruments.
HR4	The issuer or issue with this rating exhibits an insufficient capacity for timely payment of debt obligations in the short term and maintains a very high credit risk. These instruments are susceptible to falling into default.
HR5	The issuer or offering is highly probable they will fall into default on the payment of debt obligations.
HR D	The issuer or offering given this rating has the lowest credit rating and they are already in default.

2.3. Long Term Global Rating Scale

Symbol	Definition of the Rating
HR AAA (G)	The issuer or issue with this rating is considered to have the highest credit quality, offering high safety for timely payment of debt obligations. Maintains minimum credit risk on a global scale basis.
HR AA (G)	The issuer or issue with this rating is considered to have high credit quality and offers high safety for timely payment of debt obligations. Maintains very low credit risk on a global scale basis, under adverse economic scenarios.
HR A (G)	The issuer or issue with this rating offers acceptable safety for timely payment of debt obligations. Maintains low credit risk on a global scale basis.
HR BBB (G)	The issuer or issue with this rating provides moderate safety for timely payment of debt obligations. Maintains moderate credit risk on a global scale, with weakness in the ability to pay in adverse economic scenarios.
HR BB (G)	The issuer or issue with this rating provides inadequate safety for timely payment of debt obligations. Maintains high credit risk on a global scale basis.
HR B (G)	The issuer or issue with this rating provides low safety for timely payment of debt obligations and maintains a high credit risk on a global scale. The issue or issuer is susceptible to falling into default.
HR C (G)	The issuer or issue with this rating exhibits high probability of falling into default in debt obligation payments.
HR D (G)	The issuer or issue with this rating has the lowest rating on a global scale basis. The issue is already in, or is highly likely to fall into, default in the short term.

**Our ratings range from HR AAA (G) to HR D (G), a plus or minus sign may be included in the range from HR AA (G) to HR C (G), to indicate strength or weakness within a general rating category.*

2.4. Short Term Global Rating Scale

Symbol	Definition of the Rating
HR1 (G)	The issuer or issue with this rating exhibits high capacity for timely payment of debt obligations in the short term and maintains the lowest credit risk on a global scale basis. Within this category, debt instruments and or issuers with features showing relative superiority in terms of credit characteristics may be rated as HR+1 (G).
HR2 (G)	The issuer or issue with this rating exhibits an acceptable capacity for timely payment of debt obligations in the short term and maintains a higher credit risk compared with higher credit rating debt instruments on a global scale basis.
HR3 (G)	The issuer or issue with this rating exhibits a moderate capacity for timely payment of debt obligations in the short term and maintains a higher credit risk compared with higher credit rating debt instruments on a global scale basis.
HR4 (G)	The issuer or issue with this rating exhibits an insufficient capacity for timely payment of debt obligations in the short term and maintains a very high credit risk on a global scale basis. These instruments are susceptible to falling into default.
HR5 (G)	The issuer or offering is highly probable they will fall into default on the payment of debt obligations.
HR D (G)	The issuer or offering given this rating has the lowest credit rating and they are already in default.

2.5. Structured Finance Rating Scale

Symbol	Definition of the Rating
HR AAA (E)*	The issue with this rating is considered to have the highest credit quality, offering high safety for timely payment of debt obligations. Maintains minimum credit risk.
HR AA (E)*	The issue with this rating is considered to have high credit quality and offers high safety for timely payment of debt obligations. Maintains very low credit risk under adverse economic scenarios.
HR A (E)*	The issue with this rating offers acceptable safety for timely payment of debt obligations. Maintains low credit risk.
HR BBB (E)*	The issue with this rating provides moderate safety for timely payment of debt obligations. Maintains moderate credit risk, with weakness in the ability to pay in adverse economic scenarios.
HR BB (E)*	The issue with this rating provides inadequate safety for timely payment of debt obligations. Maintains high credit risk.
HR B (E)*	The issue with this rating provides low safety for timely payment of debt obligations and maintains a high credit risk. The issue is susceptible to falling into default.
HR C (E)*	The issue with this rating exhibits high probability of falling into default in debt obligation payments.
HR D (E)*	The issue with this rating has the lowest rating. The issue is already in, or is highly likely to fall into, default in the short term.

(E)* is a local rating.

***Our ratings range from HR AAA (E) to HR D (E), a plus or minus sign may be included in the range from HR AA (E) to HR C (E), to indicate strength or weakness within a general rating category.*

2.6. Short-Term Market Risk Rating Scale

Symbol	Definition of the Rating
1CP	The asset portfolio has extremely low sensitivity to changes in market conditions.
2CP	The asset portfolio has low sensitivity to changes in market conditions.
3CP	The asset portfolio has low to moderate sensitivity to changes in market conditions.
4CP	The asset portfolio is moderately sensitive to changes in market conditions.
5CP	The asset portfolio has moderate to high sensitivity to changes in market conditions.
6CP	The asset portfolio is highly sensitive to changes in market conditions.
7CP	The asset portfolio is extremely sensitive to changes in market conditions.

To indicate the rating is a limited rating, HR Ratings assigns at the end of each rating the symbol "(L)".
HR Ratings could also assign the symbol "P" to indicate a preliminary Rating.

2.7. Long-Term Market Risk Rating Scale

Symbol	Definition of the Rating
1LP	The asset portfolio has extremely low sensitivity to changes in market conditions.
2LP	The asset portfolio has low sensitivity to changes in market conditions.
3LP	The asset portfolio has low to moderate sensitivity to changes in market conditions.
4LP	The asset portfolio is moderately sensitive to changes in market conditions.
5LP	The asset portfolio has moderate to high sensitivity to changes in market conditions.
6LP	The asset portfolio is highly sensitive to changes in market conditions.
7LP	The asset portfolio is extremely sensitive to changes in market conditions.

To indicate the rating is a limited rating, HR Ratings assigns at the end of each rating the symbol "(L)".
HR Ratings could also assign the symbol "P" to indicate a preliminary Rating.

2.8. Long-Term ratings for Special-Tax Bonds of U.S.A. Local Entities (U.S.A. Scale only)

Symbol	Definition of the Rating
HR AAA	The bond with this rating is considered to have the highest credit quality, offering high safety for timely payment of debt obligations. The pledge is insensitive to market changes and shows steady growth above inflation. The bond offers multiple and adequate protections to bondholders.
HR AA	The bond with this rating is considered to have high credit quality and offers high safety for timely payment of debt obligations. Maintains very low credit risk due to the low sensitivity of its pledge to market changes, and to a steady revenue growth. The bond offers adequate protections to bondholders.
HR A	The bond with this rating offers acceptable safety for timely payment of debt obligations. Maintains low credit risk to a steady pledge that grows with inflation and that shows low sensitivity to market changes. The bond offers protections to bondholders.
HR BBB	The bond with this rating provides moderate safety for timely payment of debt obligations. Maintains moderate credit risk with weakness in the ability to pay in adverse economic scenarios due to a pledge that grows below inflation and with certain volatility.
HR BB	The Bond with this rating provides inadequate safety for timely payment of debt obligations. Maintains high credit risk due to a decreasing or volatile pledge, that is sensitive to market changes.
HR B	The bond with this rating provides low safety for timely payment of debt obligations and maintains a high credit risk. The bond is susceptible to falling into default due to a decreasing and volatile pledge that is sensitive to market changes and that depends on a concentrated tax base.
HR C	The bond with this rating exhibits high probability of falling into default in debt obligation payments.
HR D	The bond with this rating has the lowest rating on the U.S.A. scale basis. The issue is already in, or is highly likely to fall into, default in the short term.

**Our ratings range from HR AAA to HR D, a plus or minus sign may be included in the range from HR AA to HR C, to indicate strength or weakness within a general rating category. To indicate the rating is a limited rating, HR Ratings assigns at the end of each rating the symbol "(L)". HR Ratings could also assign the symbol "P" to indicate a preliminary Rating.*

3. METHODOLOGIES

3.1. Current versions of previously sent methodologies

	Methodology	
1	Methodology for the Evaluation of Charter School Debt (<i>Long Term and Short Term Global Rating Scales</i>).	https://www.hrratings.com/docs/metodologia/Ne w%20Charter%20Schools%20Methodology%20 R.pdf
2	General Methodological Criteria.	https://www.hrratings.com/docs/metodologia/GM C%20March%202019.pdf
3	Methodology for Public Finances: Unsecured Debt Ratings for Mexican Municipalities Methodology Addendum (<i>Long Term and Short Term Local Rating Scales</i>).	https://www.hrratings.com/docs/metodologia/Ade nda_Deuda_Quirografia_Municipios%20Englis h%20Final.pdf
4	HR Ratings' Corporate Debt Credit Risk Evaluation (<i>Long Term and Short Term Local Rating Scales</i>).	https://www.hrratings.com/docs/metodologia/Cor porate%20Debt%20Credit%20Risk%20Evaluatio n%20Final.pdf
5	Public Finance Methodology Unsecured Rating for Mexican States (<i>Long Term and Short Term Local Rating Scales</i>).	https://www.hrratings.com/docs/metodologia/Uns ecured%20Rating%20for%20Mexican%20States .pdf
6	U.S. State Government General Obligations Methodology Addendum (<i>Long Term and Short Term Global Rating Scales</i>).	https://www.hrratings.com/docs/metodologia/Gen eral%20Obligation%20States%20Methodology% 20March%202014_final.pdf
7	Sovereign Debt Methodology (<i>Long Term and Short Term Global Rating Scales</i>).	https://www.hrratings.com/docs/metodologia/0So vereign%20Debt%20Methodology.pdf
8	U.S. Local Government General Obligations Methodology (<i>Long Term and Short Term Global Rating Scales</i>).	https://www.hrratings.com/docs/metodologia/Gen eral%20Obligation%20Methodology%20Nov201 3_final.pdf
9	Methodology for Infrastructure (<i>Structured Finance Rating Scale</i>).	https://www.hrratings.com/docs/metodologia/0M etodologia%20para%20Infraestructura%20(eng) %20limpio1.pdf
10	Hybrid Instruments Credit Methodology (<i>Long Term Local Rating Scales</i>)	https://www.hrratings.com/docs/metodologia/Hyb rid%20Instruments%20Credit%20Methodology.p df
11	Addendum - Rating Methodology for Subordinated Debt (<i>Long Term and Short Term Local Rating Scales</i>).	https://www.hrratings.com/docs/metodologia/3.2. 2.%20Rating%20Methodology%20for%20Subor dinated%20Debt.pdf
12	Rating Methodology for Non-Bank Financial Institutions (<i>Long Term and Short Term Local Rating Scales</i>).	https://www.hrratings.com/docs/metodologia/3.2. 3.%20Non%20Bank.pdf
13	Addendum - Rating Methodology for Credit Unions (<i>Long Term and Short Term Local Rating Scales</i>).	https://www.hrratings.com/docs/metodologia/3.2. 4.%20Rating%20Methodology%20for%20Credit %20Unions.pdf
14	Addendum - Rating Methodology for Leasing Companies (<i>Long Term and Short Term Local Rating Scales</i>).	https://www.hrratings.com/docs/metodologia/3.2. 5.%20Leasing%20Agents.pdf
15	Rating Methodology for Brokerage Firms (<i>Long Term and Short Term Local Rating Scales</i>).	https://www.hrratings.com/docs/metodologia/3.2. 6.%20Brokerage%20Firms.pdf

16	Rating Methodology for Investment Funds (<i>Credit and Market Rating</i>).	https://www.hrratings.com/docs/metodologia/Investment%20Funds%20Methodology%202019.pdf
17	Addendum – Rating Methodology for Bonded Warehouses (<i>Long Term and Short Term Local Rating Scales</i>).	https://www.hrratings.com/docs/metodologia/HR290816NP%208.%20Adendum%20AGD3%20(eng).pdf
18	Partial Guarantees for Structured and Unsecure Debt Issues .	https://www.hrratings.com/docs/metodologia/Partial%20Guarantees%20Methodology.pdf
19	Water Operating Agencies: Debt Evaluation Methodology for Mexican Entities (Long Term and Short Term Local Rating Scales).	https://www.hrratings.com/docs/metodologia/Mexican%20Water%20Operating%20Agencies%20Methodology.pdf
20	Special-Tax Bonds Methodology (Long Term and Short Term Global Rating Scales).	https://www.hrratings.com/docs/metodologia/Special-Tax%20Bonds%20Methodology%20(MP).pdf
21	Debt backed by Federal Transfers to the Municipalities Addendum (Structured Finance Rating Scale).	https://www.hrratings.com/docs/metodologia/Federal%20Transfers%20Backed%20Debt%20Addendum%20(Municipalities).pdf
22	Debt backed by Federal Transfers to the States (Structured Finance Rating Scale)	https://www.hrratings.com/docs/metodologia/Federal%20Transfers%20Backed%20Debt%20Methodology%20(States).pdf
23	Revenue Sharing Obligations for Mexican States and Municipalities: Debt Backed by Sub-National Entities Own Revenues (Structured Finance Rating Scale).	https://www.hrratings.com/docs/metodologia/Own-Revenues%20Backed%20Debt%20Addendum%20(States%20and%20Municipalities).pdf
24	Methodology for Rating Banks (<i>Long Term and Short Term Local Rating Scales</i>).	https://www.hrratings.com/docs/metodologia/03.2.1.%20Banks.pdf

3.2. Current versions of qualitative and quantitative Models

a) Non-Bank Financial Institutions (IFNBs) / Bonded Warehouses

- *Version: Jul.20*
- *File Names: IFNB_(Entidad_Año).Jul.20*
- *Approved (Model): July 15, 2020.*
- *Methodology: Rating Methodology for Non-Bank Financial Institutions, May 2009. Rating Methodology for Bonded Warehouses, March 2010.*
- *Approved by HR: March 14, 2018.*
- *Developed by: HR*

Description: The model explains the principal risk factors present in these entities. Starting from the business model. Its purpose is to justify and give a different weighting to the qualitative and quantitative risk factors for the assignment of the rating by HR Ratings. Among the most important quantitative factors to consider are the historic and projected financial statements and the analysis of the operating efficiency

b) Credit Unions

- *Version: Jul.20*
- *File Names: Uniones de Crédito (Entidad_Año).Jul.20*
- *Approved (Model): July 15, 2020.*
- *Methodology: Rating Methodology for Credit Unions, August 2011.*
- *Approved by HR: March 14, 2018.*
- *Developed by: HR*

Description: The model explains the principal risk factors present in these entities. Starting with a qualitative analysis of the industry risk, the management, operational and regulatory aspects. In the quantitative analysis the model considers de historical information of the balance sheet, the income statement, and the cash flow to produce its projections.

c) Brokerage Firms Model

- *Version: Jul.20*
- *File Name: Casa de Bolsa (Entidad_Año).Jul.20*
- *Approved (Model): July 15, 2020.*
- *Methodology: Rating Methodology for Brokerage Firms, June 2009.*
- *Approved (Methodology): March 14, 2018.*
- *Developed by: HR*

Description: The model identifies the principal risk indicators within each category of credit risk affecting the firm evaluated; both those that are inherit to the entity and those arising from external factors. Regarding the ability to pay, the principal sources of risk are identified that could cause delay and even default on the settlement of any liability.

d) Mutual Funds Model – SIID.

- *Version: Jul.20*
- *File Name: Calculadora de Fondos de Inversión (Fondo_Año).Jul.20*
- *Approved (Model): July 15, 2020.*
- *Methodology: Rating Methodology for Investment Funds, May 2019.*
- *Approved (Methodology): February 2019.*
- *Developed by: HR*

Description: This model has two principal aspects: Credit Risk and Market Risk. Credit Risk is based on the credit quality of the assets that form the portfolio of the mutual fund, while Market Risk measures movements in the valuation of the fund because of changes in market interest rates and other variables, such as the exchange rate, inflation, and market volatility. The methodology incorporates a secondary aspect, the evaluation of the Management Quality of the fund for both ratings.

e) Pure Leasing Companies Model

- *Version: Jul.20*
- *File Name: Arrendadoras Puras (Entidad_Año).Jul.20*
- *Approved (Model): July 15, 2020.*
- *Methodology: Rating Methodology for Financial Leasing Agents and Pure Leasing Agents, January 2010.*
- *Approved (Methodology): March 14,2018.*
- *Developed by: HR*

Description: The model is based upon quantitative and qualitative factors that evaluates credit risks such as the possibility that the entity will be unable to collect future rents or leasing contracts and the lessor will not be able to recover the asset in a timely manner. So, it analyses the tools and processes used to collect the financial income earned and recover the leased product.

f) Models used for Sovereign Debt

- *Version: Jul.20*
- *File Name: Sovereign Debt (Country_Year).Jul.20*
- *Approved (Model): July 15, 2020.*
- *Methodology: Sovereign Debt Methodology, May 19, 2017.*
- *Approved (Methodology): March 14,2018.*
- *Developed by: HR*

Description: The model is based upon the interaction of four analytic dimensions that represent economic growth, fiscal accounts, monetary policy, and external accounts. The model also accounts for metrics that evaluate the institutional quality of the sovereign. The model uses HR Ratings forecasts for both a base and a stress model. It also incorporates data from the IMF, the World Bank, and the UN.

g) Models used for Mexican General Obligation ratings

1. States

- *Version: Jul.20*
- *File Name: Estados (Entidad_Año).Jul.20*
- *Approved (Model): July 15, 2020.*
- *Methodology: Rating Methodology for Unsecured Risk for Mexican States, July 31, 2014.*
- *Approved (Methodology): March 14,2018.*
- *Developed by: HR*

Description: The model accounts for fiscal metrics, debt metrics and debt servicing metrics. Most of them as a percent of unrestricted revenues, that discounts transfers to the municipalities and revenue sharing obligations compromised for structured debt servicing. The methodology also accounts for qualitative factors such as contingent liabilities, credit history, liquidity, and former willingness to pay.

2. Municipalities

- *Version: Jul.20*
- *File Name: Municipios (Entidad_Año).Jul.20*

- *Approved (Model): July 15, 2020.*
- *Methodology: Unsecured Risk Evaluation for Municipalities, July 31, 2015.*
- *Approved (Methodology): March 14, 2018.*
- *Developed by: HR*

Description: The model accounts for fiscal metrics, debt metrics and debt servicing metrics. Most of them as a percent of unrestricted revenues, that discounts revenue sharing obligations compromised for structured debt servicing. The methodology also accounts for qualitative factors such as contingent liabilities, credit history, liquidity, and former willingness to pay.

h) Models used for U.S. General Obligations Ratings

1. Local Governments

- Version: Nov.13
- File Name: *GOLocal_Blank (Entidad_Año).Nov13*
- Approved (Model): November 27, 2013.
- Methodology: U.S. Local Government General Obligations Methodology, November 27, 2013.
- Approved (Methodology): *March 14, 2018.*
- Developed by: HR

Description: The model is based upon the General Obligation Quantitative Risk Model which accounts for the financial balance, the primary balance, debt metrics and debt servicing metrics, all as share of total revenues or unrestricted revenues. These metrics are projected for both a base and a stress scenario. The qualitative considerations account for a liquidity analysis, a general fund analysis, pensions liabilities, state regulation and support, among others.

2. States

- Version: Mar.13
- File Name: *GOStates_Blank (Entidad_Año).Mar.14*
- Approved (Model): March 28, 2014.
- Methodology: U.S. State Government General Obligations Methodology (Addendum to Methodology), March 28, 2014.
- Approved (Methodology): March 14, 2018.
- Developed by: HR

Description: The model is based upon the General Obligation Quantitative Risk Model which accounts for the financial balance, the primary balance, debt metrics and debt servicing metrics, all as share of total revenues or unrestricted revenues. These metrics are projected for both a base and a stress scenario. The qualitative considerations account for a liquidity analysis, a general fund analysis, pensions liabilities, business type activities, among others.

i) Models used for Corporate Debt Ratings

- Version: Jul.20
- File Name: *Corporativos (Entidad_Año).Jul.20*
- Approved (Model): July 15, 2020.
- Methodology: *Corporate Debt Credit Risk Evaluation Methodology, May 21, 2014.*
- Approved by HR: *March 14, 2018.*
- Developed by: HR

Description: The model is based upon four metrics that are derived from the entity's financial statements. First the DSCR derived from the entity's period flows, then the same coefficient but adding the cash reserves to the numerator.

The third measures the years required for the entity to serve its debt. And the last one measures the value of their marketable assets as a percent of the entity's total liabilities. Qualitative considerations are incorporated to account for industry risks.

j) Models used for Charter Schools ratings

- Version: Feb. 15
- File Name: *CharterSchool (Entidad_Año).Feb. 15*
- Approved (Model): February 13, 2015.
- Methodology: *Charter Schools Credit Risk Evaluation Methodology, February 13, 2015.*
- Approved (Methodology): March 14, 2018.
- Developed by: HR

Description: The Charter Schools quantitative model is based upon the corporate debt methodology. However, the qualitative analysis accounts for the specific states laws regarding the permissions to operate and the ADA (Average Daily Attendance) and the WADA (Weighted Average Daily Attendance) upon which the state transfers are condition.

k) Models used for Rating for Debt backed by the operation of highways, toll ways and bridges.

- Version: Jul.20
- File Name: *Concesion_Peaje (Proyecto_Año).Jul.20*
- Approved (Model): July 15, 2020.
- Methodology: Methodology for Infrastructure, November 6, 2015.
- Approved (Methodology): March 14, 2018.
- Developed by: HR

Description: The model is based upon the TEA rate which accounts for the stress the revenues from users' fees can withstand without the DSCR dropping below one throughout the debt structure. The methodology also incorporates demand risks derived from economic performance of the region around the project and for diverse risks that can affect maintenance cost.

l) Models used for Water Operating Agencies for Mexican entities

- Version: Jul.20
- File Name: *OOA (Entidad_Año).Jul.20*
- Approved (Model): July 15, 2020
- Methodology: Water Operating Agencies: Debt Evaluation Methodology for Mexican Entities July 2019
- Approved (Methodology): July 2019
- Developed by: HR

Description: This model has two principal aspects: The operating metrics of the WOA, that measure efficiency in terms of charging customers and delivering water to residences, industrial complex, or local business. The second aspect measures the financial performance of the WOA based on coverage metrics, the years that would take the free cash flow to cover the debt net and the weight of non-debt liabilities.

m) Models used for Ratings of Partial Guarantees

1. Infrastructure

- Version: Jul.20
- File Name: *Garantías Parciales_Infraestructura (Entidad_Año).Jul.20*
- Approved (Model): July 15, 2020.
- Methodology: Partial Guarantees for Structured and Unsecured Debt Issues: Debt Methodology.

- Approved (Methodology): March 2019.
- Developed by: HR

2. Unsecured

- Version: *Jul.20*
- File Name: *Garantías Parciales_ Quirografarias (Entidad_Año).Jul.20*
- Approved (Model): March 2019.
- Methodology: Partial Guarantees for Structured and Unsecured Debt Issues: Debt Methodology.
- Approved (Methodology): March 2019.
- Developed by: HR

Description: For infrastructure, the partial guarantees model measures the average number of debt services that could be paid by using the guarantee, providing strength in terms of liquidity. Depending on the estimated average, certain number of notches will be awarded to the rating. For unsecured ratings, the model measures the percentage of the outstanding debt covered by the guarantee; however, the model controls for the Credit Rating of the entity providing the guarantee. According to certain values of coverage, notches will be awarded to the rating.

n) Model used for Rating Special-Tax Bonds of U.S.A. Local Entities

- Version: *Jul.20*
- File Name: *Special-Taxes Model (Entity_Bond).Jul.20*
- Approved (Model): *July 15, 2020*
- Methodology: Special-Tax Bonds Methodology.
- Approved Methodology: April 2020.
- Developed by: HR Ratings

Description: The model rates Special-Tax Bonds of U.S.A. Local entities with four set of key factors. The first one consists in an economic analysis of the elasticities of the taxed goods & services, and the concentration and strength of the tax base. The second set studies the historical performance of the trend and volatility of the pledge. The third set measures two coverage metrics and the fourth the Additional Bond Test and the Debt Service Reserve Fund requirements. Lastly, the model allows qualitative adjustments based on very specific factors and limited by concepts.

o) Models used for Mexican Structured Credit ratings.

1. States and municipalities (Federal Income)

- Version: *Jul.20*
- File Name: *Deuda Estructurada (Entidad_Banco_Clave).Jul.20*
- Approved (Model): July 23, 2020.
- Methodologies: Structured Debt of Mexican States: Federal-Transfers Backed Debt Methodology (September 2020); Structured Debt of Mexican Municipalities: Addendum to the Federal-Transfers Backed Debt Methodology (September 2020).
- Approved (Methodology): August 5, 2020.
- *Developed by: HR*

Description: The model is based upon the relationship of the Mexican economic growth and the revenue sharing obligations ("Ramo" 28) that the Federal Government transfers to the states and municipalities. Given an estimated income from said transfers, the minimum DSCR is determined along the debt structure. The revenues will be stressed through a TOE rate that will ultimately reduce the DSCR (always above one) in a critical period in such a way that the reserve funds can be reestablished in a previously determined post-critical period.

2. Municipalities (Own income, FEFOM)

- Version: *Jul.20*
- File Name: *DE Programa Especial FEFOM (Entidad_Banco_Clave).Jul.20*
- Approved (Model): July 23, 2020.
- Methodology: Structured Debt of Subnational Entities and OPDs: Addendum to the Own-Revenue Backed Debt Methodology (September 2020)
- Approved (Methodology): August 5, 2020.
- Developed by: HR

Description: The model is also based upon the TOE rate and the capacity of the revenues to reestablish the reserve funds in the post-critical period. However, in this methodology, the ability to successfully isolate the source of revenue from the entity through a trust fund is of major importance.

p) Banks / SOFIPOS / SOCAPS Model

- Version: *Nov.20*
- File Name: *Bancos (Entidad_Año).Nov.20*
- Approved (Model): *November 24, 2020.*
- Methodology: *Methodology for Rating Banks, February 2021.*
- Approved (Methodology): *December 8, 2020.*
- Developed by: *HR*

Description: The model identifies two areas of risk, the first one through the Financial Model that provides a quantitative analysis of the main metrics of efficiency, profitability, solvency, and liquidity. The second area is regarding a qualitative analysis of Environmental, Social and Governance (ESG) factors.

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This methodology describes the process by which HR Ratings assigns a rating to Special-Tax Bonds issued by municipal entities in the United States.

Special-Tax Bonds are bonds secured by a revenue stream of taxes, excluding those on property, that are levied on the sales of goods, services or the implementation of a fee in a specific region. For most municipal entities, the revenue stream is passive, as these entities hold limited control over the tax rate charged.

The scope of HR Ratings' methodology for Special-Tax Bonds considers bonds that comply with the following characteristics: (i) are issued by municipalities or other local entities; and (ii) the proceeds from the issuance are dedicated for developing infrastructure, or for funding the day to day operations. Specifically, the Special-Tax Bonds pledge consists on special revenues as defined by the Chapter 902 of Federal Bankruptcy Code (11 U.S. Code § 902). These pledges usually take the form of:

- a) Income taxes;
- b) Sales or excise taxes;
- c) Gas taxes and motor registration fees;
- d) Hotel / motel taxes and other tourist fees;
- e) Other revenues or receipts derived by functions of the debtor.

HR Ratings methodology excludes utility services taxes, as these pledges rely on the operation of a diverse set of utility companies and are related to the demand and/or performance of each service.

Methodology Description

HR Ratings methodology for Special-Tax Bonds evaluates multiple factors, both quantitative and qualitative, which are grouped in four sets that are weighted for assigning the credit rating; the weights are fixed for each rated bond. The methodology admits up to a three-notch adjustment to the rating in very specific cases in which certain factors that could enhance the credit risk of a bond are identified. These refer to a lack of information; unpredictable seasonality; weaknesses in the legal framework, beyond the factor weighted in the methodology; and in some cases, HR Ratings could determine that a factor considered in the methodology holds greater risk or a greater strength than what its weight captures. In any case, the adjustments are predetermined.

The factors weighted inside the rating are the following:

- 1) Sensitivity to Market Shocks;
- 2) Tax Base Concentration;
- 3) Tax Base Demographic Indicators;
- 4) Historic Trend of the Pledged Revenues;
- 5) Historic Volatility of the Pledged Revenues;
- 6) Maximum Annual Debt Service (MADS);
- 7) Projected Minimum Annual Coverage (PMAC);
- 8) Additional Bond Test (ABT);
- 9) Debt Service Reserve Fund (DSRF).

Special-Tax Bonds Methodology

Methodology for Local Entities of United States of America

April 2020

Special-Tax Bonds

A Special-Tax Bond is exclusive to municipalities, such as cities, towns, villages, counties, taxing districts, municipal utilities, or school districts. These bonds are served by revenues derived from taxing a specific activity or asset. Among municipal bonds, the Special-Tax Bonds are those that are backed by revenues generated by increasing an existing tax or by implementing an excise tax.

Special-Tax Bonds offer several protections to bondholders that are not typical for every municipal bond. As these bonds are served by Special Revenues, the first protection refers to bankruptcy filings. If the municipality would file for Chapter 9, under Title 11 of the U.S. Code¹, debt service payments would not be suspended during the bankruptcy court proceedings, nor would they have to be restructure under a new payment plan for the municipal debt service. It is important to clarify that each state holds its own legislation regarding which Special-Tax Bonds can be issued by its own municipalities and which Special Revenues can be levied for serving debt obligations.

The other protection held by Special-Tax Bonds is that these could be secured by the full faith and credit of the municipal issuer. In these cases, the General Obligation rating of the municipality could serve as the floor of the Special-Tax Bond rating evaluated with this methodology. However, HR Ratings will revise in the indenture and the legal framework of every bond if the municipal issuer offers its credit guarantee.

Special Revenues, as the ones use to serve Special-Tax Bonds, are defined in the “11 U.S. Code § 902 (Subchapter 1. General Provisions). Definitions for this chapter”, while the protections for Special-Tax Bonds are detailed in the “11 U.S. Code § 928 (Subchapter 2. Administration). Post-petition effect of security interest” that states that holders of Special-Tax Bonds can expect to receive debt payments during a Chapter 9 case.

HR Ratings will evaluate if the revenue source complies with the definition of Special Revenues in the 11 U.S. Code § 902; as well with each state's legislation to determine if the municipal bond is a Special-Tax Bond and in which cases this methodology is applicable.

Methodology Description

HR Ratings' methodology has the purpose of evaluating the capacity of a Special-Tax Revenue stream to serve its debt obligations. In this analysis, HR Ratings evaluates four sets of key factors that include: a) elements that could affect the future evolution of the pledged revenue stream, considering the taxed goods or services and several characteristics of the tax base, b) the historical evolution of the pledged revenues, including its trend and volatility, c) debt service coverage ratios based on both historical and projected cash flows; and d) specific characteristics of the bond's legal framework. Table 1 shows the overall structure of the methodology and details all factors considered in each set:

¹ Chapter 9, under Title 11 of the United States Bankruptcy Code deals exclusively with bankruptcy cases of municipalities and delimits the assistance available to them for restructuring their debt.

Special-Tax Bonds Methodology

Methodology for Local Entities of United States of America

April 2020

Table 1: HR Ratings' Special-Taxes Methodology

1st. Set of Factors		Rating	2nd. Set of Factors	
A. Taxed Goods & Services a) Sensitivity to Market Shocks b) Tax Base Concentration			15.0%	10.0%
B. Tax Base Demographics a) Population Growth b) Per Capita Income c) Unemployment Rate			15.0%	10.0%
3rd. Set of Factors			4th. Set of Factors	
A. Maximum Annual Debt Service (MADS)		20.0%	7.5%	A. Additional Bond Test (ABT)
B. Projected Minimum Annual Coverage (PMAC)		15.0%	7.5%	B. Debt Service Reserve Fund (DSRF)

Source: HR Ratings.

The first set of factors allows HR Rating to evaluate the strength of the pledge by analyzing the economic fundamentals of both the taxed goods & services and its tax base. The first step in this section is to evaluate the sensitivity of the pledge based on the demand of the taxed goods and services to sudden market movements. The second step allows for an evaluation regarding the concentration of the tax base considering economic activity, industries and employers. The third and last step in this section uses quantitative metrics to compare specific macroeconomic indexes of the tax base against the national level.

The second set of factors studies the historical performance of the pledge, first by contrasting its trend against the national inflation, and second by analyzing the volatility of its year over year (YoY) growth rates.

With respect to the third set of factors, HR Ratings' analysis distinguishes itself by providing two coverage metrics; the first is the Maximum Annual Debt Service (MADS), while the second is HR Ratings' Projected Minimum Annual Coverage (PMAC). For the second metric, a stress scenario that incorporates the most likely risks will be projected for the pledged revenues and the corresponding Debt Service Coverage Ratios.

The fourth set of factors analyze specific strengths of the legal framework of each bond. First the strictness and definition of its Additional Bond Test (ABT) and then the specific requirements of its Debt Service Reserve Fund (DSRF), if any.

Each factor will be weighted in order to calculate the rating for each bond evaluated with this methodology. The weights are fixed in every case.

Special-Tax Bonds Methodology

Methodology for Local Entities of United States of America

April 2020

Key Factors for the Rating

This section describes the four sets of factors that measure the credit quality of the rated bond. The weights and the way in which each factor is applied are detailed, as well as the parameters that HR Ratings expect for each rating range.

Each evaluated factor will be assigned an integer *value* between “1” (worst) and “19” (best) in order to calculate a weighted average that will determine the rating for each bond evaluated with this methodology.

First set of key factors: Taxed Goods or Services and Population Demographics ***(30.0% weight of the rating)***

The economic fundamentals of both the taxable goods or services and the tax base on which the pledge is levied are central factors to understand the strength of each issuer's ability to serve its debt obligations.

This section holds 30.0% of the rating and considers both a qualitative and a quantitative approach. The qualitative analysis allows HR Ratings to identify possible risks to the pledge that could affect the revenue stream in the short term. This includes concepts such as sudden changes in the price of a complementary or a substitute good of the taxed good, changes in the taxed base income driven by macroeconomic tendencies, or sudden bursts of unemployment related to factors such as a high concentration of employers.

The quantitative analysis is supported by historical information and it focuses on data from credible sources, both at state and federal level, of the issuer's tax base. This analysis allows HR Ratings to measure the tax base historical performance by contrasting three indicators of the tax base against national levels.

1. Taxed Goods or Services (7.5% weight of the rating)

What is HR Ratings measuring?

The risk derived from the ability of the tax base to substitute the consumption of any taxed good or service.

The analysis in this section is qualitative in nature and to each concept evaluated a label will be assigned among {Superior, Average, Limited}.

Each of the following factor hold the same weight and they allow HR Ratings to evaluate the sensitivity of the demanded quantity of the taxed goods or services that serve as the underlying asset of the pledge.

- a) ***Own price sensitivity***: This refers to the possible changes in the consumption of a good or service when setting a new tax or changing the current tax, by a fix amount or by any rate. The consumption of goods or services in more competitive markets could be greatly affected by small changes in prices.

Special-Tax Bonds Methodology

Methodology for Local Entities of United States of America

April 2020

For example: Certain taxes take advantage of the low sensitivity of consumption after price changes; i.e. tobacco and alcohol taxes can be highly profitable for entities.

- b) **Other goods price sensitivity:** This refers to the possible changes in the consumption of a taxed good or service by changes in complementary or substitute goods. If the price of a complementary good rises, the consumption of the taxed good could decrease; if the price of a substitute good rises, the consumption of the taxed good could increase.

For example, gasoline prices could affect different taxes levied on diverse markets of car sales and public transportation.

- c) **Income sensitivity:** This refers to the possible changes in the consumption of goods or services of the tax base because of changes in its available income.

For example: Some goods, historically, show no change in consumption after changes in income. These are typically known as neutral and/or necessary goods, as these need to be consumed on a fix amount regardless of price. Highly rated issuers will typically pledge revenues levied on neutral or necessary goods.

The sensitivity of the demanded quantity of the taxed goods or services to changes in income or prices requires a qualitative approach as a specific tax base not always produces the historical data needed to measure the possible impacts to these types of shocks. In most cases, the events that HR Ratings will evaluate are not common; hence, are theoretical and the analysis will only measure possible risks that need to be incorporated in any credit quality evaluation and its continuous monitoring. However, for a label to be assigned, the following concepts, in Table 2, are expected:

Table 2: Factors Analyzed for each Taxed Good or Service

Factors and Labels		"Superior"	"Average"	"Limited"
Taxed Goods or Services	Own Price Sensitivity	No risks derived from sensitivity, which implies the pledge is levied on necessary or neutral goods to income, with no other goods or services with substitutes or complements.	Goods or services levied that are not neutral or necessary to income, or that have goods or services that can substitute their consumption. However, market trends are typically and currently favorable and historical data of the pledge shows this.	Goods or services levied that are not neutral or necessary to income, or that have goods or services that can substitute their consumption. However, market trends are typically and currently unfavorable and historical data of the pledge shows this.
	Other Good's Sensitivity			
	Income Sensitivity			

Source: HR Ratings.

2. Tax Base Concentration (7.5% weight of the rating)

What is HR Ratings measuring?

The risk to the demand of the taxed goods of services derived from sudden changes in the macroeconomic stability of the tax base, considering its concentration in multiple clusters.

HR Ratings will evaluate the tax base concentration by assigning the labels {Superior, Average, Limited} to the clusters described below. This analysis is important because both exogenous and endogenous shocks will, with greater probability, have a bigger effect over the pledge when concentration is larger. This implies that concentration has

Special-Tax Bonds Methodology

Methodology for Local Entities of United States of America

April 2020

the effect of making the pledge more volatile to specific shocks, both in favorable and detrimental manner.

HR Ratings will look for concentration in the following clusters:

- 1) **Economic Activity Level:** In HR Ratings' view, macroeconomic shocks have different effects over the distinct economic activities or sectors. However, macroeconomic shocks can be anticipated, and the issuer's anti-cyclical policies to mitigate crisis will be evaluated.

For example: Agricultural activities rely mostly on weather patterns and cattle or crops epidemics, industrial activity is particularly susceptible to trade tariffs, and overall consumption is, among these sectors, the most sensitive to monetary policy.

- 2) **Industry Specific Level:** The performance of certain industries depends on factors that could not always correlate with economic activity, like a specific commodity price or local policy regarding incentives for any industry. In this sense, HR Ratings will evaluate how susceptible is the tax base to specific tendencies that not always have an impact in the federal level.

For example: While the construction industry in any given region could be soaring because of a government spending program, the mining industry could be crippled by international commodity prices. In the services sector, advances in capital productivity could have an unfavorable effect over labor productivity, stagnating salaries or even generating unemployment. Another example relates to tourist activities, as these depend on the economic activity of regions other than the issuers.

- 3) **Employer Specific Level:** If the tax base, especially for small counties, is concentrated among employers, HR Ratings will evaluate how the pledge could be affected if any employer faces financial distress or is willing to move its operation away from the county, despite macroeconomic or industry trends.

For example: Companies in the automotive market employ thousands of persons in a county. However, the industry is susceptible to factors that could lead a company to move its operation to another state or another country to improve profits and take better advantage of the current industry trends.

HR Ratings will evaluate how susceptible is the tax base, considering concentration, to several forms of economic and industry trends, as well as to inadequate financial performance of big employers. It is important to establish that the historic trends could be favorable; however, this section focuses in the possible risk of this concentration. Table 4 shows the concepts expected for each possible label:

Table 3: Factors Analyzed in each Tax Base

Factors and Labels		"Superior"	"Average"	"Limited"
Tax Base Concentration	Economic Activity	The tax base is well diversified among industries, different types of economic activity and with several different employers. Chains of production and distribution are well contained within its limit and this gives resilience to macroeconomic shocks.	The tax base shows a certain degree of concentration in any of the evaluated clusters. However, economic activity is favorable, with peaking industries or a set of well establish employers with proven resilience to macro economic shocks.	Tax Base highly concentrated in any of the evaluated clusters. Aggregated demand and consumption are highly sensible to macroeconomic and local shocks.
	Industry Concentration			
	Employer Concentration			

Factors and Labels

3. Tax Base Performance Indicators (15.0% weight of the rating)

What is HR Ratings measuring?

The strength or weakness of the tax base relative to the national average, based on metrics constructed with macroeconomic indicators.

The quantitative analysis in this section is based upon the performance of three demographics indicators. These, for each issuer tax base, will be contrasted against the national average. Each metric measures the difference and holds a weight of 5.0% of the rating; these are incorporated into the methodology as follows:

- 1) For the **population growth rate**, HR Ratings calculates the difference, in terms of basis points, between the issuer's four-year compound annual growth rate (CAGR) and the national own 4-year CAGR;
- 2) For the **per capita income**, HR Ratings compares and parametrizes the difference between the issuer's last year amount in USD with the national average;
- 3) For the **unemployment rate**, HR Ratings calculates and parametrizes the difference, in terms of basis points, between the issuer's last year unemployment rate and the national rate.

According to the value of each metric, an integer *value* between "1" (worst) and "19" (best) will be assigned. Each *value* will be weighted in the Rating of the bond. Table 4, shows what HR Ratings typically expects for each metric of an issue rated in a specific rating range:

Table 4: Tax Base Demographic Indicators

Factors and Weights			HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
Tax Base Demographics (Quantitative Metrics)	Population Growth (4-year Compound Annual Growth Rate)	5%	The entity's growth rate is 200 basis points above the country's rate.	The entity's growth rate is 125 basis points above the country's rate.	The entity's growth rate is 35 basis points above the country's rate.	The difference between the entity's growth rate and the country's rate is between 35 and -60 basis points.	The entity's growth rate is 60 basis points below the country's rate.	The entity's growth rate is 150 basis points below the country's rate.	The entity's growth rate is 225 basis points below the country's rate.
	Per Capita Income (Last Available Twelve Months Data)	5%	The entity's per capita income is \$9,000 dollars above the country.	The entity's per capita income is \$6,750 dollars above the country.	The entity's per capita income is \$3,000 dollars above the country.	The difference between the entity's per capita income and the country's is between \$3,000 and -\$3,500 dollars.	The entity's per capita income is \$3,500 dollars below the country.	The entity's per capita income is \$11,000 dollars below the country.	The entity's per capita income is \$17,000 dollars below the country.
	Unemployment Rate (Last Available Twelve Months Data)	5%	The entity's unemployment rate is 120 basis points below the country's rate.	The entity's unemployment rate is 75 basis points below the country's rate.	The entity's unemployment rate is 30 basis points below the country's rate.	The entity's unemployment rate is between -30 and 60 basis points of the country's rate.	The entity's unemployment rate is 60 basis points above the country's rate.	The entity's unemployment rate is 165 basis points above the country's rate.	The entity's unemployment rate is 320 basis points above the country's rate.

Source: HR Ratings.

Second set of key factors: Trend and Volatility Analysis ***(20.0% weight of the rating)***

The analysis for each of the two metrics described in this section begins with the evaluation of the available historical data for the pledged revenues. For each factor, a quantitative analysis measures the revenues' growth rate to obtain a metric. According to the resulting value of each metric, an integer *value* between "1" (worst) and "19" (best) will be assigned.

At least the last five years of information will be evaluated. It is important to state that more information will grant certainty to HR Rating's analysis and for a stable pledge, typically higher ratings will be assigned. For new taxes or fees, similar schemes will be evaluated; however, these will typically receive a lower *value* in this section of the evaluation.

1. Trend Analysis (10.0% weight of the rating)

What is HR Ratings measuring?

The ability of the pledged revenues to sustain growth in real or nominal terms.

In this analysis, HR Ratings will evaluate the long-term growth rate of the pledge and will contrast it against inflation trends. With the available information, HR Ratings will measure the 5-year CAGR of the last twelve months (LTM) of the pledge as well as the accumulated average inflation considering the same terms.

The purpose of this analysis is to evaluate if the pledge can sustain nominal growth, sustaining its real value or to grow in real terms. A non-decreasing pledge is what HR Ratings expects for issues rated at least at the "HR BBB" range; while a "HR AAA" issue is expected to grow at least five percent points above average inflation, and a "HR A" rated issue will commonly grow only above inflation. Table 5 shows these concepts:

Table 5: Trend of the Pledge

Factor and Weights		HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
Trend (5-year CAGR)	10%	The pledged revenues' growth rate is 500 basis points above the CPI Inflation rate.	The pledged revenues' growth rate is 200 basis points above the CPI Inflation rate.	The pledged revenues' growth rate is above the CPI Inflation rate.	The pledged revenues' growth rate is below the CPI inflation.	The pledged revenues' growth rate is no more than 200 basis points below inflation.	The pledged revenues' growth rate is no more than 400 basis points below inflation.	The pledged revenues' growth rate is more than 550 basis points below inflation.

Source: HR Ratings.

In case there is no available information of a pledge for some of the last five years, HR Ratings can use information regarding the underlying asset that generates the pledge. For example, in the case of newly instituted hotel taxes, HR Ratings can assess tourist fluency to the entity as well as the economic trends of the cities and counties from where tourists come from.

2. Volatility Analysis (10.0% weight of the Rating)

What is HR Ratings measuring?

The volatility of the Year over Year (YoY) growth rates of the sum of the last twelve months of the pledged revenues.

The analysis will initially comply with the periodicity of the debt service payments, considering both principal and interest. YoY growth rates will be estimated for the pledge, as established by the debt service terms and its integer value will be assigned considering the largest YoY drop in the last five years. HR Ratings parameters for this section are as shown in Table 6 below:

Table 6: Volatility of the Pledge

Factor and Weights		HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
Volatility (LTM YoY Growth Rates)	10%	The pledged revenues show no declines in the last five years in a YoY basis.	The pledge revenues highest decline in the past five years is below 200 basis points.	The pledge revenues highest decline in the last five years is below 500 basis points.	The pledge revenues highest decline in the last five years is below 900 basis points.	The pledge revenues highest decline in the last five years is below 1,350 basis points.	The pledge revenues highest historic decline is below 1,800 basis points.	The pledge revenues highest historic decline is greater than 1,800 basis points.

Source: HR Ratings.

Another relevant factor that HR Ratings evaluates is the intra-annual growth rates of the pledge, for which the unpredictability of seasonal fluctuations is a concern that will usually reflect weakness. In these cases, HR Ratings will apply a qualitative adjustment to the rating of the bond, as it will be described in latter sections of the methodology. These adjustments will also reflect inadequacies of the information; for example, if the debt is to be served in a quarterly basis, but the historical information of the pledge is reported in an annual basis, as there could be concerns related to historical seasonality not reflected in the data.

Third set of key factors: Coverage Metrics (35.0% weight of the rating)

Coverage metrics allow HR Ratings to measure the ability of the pledge to serve its debt obligations. In this section two coverage metrics are evaluated, these are applied to different analysis scenarios. The first metric is the market standard “Maximum Annual Debt Service (MADS)”, while the second is HR Ratings own “Projected Minimum Annual Coverage (PMAC)”

1. Maximum Annual Debt Service (MADS) (20.0% weight of the rating)

This metric is constructed by dividing the last twelve months (LTM) pledge with the largest outstanding annual debt service, considering both principal and interest payments. This metric represents the capacity of the current pledge to face the highest upcoming debt service obligations.²

$$MADS = \frac{LTM \text{ Pledged Revenues}}{Maximum \text{ Upcoming Annual Debt Service}}$$

Table 7 below shows the MADS coverage that HR Ratings typically expects to see for bonds rated in the different ranges:

Table 7: Maximum Annual Debt Service (MADS) rating ranges								
Factor and Weights		HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
MADS	20%	3.00x	2.25x	1.50x	1.10x	0.70x	0.35x	Less than 0.35x

Source: HR Ratings.

As any other quantitative metric evaluated in this methodology, an integer *value* between “1” and “19” will be assigned to the MADS estimated by HR Ratings. For the coverage metrics, all bonds to be served under the same parity by the pledge will be considered when measuring the debt service. If HR Ratings identifies that a fix amount is allocated to serve the bond, or that a share of the pledge is allocated by any given formula, then HR Ratings will calculate the MADS concerning only the rated bond.

² In certain cases, the pledge could hold a clear trend and HR Ratings can choose to incorporate into its MADS calculation its projection for the next twelve months, instead of the last twelve observable months. The projection will be the one estimated in HR Ratings’ own Base Scenario, that will be described in the next section. If HR Ratings chooses this method; it will detail its process and its justification in its Analysis Report.

Special-Tax Bonds Methodology

Methodology for Local Entities of United States of America

April 2020

2. Projected Minimum Annual Coverage (PMAC) (15.0% weight of the rating)

This metric measures the lowest coverage under a stress scenario; as shown in the following equation:

$$PMAC_t = \frac{LTM \text{ Pledged Revenues}_t}{Debt \text{ Service}_t}$$

The two components of the PMAC, its numerator and denominator, must be estimated for the same twelve-month period. In Table 8, HR Ratings shows the ratios expected for different rating ranges. For example, the “HR BBB” range typically show a PMAC coverage of at least a 1.0x value. Considering that this ratio is measured under a stress scenario, HR Ratings expects a PMAC coverage of 2.5x for bonds rated with “HR AAA”.

Table 8: Projected Minimum Annual Coverage (PMAC) rating ranges

Factor and Weights		HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
PMAC	15%	2.50x	1.70x	1.15x	1.00x	0.65x	0.28x	Less than 0.28x

Source: HR Ratings.

To calculate the PMAC, HR Ratings will construct two scenarios. The first is the Base Scenario, that will serve as the base for projecting the Stress Scenario, that will incorporate both common risks and the volatility observed in the pledge.

The Base Scenario

This scenario reflects the most probable outcome, considering recent revenue trends, seasonality, demographic trends, and macroeconomic trends. For this, the analysis team will use the most disaggregated form of data of the pledge and will project future revenues.

In its rating report, HR Ratings will describe the main assumptions used when building this scenario, as well as a detailed description of the risks associated to projecting the pledge or the debt service.

The Stress Scenario

HR Ratings' Stress Scenario will reflect the risks already identified in processes previously described in this methodology. These refer to the sensitivity of the taxed goods and services, the tax base concentration, and the trend and volatility analysis. HR Ratings will describe the way in which these factors affect the growth trends of the pledge.

Another component of this scenario is the application of a six-year stress cycle that will replicate the strongest YoY decline observed on the pledged revenues in the last five years.

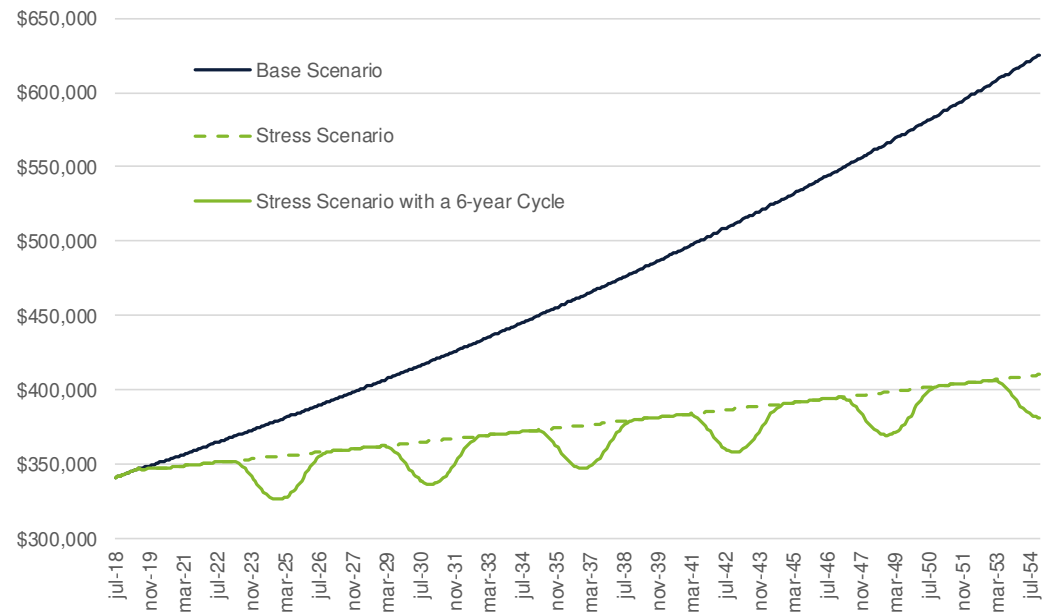
Special-Tax Bonds Methodology

Methodology for Local Entities of United States of America

April 2020

Graph 1 shows an example in which HR Ratings elaborates a base scenario with a constant growth rate, also a stress scenario in which the YoY growth rates are 70-basis points lower; and lastly a stress cycle that applies a 7.5% YoY decline every six years.

Graph 1: HR Ratings' Scenarios



Source: HR Ratings.

The PMAC is calculated as the lowest Debt Service Coverage Ratio (DSCR) in the transaction life term. Both the revenues and the debt service must correspond to the same twelve months' time frame. It is important to state that all assumptions used for building this scenario will be detailed in HR Ratings analysis report as well.

Fourth set of key factors: Legal Framework Metrics **(15.0% weight of the Rating)**

This section evaluates the strength of the legal framework and the protections it provides to the bondholders. This implies that HR Ratings will review any state or local statutes and any document used to authorize the tax and the bond issuance.

1. Additional Bond Test (7.5% weight of the rating)

This test, also known as the "parity test", serves the purpose of securing outstanding special-tax bonds by conditioning additional bond issuance to be serviced with the same pledge. These tests usually measure the capacity of historical revenues to serve outstanding issues and proposed issues.

Special-Tax Bonds Methodology

Methodology for Local Entities of United States of America

April 2020

The Additional Bond Test (ABT), which consist in a form of a coverage metric, can be defined in different ways in the legal framework of each bond or on all bonds under the same parity. HR Ratings will evaluate if the definition of the ABT provides an adequate protection to the bond and the bondholders. As part of its constant review process, HR Ratings will conduct a test in which the ABT will be estimated for each term projected in its Scenarios. This exercise could reveal weaknesses in foreseeable terms if not all coverages comply with the ABT in the bond's life term.

Despite any definition of the ABT, higher ratios will always translate to better protections for the outstanding bonds, Table 9 shows the ratios that the ABT coverages typically for the different rating ranges for this metric.

Table 9: Values for the Additional Bond Test (ABT)

Factors and Weights		HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
Additional Bond Tests (ABT) (Quantitative Analysis)	7.5%	2.25x	1.70x	1.30x	1.00x	0.80x	0.60x	Less than 0.60x

Source: HR Ratings.

As with the other quantitative factors of the methodology, a notch between “1” and “19” will be assigned according to the value of the ABT. It is important to note that if the entity is about to issue, or it issues, an additional bond, even if the ABT criteria is met, HR Ratings will review its coverage metrics through its Projection Scenarios to incorporate the credit risks associated with the increment of the debt service and will review the rating if necessary.

2. Debt Service Reserve Fund (7.5% weight of the rating)

HR Ratings will assess four features of any Debt Service Reserve Fund (DSRF), to each a label among {Superior, Average, Limited} will be assigned. All factor weight the same in this section and these are as follows: a) the required amount, b) sources of funding, c) initial funding and refunding mechanisms, and d) usage limitations. This analysis is qualitative as it considers several concepts that can provide strength or weakness depending on the issuance and its context.

- a) **The Required Amount:** Every reserve fund must be established with a target required amount, and the formula for determining this amount varies depending on each project. However, the industry standard is set by the “Three-Prong Test” which is based in the lesser of the following concepts:
 - i) Maximum Annual Debt Service,
 - ii) The 10% of par value of all Outstanding debt,
 - iii) A 125% of average annual debt service.
- b) **Sources of Funding:** The most common ways in which an entity funds its DSRF is through cash, a surety bond, or a combination of both. Cash funding is preferred as it is more liquid and doesn't entail a financial obligation to another entity once resources from the fund are used to serve debt.

Special-Tax Bonds Methodology

Methodology for Local Entities of United States of America

April 2020

- c) **Funding and Refunding Mechanisms:** HR Ratings will check the time horizon established in the indenture regarding the initial funding of the reserve fund. A fund that is available for usage from initial delivery will be consider as safer than one which requires an extended period to be fully funded. Even riskier are the funds which allow for funding to start only after Debt Service coverage falls beneath an agreed floor level (springing reserves).

After the money to cover debt service is drawn from the reserve fund, the entity must reestablish the required amount while keeping up with the scheduled interest & principal payments. The time horizon the entity is given to reestablish the fund varies between indentures. HR Ratings applies the same criteria as it does with the initial funding, meaning that a faster reestablishment of the fund will be considered as better than a longer time period.

- d) **Usage Limitations:** Limitations could refer to financial burdens or covenants inside the indenture or the overall legal framework. Higher rated funds inside this methodology will reflect clear conditions for using the DSRF and that it is only useable for this purpose. Also, that in the cases in which the fund must be refinance by the pledge or that interest must be paid, the financial burden will not compromise current debt servicing.

Table 10 shows what HR Ratings expects to identify in the DSRF for bonds rated in the different ranges:

Table 10: Factors analyzed in each Debt Service Reserve Fund (DSRF)

Factors and Label		"Superior"	"Average"	"Limited"
Debt Service Reserve Fund (Qualitative Analysis)	Required Amount	A DSRF funded beyond the 3-Prong Test, by cash from the proceedings of the issuance, it is readily available for usage, and with no financial costs or with no crippling conditions for usage when the fund is not at the objective value.	A DSRF funded at the 3-Prong Test. Funded in the first years of the structure with the revenues generated by the pledge, or by a high rated surety bond; with little financial costs after usage or with no crippling conditions for usage when the fund is not at the objective value.	A DSRF funded below the 3-Prong Test, funded with mechanisms like "springing reserves" or by a low rated surety bond; with high financial costs after usage or with crippling conditions for usage when the fund is not at the objective value.
	Sources of Funding			
	Initial Funding and Refunding Mechanisms			
	Usage Limitations			

Source: HR Ratings.

Typically, HR Ratings will consider bond proceeds at the time of issuance and the accumulation of revenues as strong mechanisms, while "springing reserves" a weak mechanism; surety bonds³, letters of credit or guaranty policies will depend on each case. As for the amount considered as adequate, HR Ratings expects "HR AAA" bonds to comply above the 3-prong test.⁴ While bonds rated in the "HR BB" range and below will typically display no DSRF, or a DSRF funded significantly below the 3-prong Test, or by a surety provided with a low credit rating.

The analysis for the DSRF is qualitative in nature and a Label, with its corresponding numerical *value*, will be assigned according to Table 2 in page 7.

³ A Surety Bond provides protection against a default, these can be use instead of cash in a DSRF.

⁴ The 3-prong test is an industry norm that requires a reserve fund to comply with the lesser of the maximum annual debt service, 1.25x of the average annual debt service or 10% of initial principal.

Special-Tax Bonds Methodology

Methodology for Local Entities of United States of America

April 2020

The Rating and Other Considerations

In this methodology, each factor is assigned an integer value between “1” (worst) and “19” (best). With these values HR Ratings can estimate a rating for every factor; but most importantly, it can determine the credit rating of the bond by calculating the weighted average of said factors.

For the quantitative factors, each metric is assigned its value according to HR Ratings own parametrization, Tables 4 through 9 show the values for each metric to reach a specific rating range. For the qualitative factors in the methodology, each is assigned a label among {Superior, Average, Limited}; these have a corresponding value of {3,2,1} respectively and the average of the sub-factors is converted into an integer *value* according to the ranges shown in the following Table 11:

Table 11: Values and Ratings			
Qualitative Curve Limits		Integer Value	Rating
Upper	Lower		
3.000	2.900	19	HR AAA
2.900	2.794	18	HR AA+
2.794	2.689	17	HR AA
2.689	2.583	16	HR AA-
2.583	2.478	15	HR A+
2.478	2.372	14	HR A
2.372	2.267	13	HR A-
2.267	2.161	12	HR BBB+
2.161	2.056	11	HR BBB
2.056	1.950	10	HR BBB-
1.950	1.844	9	HR BB+
1.844	1.739	8	HR BB
1.739	1.633	7	HR BB-
1.633	1.528	6	HR B+
1.528	1.422	5	HR B
1.422	1.317	4	HR B-
1.317	1.211	3	HR C+
1.211	1.106	2	HR C
1.106	1.000	1	HR C-

Source: HR Ratings.

For example, if the qualitative labels for “Taxed Goods and Services”, that refer to the sensitivity of the pledge to changes in income and the price of complementary or substitute goods, average 2.71; the corresponding integer value is “17”. Table 11 also shows the rating for each integer value, if a bond has a rounded average of “13”, then the credit rating will be “HR A-”.

Special-Tax Bonds Methodology

Methodology for Local Entities of United States of America

April 2020

Qualitative Adjustments

The qualitative adjustments are made in terms of notches to the rating and are limited by concept. These refer to very specific risks or strengths that are not common to every bond rated by this methodology but that will have an impact in the cases in which they are present. These could be applied as follows:

1. **Lack of information:** In the cases in which HR Ratings is provided with less than five year of the historical performance of the pledge it will subtract a notch to the rating; if it is provided with less than three years, it will subtract two notches. However, these adjustments won't be applied to new projects that provide studies, by external agencies with proven reputation, with projections for the revenue stream.
2. **Unpredictable Seasonality:** Only applicable when the aggregation of the pledge data has a higher periodicity than the debt service payments. In these cases, HR Ratings can subtract one notch to the rating; however, if it is identified that the revenue stream has an unpredictable seasonality, two notches can be subtracted.
3. **Weight of Factors:** If HR Ratings identifies that any of the factors detailed in the methodology contribute/mitigate the credit risk beyond the weight that has been assigned, it will add/subtract a notch to the rating.
4. **Additional Legal Framework factors:** For any of the following factors HR Ratings can subtract one notch to the rating: a) any state or local statutes that could harm the authorization or could modify the tax; b) weakness of the collecting agent or process, as well as an inadequate timing of deposits; c) an unclearly defined lien structure, no segregation between debt service accounts or an unclear flow for the funds.

The qualitative adjustments will be limited to a three-notch downgrade to the rating for any bond evaluated with this methodology.

Special Revenue Glossary

Special Revenues: As defined by the 11 U.S. Code § 902 (Subchapter 1. General Provisions). Definitions for this chapter⁵:

- “(A) receipts derived from the ownership, operation, or disposition of projects or systems of the debtor that are primarily used or intended to be used primarily to provide transportation, utility, or other services, including the proceeds of borrowings to finance the projects or systems;
- (B) special excise taxes imposed on activities or transactions;
- (C) incremental tax receipts from the benefited area in the case of tax-increment financing;
- (D) other revenues or receipts derived from functions of the debtor, whether the debtor has other functions; or
- (E) taxes specifically levied to finance one or more projects or systems, excluding receipts from general property, sales, or income taxes (other than tax-increment financing) levied to finance the general purposes of the debtor;”

⁵ <https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title11-section902&num=0&edition=prelim>



Special-Tax Bonds Methodology

Methodology for Local Entities of United States of America

April 2020

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This methodology is the
exclusive property of HR
Ratings.

This addendum describes the process followed by HR Ratings to evaluate the credit quality of the Structured Debt of Mexican Municipalities.

This methodology addendum outlines the process used in the evaluation of the credit quality of the debt of the municipalities of the United Mexican States acquired through irrevocable trusts (as Structured Debt, SD) and that have the respective Federal Participations (*Ramo* 28) and Contributions (*Ramo* 33) as a payment source. The credit risks evaluation model maintains the assumptions put forward in the Master Methodology: *Structured Debt of Mexican States: Federal-Transfer Backed Debt Methodology*

Description of the Master Methodology

The model described in the Master Methodology is based mainly on a quantitative exercise that measures, in a specific period, the maximum reduction resisted by revenue allocated to the SD under the condition of meeting all its payment obligations. This reduction determines the credit rating, although under specific circumstances, the rating may vary in terms of notches due to Qualitative Adjustments.

With the projection of the pledged revenue, considering HR Ratings' Macroeconomic Scenarios and the debt service in each period, the model identifies the minimum coverage and based on this applies an additional stress to the transfers over a period of thirteen months. The Target Stress Rate (TOE) measures the maximum reduction that the structure will withstand in said period. The model also considers the use of all the funds available in the trust but establishes the condition that the funds used shall be replenished with the funds remaining from the later operation.

The methodology describes the use of the Prompt Payment Guarantee, financial hedging instruments and secondary and/or substitute sources of payment. The methodology also describes the items identified through a legal opinion provided by an external legal firm and the process will be conducted in the event that there is any update of said opinion.

Description of this Methodology Addendum

This addendum uses the model described in the Master Methodology to calculate the TOE and assign the credit rating. It also incorporates additional Qualitative Adjustments, such as the unsecured rating of another sub-national entity and adjustments in the event that the reserve fund does not cover a minimum of two months' debt service to cope with operative contingencies of the states on transferring Federal funds to the municipalities.

The current Fiscal Coordination Law (LCF) establishes the minimum amount that each state must transfer to its municipalities via certain funds that compose *Ramo* 28 and *Ramo* 33. In its different scenarios, HR Ratings projects the amount applicable to each municipality considering the amount projected for each state in accordance with the process described in the Master Methodology.

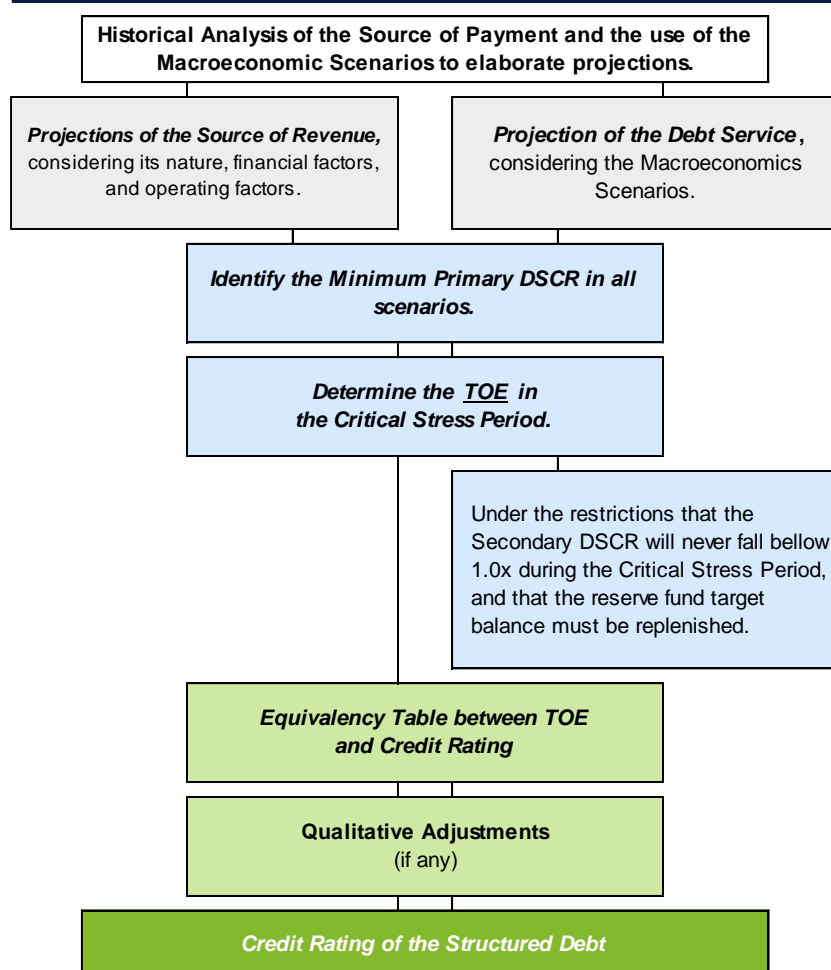
This addendum incorporates the analysis process of Global Credit Lines, which refer to an SD that promotes access to and the contracting of bank loans in competitive financial conditions for a set of municipalities. There are different requirements that may be set by the states or any Federal authority for municipalities seeking to adhere to the line.

Introduction

This addendum to the *Structured Debt of Mexican States: Federal-Transfers Backed Debt Methodology* (Master Methodology) outlines the process used in the evaluation of the credit quality of the debt of the Mexican Municipalities contracted through irrevocable trusts (as Structured Debt, SD) and that have the respective Participations and certain funds of the Federal Contributions as a payment source.¹ The amount available from these funds is determined to a great extent by the dynamic of the General Participations Fund (FGP), which is distributed through *Ramo* 28, certain funds that compose *Ramo* 33 and any other source of Federal Transfers that may be allocated as a payment source for same .

The addendum describes the elements taken from the Master Methodology and certain aspects that are unique. For example, the addendum maintains the assumption of the requirement for the payment of interest and periodic amortizations. The general structure of the rating model is similar, as can be observed in Table 1 below:

Table 1: HR Ratings' Evaluation Process



Source: HR Ratings.

¹ The Master Methodology: *Structured Debt of Mexican States: The Federal Transfers-Backed Debt Methodology*, as well as the addendum applicable to the structured debt with own revenues of the Federal entities (states), can be found at the following link: <https://www.hrratings.com/methodology/>.

Structured Debt of Mexican Municipalities

Addendum to the Federal-Transfers Backed Debt Methodology

September 2020

The Master Methodology outlines the need for and the characteristics of a legal opinion. The aspects that will be evaluated in this addendum in terms of the trusts are as detailed in said document. Therefore, the legal opinion will determine if the trust is valid, enforceable, opposable against third parties and if its implementation is adequate. This would enable HR Ratings to continue with its rating process.

The most important differences from the Master Methodology in terms of quantitative modeling refer to: (i) the additional stress levels derived from the transfers made by the state to the municipality in question, and (ii) the rating of the municipal entity whose Federal transfers is allocated.

Moreover, the factors that cannot be incorporated quantitatively into the analysis will be considered through Qualitative Adjustments in terms of *notches*. Some of these are already detailed in the Master Methodology. But others, such as the possible impact on the credit quality of the state to which the municipality or reserve requirement belongs, relate exclusively to this addendum.

Transfers to Municipalities

The current Fiscal Coordination Law (LCF) establishes the minimum percentage that each state must transfer to its municipalities via certain funds that compose *Ramo* 28. However, there is no proportion established on the total of Federal state participations.

The Federal Participations received by the municipalities from the entire state FGP may not be less than 20.0% of the amount applicable to the state. The state legislatures will establish their distribution among the municipalities based mainly on the collection incentives and replenishment principles. 100% is applicable to the municipalities in the case of the Municipal Development Fund (FFM).

Among the funds that compose *Ramo* 33, the Social Infrastructure Contributions Fund (FAIS) is set annually in the Federal Disbursements Budget (PEF) in an amount equivalent to 2.5294% of the Federal Assignable Collections (RFP), based on the estimates made based on the Federal Revenue Law (LIF) for each fiscal year. Of the total of the RFP, 0.3066% will apply to the States' Social Infrastructure Fund (FISE) and 2.2228% to the Municipal Social Infrastructure Fund of the Territorial Demarcations of the Federal District (FISM). This fund will be paid monthly in the first ten months of the year in equal parts to the states by the Federation and then by the states to the municipalities and territorial demarcations.

Global Line of Credit

The Global Line of Credit (LGC or program) is a structure that promotes access to and the contracting of bank loans in competitive financial conditions for a set of municipalities within a state². The primary payment source of loans contracted under an LGC will be Federal participations and/or contributions (FGP, FFM, FAIS), which are assigned to a master management and payment source trust by the municipalities that opt to adhere to the program³. Municipalities that contract a loan through this mechanism must sign an adhesion contract that constitutes them as Trustors Adhered to the Trust. In certain cases, an LGC may or may not be guaranteed by the respective State government.

² LGCs may be established by the Federation through BANOBRAS or through a state itself.

³ SDs whose payment source comes from own revenue, as detailed in the addendum, may also be considered: "Structured Debt of Subnational Entities and OPDs: Addendum to the Own-Revenue Backed Debt Methodology", at: www.hrratings.com/methodology/.

Structured Debt of Mexican Municipalities

Addendum to the Federal-Transfers Backed Debt Methodology

September 2020

HR Ratings may rate an LGC or the program, if required, and may also rate each financing independently. The global financial terms and conditions will be considered to analyze the program, including the analysis of future flows of the payment source. Depending on the nature of the payment source, the projection method will follow the stipulations set out in the Master Methodology, in this document or in the respective own-revenue addendum. Additionally, each of the requirements (legal and operatives) to be met by the municipal financing that adhere to the program will be analyzed.

In most cases, the legal documents of the LGC establish the capacity characteristics, maximum contracting amounts, terms, amortization profiles, interest rates, surcharges, target amount of the reserve fund, affirmative and negative covenants, among others, that must be met by all the financing arrangements. Under these circumstances, the financial and credit analysis of the program will consider these general characteristics, will conduct the same analysis process in a cyclical and critical scenario, as specified in the respective methodology and obtain a TOE.

In the event that there is the possibility that the municipalities contract financing adhered the program with different financial characteristics, HR Ratings will analyze all the possible cases and as a consequence, the rating of the program will be based on the case that produces the lowest TOE. It is important to point out that the rating of the program may consider positive or negative qualitative adjustments, as with any SD analyzed.

In terms of the possibility that each municipal financing has different characteristics, HR Ratings may rate both the program and each one individually. In this vein, a restriction may be applied to the amount of credit available to each municipality based on the maximum percentage in relation to the payment source. For example, a municipality may be restricted to maintain the amount to be contracted below 35% of the pledged transfers authorized at the time of requesting the loan.

There are also different requirements or restrictions that may be set by the states or any Federal public entity for municipalities seeking to adhere to the program. In the case of *Ramo* 33, these restrictions are subject to that the funds of the contracting year be sufficient to cover the debt. In the case of *Ramo* 28, the factors to be evaluated refer to how the minimum coverage and other factors such as the existence of a technical committee, solidarity or not among the borrowers, etc., are determined.

Quantitative Analysis Process

Preparation of the Assumptions in Base and Stress Scenarios

The procedures stipulated in the Master Methodology are inherited in the determination of the flow of revenue allocated and the debt service. These consider the following variables: 1) the rate of inflation, 2) the Gross Domestic Product (GDP), 3) interest rates, 4) the national FGP as a percentage of the RFP and 5) the percentage of the national FGP received by the state to which the municipality whose SD is evaluated belongs. Implicitly, each scenario assumes nominal levels for the GDP and actual interest rates. Each variable includes its respective stress levels (macroeconomic and cyclical) incorporated in accordance with the terms put forward in the Master Methodology.

The Master Methodology explains how the flow of the RFP is distributed among the different *Ramos* and their funds. The addendum mentions those that are relevant to the case of the municipalities.

Structured Debt of Mexican Municipalities

Addendum to the Federal-Transfers Backed Debt Methodology

September 2020

HR Ratings prepares projections of the percentage relating to the State FGP and the National FGP. For the analysis presented in this addendum, projections are prepared in terms of the percentage of the State FGP that apply to the municipalities of each entity and within this distributable percentage, the percentage that applies to each particular municipality.

The Municipal Development Fund (FFM) is also projected through the percentage assigned to each RFP fund⁴. Lastly, the FAIS revenue is projected through the percentage assigned annually in the PEF.

Mexican Federal legislation allows a state to allocate up to 25% of the revenue to which it is entitled annually to a SD (applicable both to the Contributions Fund for the Strengthening of Federal States (FAFEF) and to the FAIS). Taking the foregoing into account, this rule stipulates that, for future years, the municipality may allocate a minimum amount equal to 25% of the revenue allocated to it in the contracting year. Therefore, if the total amount of the funds received by the municipality through the FAIS program in a future year (for example, t_1) is lower than the total amount received in the contracting year (t_0), the structure will receive an amount of funds at least equal to 25% of the contracting year.

Stress Scenario

There are two additional assumptions of stress for municipal structures, as well as the stress at state level detailed in the Master Methodology.

The first consists of the assumption that of the participations allocated, that each state distributes to its municipalities is reduced in comparison with the percentage obtained in the Base Scenario. It is generally taken as a preliminary assumption that the state distributes 20% of the participations received among its municipalities. The percentage is subject to conditions of stress in the preparation of the projections of the Federal Transfers distributed among the municipalities.

The second assumption refers to the case in which the percentage allocated to the municipality is reduced in comparison with the percentage allocated in the Base Scenario. This scenario reflects the risk of a situation in which the revenue from state-level participations does not change, but revenue lower than expected is received at municipal level.

If the structure depends on transfers allocated through the FAIS, it shall be stressed based on the percentage allocated in the PEF.

Determination of the Target Stress Rate (TOE)

The Debt Service Coverage Ratio (DSCR) is obtained once the pledged revenues and the debt service are determined. The analysis of this item is conducted based on the Master Methodology.

The analysis process is conducted throughout the period in which there is an outstanding balance of the debt acquired pending payment⁵. However, in order to incorporate the sensitivity of creditor faced with the weakness of a structure in coming periods, subject to

⁴ Currently the PEF, based on the Fiscal Coordination Law in force, establishes the amount 1% of the RFP as transfers allocated to the National FFM.

⁵ In terms of the determination of the outstanding balance of the SD, HR Ratings shall confirm with the borrower if the amount contracted was the same as that actually drawn-down. If this information is not available, for the purposes of model, a draw-down of 100.0% of the amount contracted will be assumed. If the amount drawn-down is confirmed as being less than the amount contracted, future draw-downs must be monitored in case that the draw-down period is still valid.

Structured Debt of Mexican Municipalities

Addendum to the Federal-Transfers Backed Debt Methodology

September 2020

certain conditions, the time line in which the payment period will sought with the minimum Primary DSCR may be reduced. This time line is extended over the next two macroeconomic cycles according to the scenarios generated by HR Ratings. However, the analysis will extend to the entire term of the SD under the conditions established in the Master Methodology.

The TOE is calculated using the optimization process, which, has the TOE as a variable “target”. The full payment of the respective debt service is a restriction, which would be reflected in a Secondary Coverage (those that include the reserves) equal to or greater than 1.0x. The second condition is this process is that the reserve fund is replenished to its target balance within a set period after its use. The macroeconomic variables that will be use in this process will be those used in the Stress Scenario that reflects the most adverse conditions for the SD.

The TOE represents the maximum-possible stress that the payment source allocated, in favor of the SD, may withstand without falling into default and allowing the replenishment of the reserve. However, there are cases of SDs in certain municipalities that do not contemplate a reserve fund. In these cases, the metrics of the Primary and Secondary Coverages will be matched and stressed until the lower of their values reach the unit in the Critical Stress Period.

The equilibrium $TOE (TOE^E)$ allows, through an assignment curve, the Credit Rating of the SD to be determined. This curve is shown in Table 2:

Table 2: Ratings to TOE

Credit Rating	TOE Ranges
HR AAA (E)	[85.0% , 100%)
HR AA+ (E)	[78.0% , 85.0%)
HR AA (E)	[71.0% , 78.0%)
HR AA- (E)	[64.0% , 71.0%)
HR A+ (E)	[56.4% , 64.0%)
HR A (E)	[48.8% , 56.4%)
HR A- (E)	[41.2% , 48.8%)
HR BBB+ (E)	[33.6% , 41.2%)
HR BBB (E)	[26.0% , 33.6%)
HR BBB- (E)	[18.4% , 26.0%)
HR BB+ (E)	[16.0% , 18.4%)
HR BB (E)	[14.0% , 16.0%)
HR BB- (E)	[12.0% , 14.0%)
HR B+ (E)	[10.0% , 12.0%)
HR B (E)	[8.0% , 10.0%)
HR B- (E)	[6.0% , 8.0%)
HR C+ (E)	[4.0% , 6.0%)
HR C (E)	[2.0% , 4.0%)
HR C- (E)	[0.0% , 2.0%)

Source: HR Ratings.

This table shows the intervals or ranges within the curve on a scale of 0% to 100%, with which HR Ratings will determine the credit rating based on the value of the TOE. However,

Structured Debt of Mexican Municipalities

Addendum to the Federal-Transfers Backed Debt Methodology

September 2020

if in an annual review or during the follow-up process, it is identified that the TOE has changed to another rating range as a result of the analysis conducted, HR Ratings may maintain the rating or modify its attribute by considering the evolution expected of the TOE.

Credit Rating and Qualitative Adjustments

There are relevant factors that cannot be incorporated quantitatively into the analysis; therefore, they are considered as Qualitative Adjustments within the process. These factors are atypical and there are specific guidelines for them to be considered in the credit rating of the SD. The analysis of the conditions to be met to consider these factors and the impact that they may have on the rating of as SD is explained in detail in the Master Methodology.

Adjustments Related to the Entity's Unsecured Rating

Typically, the Qualitative Adjustments consider the unsecured rating of the state and the possibility that the state contributes funds directly to the trust.

This factor can be analyzed in three different ways. The first refers to the fact that the unsecured rating of a contracting entity is below "HR BBB-"⁶. The second refers to the possibility that the SD contemplates, either implicitly or explicitly, the funds of a second sub-national entity. And the third refers to that the entity's rating shows a high credit quality, thus offering certainty regarding the timely payment of its debt obligations. This point is described in greater detail in the Master Methodology.

Under certain conditions, the credit rating of the state may be relevant. If this entity offers a guarantee to the SD, it must be evaluated to establish if it a secondary or substitute source in order to determine if it may imply an impact on the quantitative model. In these cases, in order not to assign an unfavorable adjustment, the state's rating must be greater than or equal to "HR BBB-" if the guarantee is constituted by Federal transfers and "HR BBB" if the guarantee is constituted by own revenue.

Adjustments Related to Affirmative and Negative Covenants

If for any reason the legal documentation of the SD links the credit risk of the structure to any unrelated risk, HR Ratings shall evaluate the potential impact on the credit quality of the SD. This type of risks, typically, are described in the Affirmative and Negative Covenants Clause ("Covenants") and that, on being signed by the parties involved, have been committed to be performed. This point is described in greater detail in the Master Methodology.

Adjustment related to the Reserve Fund

Given that the distribution and transfer of the Federal funds depends generally on the state, there is the possibility that the SD will be exposed to operative risks. Therefore, the absence of a reserve equivalent to at least two months' debt service is the cause for an Qualitative Adjustment (one *notch*) on the rating of the SD. This obeys that the use of the resources held in a reserve fund are not exposed to said operative risks.

⁶ The rating level established in this section refers to an SD the debt of which is backed by Federal Transfers.

Structured Debt of Mexican Municipalities

Addendum to the Federal-Transfers Backed Debt Methodology

September 2020

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This methodology is the
exclusive property of HR Ratings.

This document describes the methodology used by HR Ratings to evaluate the credit quality of the Structured Debt of Mexican States.

This document is focused on both banking and securities market Structured Debt (SD) of the states of the United Mexican States, which is acquired through irrevocable trusts with Federal funds from *Ramo 28* (Federal Participations), *Ramo 33* (Federal Contributions) as a payment source or any other Federal transfers that may be pledged as a payment source.

Description of the Methodology

The HR Ratings' model is based mainly on a quantitative exercise that measures, in a specific period, the maximum reduction in the pledged revenues resisted by the SD under the condition of meeting all its debt obligations. This reduction determines the credit rating, although under specific circumstances, the rating may vary in terms of *notches* due to Qualitative Adjustments.

With the projection of the pledged revenues and the debt service in each period, the model identifies the minimum hedging and based on this applies an additional stress to the revenue over a period of thirteen months. The Target Stress Rate (TOE) measures the maximum reduction that the structure will withstand in said period. It also considers the use of all the resources available in funds and guarantees, but establishes the condition that the resources used be replenished with the remaining amounts of the operation in the future.

For the projection of the pledged transfers and the debt service, this methodology uses macroeconomic scenarios constructed by HR Ratings' Economic Analysis Department and that consider different variables such as economic growth, inflation and interest rates. The scenarios incorporate stress factors as a cyclical impact for variables such as Federal Assignable Collections (RFP) or national *Ramo 28* national and the variable applicable to each state.

The methodology allows other factors to be incorporated into the quantitative analysis, which include the monetization of GPOs or financial derivatives, as well as cases in which a third party pays the respective amortizations of the period either partially or totally, and the inclusion of secondary and substitute payment sources.

The Credit Rating can be assigned to the SD after the TOE is determined. Qualitative Adjustments can then be incorporated based on the state's unsecured rating or the contractual affirmative or negative covenants, which may trigger early maturity events.

HR Ratings' rating process for the SD of states of the United Mexican States must have a legal opinion that evaluates the capacity of the trust contract to perform its functions, obligations and responsibilities entrusted to it and that allows it to operate as such. The methodology describes the items identified through a legal opinion provided by an external legal firm and the process will be conducted in the event that there is any update of said opinion.

Structured Debt of Mexican States:

Federal-Transfers Backed Debt Methodology

September 2020

Introduction

This methodology describes the analysis process to determine the credit quality of the Structured Debt (SD) of the states of the United Mexican States, which is acquired through irrevocable trusts with Federal funds from *Ramo 28* (Federal Participations), *Ramo 33* (Federal Contributions) as a payment source or any other Federal transfers that may be allocated as a payment source. Debt may be constituted through bank loans or securities issued on the stock market through debt instruments.

This methodology assumes as Structured Debt (DE) in which the payment of interest and periodic and obligatory amortizations are required (referred to jointly as debt service). To do so, HR Ratings bases its analysis mainly on the projections of the payment source through a flow analysis, considering the reserves constituted and any additional recourse available (credit improvement) that may be quantified and that serves to cover the payment of the debt service. This evaluation considers the performance of the debt, the payment source and/or additional flows throughout the legal term of the loan or the issue.

An important characteristic in this methodology is the fact that it only considers the unsecured rating of the state, the Federal funds of which are allocated as a payment source of the debt, when below "HR BBB-", or the equivalent in the market. In these cases, HR Ratings may include a qualitative adjustment on the rating of a SD.

Finally, the analysis process described in this methodology may also be applied in SDs whose payment source comes from the collection rights of a portfolio, the underlying assets of which are bank loans or even the remainder of another SD. In both cases, the requirement that the payment source must be come from Federal transfers and that the credit quality of the underlying assets or the preferential SD is met.

HR Ratings' quantitative analysis described in this methodology is based on measuring the capacity of the structure of the debt to resist a sudden contraction of the funds available for the debt service. In this vein, the model identifies the minimum value of the coverage of the debt service and applies an extraordinary stress of thirteen months around said coverage. This period considers the weakest month from the financial point of view and the stress will be applied to the transfers allocated through the Target Stress Rate (TOE). The reduction of revenue is conditioned to there being sufficient funds to meet the debt obligations and to that the structure being capable to replenishing the reserves used with remaining amounts.

HR Ratings recognizes that not all the factors that affect the credit quality of the SD are quantifiable; therefore, the analysis process also allows for a series of Qualitative Adjustments. These are specific and their impact on the rating is limited to the description provided in this methodology. HR Ratings' rating report will outline and justify the adjustments incorporated into the credit rating of the SD.

The methodology has two addenda: *Structured Debt of Mexican Municipalities: Addendum to the Federal-Transfers Backed Debt Methodology* and *Structured Debt of Subnational Entities and OPDs. Addendum to the Own-Revenue Backed Debt Methodology*. The first refers to the debts of municipalities with Federal transfers as a payment source, whereas the second refers to the debts of the states, municipalities and their decentralized bodies with non-Federal revenue as a payment source (such as taxes, duties and levies collected by the entity itself).

Legal Strength of Evaluated Structured Debt

There are two fundamental legal elements that must be evaluated in each case in which the rating process described in this methodology is used. These elements refer to the concept of the trust within the SD and the validation of their legal strength by an external legal firm through a Legal Opinion.

The credit analysis of an SD begins from the fact that there is a legal and operative separation between the financial structure and the entity's payment capacity and/or intention. Therefore, the methodology allows the credit quality of the SD to be captured without considering the credit quality of the entity. However, it must be clarified that, although this separation allows HR Ratings to prepare a quantitative analysis that does not incorporate the credit rating of the entity. This may have an impact through Qualitative Adjustments.

This section describes the treatment of the legal opinion and the HR Ratings' interpretation to assess the legal strength of the structure. The section focuses first on the concept of the trust and then the legal opinion, followed by the treatment and the potential impact of the update of the legal documentation.

The Concept of the Trust.

A trust contract is the legal means, vehicle or instrument that stipulates all the terms, conditions, rights and obligations that give form to the organizational and operative structure of a bank loan or stock market issue during its entire term. The existence of this contract, which must be unconditional and irrevocable, is what allows the loan or issue to be considered as an SD.

The concept of the trust must meet the following characteristics: 1) be irrevocable and transparent until it performs its purpose, 2) be a management trust, which implies the existence of a third party (trustee) who manages the assets and/or funds used as a payment source between the debtor (trustor) and the creditor (beneficiary, the institution that grants the loan or the investors holder of the issue instruments); 3) be a trust in which the parties indicate the manner in which the SD should operate and therefore, service their payment obligations; 4) be a payment vehicle, through which the debtor is obliged to maintain the funds available at all times to meet the payment obligations, and 5) determine the priority of payments. All this is conducted by allocating said funds to the trust.

Legal Opinion¹

The rating process for the SD must have a legal opinion that evaluates the capacity of the trust contract to perform its functions, obligations and responsibilities entrusted to it and that allows it to operate as such. The rating process must also confirm that the trust contract and the rest of the legal documents of the transaction meet the legal obligations and provisions applicable to the contracting of financing or the issuing of debt, including the allocation mechanism of the payment source, guarantee contracts and financial derivatives. If all the above is complied with in accordance with the law firms' internal criteria, then the Legal Opinion would consider that the trust is valid, enforceable, opposable against third parties

¹ In its General Methodological Criteria (CGM), HR Ratings explains the concept of the Legal Opinion, the characteristics that must be met and its importance for the SD. The CGM may be consulted at the following link: <https://www.hrratings.com/methodology/>.

and if its implementation is adequate, which would enable HR Ratings to continue with its rating process.

Otherwise, when the Legal Opinion determines that these points are not adequately addressed in the legal documentation, one of the following two situations may arise. The first is when the loan contract explicitly stipulates that the entity must contribute resources for the payment of the debt service. In these cases, HR Ratings may assign the SD the unsecured credit rating assigned to the entity. The second situation is the one in which the structure does not admit resources from the entity; therefore, in these cases, HR Ratings will suspend its rating process.

Update of the Legal Opinion

During the review process of a credit rating of and SD, there is the possibility that the parties involved in the financial transaction make modifications or additions to the legal documents reviewed initially by HR Ratings and the law firm. Under these circumstances, HR Ratings may request an update of the current Legal Opinion in accordance with certain criteria.

Faced with any modification and/or addition to the legal documents, HR Ratings may proceed to request the trustor for all the new documents in order to determine whether or not an update to the Legal Opinion is required². As a consequence, the possible situations are:

1. If the modifications to the legal documents do not have any effect on the terms of the allocation of the funds offered as payment guarantee, HR Ratings will not request the update of the Legal Opinion. Despite this, it may be possible that the modifications have an impact on the current rating level of the SD or its attribute³.
2. If the modifications require the update of the Legal Opinion, it must be updated preferably with the law firm that issued the original opinion; otherwise, another law firm authorized by HR Ratings will have to be engaged. Here the following scenarios may arise:
 - If the update of the Legal Opinion considers that the documentation referring to the trust guarantees that it is valid, enforceable, opposable against third parties and its implementation is adequate, HR Ratings shall incorporate the modifications into the quantitative analysis and perform the respective rating action.
 - If the update of the Legal Opinion does not guarantee that the trust is valid, enforceable, opposable against third parties and its implementation is adequate, HR Ratings may incorporate said modifications into its analysis and propose a Qualitative Adjustment as part of the review process. The impact on the number of *notches* would be reflected in that the credit rating of the SD being equal to the rating of the trustor in cases identified as having the obligation to contribute funds to the trust.
 - If the law firm does not conclude the update process of the Legal Opinion by the date of the annual rating review, HR Ratings shall report the status of the operation, including the possible changes in the current rating or its attribute

² The update of the Legal Opinion may be requested at any time during the term of the operation, but not necessarily during the annual review process performed by HR Ratings.

³ Attribute shall be understood as: Outlook, Observations or Special Review, as defined in HR Ratings' CGM.

based on the information it holds. The review process will continue its course once the lawyers send the updated Legal Opinion.

Finally, if HR Ratings identifies any change on the legal documentation, depending on the magnitude or relevance of the changes, it may place the rating in "Review in Process". In this period, the changes will be evaluated to confirm if they have an impact on the financial characters and if an update of the Legal Opinion is required. In general, during the monitoring of the rating or the follow-up process, an update of the Legal Opinion may be request should any changes in the relevant documents be identified.

General Structure of Analysis Model

The first step of HR Ratings' quantitative model consists of developing a projection of the payment source and the debt service of the SD. To do this, several different macroeconomic scenarios generated by HR Ratings' SD Economic Analysis Department are used. The first of these scenarios replicates the economic and financial conditions prevailing in the Mexican market (Base Scenario). The rest incorporate stress conditions, first a Low Growth with Low Inflation Scenario and then a Scenario of Stagflation. The rating process considers the historical information available at the time and uses current projections in order to assign the rating. In each analysis report, HR Ratings will outline the main risks derived from movements in the macroeconomic variables to the rating assigned.

Once the revenue and debt service projections are prepared for each Macroeconomic Scenario, the Debt Service Coverage Ratio (DSCR) will be calculated at each payment date and for the remaining term of the SD⁴. Based on this, the scenario in which the smallest DSCR arises will be identified and an additional stress on the payment source will be applied around it for a period of six months before and six months after. The application of this exercise will determine the Target Stress Rate (TOE), which fulfills the purpose of calculating the maximum level of stress that a structure may tolerate on its payment source without falling into default in a specific time. The level of stress may be greater if there is any other liquid resource and available within the SD for the payment of the debt service. Examples of this are the reserve funds, coverage contracts and payment guarantees.

If the SD has a reserve fund and/or a payment guarantee, the TOE must meet the additional condition that the remainders of the future flows of the payment sources must be replenishable to the target amount of the reserve, in accordance with the stipulations of the legal documentation and/or pay the funds used from the guarantee⁵. In technical terms, if the SD has additional funds, the maximum level of stress will be that in which the minimum DSCR is equal to 1.0x (times). Otherwise, if there is a reserve fund and/or payment guarantee, obtaining a DSCR below 1.0x is feasible. However, the level of this coverage must be such that, once this additional stress period ends, there are sufficient funds to replenish the reserves and/or pay the guarantee in a specific time⁶.

The credit rating is determined based on the value of the TOE, which in turn may be adjusted in terms of *notches*, either positively or negatively, if there are Qualitative Adjustments. The types of factors evaluated in these adjustments typically refer to the analysis of the terms and conditions of the financial transaction and if its existence represents an improvement

⁴ In this methodology, the Primary DSCR is the relevant coverage metric. The concept of "Primary" refers to that the coverage only considers the resources allocated to the payment of the debt service of the SD.

⁵ The analysis process of an SD with a Partial Guarantee or Prompt Payment Guarantee is presented in the methodology: "Partial Guarantees for Issues of Structured and Unsecured Debt" document, published in March 2019 by HR Ratings on www.hrratings.com.

⁶ This lapse is defined as the Post-Critical Stress Period and its duration, in the case of the reserve funds, will depend on the amount of funds available to service the debt in terms of periods.

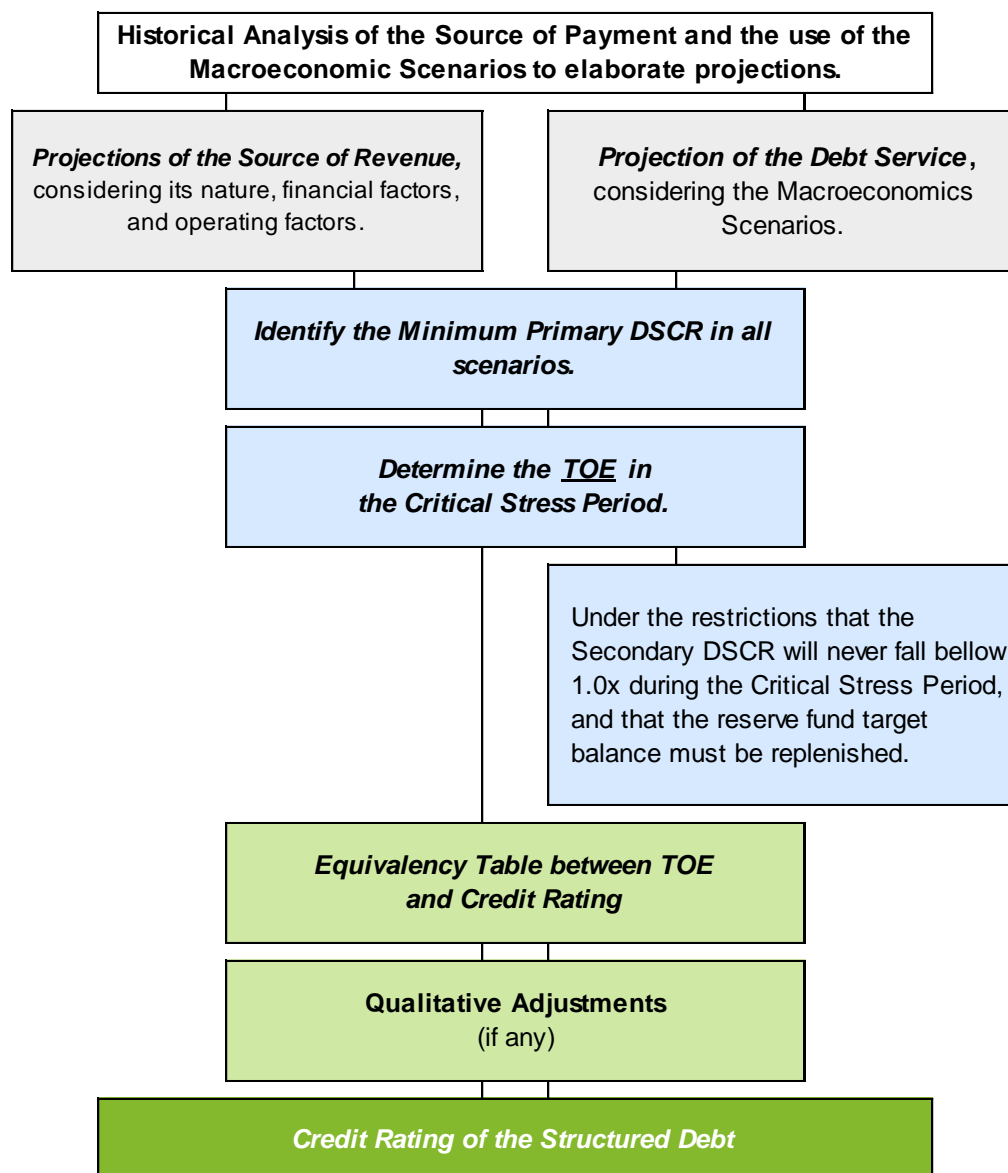
Structured Debt of Mexican States:

Federal-Transfers Backed Debt Methodology

September 2020

or an additional credit risk. These adjustments will be explained later. For the time being, Table 1 shows the structure of the model described in this section:

Table 1: HR Ratings' Evaluation Process



Source: HR Ratings.

The emphasis on the calculation of the TOE value reflects the assumption that the payment capacity of the SD is as strong (in financial terms) as its performance at its weakest point, which is represented by the minimum DSCR projected throughout the term of the legal maturity.

Lastly, pursuant to the number of bank loans and securities issues rated by HR Ratings, the payment source of most of these SDs comes from Federal transfers received from Federal Participations (*Ramo 28*)⁷.

Macroeconomic Scenarios.

HR Ratings prepares various Macroeconomic Scenarios to evaluate the financial strength of a loan or the issue of securities market debt under stress situations: 1) the Base Scenario, 2) the Stagflation Scenario and 3) the Low Growth with Low Inflation Scenario. Macroeconomic Scenarios also allow the projection of financial expenses, such as the cost of debt, because they provide a series for different interest rates (Equilibrium Interbank Interest Rates), exchange rate, inflation and the value of the Investment Unit (UDI).

The Federal Assignable Collection (RFP) is the most important variable projected, as well as the Federal funds of *Ramo 28* and *Ramo 33*, which may be allocated. HR Ratings considers the estimates of the Gross Domestic Product (GDP) in each scenario as a point of reference⁸. In general terms, the projection of a specific Federal fund may consider, within its calculation, the historical percentage in terms of the GDP.

With the GDP projections, under the different Macroeconomic Scenarios, HR Ratings makes estimates for the RFP and for the different Federal Revenues funds that may be allocated by the states. The main relationships calculated in this process are: 1) RFP to national GDP, 2) FGP by state to national FGP, 3) FAIS by state to national FAIS and 4) FAFEF by state to national FAFEF.

The historical information will be used to project these series and the constant proportions will be maintained for the Base Scenario. For the case of stress scenarios, multiple levels of stress will be incorporated, which will be explained later.

Federal Assignable Collection (RFP)

The RFP is constituted from a set of funds collected by the Federation through Federal taxes and a large portion of these are assignable by the states and municipalities⁹. This suggests that the national economic activity determines, to a great extent, the amount that year-on-year is approved of this item in the Federal Revenues Law (LIF)¹⁰.

Based on the foregoing, the RFP projections are based on the historical percentage that has been shown as part of the rated GDP. In the Base Scenario, this percentage is projected using the weighted average of the last five years observed and the current year: $\{t_{-5}, \dots, t_0\}$ ¹¹; the current calendar year is considered as year zero (t_0)¹².

⁷ Although this methodology refers to transfers from Federal funds that may be allocated according to the Fiscal Coordination Law (LCF, 2018), any future change in the law on the origin, the criteria and the calculation of the transfers that the sub-national entities (the states) may receive must be analyzed under this same methodology. In the nature of the Federal transfers changes, HR Ratings may conduct a separate analysis process.

⁸ These two include the main funds used for the payment of states' and municipalities' debt obligations. Nowadays, approximately 94% of the sub-national debt rated by HR Ratings has the General Participations Fund (FGP) and the Municipal Development Fund (FFM) as payment sources.

⁹ In addition to Federal taxes, the RFP include mining duties and 80.29% of the Federal Government's oil revenues, as well as surplus income. The foregoing is according to the current Fiscal Coordination Law (LCF).

¹⁰ Other elements that may influence the performance of the RFP are certain international financial variables (such as fuel prices) and tax reforms that may be approved by the Legislative Branch.

¹¹ HR Ratings review and/or re-evaluate the RFP projection and as a consequence, the rest of the relevant funds, at least once a year. This review will preferably be conducted at the beginning of the year in order to include all the new data observed.

¹² The projection process conducted by HR Ratings may consider the amount budgeted in the RFP in the LIF as a reference for t_0 (base year or current year).

Structured Debt of Mexican States:

Federal-Transfers Backed Debt Methodology

September 2020

In the Macroeconomic Stress Scenarios, the calculation of the historical proportion of the RFP to the PIB will consider additional adjustments. The first refers to a stress to be applied to the period projected between years t_1 and t_5 , the second adjustment refers to another stress of a different magnitude to be applied to years t_6 and t_{10} , and the last stress fixed from t_{11} . A Cyclical Stress will also be applied, which refers to the reduction on years t_2 and t_3 . This cycle will be repeated every six years; therefore, the second cycle will occur in years t_8 and t_9 , and the third cycle will be applied to t_{14} and t_{15} and then successively. It is important to mention that the value of this reduction may change in accordance with the prevailing economic conditions.

Table 2 illustrates how HR Ratings applies its stress to the relationship between the RFP and the Rated GDP. The series relating to the Rated GDP are prepared by HR Ratings' Economic Analysis Department, provided that the RFP for each scenario relates to the method described herein.

Table 2: Applying Stress to the Projections of the RFP.

Year	Base Scenario			Stress Scenario				
	Nominal GDP	RFP		Nominal GDP	RFP		Stress Factors	
	Amount	Amount	% of GDP	Amount	Amount	% of GDP	Regular	Cyclical
t_{-6}	\$450,152	\$167,457	37.20%	\$450,152	\$167,457	37.20%	n/a	
t_{-5}	\$473,110	\$174,436	36.87%	\$473,110	\$174,436	36.87%	n/a	
t_{-4}	\$492,980	\$184,769	37.48%	\$492,980	\$184,769	37.48%	n/a	
t_{-3}	\$526,503	\$190,173	36.12%	\$526,503	\$190,173	36.12%	n/a	
t_{-2}	\$547,037	\$201,966	36.92%	\$547,037	\$201,966	36.92%	n/a	
t_{-1}	\$569,465	\$211,215	37.09%	\$569,465	\$211,215	37.09%	n/a	
t_0	\$597,938	\$217,850	36.43%	\$538,145	\$217,850	40.48%	n/a	
t_1	\$627,835	\$230,933	36.78%	\$502,268	\$183,792	36.59%	0.00095	
t_2	\$659,227	\$242,479	36.78%	\$494,420	\$179,931	36.39%	0.00095	-0.20%
t_3	\$692,188	\$254,603	36.78%	\$519,141	\$188,954	36.40%	0.00095	-0.10%
t_4	\$726,798	\$267,334	36.78%	\$545,098	\$198,429	36.40%	0.00095	
t_5	\$763,138	\$280,700	36.78%	\$572,353	\$207,806	36.31%	0.00095	
t_6	\$801,295	\$294,735	36.78%	\$600,971	\$217,746	36.23%	0.00075	
t_7	\$841,359	\$309,472	36.78%	\$631,020	\$228,160	36.16%	0.00075	
t_8	\$883,427	\$324,946	36.78%	\$662,571	\$237,746	35.88%	0.00075	-0.20%
t_9	\$927,599	\$341,193	36.78%	\$695,699	\$249,807	35.91%	0.00075	-0.10%
t_{10}	\$973,979	\$358,253	36.78%	\$730,484	\$262,480	35.93%	0.00075	
t_{11}	\$1,022,678	\$376,165	36.78%	\$767,008	\$275,182	35.88%	0.00055	
t_{12}	\$1,073,811	\$394,973	36.78%	\$805,359	\$288,499	35.82%	0.00055	
t_{13}	\$1,127,502	\$414,722	36.78%	\$845,627	\$302,458	35.77%	0.00055	
t_{14}	\$1,183,877	\$435,458	36.78%	\$887,908	\$315,317	35.51%	0.00055	-0.20%
t_{15}	\$1,243,071	\$457,231	36.78%	\$932,303	\$331,503	35.56%	0.00055	-0.10%
t_{16}	\$1,305,225	\$480,093	36.78%	\$978,918	\$348,518	35.60%	0.00055	
t_{17}	\$1,370,486	\$504,097	36.78%	\$1,027,864	\$365,379	35.55%	0.00055	
t_{18}	\$1,439,010	\$529,302	36.78%	\$1,079,258	\$383,054	35.49%	0.00055	
t_{19}	\$1,510,961	\$555,767	36.78%	\$1,133,220	\$401,584	35.44%	0.00055	
t_{20}	\$1,586,509	\$583,556	36.78%	\$1,189,881	\$418,629	35.18%	0.00055	-0.20%

Source: HR Ratings' example.

Throughout the projections in the Base Scenario, the relationship for the RFP to the Rated GDP remains fixed with a base in a weighted average of the percentages observed between

{t-5, ..., t₀}. This percentage is taken for the Stress Scenario, but the reductions observed in the two right-hand columns, regular stress and cyclical stress, are applied to it.

National General Participations Fund

The current LCF establishes the transfer mechanisms of the RFP funds to the states and municipalities. The Law stipulates that the FGP will be calculated year-on-year in the Federal Expenditure Budget (PEF) considering a proportion equivalent to 20.0% of the RFP. In such a manner that, beginning with the RFP series under the Base Scenario and the Stress Scenarios, this proportion may be applied to obtain the projection of the national FGP¹³.

State General Participations Fund

HR Ratings will also weight the historical proportion of the last five years and the current year between the FGP of each state and the national FGP to project the proportion of the national FGP applicable to each state. The PEF will be taken as a reference for the current year. This process relates to the projection of the Base Scenario¹⁴.

An additional adjustment will be made for the Macroeconomic Stress Scenarios. This process is equivalent to the one described for the proportion of the RFP on the GDP, excluding the application of the Cyclical Stress. The magnitude of each of these adjustments will be the same for all the states and will be applied in the same years.

Finally, a monthly series projected for each state will be constructed on the series of state FGP. These will consider the historical seasonality factor inherent to each state, which will be obtained from the weighted average of prior years¹⁵.

Social Infrastructure Contributions Fund (FAIS) and the Contributions Fund for the Strengthening of Federal States (FAFEF)

The transfer mechanism to the states established in the LCF will be applied for the projections of the FAIS and FAFEF, which are funds from *Ramo* 33. The national FAIS will be determined annually in the PEF with Federal funds in an amount equivalent to 2.5294% of the RFP¹⁶. The FAFEF fund will be determined annually in the PEF in an amount equivalent to 1.4% of the RFP.

Considering the different series of the RFP that have been projected for each scenario, these percentages will be applied and the series will be obtained (base and stress) for both national funds. The state series will be constructed based on this:

The process to obtain these series will be same as used for the state FGP. In other words, the historical proportion of the last five years plus the current year between the FAIS of each state and the national FAIS will be calculated. The weighted average of these years will be taken to prepare the projection for each state in each scenario. The process to apply the

¹³ Although there is a legal reference of 20.0%, HR Ratings recognizes that there may be small historical deviations. Therefore, HR Ratings will review the proportions observed to confirm said relationship and in the event that of a deviation, it may propose to the Analysis Committee a calculation process of the proportion similar to the PIB / RFP proportion. In other words, the proportion used in the projection of the national FGP would be the result of the weighted average of the last five years observed (RFP / national FGP) and the current year.

¹⁴ In general terms, the same weightings will be used for the five years and the current year observed in each state. In extraordinary cases, the Analysis Committee may adjust the weightings applied to particular state(s).

¹⁵ If there is any extraordinary event in the amount or distribution of FGP of a specific state, the six-year period may be extended.

¹⁶ Of the total of the RFP, 0.3066% will apply to the States' Social Infrastructure Contributions Fund (FISE) and 2.2228% to the Municipal Social Infrastructure Fund of the Territorial Demarcations of the Federal District (FISM). For the purposes of this methodology, the FAIS and FISE concept are synonymous in the cases of the states. The FAISM and FISM applies to the municipalities.

stress in the respective scenarios is equivalent to the rest of the variables described in this document.

Lastly, in terms of the seasonality of the series, the LCF stipulates a specific monthly transfer mechanism for these funds. The FAIS (FISE and FISM) will be paid monthly in the first ten months of the year in equal parts to the states by the Ministry of Finance and Public Credit (SHCP) and then by the states to the municipalities¹⁷. The FAFEF funds will be paid to the states monthly in twelve equal installments¹⁸.

Federal Participations (*Ramo 28*)

Federal Participations (national *Ramo 28*) will be projected based on their historical percentage compared to the national GDP. In the Base Scenario, the proportion expected through the series would once more be the weighted average of the last five plus the current year¹⁹.

The process to apply the reductions in the Stress Scenarios is equivalent to the process described in the preparation of the RFP quotient to GDP, as shown in Table 2. This includes the second adjustment mentioned in said section, which applies the Cyclical Stress Scenario in the projections of national *Ramo 28* as a percentage of the national GDP.

Federal Participations per State

The transfers levels at state level will be determined using the projections of Federal Participations at national level for the different macroeconomic scenarios. The percentage of *Ramo 28* to be received by each state is projected through the historical relationship between their own *Ramo 28* and the national *Ramo 28*²⁰. The proportion applied to all the years of the SD will be the result of the weighted average of the last five years plus the current year: This proportion will not incur any change in the Base Scenario.

The process described in Table 2 will also be used for the stress scenarios and the calculation of the Federal Participations per State, without applying the Cyclical Stress.

Finally, a monthly series will be projected for each state on the annual series of *Ramo 28*. These will consider the historical monthly seasonality factor inherent to each state, which will be obtained from the weighted average of the six prior years²¹.

Transfers to Municipalities

Although the current LCF establishes the percentage that each state must transfer to its municipalities from the funds that compose *Ramo 28*, no proportion is established on the total of the Federal Participations to the states.

In this vein, the Federal Participations received by the municipalities from the entire state FGP may not be less than 20% of the amount applicable to the state, which must distribute

¹⁷ The states shall pay their respective municipalities and in the case of Mexico City, the territorial demarcations, the fund applicable to them in accordance with the calendar pursuant to which the Federation pays the states. Said calendar must be published by the states by the latest January 31 of each fiscal year in their respective gazettes.

¹⁸ If the Federal payment source has characteristics other than those analyzed in this methodology, the Analysis Team, together with the General Analysis Department, may determine a process for its projection.

¹⁹ The projection process for the national and state *Ramo 28* amount may take the amounts budgeted year-on-year in the LIF as a reference. HR Ratings may also make adjustments that reflect the particular performance of each state for the period t_0 .

²⁰ The LCF stipulates the distribution criteria of national *Ramo 28* among the 23 states. It must be mentioned that from the 2015 reform to said Law, additional funds were constituted in *Ramo 28*.

²¹ If there were any extraordinary event in the amount or distribution of *Ramo 28* of a specific state, the six-year period may be extended.

them in accordance with the applicable legislation. The local legislatures will establish their distribution among the municipalities based mainly on the collection incentives and replenishment principles in the municipal part²².

As already mentioned, the FAIS is set annually in the PEF in an amount equivalent to 2.5294% of the RFP, based on the estimates made based on the LIF for each fiscal year. Of the total of the RFP, 0.3066% will apply to the States' Social Infrastructure Fund (FISE) and 2.2228% to the Municipal Social Infrastructure Fund of the Territorial Demarcations of the Federal District (FISM). This fund will be paid monthly in the first ten months of the year in equal parts to the states by the Federation and then by the states to the municipalities and territorial demarcations.

Interest Rates and Surcharges

Up to now, this methodology has explained the procedure used to project future Federal transfers that may be allocated to the payment source of the SD and that is credited to the state. In terms of the financial cost expected from the SD, HR Ratings also uses different macroeconomic scenarios generated by its Economic Analysis Department for cases in which the cost of the debt is referenced to a variable interest rate or to the Investment Unit (UDI).

Moreover, the financial cost of the debt may consider a surcharge (additional base points), which is generally linked to the credit rating obtained and maintained by the SD. In this case, the base financial scenario would consider the surcharge associated to the lowest credit rating (or with the greatest risk) prevailing the market. For the case of stress scenarios, the surcharge considered would be the one at the credit rating level lower than the level of the Base Scenario²³.

If the SD has financial hedging instruments such as CAPs or SWAPs, the quantitative model will incorporate their effects (positive or negative). The duration and magnitude of these effects will be different according to the macroeconomic scenario analyzed.

Calculation Model of the Target Stress Rate (TOE)

HR Ratings' quantitative model is based on the calculation of the Target Stress Rate (TOE), which captures the maximum reduction of the revenue that an SD may withstand in the specified lapse, without defaulting on its payment obligations. This first section defines the main variables, concepts and metrics used to calculate the TOE; it continues with the description of the model and offers a formal definition of this rate and the problem of optimization it causes. Lastly, this section provides an example of how a credit rating is calculated and interpreted.

Variables, Concepts and Metrics

To describe the quantitative model, it is first necessary to define the main variables used :

Definition: *Revenue Allocated*.

For the terms of this methodology, Revenue Allocated refers to the future cash flow available to serve the debt and cover certain expenses. This flow is assigned by the state during the

²² Currently, there are states that transfer more than 20% to their municipalities.

²³ In some cases, the legal documents of the SD stipulate that the surcharge is based on the credit rating with the greatest risk and on its remaining term. In these cases, the surcharge is fixed throughout the term of the SD.

Structured Debt of Mexican States:

Federal-Transfers Backed Debt Methodology

September 2020

term of the SD the Federal transfers it receives mainly from the Participations (*Ramo* 28) and certain Contributions (*Ramo* 33). Said transfers must be in turn transferred directly to a trust (FISO) the purpose of which is to serve the debt.

***Note:** It must be clarified that the *Revenue Allocated* used by the HR Ratings in its model incorporates the different levels of stress described in the preceding section.

Definition: *Debt Service*.

For the terms of this methodology, debt service refers to the periodic payment of interest and amortization through the FISO with the *Revenue Allocated*. If the SD has an active financial hedging instrument, the effects (positive or negative) shall be incorporated into the amount of interest payable in in each period.

Definition: *FISO Expenses*.

For the terms of this methodology, *FISO Expenses* refer to disbursements to be made by the FISO for commission, fees, considerations for guarantees, annual fees for certain services, contractual premiums for certain financial derivatives, among others.

Definition: *Available Reserves*.

For the terms of this methodology, *Available Reserves* refer to the funds available at all times to assists in the *Debt Service* if it cannot be covered in full by the *Revenue Allocated*. These reserves can take forms such as funds determined by fixed target balance or by a number of months of *Debt Service*, partial guarantees, letters of credit, etc.

Definition: *Primary Coverage*.

Expressed in terms of times (x), *Primary Coverage* reflects the capacity of the future cash flow available to service the debt obligations and is calculated for the entire term of the SD using the following formula:

$$DSCR_t^{Primaria} = \frac{\text{Ingreso Afectado}_t - \text{Gasto del FISO}_t}{\text{Servicio de Deuda}_t}$$

Definition: *Critical Stress Period*.

This refers to a lapse of thirteen months around the minimum $DSCR_t^{Primaria}$, in which an additional stress will be applied to the *Revenue Allocated* and is defined as follows:

$$\{t_{-6}, \dots, t_{-1}, t_0 \Leftrightarrow \min \{DSCR_{t_0}^{Primaria}\}, t_1, \dots, t_6\}$$

Definition: *Secondary Coverage*.

Expressed in terms of times (x), *Secondary Coverage* reflects the capacity of the future cash flow and the reserves available to service the debt obligations and is calculated using the following formula:

Structured Debt of Mexican States:

Federal-Transfers Backed Debt Methodology

September 2020

$$DSCR_t^{Secundaria} = \frac{\text{Ingreso Afectado}_t - \text{Gastos del FISO}_t + \text{Reservas Disponibles}_t}{\text{Servicio de Deuda}_t}$$

Definition: *Post-Critical Stress Period*.

Refers to the lapse, following the Critical Stress Period, in which the SD, with the use of remainders existing in the FISO, must replenish the funds of the reserves used to comply with the *Debt Service* payment. In cases of reserve funds, this implies replenishing the target balance and in the case of partial guarantees, it refers to repaying the funds used considering the respective interest. The replenishment shall always be based on the applicable legal documentation that describes the conditions of any reserve fund, guarantee or any other instrument.

The length of this period is defined in terms of the funds available; for example, in the case of a reserve fund, it will depend on the number of months represented by the funds in the reserve in terms of *Debt Service*²⁴.

Conditions for the Critical Stress Period and Post-Critical Stress Period.

The first step of the quantitative model consists of identifying the minimum *Primary Coverage* during the term of the structure. On identifying this minimum value, the Critical Stress Period is constructed in which an additional stress will be applied to the Revenue Allocated, which must meet the multiple conditions. It is important to clarify that the HR Ratings model will be applied in one of the two stress scenarios, which implies that it will incorporate the projections of the respective macroeconomic variables. The stress scenario will be selected based on the one that shows the smallest minimum *Primary Coverage*.

In the absence of reserves, the stress that will be applied to the Revenue Allocated in this period would consider the restriction of the $DSCR_t^{Primaria} \geq 1.0x$. However, it is most common that the SD evaluated with this methodology has access to reserves; therefore, its use would permit lower $DSCR_t^{Primaria}$ in the *Critical Stress Period*. Notwithstanding this, under these circumstances, it must meet the condition of replenishing the reserves used in the *Post-Critical Stress Period*.

This implies that the stress to be applied in the *Critical Stress Period* must always consider the capacity of the remainders to replenish, in the *Post-Critical Stress Period*, the reserves used.

The following section defines the rate that determines the magnitude of the stress to be applied in the *Critical Stress Scenario*.

Calculating the TOE

Definition: *Target Stress Rate (TOE)*

The TOE refers to the maximum stress that the Revenue Allocated can withstand toward the SD during the *Critical Stress Period*, complying with the *Debt Service*, but will the condition of replenishing the reserves used during the *Post-Critical Stress Period*. The equilibrium value of this (TOE^E) rate that meets these conditions is determined by applying the following problem of optimization.

²⁴ In the case of Partial Guarantees, the criterion use is contained in the *Partial Guarantees for Issues of Structured and Unsecured Debt: Debt Methodology*, published by HR Ratings in March 2019.

Structured Debt of Mexican States:

Federal-Transfers Backed Debt Methodology

September 2020

Calculate: the TOE^E

Subject to:

- i) $(1 - TOE^E) \sum_{t=1}^{C=13} Pledged\ Revenue_t - FISO\ Expenses_t + Available\ Reserves_1 \geq \sum_{t=1}^{C=13} Debt\ Service_t$
- ii) $Available\ Reserves_{C+n} = Target\ Amount\ of\ the\ Reserve\ Fund_{C+n}$

Where:

TOE^E : Represents the Target Stress Rate that solves the problem of optimization.

C : Refers to the extension of the Critical Stress Period.

n : Refers to the extension of the Post-Critical Stress Period.

Definition: Critical Revenue.

During the *Critical Stress Period*, the revenue that results after applying the TOE^E to the *Revenue Allocated* is defined as *Critical Revenue*, the calculation of which is shown in the following expression:

$$Critical\ Revenue_{t_i} = Pledged\ Revenue_{t_i} (1 - TOE)$$

Where: $i = \{-6, \dots, 0, \dots, 6\}$ and $i \in \{-6, \dots, 0, \dots, 6\}$ represents the of months of the *Post-Critical Stress Period*.

Equivalence between the TOE and the Credit Rating of the SD

The rating of the SD is related to the value of the TOE through an equivalence. The relationship between the TOE calculated in the financial flows model and the rating level is determined based on Table 3.

Structured Debt of Mexican States:

Federal-Transfers Backed Debt Methodology

September 2020

Table 3: Ratings to TOE	
Credit Ratings	TOE Ranges
HR AAA (E)	[77.5% , 100%]
HR AA+ (E)	[71.5% , 77.5%)
HR AA (E)	[65.5% , 71.5%)
HR AA- (E)	[59.5% , 65.5%)
HR A+ (E)	[52.5% , 59.5%)
HR A (E)	[45.5% , 52.5%)
HR A- (E)	[38.5% , 45.5%)
HR BBB+ (E)	[31.5% , 38.5%)
HR BBB (E)	[24.5% , 31.5%)
HR BBB- (E)	[17.5% , 24.5%)
HR BB+ (E)	[16.0% , 17.5%)
HR BB (E)	[14.0% , 16.0%)
HR BB- (E)	[12.0% , 14.0%)
HR B+ (E)	[10.0% , 12.0%)
HR B (E)	[8.0% , 10.0%)
HR B- (E)	[6.0% , 8.0%)
HR C+ (E)	[4.0% , 6.0%)
HR C (E)	[2.0% , 4.0%)
HR C- (E)	[0.0% , 2.0%)

Source: HR Ratings.

This table shows the intervals or ranges within the curve on a scale of 0% to 100%, with which HR Ratings will determine the credit rating based on the value of the TOE.

However, if in an annual review or during the follow-up process, it is identified that the TSR has changed to another rating range as a result of the analysis conducted, HR Ratings may maintain the rating or modify its attribute by considering the evolution expected of the TSR.

Example of the TOE Calculation

In this section, HR Ratings offers an example of how the TOE is calculated, considering the variables, concepts, metrics and the process defined in the preceding section. Table 4 shows a structure in which in t_0 the minimum *Primary Coverage* is 2.43x; and the Critical Stress Period is constructed around this period.

In this particular example, the *Post-Critical Stress Period* is composed of five periods and the target balance of the reserve fund is P\$25 million (m). As can be observed, the TOE^E is 80.62% and enables that the $DSCR_{t_6}^{Primaria} = 0.49$ and the $DSCR_{t_6}^{Secundaria} = 1.0x$. In this case, the entire reserve fund is used during the *Critical Stress Period* and the remainders during the *Post-Critical Stress Period* are such that they allow the said fund to be replenished in full.

Structured Debt of Mexican States: Federal-Transfers Backed Debt Methodology

September 2020

Table 4: Model to determine the Target Stress Rate (TOE).

Cyclical Pledged Revenues	Debt Service	Primary DSCR	Min. DSCR	Critical Revenue (TOE)	Primary DSCR	Balance without Reserve Fund	Available Reserve Fund		Secondary DSCR	Funds remaining by the end of the period
			2.43x	80.62%			Beginning	End		
\$9,126,966	\$3,285,468	2.78x		\$9,126,966	2.78x	\$5,841,498	\$25,000,000	\$25,000,000	10.39x	\$5,841,498
\$9,128,335	\$3,334,750	2.74x		\$9,128,335	2.74x	\$5,793,585	\$25,000,000	\$25,000,000	10.23x	\$5,793,585
\$9,129,704	\$3,384,771	2.70x		\$9,129,704	2.70x	\$5,744,933	\$25,000,000	\$25,000,000	10.08x	\$5,744,933
\$9,131,074	\$3,435,543	2.66x		\$9,131,074	2.66x	\$5,695,531	\$25,000,000	\$25,000,000	9.93x	\$5,695,531
\$9,132,443	\$3,487,076	2.62x	t-6	\$1,769,754	0.51x	-\$1,717,322	\$25,000,000	\$23,282,678	7.68x	\$0
\$9,133,813	\$3,539,382	2.58x	t-5	\$1,770,019	0.50x	-\$1,769,363	\$23,282,678	\$21,513,315	7.08x	\$0
\$9,156,648	\$3,592,473	2.55x	t-4	\$1,774,444	0.49x	-\$1,818,028	\$21,513,315	\$19,695,287	6.48x	\$0
\$9,179,539	\$3,646,360	2.52x	t-3	\$1,778,881	0.49x	-\$1,867,479	\$19,695,287	\$17,827,808	5.89x	\$0
\$9,202,488	\$3,701,055	2.49x	t-2	\$1,783,328	0.48x	-\$1,917,728	\$17,827,808	\$15,910,080	5.30x	\$0
\$9,225,495	\$3,756,571	2.46x	t-1	\$1,787,786	0.48x	-\$1,968,785	\$15,910,080	\$13,941,295	4.71x	\$0
\$9,248,558	\$3,812,920	2.43x	t0	\$1,792,256	0.47x	-\$2,020,664	\$13,941,295	\$11,920,631	4.13x	\$0
\$9,271,680	\$3,812,939	2.43x	t1	\$1,796,736	0.47x	-\$2,016,203	\$11,920,631	\$9,904,428	3.60x	\$0
\$9,294,859	\$3,812,958	2.44x	t2	\$1,801,228	0.47x	-\$2,011,730	\$9,904,428	\$7,892,699	3.07x	\$0
\$9,373,865	\$3,812,977	2.46x	t3	\$1,816,539	0.48x	-\$1,996,438	\$7,892,699	\$5,896,260	2.55x	\$0
\$9,453,543	\$3,812,996	2.48x	t4	\$1,831,979	0.48x	-\$1,981,017	\$5,896,260	\$3,915,243	2.03x	\$0
\$9,533,898	\$3,813,015	2.50x	t5	\$1,847,551	0.48x	-\$1,965,464	\$3,915,243	\$1,949,779	1.51x	\$0
\$9,614,936	\$3,813,034	2.52x	t6	\$1,863,255	0.49x	-\$1,949,779	\$1,949,779	\$0	1.00x	\$0
\$9,696,663	\$3,813,053	2.54x		\$9,696,663	2.54x	\$5,883,610	\$0	\$5,883,610	2.54x	\$0
\$9,779,085	\$3,813,072	2.56x		\$9,779,085	2.56x	\$5,966,013	\$5,883,610	\$11,849,623	4.11x	\$0
\$9,925,771	\$3,813,091	2.60x		\$9,925,771	2.60x	\$6,112,680	\$11,849,623	\$17,962,302	5.71x	\$0
\$10,074,658	\$3,813,110	2.64x		\$10,074,658	2.64x	\$6,261,547	\$17,962,302	\$24,223,850	7.35x	\$0
\$10,225,778	\$3,813,129	2.68x	t11	\$10,225,778	2.68x	\$6,412,648	\$24,223,850	\$25,000,000	9.03x	\$5,636,498
\$10,379,164	\$3,813,149	2.72x		\$10,379,164	2.72x	\$6,566,016	\$25,000,000	\$25,000,000	9.28x	\$6,566,016
\$10,379,745	\$3,813,168	2.72x		\$10,379,745	2.72x	\$6,566,578	\$25,000,000	\$25,000,000	9.28x	\$6,566,578
\$10,380,327	\$3,813,187	2.72x		\$10,380,327	2.72x	\$6,567,140	\$25,000,000	\$25,000,000	9.28x	\$6,567,140

Source: HR Ratings.

With these characteristics and with a $TOE^E = 80.62\%$, the credit rating in this example is "HR AAA (E)". Notwithstanding, and as shown in the Table 5, the value of the TOE^E is sensitive to the extension of the *Post-Critical Stress Period*. In the case, this lapse is reduced to three period for the SD.

Structured Debt of Mexican States: Federal-Transfers Backed Debt Methodology

September 2020

Table 5: Restriction to the Model and the Restitution of the Reserve Fund in three periods.

Cyclical Pledged Revenues	Debt Service	Primary DSCR	Min. DSCR	Critical Revenue (TOE)	Primary DSCR	Balance without Reserve Fund	Available Reserve Fund		Secondary DSCR	Funds remaining by the end of the period
			2.43x	74.80%			Beginning	End		
\$9,126,966	\$3,285,468	2.78x		\$9,126,966	2.78x	\$5,841,498	\$25,000,000	\$25,000,000	10.39x	\$5,841,498
\$9,128,335	\$3,334,750	2.74x		\$9,128,335	2.74x	\$5,793,585	\$25,000,000	\$25,000,000	10.23x	\$5,793,585
\$9,129,704	\$3,384,771	2.70x		\$9,129,704	2.70x	\$5,744,933	\$25,000,000	\$25,000,000	10.08x	\$5,744,933
\$9,131,074	\$3,435,543	2.66x		\$9,131,074	2.66x	\$5,695,531	\$25,000,000	\$25,000,000	9.93x	\$5,695,531
\$9,132,443	\$3,487,076	2.62x	t-6	\$2,301,706	0.66x	-\$1,185,370	\$25,000,000	\$23,814,630	7.83x	\$0
\$9,133,813	\$3,539,382	2.58x	t-5	\$2,302,051	0.65x	-\$1,237,331	\$23,814,630	\$22,577,299	7.38x	\$0
\$9,156,648	\$3,592,473	2.55x	t-4	\$2,307,806	0.64x	-\$1,284,667	\$22,577,299	\$21,292,633	6.93x	\$0
\$9,179,539	\$3,646,360	2.52x	t-3	\$2,313,576	0.63x	-\$1,332,784	\$21,292,633	\$19,959,849	6.47x	\$0
\$9,202,488	\$3,701,055	2.49x	t-2	\$2,319,360	0.63x	-\$1,381,696	\$19,959,849	\$18,578,153	6.02x	\$0
\$9,225,495	\$3,756,571	2.46x	t-1	\$2,325,158	0.62x	-\$1,431,413	\$18,578,153	\$17,146,740	5.56x	\$0
\$9,248,558	\$3,812,920	2.43x	t0	\$2,330,971	0.61x	-\$1,481,949	\$17,146,740	\$15,664,791	5.11x	\$0
\$9,271,680	\$3,812,939	2.43x	t1	\$2,336,799	0.61x	-\$1,476,140	\$15,664,791	\$14,188,651	4.72x	\$0
\$9,294,859	\$3,812,958	2.44x	t2	\$2,342,641	0.61x	-\$1,470,317	\$14,188,651	\$12,718,334	4.34x	\$0
\$9,373,865	\$3,812,977	2.46x	t3	\$2,362,553	0.62x	-\$1,450,424	\$12,718,334	\$11,267,910	3.96x	\$0
\$9,453,543	\$3,812,996	2.48x	t4	\$2,382,635	0.62x	-\$1,430,361	\$11,267,910	\$9,837,548	3.58x	\$0
\$9,533,898	\$3,813,015	2.50x	t5	\$2,402,887	0.63x	-\$1,410,128	\$9,837,548	\$8,427,420	3.21x	\$0
\$9,614,936	\$3,813,034	2.52x	t6	\$2,423,312	0.64x	-\$1,389,723	\$8,427,420	\$7,037,698	2.85x	\$0
\$9,696,663	\$3,813,053	2.54x		\$9,696,663	2.54x	\$5,883,610	\$7,037,698	\$12,921,308	4.39x	\$0
\$9,779,085	\$3,813,072	2.56x		\$9,779,085	2.56x	\$5,966,013	\$12,921,308	\$18,887,320	5.95x	\$0
\$9,925,771	\$3,813,091	2.60x	t0	\$9,925,771	2.60x	\$6,112,680	\$18,887,320	\$25,000,000	7.56x	\$0
\$10,074,658	\$3,813,110	2.64x		\$10,074,658	2.64x	\$6,261,547	\$25,000,000	\$25,000,000	9.20x	\$6,261,547
\$10,225,778	\$3,813,129	2.68x		\$10,225,778	2.68x	\$6,412,648	\$25,000,000	\$25,000,000	9.24x	\$6,412,648
\$10,379,164	\$3,813,149	2.72x		\$10,379,164	2.72x	\$6,566,016	\$25,000,000	\$25,000,000	9.28x	\$6,566,016
\$10,379,745	\$3,813,168	2.72x		\$10,379,745	2.72x	\$6,566,578	\$25,000,000	\$25,000,000	9.28x	\$6,566,578
\$10,380,327	\$3,813,187	2.72x		\$10,380,327	2.72x	\$6,567,140	\$25,000,000	\$25,000,000	9.28x	\$6,567,140

Source: HR Ratings.

In this case, the $DSCR_{t_6}^{Primary} = 0.64x$ and the $DSCR_{t_6}^{Secondary} = 2.85x$, both greater than in the case that the *Post-Critical Stress Period* were five periods. Because the example now only considers three periods to replenish the target balance of the reserve fund, the structure cannot make use of the entire fund during the *Critical Stress* and the TOE^E fell to 74.80%, which relates to a credit rating of "HR AA+ (E)".

Particular Characteristics in the Application of the Model

Timeline for the TOE Calculation

The analysis process is conducted throughout the period in which there is an outstanding balance of the debt acquired pending payment²⁵. However, in order to incorporate the sensitivity of creditor faced with the weakness of a structure in coming periods, the time line in which the payment period will sought with the minimum Primary DSCR will reduce. This time line is extended over the next two macroeconomic cycles according to the Cyclical Stress generated by HR Ratings and described in the two preceding sections.

²⁵ In terms of the determination of the outstanding balance of the SD, HR Ratings shall confirm with the borrower if the amount contracted was the same as that actually drawn-down. If this information is not available, for the purposes of model, a draw-down of 100.0% of the amount contracted will be assumed. If the amount drawn-down is confirmed as being less than the amount contracted, future draw-downs must be monitored in case that the draw-down period is still valid.

Structured Debt of Mexican States:

Federal-Transfers Backed Debt Methodology

September 2020

Notwithstanding this, HR Ratings considers that the structure of the amortizations may imply a credit risk that, on applying the timeline criterion, it will not be captured in the analysis, above all of the curve of these amortizations is ascending.

In order for the credit rating of the SD capture this risk and at the same time the timeline criterion be applied, the TOE analysis will be replicated considering the full term of the SD. Unfavorable qualitative adjustments may be assigned if the value of the SD that considers the full term of the SD is equivalent to one rating level below, by at least one *notch*, the rating that relates to the TOE calculated considering the timeline, which is limited to the next two economic cycles.

Determination of the Target Stress Rate (TOE) of *Ramo 33*

This section explains the calculation process of the TOE for state debt backed by specific revenue flows from *Ramo 33*: FAFEF and FAIS. Unlike the funds of *Ramo 28*, the FAFEF and FAIS have certain rules the govern how the funds available for the payment of the state's debt obligations are calculated.

Mexican Federal legislation allows a state to allocate up to 25% of the revenue to which it is entitled annually to a SD (applicable both to the FAFEF and to the FAIS). This rule also stipulates that, for future years, the state may allocate a minimum amount equal to 25% of the revenue allocated to it in the contracting year. There, if the total amount of the funds received by the state through the FAFEF program in a future year (for example, t_1) is lower than the total amount received in the contracting year (t_0), the structure will receive an amount of funds at least equal to 25% of the contracting year.

In the example, if the FAFEF in a future year (t_1) decreases by 30% in comparison with the contracting year t_0 (i.e., that the funds in the reserve in t_1 represent 70% of the amount of t_0) and if the state initially allocated 25% of this fund, then 25% of the 70% will be the amount of funds equivalent for the use of the SD in t_1 . Based on the foregoing, in t_1 the structure would receive the amount of funds equivalent to at least 35.7% of the FAFEF of the current year.

For the calculation of the TOE, if there is a surplus amount over the minimum absolute amount guaranteed by the FAFEF or FAIM program (25%), it will be considered as a resource available within the analysis of the SD. The cause of the possible existence of a surplus amount would be the result of the projected growth, both of the FAFEF and the FAIS, in the long term.

For the calculation of the TOE, in the first place, it must be considered if the funds allocated from the payment source in the contracting year are sufficient to service the debt of the SD around the period of the minimum DSCR. Once the foregoing has been reviewed, the TOE will be calculated based on the funds available from the payment source of the reserve fund year and the other liquid resources that form part of the SD (reserve funds).

Monetization of the Prompt Payment Guarantee (GPO)

As already mentioned, the analysis of the TOE may be extended beyond the Critical Stress Period to ensure that the future flows projected of the structure are able to meet the state's financial obligations, such as the replenishment of the reserve fund balance and/or, in the case of the GPO, any payment required by a third-party guarantee.

As long as the legal documentation permits the flows provided by a GPO to be monetized within the financial model, from a technical point of view, their existence will be considered as additional funds to service the payment of the debt. Under these circumstances, the

Structured Debt of Mexican States:

Federal-Transfers Backed Debt Methodology

September 2020

analysis would be similar to a typical reserve fund and as a consequence, the periods in addition to the Post-Critical Stress Period, considered to meet the financial obligation would have an effect on the value of the TOE.

The analysis process of a GPO must always consider all its operating characteristics and conditions. Some of the characteristics that can be mentioned are: the freezing of the guarantee or the revolving nature of same once used, the mechanism to calculate the exposed amount, the level of consideration, etc. The credit rating of the guarantee must also be an important element given that it determines the effectiveness and capacity of the GOP to meet the state's obligations in conditions of stress²⁶.

Monetization of Derivative Financial Instruments

If the legal documentation of the SD stipulates the contracting of a Hedging Contract, specifically a CAP or a SWAP, as an obligation, HR Ratings shall include all the expenses (premiums or any other expense associated to its contracting) and, if applicable, the earnings or losses generated by these instruments within the financial projection model.

In general, Hedging Contracts are those that set the value of a financial variable (CAP) or exchange its value for another (SWAP). The hedge applies in the specific time and may involve the payment of a premium. The variables subject to hedging are, among, others, interest rates, investment units (UDI) or the exchange rate.

The terms and conditions of the contracts shall be provided by the trustor so that the modeling may adhere to the financial conditions stipulated in the legal documents. Otherwise, HR Ratings may make its projections in accordance with the prevailing market conditions.

In the same manner as occurs with the technical treatment of a GPO, the credit rating of a financial institution offered and backed by the derivative is important and must be considered by HR Ratings. In general terms, if the financial institution's credit rating (Relevant Rating) is greater than the SD's rating, the effect of the hedging will be considered in the analysis. Otherwise, if the institution's credit rating is less than or equal to the rating issued to the SD, HR Ratings will not incorporate its credit improvement within its analysis.²⁷

Structured Debt with Amortizations Backed by a Financial Instrument

When a state contracts an SD with a banking institution, generally with Development Banking Institutions, and the payment of the capital is backed by a Zero Coupon Bond or any other instrument (generally issued by the Federal Government), HR Ratings considers that the state only acquires the obligation to pay interest.

In these cases, both the calculation of the TOE and the determination of the Critical Stress Period will not change. However, only the amount of interest accrued throughout the term of the SD will be considered in the calculation of the debt service in each period.

If the Zero Coupon Bond associated to this financial transaction or any other instrument that performs the function of covering the entire amortization were issued by a public or private entity other than the Federal Government, HR Ratings must contemplate the issuer's credit

²⁶ For further information about the monetization process of the GPO, refers to the "Partial Guarantees for Issues of Structured and Unsecured Debt" document, published in March 2019 by HR Ratings on www.hrratings.com

²⁷ The consideration of Relevant Ratings may be extended to insurance and bonding contracts, if any. Once more, the financial institution's rating must be granted preferably by HR Ratings; if not, HR Ratings may consider the lowest rating available in the market.

quality²⁸. If a risk is identified, a qualitative adjustment to the rating of the SD may be proposed.

Secondary and Substitute Payment Sources

The primary payment source is defined the funds (Federal transfers) that, having been allocated by the state, are used by the trustee to service the debt, the payment of the FISO expenses and to replenishment of the reserve funds before any other resource existing and available in the trust.

In order to improve the credit quality of an SD, it is common that the entity also offers an additional source of funds as a payment guarantee. These are known as secondary and substitute payment sources. HR Ratings has a special technical treatment for each one of them.

The secondary payment source represents a flow of funds that are fully available to the trustee for the payment of the debt service and the replenishment of the reserve fund of the SD²⁹. In this vein, the payment source is used at all times to overcome a partial or total lack of liquidity of the primary payment source.

HR Ratings projects the flows of the secondary payment source on a par with the primary payment source, and given its characteristics, it will be used to calculate the series of Primary DSCR and as a consequence, the TOE^E . It is important to comment that during the Critical Stress Period, both sources will be subject to the reduction percentage.

There is a type of payment source, which is not secondary, but that, under certain conditions, may be used by the trustee to replenish the structure's reserve funds or if an Acceleration Event or Advanced Maturity is triggered.

In the case, HR Ratings' technical treatment of these funds is similar to that of an additional reserve. The funds would be considered available for the payment of debt capital and interest (by funding the reserve); however, neither would they be contemplated for the calculation of the Primary DSCR nor would the reduction percentage used to determine the TOE^E be applied to them. Also, unlike a traditional reserve fund, replenishing the funds used during the Post-Critical Stress Period would not be a condition within the optimization model of the TOE^E .

Lastly, in the case of substitute payment sources, their main characteristic is the fact that they are only available to comply with the payment of the debt service if the primary payment source is eliminated or substantially modified. In these cases, the elimination or change, from a legal standpoint, is a sufficient reason for the annulment of the original allocation made by the state to the SD³⁰.

Another of the characteristics of this type of funds is that they do not always circulate within the trust accounts. In certain cases, if the substitution of the primary payment source is required, the trustee or other authorized entity must issue an instruction to release the funds to the SD.

In the preceding examples, it is assumed that the origin of both the primary and the additional payment sources is Federal. However, there are cases in which a state offers a

²⁸ If HR Ratings has not rated the issuer of the Zero Coupon Bond, the lowest rating in the market shall be used.

²⁹ HR Ratings considers that the fact that the flow circulating through the FISO ensures greater credit strength; otherwise, the trustee's access (operatively and administratively) to this resource will be analyzed. If limitations are identified, a qualitative adjustment may be assigned.

³⁰ There are clauses in this regard in certain trust contracts, which stipulate the mechanisms or steps to be taken if the primary payment source ceases to be allocated.

Structured Debt of Mexican States:

Federal-Transfers Backed Debt Methodology

September 2020

Federal fund as a primary payment source and an own fund as an additional payment source (secondary or substitute) or vice-versa³¹.

If the primary source is of Federal origin and the state offers a secondary payment source of own origin as a guarantee, three possible cases will arise.

- Federal primary source and own secondary source: In this case, Federal funds will be projected in accordance with this methodology, whereas own revenues will be projected based on the addendum that explains the projection method³². The minimum Primary DSCR will be determined once both series of future flows have been constructed. The sum of both funds would also be subject to the percentage reduction process to determine the TOE^E .
- The primary Federal source and own revenues that will only be used to replenish the reserve fund in an Acceleration or Advanced Maturity Event: Under these circumstances, the projection of own revenues would not be considered for the calculation of the Primary DSCR nor would the reduction percentage used to determine the TOE^E be applied to them. However, they will have an impact on being funds available in the calculation of secondary hedging, without the need for the obligation of replenishment at the end of the Post-Critical Stress Period.
- Federal primary source and own substitute source: Once again, Federal funds will be projected in accordance with this methodology and own revenues will be projected based on the respective addendum. Under these circumstances, although the own revenues flows are projected, they will not be considered for the calculation of the minimum Primary DSCR or the calculation of the TOE^E . This process enables HR Ratings to establish the strength of the substitute source.

For the first and second cases, HR Ratings may conduct an additional analysis process in order to evaluate the probable credit improvement of the SD due to having a Federal payment source and own revenues (funds diversification factor). In these cases, a qualitative adjustment on credit rating of the SD may be incorporated.

Credit Rating and Qualitative Adjustments

The credit rating of the SD is based on the value of the TOE, and if any factors that can be incorporated into the quantitative model are identified, they will be incorporated through Qualitative Adjustments. These factors are atypical and this section describes which may be considered and which possible impacts each may have on the credit rating.

Adjustments Related to the Entity's Unsecured Rating

This factor can be analyzed in three different ways. The first refers to the fact that the unsecured rating of a contracting entity is below "HR BBB-"³³. The second refers to the possibility that the SD contemplates, either implicitly or explicitly, the funds of a second sub-national entity. The third refers to that the entity's rating shows a high credit quality, thus

³¹ For the purposes of this methodology and its addenda, "own revenues" is defined as all funds collected and generated by the state's own economic activity.

³² The technical treatment of own revenues as a payment source (in particular the projection process of future flows) is explained in the document: *Structured Debt of Subnational Entities and OPDs: Addendum to the Own-Revenue Backed Debt Methodology*, available at: www.hrratings.com.

³³ The rating level established in this section refers to an SD the debt of which is backed by Federal transfers.

Structured Debt of Mexican States:

Federal-Transfers Backed Debt Methodology

September 2020

offering certainty regarding the timely payment of its debt obligations in the specific cases in which there is the possibility that a state contributes funds in stress situations of the SD.

Unsecured Rating of the State below “HR BBB-”

In relation to the first possibility, there are three scenarios based on the unsecured rating of a contracting state and on the existence or not of an implicit or explicit guarantee on its part³⁴. This guarantee or recourse is relevant on considering situations or high financial stress that increase the liquidity risk of the SD.

- The unsecured rating of the state is equal to or greater than “HR BBB-” and the SD does not have funds provided by the state, which would be established in the legal documentation. In said case, the unsecured rating is not a relevant factor for the rating of the DE; therefore, a structure may be granted a lower rating than the state. In this case, there would be no qualitative adjustment.
- The unsecured rating of the state is equal to or greater than “HR BBB-” and the structure has funds provided by the state. In this case, an unsecured rating represents a floor for the credit rating of the SD.
- The unsecured rating of the state is below “HR BBB-” In this case, the fund provided by the state is irrelevant because it is assumed that the state with this rating would have difficulties to respond to its debt in situations of high economic stress. Additionally, it may be assumed that the state would seek to restructure its debt or amend the legal documentation to make use of the cash allocated by the trust, which would weaken the credit quality of the SD. Therefore, if the rating of the SD is higher than the state’s rating, HR Ratings will propose an unfavorable adjustment, of one *notch*, the rating of the SD.

Funds Provided by a Second State.

In terms of the second possibility, which considers that the SD has Federal revenues as a payment source and their funds toward the contracting state, and in addition, there is another guarantee of a second sub-national entity, HR Ratings shall proceed as follows.

- In the funds are liquid and circulate through the payment trust’s accounts (i.e., there is an allocation), HR Ratings shall monetize these funds within the calculation of the TOE³⁵.
- If the fund are not liquid, but they do guarantee the payment of all the financial obligations of the SD contracted by the state, an adjustment will only be proposed if the Federal Government is the guarantor. In this case, the SD will be matched to the Federal Government’s credit rating.

Unsecured rating with a high credit quality

Finally, the third possibility establishes a criterion that relates the rating of the SD with the unsecured rating of the state when both reflect credit strength and the legal documentation admits funds from the state. The criterion establishes a positive adjustment on the credit rating of the SD if it is equal to or below the rating of the state if and only if, the SD, as well as contemplating the existence of funds to the state, it complies with certain financial conditions.

- If the rating of the SD is below the unsecured rating, then the structured rating will be the same as the rating of the state.

³⁴ Unlike bank loans, in most cases securities issues do not have a guarantee or recourse in terms of additional funds provided by the issuer.

³⁵ In this situation, it must be borne in mind that the guarantee does meet any of the assumptions of the section “Secondary or Substitute Payment Sources”. The fact that the unsecured rating of the second entity is below “HR BBB-” will also be considered.

- If the rating of the SD is equal to the state's rating, the minimum financial conditions necessary to make a favorable adjustment are as follows:
 - The SD must have a legal opinion that considers that the trust is valid, enforceable, opposable against third parties and its implementation is adequate.
 - Throughout its term, the SD must have an annual minimum Primary DSCR of 2.0x³⁶.
 - Throughout its term, the SD must have a minimum annual reserve fund equivalent to 1.0x of the debt service.
 - The SD must not have contractual clauses that significantly increase its credit risk.

It is important to emphasize that the favorable adjustment described in this section requires that the legal documentation of the structure admits that the state contribute funds in financial stress situations.

Adjustments Related to Contractual Affirmative and Negative Covenants

If for any reason the legal documentation of the SD links the credit risk of the structure with any risk not related to its operation, HR Ratings shall evaluate the potential impact on the credit quality of the SD. This type of risks, typically, are described in the section of the loan contract or issue instrument related to the Affirmative and Negative Covenants Clause ("Covenants") and that, on being signed by the parties involved, have been committed to be performed.

For HR Ratings, the potential risks represented by these obligations are not associated to their mere existence, but to the possible triggering of an "Advance Maturity" event if the state defaults on any clause³⁷.

For the purposes of this methodology, an "Advance Maturity" event means that the creditor (banking institution or the investing public) has the authority to request immediate payment of the entire amount of principal pending and the interest accrued of the debt, as well as any other obligation agreed by the state. In HR Ratings' opinion, if the creditor decides to trigger this type of event, the rating of SD may be affected because it would be possible that the state would not have the liquidity required to meet said obligation at that time.

The Affirmative and Negative Covenants that HR Ratings has identified in the legal documentation of the different SD include: 1) maintaining a minimum level of primary DSCR ; 2) maintaining the target balance of the reserve fund; 3) compliance by the state with certain public finance metrics; 4) maintaining a minimum rating of the states and/or the SD; 5) contracting financial derivatives; 6) the obligation to send information on public financial to a third party involved in the transaction, and 7) the cross-maturity with other financial obligations maintained by the states triggered by default³⁸.

The credit risk of default on the aforementioned clauses may not be quantified. Although the analysis may be focused on the probability of the occurrence of the event. Typically, the

³⁶ The value of the Primary DSCR projected may be rounded to the unit to the same as the value of the reserve fund.

³⁷ The default on one of these obligations not only may trigger an "Advance Maturity" event, but there may also be Preventive Events or Acceleration Events (partial or total). In these latter two cases, the effect on the credit quality of the SD is quantifiable and is typically reflected in the value of the TOE.

³⁸ This type of clauses refer to that the default on the payment of another valid financial obligation and recognized by the state may give rise to the declaration of default on payment of the SD rated by HR Ratings. the definition of financial obligation may include direct or contingent debt, short-term debt, structured debt or any other type of liability, obligations within same or different payment trusts, or with itself or other creditors.

Structured Debt of Mexican States:

Federal-Transfers Backed Debt Methodology

September 2020

contracts or issue instruments stipulate that default on one or several of these obligations by the states does not automatically trigger an Advanced Maturity event, but that the decision is taken by the creditor bank or by the meeting of holders based on the circumstances.

The qualitative adjustment will be based on HR Ratings' perception and experience of the probability that the bank or holders' meeting trigger an Advanced Maturity. Different rating actions may be taken in these cases, from the change of attribute to an unfavorable adjustment in terms of *notches*. The foregoing is due to that the triggering of an Advanced Maturity event typically considers a cure period or, if it were to materialize, would lead to the state being declared as incapable of paying the obligation demanded from it in full. As a consequence, failing to pay the obligation would lead to the SD rating being at time the equivalent to HR D (E).

Table 6 explains how the adjustments will be applied if there are cross-maturity clauses related to events of default or even with the affirmative and negative covenants, which at the discretion of HR Ratings substantially increase the ratings of the triggering of a maturity:

Table 6: Advance Maturity

Affirmative and Negative Covenants	
	Maturity not related to an event of non-payment
	A notch may be deducted in cases in which covenants that substantially enhance the risk of triggering Advance Maturity exist.
	Cross-Default related to an event of nonpayment
	A notch may be deducted in cases in which covenants that are related to short-term debt (with any financial institution) exist.*
	A notch may be deducted in cases in which covenants that can be trigger if any liability is registered in the Credit Bureau.*

Source: HR Ratings.

*The adjustment is only applicable in the cases in which the entity's credit rating is below HR AA- (E).

It is important to clarify that the credit rating of an SD may accumulate a downgrade of at least three *notches* in cases that present the risks proposed in Table 6 simultaneously and those in which the rating of the state is equal to or less than "HR A+", or its market equivalent. In the event that the rating is greater than or equal to "HR AA-", or its market equivalent, the SD may only be downgraded and by only one *notch*, when there are clauses that are not connected with events not related to default but do increase the risk of triggering an Advanced Maturity.

Structured Debt of Mexican States:

Federal-Transfers Backed Debt Methodology

September 2020

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This methodology is the exclusive property of HR Ratings.

This addendum describes the process followed by HR Ratings to evaluate the credit quality of the Structured Debt of the Mexican states, municipalities and decentralized public bodies (OPDs) backed by their own revenues.

This methodology addendum outlines the process used in the evaluation of the credit quality of the debt of the states, municipalities and decentralized bodies of the United Mexican States acquired through irrevocable trusts (as Structured Debt, SD) and that are paid by own revenues. The credit risks evaluation model maintains the main assumptions put forward in the Master Methodology: *Structured Debt of Mexican States: Federal-Transfers Backed Debt Methodology*.

Description of the Master Methodology

The model that describes the Master Methodology is based mainly on a quantitative exercise that measures, in a specific period, the maximum reduction resisted by the revenue pledged to the SD under the condition of meeting all its payment obligations. This reduction determines the credit rating, although under specific circumstances, the rating may vary in terms of notches due to Qualitative Adjustments.

With the projection of the pledged revenues, considering HR Ratings' Macroeconomic Scenarios and the debt service in each period; the model identifies the minimum debt coverage, and based on this, applies an additional stress to the projected revenues over a period of thirteen months. The Target Stress Rate (TOE) measures the maximum reduction that the structure will withstand in said period. The model also considers the use of all the funds available in the trust, but establishes the condition that the funds used shall be replenished with the funds remaining from the later operation.

The methodology describes the use of the Prompt Payment Guarantee, financial hedging instruments and secondary and/or substitute sources of payment. The methodology also describes the items identified through a legal opinion provided by an external legal firm and the process will be conducted if there is any update of said opinion.

Description of this Methodology Addendum

In this addendum, the own revenues of the state will be used as a payment source of the debt service. These revenues are projected based on economic factors that refer to the sensitivity of the payment source to changes in the income of the target population subject to the tax or duty, or changes to consumption patterns due to fluctuations in the prices of different goods and services. Regarding financial factors, the historical trends of the sources of payment are analyzed, as well as a volatility and seasonality analysis. The operating capacities of decentralized bodies to provide service and their collection capacities are analyzed. Several operating or administrative factors that may have an impact on the credit rating of the SD are also included in the analysis. These factors include failures in the coordination mechanisms that enable the state or a third party to collect the revenue pledged and transfer it to the payment trust that serves the debt. Factors such as the periodic compatibility of the deposits into the trust and the dates stipulated for the debt service are also considered.

As part of the quantitative analysis, a specific treatment is offered for the SD of municipalities that use any type of funds generated by the state entity as a secondary payment source. This process would also be applicable to any SD with a payment source from any own revenue generated by another state and in the cases in which the origination of said funds is not clearly defined.

Lastly, Qualitative Adjustments may be included based on the unsecured rating of the state, municipality or any third party capable of contributing funds to the trust or may have any effect on the isolation of the payment source.

Introduction

This addendum is based on the Master Methodology: *Structured Debt of Mexican States: Federal Transfers-Backed Debt Methodology*, which describes the process used by HR Ratings to evaluate the debt structures acquired through irrevocable trusts with Federal funds as a payment source¹.

This addendum describes the evaluation process of Structured Debt (SD), also based on irrevocable trusts, but those in which the flow pledged by the debt service comes from the own revenues of the states, municipalities, decentralized public bodies and semi-state companies.

HR Ratings' rating process for these SD is like the process described in the Master Methodology. The minimum Primary Hedging is identified with the revenue pledged and the debt service projected, and the Critical Stress Scenario is constructed in said period. In this period, revenue will be reduced through Target Balance Stress Rate (TOE^E) with which the structure reaches the limit point at which it may comply with its payment obligations. The TOE^E , which solves the problem of optimization, guarantees that the reserve fund will be replenished after use in a specific time that the methodology identifies as the Post-Critical Stress Period.

In conceptual terms, the difference from the Master Methodology refers to the process through which HR Ratings projects pledged revenue for the debt service. In this case, the revenue does not come from Federal Participations or Contributions, but from all the funds that the state can tax or collect, such as taxes or duties, considerations for the operation of any decentralized body and even from the distribution to state funds to the municipalities. The most common sources of revenue that may be evaluated with this addendum are listed as follows:

- Payroll taxes;
- Vehicle taxes;
- Income from the operation of Federal or state concessions;
- The State Municipal Strengthening Fund (FEFOM) of the State of Mexico.

HR Ratings will project the source of Revenue, as well as the debt service, the reserve funds involved, sundry expenses and any other component included in the SD under different scenarios. The macroeconomic variables included in them are developed by HR Ratings' Economic Analysis Department and typically use: the Gross Domestic Product (GDP); the National Consumer Prices Index (INPC), its growth and the value of the Investment Unit (UDI) and several interest rates such as the TIIE₂₈ and the TIIE₉₁ Interbank Equilibrium Interest Rates.

The scenarios can also incorporate assumptions on the growth of the payment source pledged. Due to the diversity of the sources of payment available, HR Ratings does not offer a mechanism in this document to project every possible source. Instead it describes the analysis of the characteristics and the process to establish the assumptions to be made to develop its projections.

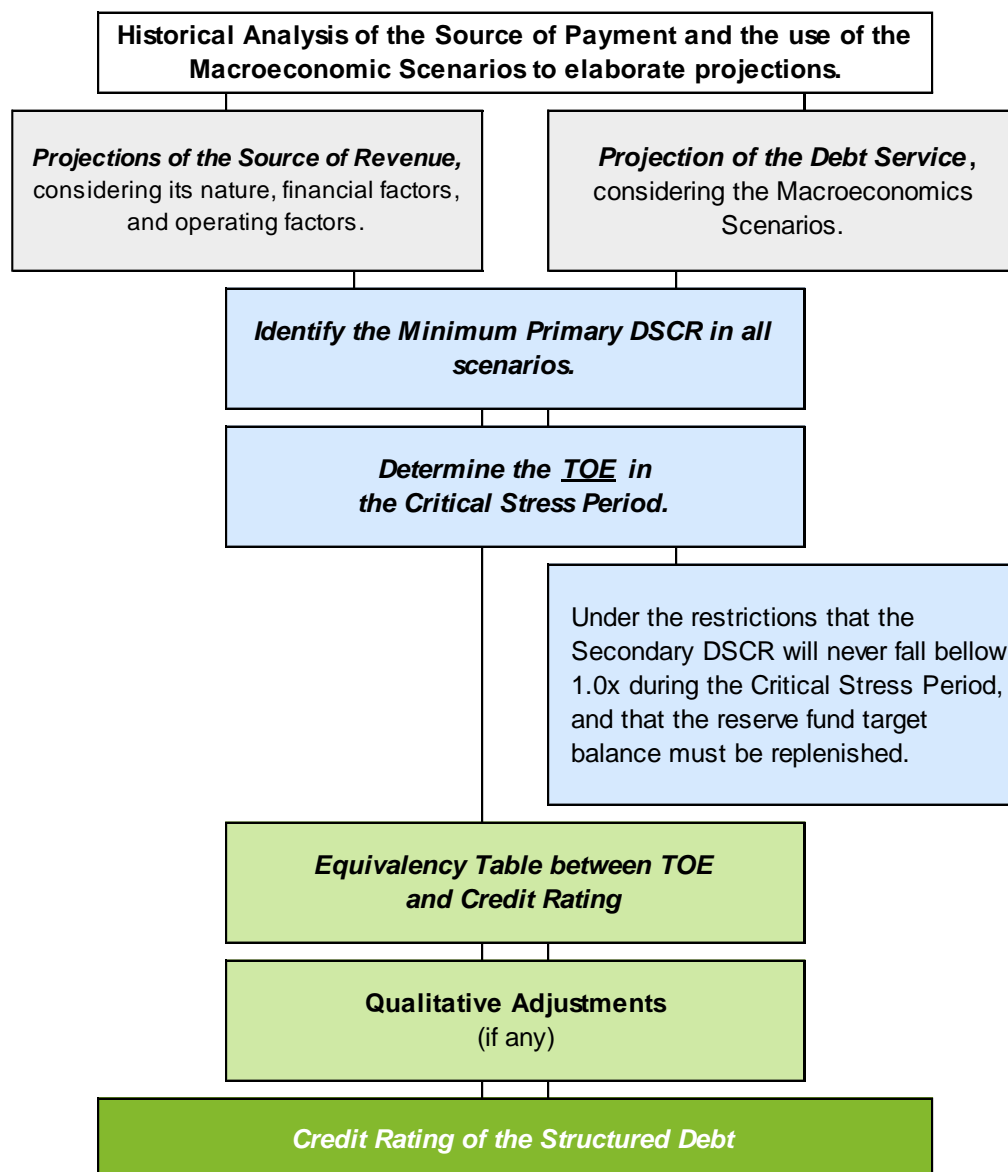
Typically HR Ratings starts from a historical analysis of the payment source, focusing on trends, volatility and seasonality. The evaluation must also include an analysis of the nature of the tax or duty, the revenue, and the demographic mobility of the population subject to

¹ The Master Methodology: *Structured Debt of Mexican States: Federal-Transfers Backed Debt Methodology*, as well as the addendum applicable to the structured debt of Mexican municipalities, can be found at the following link: <https://www.hrratings.com/methodology/>.

collection, the tax rate, the object taxes, the mechanisms and the revenue flow movement, the frequency of payment, among other factors.

Table 1 shows the general structure of this methodology addendum, which begins with the analysis of the macroeconomic, financial and operative factors that may influence the projection of a payment source:

Table 1: HR Ratings' Evaluation Process



Source: HR Ratings.

All these factors are considered in the development of the projections under the conditions of diverse Macroeconomic Scenarios, such as the Low Growth and Low Inflation Scenario or the Scenario of Stagflation, prepared by the Economic Analysis Department, and the

Structured Debt of Subnational Entities and OPDs

Addendum to the Own-Revenue Backed Debt Methodology

September 2020

projection that, given the conditions of the payment source, offers the best stress possible in terms of hedging, will be used.

With projection of the pledged revenue, the debt service projection and the TOE^E that results from the problem of optimization; HR Ratings determines the credit rating of the SD evaluated. But, in the same way as the Master Methodology, this addendum allows qualitative adjustments, in terms of notches, based on specific factors that cannot be quantified.

The factors that may merit a qualitative adjustment refer to the specific weaknesses of the payment source; for example, an operative aspect that may affect the transfer capacity of the funds to the payment trust. The unsecured rating of the state, municipality, decentralized body is also considered, as well as the entity responsible for generating the fund pledged as a payment source. These concepts may even be considered simultaneously. This analysis is relevant because in periods of economic or political stress, incentives may be generated to undermine the isolation of the source or payment or eliminate it, such as in the cases of a tax or fee pledged.

Among the items that this addendum includes from the Master Methodology, in addition to the quantitative revenue reduction process, there is the need for an external legal opinion that evaluates if the trust is valid, enforceable, opposable against third parties and if its implementation is adequate. This would enable HR Ratings to continue with its rating process.

Quantitative Analysis Process

This first section outlines the macroeconomic concepts that will be common in the construction of scenarios to project the payment source, the debt service and other items such as the reserve fund and relevant expenses. The aspects specific to the operation of the SD and that may have a negative effect on the flow of funds to the fund to service the debt will be described. Lastly, the quantitative process to determine the TOE^E and the credit rating of SD is described, as explained in the Master Methodology. Additionally, the addendum describes the specific treatment of the SD used as part of its payment source to the State Municipal Strengthening Fund (FEFOM) of the State of Mexico.

The Economic and Financial Factors Considered in the Construction of the Base Scenario and the Stress Scenario

The procedures stipulated in the Master Methodology are inherited in the determination of the flow of pledged revenue and the debt service. These relate to the following variables: 1) rate of inflation, 2) Gross Domestic Product (GDP), and 3) interest rates. These variables are projected by HR Ratings' Economic Analysis Department for a Base Scenario, a Low Growth and Low Inflation Scenario or a Scenario of Stagflation. The variables included in these scenarios will be used only in the cases where they are relevant and their use will be justified in the analysis report, as well as the main risks relating to these projections.

The historical trend of each payment source will be analyzed with an emphasis on identifying the behavior of the source in previous periods of stress. An analysis is also conducted of the volatility of the revenue, emphasizing two factors: the annual growth in different periods (monthly, quarterly, half-yearly and annually) and the predictability of seasonality.

There are aspects that may be specific to one payment source. In the case of a tax or fee on a good or service, the sensitivity of a consumption pattern when faced with changes in

Structured Debt of Subnational Entities and OPDs

Addendum to the Own-Revenue Backed Debt Methodology

September 2020

the revenue of the target population must be identified, or changes in the population itself. If changes in the prices of certain goods that may be revealed as substitutes or complements have any effect on taxation must also be identified.

In cases in which the revenue is originated by a decentralized body, its capacity to generate earnings must be evaluated. This includes the efficiency of collection and ensuring coverage to the target population. The analysis report will list each factor included in the projection of the payment source and will detail the impact that each one may have on the respective scenario.

The Operative Factors Considered in the Construction of the Base Scenario and the Stress Scenario

This section outlines some of the factors that apply only to the debt structure and that may have a direct effect on the flow of funds received by the payment trust directly.

For example, the collection mechanisms of the payment source will be evaluated. These are particularly relevant in cases in which any figure not related to the state generates the revenue or if the payment source is originated or collected by more than one state. The operative and administrative coordination mechanisms must be clearly documented, as well as the route the payment source will follow. If HR Ratings considers that the mechanisms are not viable in operative and administrative terms or are not clearly stipulated in the legal documentation, the performance of the source or payment may be projected with an unfavorable bias.

In the same manner, the rules, the legislation or the contracts that allow the funds to be generated will be monitored continuously to determine if any change may have any effect on the volume or the flow of the payment source. This refers to the political risk that may be quantified in HR Ratings' projections.

The compatibility between the collection periods and the debt service periods is also relevant. If the trust receives the funds sufficiently in advance, the operative risks that affect the flow of the source itself may be mitigated. This is particularly relevant in cases in which there is one or more third parties not related to the state, who are responsible for collecting the payment source.

In the case of fees or taxes in which the user may pay through financial institutions or self-service establishments, the feasibility that the source or payment arrives promptly and completely to the trust that services the SD must be evaluated based on the historical performance and operating capacity of these institutions.

As stipulated in the preceding section, the analysis report will list each fact incorporated in the projection of the payment source and will detail the impact that each may have on the projection of the payment source in the scenarios.

Determination of the Target Stress Rate (TOE, Spanish acronym)

The Debt Service Coverage Ratio (DSCR) is obtained once the revenue pledged and the debt service are determined. The analysis of this item is conducted based on the Master Methodology.

The TOE is calculated using the optimization process, which, like the Master Methodology, has the TOE as a variable "target". The full payment of the respective debt service is a restriction, which would be reflected in a Secondary Coverage (those that include the

Structured Debt of Subnational Entities and OPDs

Addendum to the Own-Revenue Backed Debt Methodology

September 2020

reserves) equal to or greater than 1.0x. The second condition is this process is that the reserve fund is replenished to its target balance within a set period after its use. The macroeconomic variables that will be use in this process will be those used in the Stress Scenario that reflects the most adverse financial conditions for the SD.

The TOE represents the maximum-possible stress that the payment source pledged, in favor of the SD, may withstand without falling into default and allowing the replenishment of the reserve in accordance with the conditions stipulated by the Master Methodology. If SDs are identified in which no reserve fund is contemplated, the metrics of the Primary and Secondary Coverages will be matched and would be stressed until the lower of their values reach the unit.

The TOE^E allows, through an assignment curve, the Credit Rating of the SD of be determined. This curve is shown in the addendum: *Structured Debt of Mexican Municipalities: Addendum to the Federal-Transfers Backed Debt Methodology*. This curve will also apply to the SD that has multiple sources of payment, provided that the primary source is Own Revenue. However, if in an annual review or during the follow-up process, it is identified that the TOE has changed to another rating range as a result of the analysis conducted, HR Ratings may maintain the rating or modify its attribute by considering the evolution expected of the TOE. Said situation will be justified in the analysis report by presenting the financial strengths or weaknesses produced by our projection model.

The analysis process is conducted throughout the period in which there is an outstanding balance of the debt acquired pending payment². However, in order to incorporate the sensitivity of creditor faced with the weakness of a structure in coming periods, the timeline in which the payment period will sought with the minimum Primary DSCR will be reduced. This timeline is extended over the next two macroeconomic cycles according to the scenarios generated by the Economic Analysis Department. Under the criteria set in the Master Methodology, the analysis will be extended to the rest of the term of the SD.

The State Municipal Strengthening Fund (FEFOM) of the State of Mexico

This section describes the calculation of the TOE for the SD contracted for the municipalities of the State of Mexico when the primary payment source is Federal Participations from Branch 28 (or any of its sub-accounts) and the secondary or subsidiary source are funds from the State Municipal Strengthening Fund (FEFOM), which are generated by the State of Mexico itself.

In contrast with the funds from Branch 28 and/or Branch 33, which are transferred by the Mexican Federal Government (HR AAA, on the local scale) to the 32 States of the Republic, the FEFOM funds are originated, allocated and transferred by the State of Mexico to each of its municipalities. The origin of the funds and the distribution method are determined by the State of Mexico in accordance with internal standards and criteria, which may be modified year to year. Therefore, no municipality has control over the amount of these funds.

Due to that the FEFOM is originated by the State of Mexico, the credit quality of which below that of the Federal Government, HR Ratings' analysis incorporates an additional stress factor through a modification in the TOE calculation method. The resulting problem of optimization is as follows:

² In terms of the determination of the outstanding balance of the SD, HR Ratings shall confirm with the borrower if the amount contracted was the same as that actually drawn-down. If this information is not available, for the purposes of model, a draw-down of 100.0% of the amount contracted will be assumed. If the amount drawn-down is confirmed as being less than the amount contracted, future draw-downs must be monitored in case that the draw-down period is still valid.

Structured Debt of Subnational Entities and OPDs

Addendum to the Own-Revenue Backed Debt Methodology

September 2020

Calculate the TOE^E

Subject to:

- 1) $(1 - TOE) \sum_{t=1}^{13} FGP_t + (1 - Z) \sum_{t=1}^{13} FEFOM_t + FR_{t=1} \geq \sum_{t=1}^{13} SD_t$
- 2) $Y = f(TOE)$
- 3) $Z = TOE + Y$
- 4) $FR_{T+n} = SO_{T+n}$

Where:

TOE : Percentage of reduction applicable to PPS (Primary Payment Source).

Y : Additional stress factor of FEFOM (Subsidiary Payment Source).

Z : Percentage of reduction applicable to FEFOM (Subsidiary Payment Source).

FGP_t : Pledged Revenue of PPS in month t .

$FEFOM_t$: Pledged Revenue of FEFOM in month t .

T : Number of months of Critical Stress Period (13 months).

FR_t : Reserve fund in month t .

SD_t : Debt service in month t .

SO_T : Target Balance of Reserve Fund in month T .

n : Number of months of Post-Critical Stress Period.

In the same manner as in the rest of the structures, the month with the minimum Primary DSCR expected in the cyclical stress period will be determined. The Critical Stress Period will be established around this month, in which a differentiated reduction will be applied as follows:

a) the reduction for the Primary Payment Source (PPS) will be calculated using the TOE model. This reduction will determine the additional stress factor to be applied to the Secondary or Subsidiary Payment Source (FEFOM),

b) once the additional stress factor is determined, the reduction on the FEFOM will be defined as the sum of the level of reduction of the PPS, plus the additional stress factor. In such a manner that the reduction of the FEFOM will depend on the reduction of the PPS.

The TOE^E is the maximum percentage of reduction that solves the problem. It is important to mention that its value must guarantee the replenishment of the target balance of the reserve fund once the Critical Stress Period ends, in accordance with the Master Methodology. Based on the foregoing, the credit rating of the SD will be based on the differentiated reduction applied to the PPS and the FEFOM. The value of " $Y = f(TOE)$ " may vary based on the value of " TOE^E ", as shown as Table 2.

Structured Debt of Subnational Entities and OPDs

Addendum to the Own-Revenue Backed Debt Methodology

September 2020

Table 2: Values of $Y = f(TOE)$			
Ratings	Min. V.	TOE Range	$Y = f(TOE)$
HR AAA (E)	85.0%	[0.850 , 1.000)	0.070
HR AA+ (E)	78.0%	[0.780 , 0.850)	0.070
HR AA (E)	71.0%	[0.710 , 0.780)	0.070
HR AA- (E)	64.0%	[0.640 , 0.710)	0.070
HR A+ (E)	56.4%	[0.564 , 0.640)	0.076
HR A (E)	48.8%	[0.488 , 0.564)	0.076
HR A- (E)	41.2%	[0.412 , 0.488)	0.076
HR BBB+ (E)	33.6%	[0.336 , 0.412)	0.076
HR BBB (E)	26.0%	[0.260 , 0.336)	0.076
HR BBB- (E)	18.4%	[0.184 , 0.260)	0.076
HR BB+ (E)	16.0%	[0.160 , 0.184)	0.024
HR BB (E)	14.0%	[0.140 , 0.160)	0.020
HR BB- (E)	12.0%	[0.120 , 0.140)	0.020
HR B+ (E)	10.0%	[0.100 , 0.120)	0.020
HR B (E)	8.0%	[0.080 , 0.100)	0.020
HR B- (E)	6.0%	[0.060 , 0.080)	0.020
HR C+ (E)	4.0%	[0.040 , 0.060)	0.020
HR C (E)	2.0%	[0.020 , 0.040)	0.020
HR C- (E)	0.0%	[0.000 , 0.020)	0.020

Source: HR Ratings.

The problem of optimization explained in this section shall be applicable to any SD with a secondary payment source generated by the own revenue of another state (for example, through budgetary items). Under these circumstances, it is probable that neither the amount not the distribution method are known or are under the control of the municipality, but instead are defined the second state.

Credit Rating and Qualitative Adjustments

There are relevant factors that cannot be incorporated quantitatively into the analysis; therefore, they are considered as Qualitative Adjustments within the process. These factors are atypical and there are specific guidelines for them to be considered in the credit rating of the SD.

Typically, the Qualitative Adjustments incorporate the analysis of the unsecured rating of the state and the possibility that the state contributes funds directly to the trust. The existence of funds from the state may be taken into account in the case of the municipalities, and in the case of decentralized bodies, funds from the state or any municipality may be considered, as applicable.

The isolation of the payment source must be considered in the case for debt backed by own revenues; i.e., measuring the capacity to alter the operation of the trust in accordance with the terms of the initial contract. An evaluation is conducted to ensure that the state or municipality maintains the power or intention to channel the funds pledged to any other activity, or if applicable, to change the nature of the revenue used as a payment source.

Structured Debt of Subnational Entities and OPDs

Addendum to the Own-Revenue Backed Debt Methodology

September 2020

The interaction of these three variables (funds, unsecured rating and isolation of the payment source) allows the evaluation of the quality of the revenue pledged and the possible incentives that a state may have to make use of these funds in any stress situation.

In terms of the existence of the funds from the state, its credit rating and the adequate isolation of the payment source, three cases may be considered:

Case 1: If the payment source has been determined as adequately isolated, the states involved do not offer any type of fund, the unsecured rating of the state in question is equal to or greater than HR BBB. Then the credit rating will tend to be that determined through the *TOE^E*.

Case 2: If the payment source has been determined as adequately isolated, at least one of the states involved offers some type of mechanism to contribute funds to the trust, if necessary, said state will be granted a rating equal to or greater than BBB. Then the minimum value of the credit rating of the SD will be equivalent to the maximum of the unsecured ratings that offer funds, subject to the state in question being able to cover the respective debt service correctly and promptly.

Case 3: If the payment source has been determined as adequately isolated, but the unsecured rating of the state is below HR BBB. Then, considering the state's fund as a non-relevant variable, the pressure that said state perceives to restructure its debt given the pledged revenue must be evaluated. This would be reflected in an unfavorable adjustment of one notch on the credit rating of the SD.

Unlike the Master Methodology, the reference value for the qualitative adjustments due to the unsecured rating of the state is HR BBB, one notch above that stipulated to reflect the additional risk that the payment source does not come from Federal transfers. This will also apply in cases in which there are multiple payment sources, even when some of them come from Federal transfers.

HR Ratings may also assign a favorable qualitative adjustment of one notch to an SD that has a source of revenue composed of own revenues and a Federal transfer. In order to be able to assign this adjustment, two conditions must be met simultaneously: (i) the first refers to the strength or weakness of the source of revenue, which are aspects that cannot be captured through the quantitative model. For example, if the source refers to a tax the collection and isolation of which, that depends on the state itself, shows operative clarity and efficiency. (ii) The second point requires that at least 20.0% of the revenue come from a Federal source.

Structured Debt of Subnational Entities and OPDs

Addendum to the Own-Revenue Backed Debt Methodology

September 2020

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HR Ratings bases its ratings and/or opinions on information obtained from sources considered to be accurate and reliable. However, HR Ratings does not validate, guarantee or certify the accuracy, precision or entirety of any information and is not liable for any error or omission or for the results obtained from the use of said information. Most of the debt instrument issuers rated by HR Ratings have paid a credit rating fee based on the amount and type of the issue. The advantage of the instrument or the solvency of the issuer and, if applicable, the opinion of the capacity of an entity in terms of the management of assets and the performance of its corporate purpose may be modified, which will affect, as applicable, the upgrade or downgrade of the rating, without this implying any liability whatsoever for HR Ratings. HR Ratings issues its ratings and/or opinions in an ethical manner and in accordance with sound market practices and the applicable standards provided on its web page www.hrratings.com, where documents such as the Code of Conduct, the ratings methodologies or criteria and current ratings can be consulted.

The ratings and/or opinions issued by HR Ratings consider an analysis of the relative credit quality of an entity, issuer and/or issue; therefore, they do not necessarily reflect a statistical probability of default on payment, this being understood as the impossibility or the lack of will of an entity or issuer to perform its contractual payment obligations. Creditors and/or holders may then be forced to take measures to recover their investments, which may even include restructuring the debt due to the stress situation faced by the debtor. Notwithstanding the foregoing, to grant greater validity to our credit quality opinions, our methodology considers stress scenarios as a complement to the analysis prepared on a base scenario. The fees paid to HR Ratings by issuers generally vary from US\$1,000 to US\$1,000,000 (or the equivalent in local currency) per issue. In some cases, HR Ratings will rate all or some of the issues of a particular issuer for an annual fee. The annual fees are expected to vary between US\$5,000 and US\$2,000,000 (or the equivalent in local currency).

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This methodology is the exclusive property of HR Ratings and takes effect beginning October 13th, 2020.

Methodology to evaluate the credit quality of hybrid debt instruments and their possible impact on the credit quality of their issuers

Hybrid debt instruments are those that incorporate capital characteristics through their legal documentation. Due to this characteristic, they reflect an incremental credit risk for their issuer, which is typically due to its subordination and because they include mechanisms that allow losses to be absorbed and cash to be held.

This document has two objectives. The first is to describe the process used by HR Ratings to rate hybrid debt instruments, considering both their subordination status and their capacity to absorb losses. Whereas the second objective is to detail the process to incorporate these instruments into the credit evaluation of their issuers.

Description of the Methodology

This methodology details the process applied by HR Ratings to rate hybrid instruments that may be issued mainly by financial Institutions or corporations. For the methodology, a hybrid instrument refers to a debt instrument with characteristics that offer financial flexibility and are commonly associated with the behavior of capital. The different ways in which these characteristics may arise define both the adjustment in the term of *notches* applied to the hybrid instrument in relation to the credit rating of its issuer, as a percentage of the instrument that will be considered debt or capital for its accounting record.

To assign a credit rating to these instruments, the first step consists of establishing the issuer's credit rating because this is the based on which the adjustments in terms notches will be applied. Once the starting point is established, HR Ratings will analyze the subordination and the loss absorption mechanisms present in the instrument in order to detail the credit adjustment to be applied.

The subordination analysis seeks to determine the risk faced by the instrument due to its unfavorable position in the priority of payments and this would affect its credit quality in a stress situation. The loss absorption analysis is based on the consideration of two dimensions, *severity* and *ease of activation*, which capture the additional risk faced by the hybrid instrument through the additional mechanisms that may be established in this legal documentation in order to overcome stress situations.

The methodology also outlines the process with which these instruments are incorporated into the evaluation of the risks of financial institutions and corporations that issue them. The first step consists of determining the composition of these instruments in terms of capital and debt. This process considers the characteristics of the instrument for its classification in accounting as debt or as capital. HR Ratings considers three possible compositions, 0% capital and 100% debt, 50% capital and 50% debt, and 100% capital and 0% debt. Once the composition is determined, these instruments may be included in the quantitative analysis and in the issuers' credit ratings through the effect that they may have on HR Ratings' financial metrics.

General Structure of the methodology

Table 1 shows the general structure of this methodology, both in the manner of determining the credit rating of the hybrid instrument and how the impact of the instrument is included in the issuer's credit rating.

Table 1: Overview of HR Ratings' Methodology

Credit Rating of the Hybrid Instrument	
1. Instrument's Subordination	The analysis considers a one notch downgrade starting from the Credit Ratings assigned to the Issuer.
2. Loss Absorption Mechanisms	<p>A. Severity of the Loss Absorption Mechanisms- a label of "low" or "high" is assigned depending on the consequences that said mechanisms could hold over the payment of the debt.</p> <p>B. Ease of Activation of the Loss Absorption Mechanisms- a label of "low" or "high" is assigned depending on the requirements for activating the mechanisms.</p> <p>C. Assigning the notching downgrade- according to the labels assigned, HR Ratings will apply a downgrade of up to 2 notches.</p>
Debt-Capital Composition Analysis	
1.1. Three possible compositions:	<p>{0% capital, 100% debt}</p> <p>{50% capital, 50% debt}</p> <p>{100% capital, 0% debt}</p>
1.2. Factors considered for determining composition	<p>→ The capacity to defer debt service.</p> <p>→ If debt service deferral is considered a non-payment event.</p> <p>→ Subordination of the instrument.</p> <p>→ If the instrument is linked to Cross-Maturity clauses.</p> <p>→ If the instrument can be converted into shares.</p> <p>→ If the instrument has a buyback option.</p> <p>→ If it has a buyback option, the period in which it can be applied.</p> <p>→ If it has a buyback option, the incentives to be applied.</p>

Source: HR Ratings.

Hybrid Instruments Rating Criteria

As already mentioned, for HR Ratings, these instruments show an incremental risk of default in terms of the risk reflected by the issuer's credit rating. Therefore, the first step in the rating process will always be to establish the issuer's credit rating. The risks identified in this analysis also relate to the hybrid instrument evaluated.

The incremental risk of these instruments, which form part of the issuer's debt, will be applied in terms of a downward adjustment in *notches* and typically refers to two concepts: (i) the subordination of instruments in terms of the rest of the debt, and (ii) the loss absorption loss and cash holding clauses. In cases in which credit strength/weakness of the issuer is observed that does not extend to the instrument, an additional adjustment may be applied in terms of *notches*.

1) Subordination of Instrument

It is important to clarify that credit analysis of the issuer conducted by HR Ratings considers the payment capacity and intention of the total of the debt obligations. Therefore, on rating a hybrid debt instrument, the process must always begin with the issuer's rating. In this vein, hybrid debt instruments reflect the issuer's credit risk.

The risk due to the subordination of the instrument in relation to the rest of the debt, which refers to its position in the payment priority in the event of a stress situation, will be reflected in its credit rating through a downward adjustment of one *notch* from the issuer's rating. Notwithstanding this, there will be cases in which HR Ratings may not assign an adjustment for the subordination of the instrument. These refer to cases in which it is identified that the issuer shows favorable leverage metrics or a debt structure that mitigates the risk of subordination.

2) Loss Absorption Mechanisms

In general, the rated hybrid instruments have loss absorption loss and cash holding clauses, which increase the instrument's risk of default. These clauses include:

- The capacity to defer debt service payments,
- The capacity to not accumulate deferred payments previously,
- The existence of clauses that permit or oblige the convertibility of the instrument to capital,
- The existence of clauses that write-down the value of the principal permanently.

In the light of existence of any clause of this type, HR Ratings may downgrade the rating in terms of *notches* and in addition to the subordination adjustment. To determine the magnitude of the adjustment for different absorption mechanisms, HR Ratings will analyze two dimensions: the severity and the ease of activation.

a) Severity of the Loss Absorption Mechanisms

Severity may be labeled as "low" or "high", depending on the consequences of the activation of the mechanism may have on the payment of the debt. In cases in which the loss absorption arises through mechanisms such as the cumulative deferral of payments, a "low" level of severity will be assigned because the debt service scheme can be expected to be resumed after a set period.

A "high" severity label refers to cases in which, once the mechanism is activated, a deferral or a partial payment of the outstanding balance is inevitable. As is the case of the capital conversion and principal reduction clauses.

b) Ease of Activation of the Loss Absorption Mechanisms

Moreover, ease of activation refers to how feasible it is to fulfill the conditions necessary to activate the loss absorption mechanisms, and are also labeled as “low” or “high”. For example, in the case that identifies that the activation clauses depend in requirements that are difficult to meet and that once the conditions are fulfilled, the activation shall be at the discretion of the issuer, a “low” label will be assigned.

Otherwise, when it can be identified that the requirements of an activation clause are difficult to meet, and that on fulfilling this condition, the activation will be automatic, a “high” label will be assigned.

Table 2 summarizes the items discussed on this section:

Table 2: Label description by concepts		
Concepts analyzed in the mechanisms	<i>Baja</i>	<i>Alta</i>
Severity	The loss absorption mechanisms interrupt debt service, but there is no write-down clauses to the value of the principal.	The mechanisms, while activated, represent a total or partial write-down to the value of the debt principal.
Ease of Activation	The requirements for activation are hard to reach; and when they are met, the activation remains under the discretion of the issuer.	The requirements for activation are easy to reach; and when they are met, the activation is automatic.

Source: HR Ratings.

c) Assignment of Adjustment

As already mentioned, faced with the existence of loss absorption mechanisms, a downward adjustment may be applied to the hybrid instrument, in terms of *notches*, with regard to the issuer's rating. The cases in which HR Ratings will apply an adjustment of two *notches* will be when it assigns a “high” label to the severity and the ease of activation of these clauses simultaneously. This is shown in Table 3, below:

Table 3: Adjustments related to loss absorption		
Severity	High	-1 notch
	Low	No Adjustment
	Low	High
	Ease of Activation	

Source: HR Ratings.

The downward adjustment to two *notches* will only be applied to hybrid instruments whose clauses represent a total or partial reduction of the principal of the debt, whose activation is automatic, and the requirements are easy to meet. Moreover, in cases where it can be identified that the loss absorption mechanisms are not easily activated and that, on doing so, their application may be at the discretion of the issuer, no adjustments will be assigned.

Although the use of the mechanism does not represent a situation of default, in practice the hybrid will cease to function as a debt instrument. In cases in which the activation of the mechanism implies a temporary suspension, but not the cancellation of the debt service, HR Ratings will maintain the rating assigned through the process described in this document and will only update the rating if there is a change in the issuer's credit rating. In cases in which the suspension of payments exceeds the limit set in its legal documentation, an "HR D" will be assigned.

Criteria to Determine the Debt-Capital Composition

The second objective of this methodology is to measure the impact that a hybrid instrument may have on the issuer's credit rating. In this vein, the percentage of the cash drawn-down with these instruments considered capital and the percentage considered as debt must be determined. The IFRS accounting standards allow these hybrid instruments to be recorded as stockholders' equity. This is upheld by IFRS 9 and IAS 32. Once the debt-capital composition is determined, HR Ratings shall make the respective adjustments on the financial metrics relevant to each case.

1) Debt-Capital Composition

Due to the complexity of these instruments, HR Ratings only assigns the debt-capital composition in three ways: {0% capital, 100% debt}, {50% capital, 50% debt} and {100% capital, 0% debt}. The characteristics of these compositions are shown as follows:

- a) {0% capital, 100% debt}
 - The issuer does not have the capacity to defer its debt service;
 - The instrument is not subordinated to the issuer's entire debt;
 - The instrument has Cross-Maturity events;
 - Deferring the payment of the instrument's debt service is considered default;
 - The instrument cannot be converted into shares;
 - The instrument has a buy back option without a clause that refers to the funds to exercise the option;
 - The term for the buyback option is less than five years;
 - In the term for the buyback option, the instrument shows an increase in its interest rate or any other incentive to exercise the option.
- b) {50% capital, 50% debt}
 - The issuer has the capacity to defer interest;
 - The instrument is subordinated to the issuer's entire debt;
 - The instrument does not have Cross-Maturity events;
 - Deferring the payment of the instrument's debt service is considered as an event of default;
 - The instrument has optional conversion to shares or is not convertible;
 - The instrument has a buy back option without a clause that refers to the funds to exercise the option;
 - The term for the buyback option is at least five years;

- The buyback option may have incentives for its exercise, in particular the potential increase in the interest rate will be measured.
- c) {100% capital, 0% debt}
- The issuer has the capacity to defer interest;
 - The instrument is subordinated to the issuer's entire debt;
 - The instrument does not have Cross-Maturity events;
 - Deferring the payment of the instrument's debt service is considered as an event of default;
 - The instrument has an obligatory conversion to shares;
 - The instrument does not have a buy back option, or its buy back option includes a clause that indicates that it must be substituted for a comparable instrument or by the capital contribution;
 - If applicable, the term for the buyback option is greater than five years;
 - If applicable, the instrument will not have incentives to exercise the buy back.

HR Ratings recognizes that it is difficult for any instrument to comply fully with the aspects described in each composition; therefore, the factors presented in each hybrid instrument must be weighted and the composition assigned must be justified in the issuer's analysis report.

Appendix: The General Overview of the Methodology

A. Assigning a Credit Rating to the Hybrid Instrument

First Step: To identify the credit rating of the issuer, that will be the starting point for applying downgrade adjustments to the credit rating of the hybrid instrument.

Second Step: Applying a one notch downgrade to the instrument based on its subordination. The notch downgrade will not be assigned if the issuer shows low debt levels or if its debt structure mitigates the risk of subordination.

Third Step: Apply an adjustment of up to two notches based on the *severity* and *ease of activation* of the loss absorption mechanisms incorporated. This adjustment will be applied based on a system of labels for each concept.

The Assignment of the Adjustment in the Third Step

Severity	High	-1 notch	-2 notches
	Low	No adjustments	-1 notch
		Low	High
		Ease of Activation	

Severity of the Mechanism:

When the loss absorption mechanisms are activated, is there a partial or total write-down of the debt principal.

Ease of Activation of the Mechanism:

It evaluates the ease to comply with the requirements to activate the mechanisms, and if met, if the activation is optional or automatic.

B. Assignment of the Debt - Capital Composition (Three Options)

a) {0% capital, 100% debt}

- The issuer does not have the capacity to defer its debt service;
- The instrument is not subordinated to the issuer's entire debt;
- The instrument has Cross-Maturity events;
- Deferring the payment of the instrument's debt service is considered default;
- The instrument cannot be converted into shares;
- The instrument has a buy back option without a clause that refers to the funds to exercise the option;
- The term for the buyback option is less than five years;
- In the term for the buyback option, the instrument shows an increase in its interest rate or any other incentive to exercise the option.

b) {50% capital, 50% debt}

- The issuer has the capacity to defer interest;
- The instrument is subordinated to the issuer's entire debt;
- The instrument does not have Cross-Maturity events;
- Deferring the payment of the instrument's debt service is considered as an event of default;
- The instrument has optional conversion to shares or is not convertible;
- The instrument has a buy back option without a clause that refers to the funds to exercise the option;
- The term for the buyback option is at least five years;
- The buyback option may have incentives for its exercise, in particular the potential increase in the interest rate will be measured.

c) {100% capital, 0% debt}

- The issuer has the capacity to defer interest;
- The instrument is subordinated to the issuer's entire debt;
- The instrument does not have Cross-Maturity events;
- Deferring the payment of the instrument's debt service is considered as an event of default;
- The instrument has an obligatory conversion to shares;
- The instrument does not have a buy back option, or its buy back option includes a clause that indicates that it must be substituted for a comparable instrument or by the capital contribution;
- If applicable, the term for the buyback option is greater than five years;
- If applicable, the instrument will not have incentives to exercise the buy back.

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This document is the exclusive property of HR Ratings and is applicable beginning October 28th, 2020.

This document establishes HR Ratings' General Methodological Criteria.

HR Ratings' General Methodological Criteria describes concepts that are applicable to all the rating assigned to states, issuers, issues, credits and structured products. The common concepts to understand HR Ratings' ratings are the following:

- **HR Ratings' ratings** reflect an evaluation of the credit quality of an entity, issuer, issue, credit or structured product against other similar entities, products or assets and not necessarily a statistical probability of payment default (*page 2*);
- **Default Criteria.** On assigning a rating based on level of default, HR Ratings' methodologies allow the distinction between the default of specific debt Instruments and entities subject to the payment obligation (*page 2*).
- **Liabilities with Specific Accounting Treatment.** There are entities that have lines of credit or liabilities with finance cost that may not be posted in accounting as a banking and/or securities market debt. Notwithstanding, HR Ratings considers any breach or delay of previously agreed debt payment obligations as a default or non-payment (*page 4*).
- **Relationship between Short- and Long-Term Ratings.** Although the ratings on each scale between these concepts have a typically direct relationship, short-term ratings may be in a higher range based on the credit strengths that facilitate short-term funding (*page 5*).
- **HR Ratings' ratings may be assigned on a Local Scale and/or a Global Scale.** Here, the difference is based on that Global Scale ratings consider the sovereign risk of the country in which the entity predominantly operates (*page 5*).
- **Equivalence of Global to Local Scale.** HR Ratings has a process to measure the credit risk of any entity in a country not rated directly by HR Ratings and make an equivalence with the credit risk that another entity may have in a country rated by HR Ratings (*page 6*).
- **Ratings Actions and Attributes:** HR Ratings assigns one of three possible attributes to its ratings: Outlook, Observations or Review in Process (*page 7*).
- **Sovereign Support.** HR Ratings may consider that an entity or issue has the backing of the Federal Government or Central Government of the country in which it operates and therefore, both would maintain the same rating (*page 8*).
- **Legal Opinion.** In the case of structured transactions, such as products, issues or loans with any directly assigned payment source, HR Ratings may request a Legal Opinion from an external independent lawyer (*page 8*).
- **Treatment of the Lack of Transparency in the Information Presented or the Low Level of Corporate Governance.** If HR Ratings identifies shortfall in the information provided for analysis or identifies weakness in the Corporate Governance of the rated entity, it may apply an unfavorable qualitative adjustment to the rating (*page 9*);
- **Limited and Preliminary Ratings.** These represent an analysis of credit strength under specific assumptions, these do not have a determined term and are not subject to withdrawal, monitoring or update. Therefore, these ratings are not regulatory (*page 9*).
- **Influential Ratings.** This refers to the use of credit ratings assigned by other rating agencies authorized by the relevant authorities and that have an impact of HR Ratings' rating processes (*page 11*).

1. HR Ratings' Ratings

HR Ratings' ratings are an evaluation of the credit quality of an entity, issuer, issue, credit or structured product against other similar entities, products or other forms of structured debt. The ratings show the relative position of an asset and entity in its market and do not represent a statistical probability of default; therefore, they are not associated with an evaluation of the risk of non-payment at each rating level. Moreover, credit quality refers to the capacity and intention of complying with the debt obligations (and/or contractual obligations in the case of insurance and bonding institutions) and the time and manner stipulated.

These ratings may be assigned for the Short-Term and/or the Long-Term with their respective scales that reflect the respective risks. These ratings may also be assigned in the Local Scale and the Global Scale and regardless of the lapse they evaluate and the scale in which they are assigned, they may be granted one of the following three attributes: Outlook, Observations or Review in Process.

The credit ratings are dynamic; therefore, HR Ratings will follow-up on and monitor them constantly during the entire time the ratings remain valid.

2. Default Criteria.

2.1. Default: Definitions be level of default

On assigning a rating based on level of default, HR Ratings' methodologies allow the distinction between the default of specific debt Instruments and entity subject to the payment obligation. Additionally, HR Ratings does not limit the default rating to the event of non-payment, but instead extends its analysis to cases in which payments do not meet the conditions originally agreed in terms of time and manner.

In the specific context of debt instruments, HR Ratings defines non-payment or default (HR D) as a delay or suspension in obligatory principal or interest payments, in accordance with the terms, conditions and deadlines originally agreed. In terms of the entity responsible, the assignment of the credit rating depends on the level of credit of all its obligations taken as a whole: When an entity's default covers the "Predominant" part of its debt, the rating is held at HR D. When the default is "Significant", but not necessarily "Predominant", the entity's rating would be assigned as HR DS (selective default). In these cases, the importance and relevance of the debt in default would be considered.

In many cases, an entity may find itself in adverse or stress conditions that affects its intention and/or capacity to meet its payment obligations in accordance with the conditions originally agreed, which may result in a renegotiation of the payment terms between the entity and its creditors. HR Ratings considers a forced restructure as one in which the creditors and the entity agree payment terms other than those previously established and for which, if said modification were not implemented, the entity would not have had the capacity to meet its obligations correctly and promptly. Under these assumptions, HR Ratings would consider the assignment of a rating of HR DT (technical default).

However, based on the evolution of the circumstances (e.g., acceptance by the creditors, the contracting or new debt by the entity), the credit ratings of these instruments may undergo more accelerated improvements, above all in comparison with instruments rated as HR D or HR DS.

In terms of the credit rating of any entity with one or more instruments rated as HR DT, HR Ratings will apply its "Preponderance" criterion to determine if said entity will be granted a

rating of HR D or HR DS. The Preponderance of the debt shall be based on the following concepts:

- **Proportion:** This is the magnitude of the debt in debt compared to the debt that is up to date.
- **Timing:** This is the current impact the debt has on default. It is weighted in context: When was it issued? When did it have to be settled? Is it still current for our analysis?
- **Litigation:** It is determined if the debt in default is in legal process to define if the payment could be inadmissible and the considerations around said process.

HR Ratings considers that when default does not represent the “Predominant” part of the entity’s debt, the rating process will be conducted in order to evaluate the result of the analysis qualitatively to then incorporate the effect on the credit quality of the history of the default. HR Ratings will evaluate the “Preponderance” of the debt in default continuously; therefore, the entity’s credit rating of the debt credit and thus, its obligations may change over time.

Ratings of HR D and HR DT would be applied to the default of a debt instrument with any third-party creditor, whether this be an institution, a fund, an individual, either private or public. These ratings would also apply if the creditor is the original or the purchaser of the instrument in the secondary market, except in situations in which there were a non-transfer clause. Ratings of HR D and HR DT may not be applied in cases in which the creditor was not a third party, but instead an entity related intrinsically with the debtor. For example, a debt contracted by and between a country and a development or a social security entity. Table 1 summarizes the types of default in which an entity or an issue may incur:

Table 1: Default by:		
	Issuer	Issue
HR D	Yes	Yes
HR DS	Yes	No
HR DT	Yes	Yes

Source: HR Ratings.

In the case of issuers, the movement from one status to another (from default to payment or to modified payment, with all its circumstances) both the level of downgrade of *notches* and the duration of said downgrade will be considered by HR Ratings, which will reduce gradually if the entity shows consistency in its payments.

In cases where a default is identified of an issue not related to the payment capacity and/or intention of the issuer because it is due to the operative failures of an intermediary or any other entity through which cash flows in order to service the debt, HR Ratings will consider the lapse expected for payment to be made and may determine that said default does not require a rating action. This decision will be reported to the market in a press release. However, if this type default is frequent, it will be considered as a weakness of the issue and HR Ratings may assign an unfavorable qualitative adjustment or change in the attribution of the rating through a rating action.

2.2. Obligations in compliance in entities with histories of default

An entity, despite having breached certain obligations, may be up to date with the payment of other credits. Therefore, even if the rating of an entity is HR D, HR DS, HR DT or with a penalization for default on certain instrument, it would be possible to proceed with the rating of a debt obligation that in being paid normally within the terms established (in compliance).

The rating process would be conducted in accordance with the methodology relevant to the type of asset. However, if the entity's rating is HR D, HR DT or HR DS, the rating granted to the obligation in compliance may receive a qualitative penalization.

2.3. Stage following default for entities

If an improvement is observed in the "Preponderance" of the current debt or even the entire debt that the entity had in default is paid, the qualitative penalization will continue for an indefinite period, and may be progressively less.

When HR Ratings assigns a rating of HR D due to structural or non-structural factors, it will proceed to assign a rating of HR C immediately after having repaid all the financial obligations. However, the criterion to assign higher ratings will vary based on the reasons for falling into default. These criteria are detailed as follows:

- a) The following elements will be considered in the event of a structural default:
 1. A rating of HR D will be assigned in the event of default.
 2. A rating of HR C will be assigned when the default is paid.
 3. HR Ratings' evaluation of the entity's financial situation.
 4. Assignment of a rating considering the entity's financial situation and several adjustment factors. The improvement of the rating will be gradual, as the entity's situation continues to be reflected.
- b) The ratings will be as follows if there is a non-structural default:
 1. A rating of HR D will be assigned in the event of default.
 2. A rating of HR C will be assigned when the default is paid.
 3. There is a Monitoring Period in which the possible effects related to default are evaluated, such as cross-debt maturity, events of advanced or accelerated amortization of credits or debt issues and the possible legal consequences on the entity. This lapse is indefinite.
 4. A Recovery Period that may last for up to six months in which a Rating Adjusted for Default may be assigned. The Rating Adjusted for Default incorporates a certain number of adjustment *notches* because of factors that lead to the non-structural default.
 5. Assignment of a rating without an adjustment for default.

3. Treatment of Liabilities with no Specific Accounting Treatment

HR Ratings may observe cases in which entities that have lines of credit or liabilities with finance cost operate and that due to the nature of said lines or the accounting treatment used may not be presented as a banking and/or securities market debt. In these cases, HR Ratings considers that these captions represent liabilities with cost regardless of how they are recorded by the borrower in the information presented. Pursuant to this, the entity shall be default or non-payment at the time there is a breach or delay in the previously agreed obligations. Also, default is considered even if the bank or creditor entity does not classify it

as past-due portfolio from the beginning, but until the legal period to recognize said account in accounting has elapsed.

4. Relationship between Short- and Long-Term Ratings

HR Ratings may grant Short- and Long-Term Ratings to entities depending on the requirement generated. The analysis conducted, in accordance with the relevant methodology, captures the credit risks associated to different factors and their specific impact in these lapses. In general terms, the relationship between the rating scales in different lapses is shown in Table 2:

Table 2: Equivalencies	
Ratings	
Long Term	Short Term
HR AAA	HR+1
HR AA (+/-)	HR1
HR A (+/-)	HR2
HR BBB (+/-)	HR3
HR BB (+/-)	HR4
HR B (+/-)	
HR C (+/-)	
	HR5

Source: HR Ratings.

However, the equivalence shown in this Table 2 is not direct. The Short-Term rating may be higher at Long-Term rating level when the entity or the issue has an immediate source of liquidity. For example, in cases in which certain issuers are recurring and have the capacity to fund themselves in the market in the Short-Term. Also, certain issuers or issues have contingent lines of cash or some form of partial guarantee. For example, if HR Ratings identifies that an entity has any of these strengths, it may assign a Long-Term rating in the range of HR A (+/-), but the Short-Term rating assigned may be HR1.

5. Local and Global Scale Ratings

HR Ratings' ratings may be assigned on a Local Scale and/or a Global Scale. The Local Scale refers to an issuer's or issue's credit quality within a specific country. In occasions, HR Ratings will rate entities that have cash flow that originate from multiple currencies. However, the following factors must be considered in order to determine on which Local Scale the rating is to be assigned:

- Country or countries in which the entity operates;
- The composition of earnings and/or income in terms of currency;
- The denomination of the debt obligations, the functional currency in which the financial information is reported;
- The exchange rate risk to which it may be exposed;
- The operating conditions of the entity that may lead to any direct relationship with any jurisdiction.

In general, HR Ratings' models and methodologies assign ratings on the scale because the parametrization of the metrics used in the analysis will have the same validation regardless on the political demarcation where the entity operates.

Moreover, ratings on the Global Scale include the Sovereign Risk, which refers to the risks associated with degradation, convertibility and transferability of the currencies involved in the entity's operation.

To assign a rating on the Global Scale to an entity that only operates in one country, only uses the currency of that country and has only been assigned a rating on the Local Scale, the difference in terms of *notches* between the ratings on the Local Scale and the Global Scale assigned to the respective country will be applied to it.

For entities that have cash flow that originate from multiple currencies, HR Ratings will evaluate to what extent each currency contributes to or mitigates the risk to assign its rating on the Global Scale. In this vein, HR Ratings does not consider that the rating on the Local Scale is a ceiling for the rating on the Global Scale, considering the country in which the entity operates.

6. Equivalence of Global to Local Scale

In occasions, HR Ratings must measure the credit risk on the Local Scale of an entity (a subsidiary) that depends on another entity (a holding company) that operates in a different country. An example of this is in cases in which it is determined that the credit risk of a subsidiary applies to the risk of its holding company in another country.

This equivalence would only be necessary when HR Ratings does not have the credit rating of the holding company¹, and the following elements would be required to apply it:

- i. The holding company's credit rating on the Global Scale².
- ii. The sovereign rating of the country in which the holding company operates³.
- iii. The average of the Influential Ratings in the market of the country in which the holding company operates⁴.
- iv. HR Ratings' sovereign rating of the country in which the subsidiary operates.

The process to determine the HR Ratings' rating on the Local Scale for these entities is as follows:

1. The difference is measured in terms of *notches* between the average of Influential Ratings (element iii) and the sovereign rating of the entity rated by HR Ratings (element iv).
2. The difference is measured in terms of *notches* between the Influential Rating of the holding company (element i) and the Influential Rating of the country in which the holding company operates (element ii).

¹ This equivalence may only be applied when HR Ratings has assigned a rating on the Local Scale and on the Global Scale to the country in which the subsidiary operates.

² Since HR Ratings does not have the credit rating of this entity, it must use the lowest Influencing Rating on the market. Influential Ratings are defined in section 11 on page 11 of this document.

³ In this case, the Influencing Rating of the same rating agency is required.

⁴ The Influential Ratings must have been assigned on the Global Scale.

3. Based on the differences explained in points 1 and 2, the rating will be assigned to the entity (subsidiary) on the Local Scale of the country rated by HR Ratings.
4. HR Ratings may make adjustments to the rating on the Local Scale of the entity (subsidiary) based on its specific situation.

7. Ratings Actions and Attributes of Ratings

HR Ratings defines the term “Rating Action” as all decisions that refer to an assignment, modification, ratification or withdrawal of a rating or to the assignment, modification, ratification or withdrawal of a rating attribute. A rating cannot have an attribute of Review in Process and Observations and/or Outlook at the same time because a Review in Process precedes an Observation or an Outlook.

HR Ratings defines a Rating Attribute as a particular characteristic of a rating and recognizes three types:

- a) **Outlook.** Outlook refers to trends, typically long-term, observed from the rating process, whether macroeconomic, related to an industry, or inherent to the entity or issue rated. The sense of the effect is known; therefore, the Outlook is assigned as: “Positive”, “Negative” or “Stable” and in general terms, relates to any Long-Term rating assigned by HR Ratings⁵. However, in cases in which HR Ratings only rates or publishes the Short-Term rating, it will assign an Outlook on the risks it identifies.
- b) **Observation.** An observation refers to Short-Term events or trends that may have an impact on the rating and its sense is also known. These events or trends are typically inherent to the entity or issue but may also manifest themselves following macroeconomic events or events related to an industry or sector. This type of attribute differs from the Outlook in which the events that cause it would have an effect in the Short-Term.

The Observations period is from zero to nine months and it is HR Ratings’ obligation to renew it in accordance with the terms indicated. To do so, a report and/or communicate will be issued within a maximum of nine months from the date of the previous Observation, in which said attribute may be modified, ratified or withdrawn. A rating cannot have an attribute of Observation and/or Outlook at the same time because an Observation precedes an Outlook.

- c) **Review in Process.** This type of attribute differs from the previous attributes because it refers to a structural change of the entity or a specific scenario and above all, the sense and/or the magnitude of the impact cannot always be anticipated. Additionally, HR Ratings may place any entity or issue into Review in Process following a methodological change.

For example, an acquisition could have been announced with uncertain effects (which in itself may give rise to an Observation action), but there may be uncertainty with regard to the consummation of said acquisition or the case may arise in which an acquisition is arranged to take place, but the method of financing (debt or capital) has yet to be determined or announced. In these cases, a Review in Process action will be assigned if there is no further information.

Generally, a Review in Process lasts for up to nine with the probability that it may be extended if the events that give rise to said action prevail. Unlike the Observation and

⁵ In this section, the sense refers to whether the impact is positive, negative or neutral.

the Outlook, the Review in Process is neutral if the details of the possible change or the possibility that they will occur are unknown.

When a Review in Process is assigned, the most-recent rating action must be mentioned, substituting the previous attribute. If this Review in Process is applied, HR Ratings will issue a report and/or communique within a maximum of nine months from the date of the previous review, and the review period being extended for a further nine months or the Review in Process may be withdrawn.

8. Sovereign Support

HR Ratings may consider that an entity or issue has the backing of the Federal Government or Central Government of the country in which it operates and therefore, it would maintain the same rating. This assignment is justified when the entity or issue:

1. Provides significant financial support to the Federal Government and incapacity to pay would imply an immediate reduction of the flow of income for the Public Sector;
2. In the case of default by an institution, the economy and the markets would be affected, this generating difficulties for the Public Sector, which would be obliged to assist said institution or issue to avoid an event of default;
3. It has such an important level of political influence that the authorities are obligated to intervene to avoid an event of default.

In those cases, in which an entity or issue is considered to have a sovereign credit risk, the rating process will consist of:

1. An evaluation of the reasons why the entity or issue deserves the same sovereign risk rating.
2. An analysis of the macroeconomic factors and those inherent to the entity, including all those related to the specific methodology.

9. Legal Opinion

In the case of structured transactions, such as products, issues or loans with any directly assigned payment source, HR Ratings may request a Legal Opinion from an external independent lawyer. The main purpose of the Legal Opinion is to ensure that the legal documents and accessory legal elements used in the rating process are valid in accordance with the applicable legislation, they meet all the requirements to be upheld in a legal process and be enforceable, and that they adequately isolate the resource or asset to be used to service payment of the debt. This last point would indicate that if the entity related to the structured transaction incurred in default and therefore the entity would face a situation of bankruptcy or liquidation, the assets assigned for the payment of the transaction would not be considered as part of the entity's mass in the bankruptcy or liquidation process.

In general terms, the Legal Opinion would have a binary characteristic, which would be defined as either enough or insufficient. If the Legal Opinion is insufficient, HR Ratings will not take the benefit of the structure into account for the assignment of the rating; therefore, the analysis profile and the methodology used may differ from those used for structured transactions.

10. Treatment of the Lack of Transparency in the Information Presented or the Low Level of Corporate Governance.

There are occasions in which, at HR Ratings' discretion, the information submitted by issuers or entities have a low level of transparency in terms of presentation and/or consistency. This may include situations in which an entity does to adhere to international accounting standards or sound market practices.

Due to this, HR Ratings may apply a negative adjustment factor to the rating of any issuer or issue when the information submitted lacks transparency. Said adjustment shall consider the following factors, which will determine the extent of the adjustment on the rating assigned:

1. **Severity:** HR Ratings will evaluate the severity of the low level of transparency/lack of adherence in terms of the information submitted, considering the severity as proportional to the impact that the low level of transparency has on the analysis conducted.
2. **Frequency:** HR Ratings will evaluate the frequency with which the information submitted lacks transparency, considering a greater frequency as more severe.
3. **Capacity and Will to React:** After identifying the lack of transparency, HR Ratings will evaluate the efforts made by the issuer or entity to improve its transparency and adherence to the accounting standards. HR Ratings will also evaluate the entity's or issuer's capacity and will to react in terms of the possible adjustments made to the information submitted and the adjustments to be incorporate into future information.

Moreover, there are occasions on which the company or entity shows poor compliance in terms of sound Corporate Governance practices, including the lack of support committees or structures that allow for objectivity, mainly in the sphere of auditing and internal control. To do this, HR Ratings may apply adjustments to the rating, considering factors of severity and capacity to react, as described, in order to establish the impact of said adjustments. This is additional to what the methodology in each case ma weight in relation to Corporate Governance practices.

11. Limited and Preliminary Ratings.

Limited Ratings are an analysis of credit strength requested by a client in which HR Ratings is asked to evaluate a particular entity, issue or credit under a set of hypothetical or specific characteristics, assumptions or scenarios in order to establish the rating that could be assigned if said characteristics were met or observed.

Moreover, Preliminary Ratings are an analysis of credit strength requested by the entity or issuer in which HR Ratings is asked for a prior or initial evaluation of any transaction that the issuer intends to perform, but does not yet have the information in order to close the transaction. This is generally for the purpose of initiating is sale or prospecting to investors. HR Ratings will evaluate the entity, issue or credit based on the methodologies used for each type of asset.

Limited and Preliminary Ratings have no validity beyond the time they are granted and are not subject to withdrawal, monitoring or update. Therefore, these ratings are not regulatory. However, a Preliminary Rating can be converted into a Regulatory Credit Rating after confirming the conditions applicable to the Preliminary Rating.

It is important to note that a Regulatory Ratings may differ from the Preliminary Rating if on materializing there were any change in the conditions applicable to the Preliminary Rating. Once the Preliminary Rating is converted into Regulatory Credit Rating, it will receive the same treatment and have the same terms as the rest of the rating and will be subject to withdrawal, monitoring or update.

HR Ratings will explain in the report or communicate that it is in fact a Limited or Preliminary Rating and they may be private or public depending on the requirements of the entity or issuer.

In the case of Limited Ratings, HR Ratings will evaluate the entity, issue or credit based on the methodologies used for each type of asset, considering the assumptions provided by the client; therefore, the rating will be granted based on said assumptions. HR Ratings may incorporate its own assumptions, where appropriate, to conduct the rating process.

The following cases are some examples of the use of a Limited Rating:

- When seeking to analyze an issue or credit under the set of specific hypothetical characteristics (specific level of capacity, coverage, term, amount, payment source, to mention a few).

- When seeking to evaluate the impact in terms of the credit quality of a transaction that an entity may perform (merger, acquisition, a specific purchase, investment projects, refinancing or restructuring process, sale of assets, spin-off of business units, among others).

- When seeking the credit evaluation for transactions without having the final documentation or legal opinions available in order to consider possible changes to issues already in the market. In the light of this, considering the hypothetical changes, the Limited Rating may be a requirement for stockholders' or holders' meetings to approve the modifications proposed.

Preliminary Ratings include assumptions on variables that are known to be relevant but have yet to be determined. Preliminary Ratings are usually required as part of predetermined processes, such as placements or applications to guarantees.

The following cases are some examples of the use of a Preliminary Rating:

- When a public-sector entity or any other institution seeks to evaluate the capacity of a bidder to finance a certain project or transaction.

- When in the case of structured and non-structured transactions, the credit evaluation is sought without having the final documentation.

In order to assign a Limited or Preliminary Rating, the first step will be the express request of the entity or issuer. Then HR Ratings will conduct the analysis to determine said rating with the information and assumptions provided by the entity or issuer (in the case of Limited Ratings). During the analysis process, HR Ratings will not provide any feedback whatsoever on the rating to be assigned or the sensitivity to it. This is because Limited and Preliminary Ratings do not include any financial advice or restructuring service.

In the report or communicate HR Ratings will explain the assumptions taken into consideration for the assignment of the rating, clarifying that it is in fact a Limited or Preliminary Rating and that said rating depends on the assumptions included in the analysis.

The scale used for the Limited Ratings is the same as the one used in the scales relating to each type of asset. However, to indicate that it is a Limited Rating, HR Ratings assigns the indicative "(L)" to the end of each symbol. The scale used for the Preliminary Ratings is the same as the one used in the scales relating to each type of asset. However, to indicate that it is a Preliminary Rating, HR Ratings assigns the indicative "(P)" to the end of each symbol.

12. Influential Ratings.

In certain analysis processes, HR Ratings requires the credit analysis or evaluation of entities that do not maintain a rating assigned. In these cases, a rating issued by another rating agency may be used, which is defined as an Influential Rating. The Influential Ratings must be granted by rating agencies authorized by the regulators in each jurisdiction and in each case HR Ratings may evaluate if it considers or not the Influential Rating in the assignment of the ratings in accordance with the different methodologies applicable.

If an Influential Ratings is used, the analysis team must follow-up on it in accordance with the stipulations set forth in its internal policies and procedures to monitor possible changes in said rating and which would affect the analysis performed by HR Ratings.

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The ratings and opinions of HR Ratings de México S.A. de C.V. (HR Ratings) are opinions on the credit quality and/or asset management capacity or relative to the performance of the tasks focused on complying with the corporate purpose by issuers and other entities or sectors. Said ratings and opinions are based exclusively on the characteristics of the entity, issue and/or transaction, regardless of any business activity by and between HR Ratings and the entity or issuer. The ratings and/or opinions granted are issued on behalf of HR Ratings and not of its management or technical staff and do not constitute recommendations to purchase, sell or hold any instrument or perform any type of business, investment or transaction. In addition, said ratings and/or opinions may be subject to updates at any time in accordance with HR Ratings' ratings methodologies, pursuant to the terms of section II and/or III, as applicable, of Article 7 of the "General Provisions Applicable to Securities Issuers and Other Participants in the Securities Market".

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The ratings and/or opinions issued by HR Ratings consider an analysis of the relative credit quality of an entity, issuer and/or issue; therefore, they do not necessarily reflect a statistical probability of default on payment, this being understood as the impossibility or the lack of will of an entity or issuer to perform its contractual payment obligations. Creditors and/or holders may then be forced to take measures to recover their investments, which may even include restructuring the debt due to the stress situation faced by the debtor. Notwithstanding the foregoing, to grant greater validity to our credit quality opinions, our methodology considers stress scenarios as a complement to the analysis prepared on a base scenario. The fees paid to HR Ratings by issuers generally vary from US\$1,000 to US\$1,000,000 (or the equivalent in local currency) per issue. In some cases, HR Ratings will rate all or some of the issues of a particular issuer for an annual fee. The annual fees are expected to vary between US\$5,000 and US\$2,000,000 (or the equivalent in local currency).

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This Methodology is of the exclusive property of HR Ratings and it is applicable starting February 10th, 2021.

This document explains the methodology used by HR Ratings to assign credit ratings to financial banking institutions.

HR Ratings' methodology allows credit ratings to be assigned that represent the capacity and will of financial institutions to meet their debt obligations promptly and correctly. The analysis conducted to establish said capacity is based on two concepts: first, on a quantitative analysis that requires the projection and weighting of a series of financial metrics in a Base Scenario and a Stress Scenario, and second, on a qualitative analysis that evaluates to what extent the environmental, social and corporate governance (ESG) factors have an impact on the bank's credit quality.

HR Ratings' quantitative analysis begins with an analysis of the bank's assets, considering trend, composition and concentration. It also analyzes liabilities in terms of access to different sources of funding and liquidity, considering the composition of the liabilities and the concentration of the main savers. The final elements considered in this aspect are the exchange rate and interest rate risks to which the bank is exposed, as well as the hedging tools it uses. This evaluation is used to develop the Financial Model, which weights metrics that are divided into three categories: (i) profitability and efficiency, (ii) solvency and capitalization and (iii) liquidity. Each of these metrics considers the last eight quarters (two years) of historical information and the projection for the next eight quarters. The projection exercise is conducted for two scenarios and requires the bank's evaluated historical financial information, considering the balance sheet, the statement of income and the statement of cash flow in order to determine a series of financial ratios to be evaluated.

The metrics used by HR Ratings incorporate concepts that are normally considered regulatory, such as the Capitalization Indexes (ICAPs), the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR).

With regard to the assumptions that HR Ratings will use to construct its scenarios, the analysis will depend on the characteristics observed in each bank, the strategies adopted and the tolerance to the risk they face. The factors that will be common to each evaluation relate to the construction of Macroeconomic Scenarios that reflect the current situation. In turn, the projected Base Scenario considers the projection of the behavior that has a greater likelihood of occurrence in the future given the bank's specific characteristics, whereas the Stress Scenario seeks to emulate a scenario of maximum adversity for the bank considering the main risks to which it is exposed.

In terms of the qualitative analysis, HR Ratings evaluates the impact of the ESG factors as a fundamental part to identify the credit quality of the bank. For the environmental analysis, factors such as the bank's policies and approach to said aspect are evaluated, as well as its exposure to natural phenomena in terms of portfolio and operation. The social analysis evaluates factors such as the bank's human capital policies, as well as its reputational risk and its social approach in terms of services and in terms of offering competitive prices. The last part of the ESG section refers to corporate governance and HR Ratings evaluates factors such as internal regulation, the quality of Upper Management, the mechanisms to mitigate the regulatory and macro-economic risk, the operational risk and the quality and transparency of the information generated by the bank.

Lastly, HR Ratings may assign qualitative adjustments to the relating in any direction, limited to three notches when any of the following factors is detected: (i) support by the authorities when there is a certain systemic relevance of the bank to the financial market in which it operates, (ii) when the bank's historical information cannot be representative of its future operation, and (iii) when the strength or weakness of an asset, liability or any other quantitative factor cannot be fully incorporated into the financial model.

1. Introduction

Banks and financial institutions that due to their function represent one of the main pillars of economic growth in any country. Granting credit to consumers and other productive segments enables the movement of capital that results in new investments and improves economic conditions. However, an adverse scenario in the sector may represent a significant source of risk for the economy as a whole.

The credit rating described in this methodology determines the bank's capacity and will to meet its debt obligations, including claims from its deposits. This implies evaluating if the capital available and the cash flow generated by the bank's diverse assets are sufficient to service the debt and to cover any claims that arise over time and in specific periods. Therefore, the methodology offers the tools necessary to measure the bank's capacity to generate high-quality assets that maintain their value over time, as well as the capacity of its management to propose and implement a strategy that ensures sufficient solvency and maintains a certain level of liquidity at all times.

HR Ratings' methodology uses quantitative analysis based on its Financial Model, which stands out for constructing projection scenarios to evaluate the main risks and measure the efficacy of the controls of each bank. The metrics that will be projected in each Scenario, which are grouped in accordance with their capacity to describe the operating profit and capacity, are solvency through the potential capital it would have and available liquidity.

It is important to clarify that the methodology considers that credit institutions, due to their importance and the systematic risk they face daily, are subject to robust regulatory measures. There are also international guidelines and general recommendations of international bodies, such as those of the Basel Committee, which seek to establish contingency plans to maintain solvency and liquidity of the sector when faced with stress scenarios. The metrics used by HR Ratings in its evaluation reflect to a certain extent the adherence to these international regulations. An example is that the solvency section considers capitalization indexes, whereas the liquidity section considers measurements such as the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR). The first metric measures a bank's liquidity to face a stress scenario for 30 days, whereas the second measures the volume of the liabilities enforceable in the long-term against highly-liquid assets.

HR Ratings' methodology also presents a qualitative analysis based on different environmental, social and corporate governance (ESG) factors, which allows the impact that these factors have on the credit quality of each bank evaluated to be incorporated.

It is important to clarify that the ESG factors, despite having their own evaluation, may have an impact on the construction of the Projection Scenarios and therefore, on the Financial Model metrics.

2. General Structure of the Methodology

HR Ratings' methodology is based principally on three steps: first, on an analysis of the bank's assets, liabilities and position in terms of financial and derivative instruments.

Methodology for Rating Banks

Financial Institutions
February 2020

The second step is conducted using this information, which refers to the development of the bank's Financial Model and its ESG factors. The final step refers to the assignment of a qualitative adjustment, limited to three notches in any direction, in order to capture factors that cannot be incorporated into the Financial Model and that may have an impact on the bank's credit quality.

The quantitative analysis of the bank and the credit rating is based on weighting two main captions: the first is the Financial Model, with a weight of 70.0% of the bank's rating, and that begins with the projection of the bank's financial statements and constructs financial metrics in a Base Scenario (65.0% of the Financial Model) and a Stress Scenario (35.0% of the Financial Model). The second caption relates to the ESG analysis and is based on evaluating a series of factors and risks to which the bank is exposed and its capacity to mitigate them.

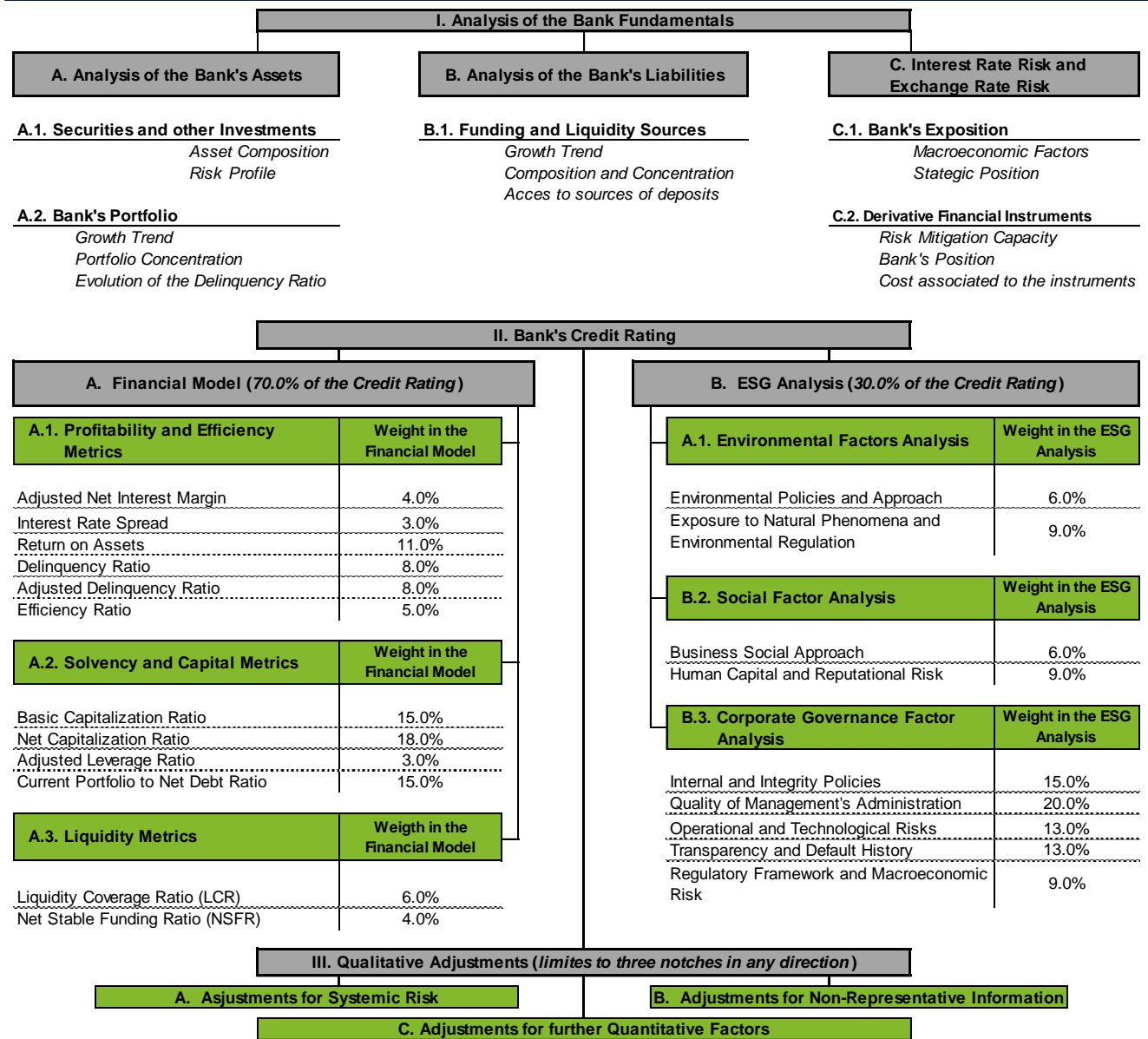
In terms of the Financial Model, HR Ratings separates the metrics it analyzes into three items: (i) profitability and efficiency measurement metrics, (ii) solvency and capital metrics and (iii) liquidity metrics. The metrics will be estimated not only for the last two years observed (the last 8 quarters), but they will also be projected in the two scenarios for the next two years (the next 8 quarters). This exercise is conducted based on the analysis of the bank's financial statements; therefore, in this vein, their clarity and transparency is fundamental. On the projections side, the Base Scenario begins with what HR Ratings considers as the bank's most likely performance, and incorporates the current macro-economic situation. Moreover, the Stress Scenario incorporates the risks detected in the financial analysis, considering the risk policies and tolerance, as well as the macroeconomic risks in order to incorporate the greatest-possible degree of stress.

The main risks that will be incorporated into both Projection Scenarios refer to items such as the bank's operational and administrative risks, the expected loss due to the possible growth of the past-due portfolio, the considerations of dispersed and centralized portfolios, and the loss of portfolio value due to market movements, among others .

In the ESG analysis, the factors will be evaluated through the three possible labels: *Upper*, *Average* and *Limited*: which refer to the bank's capacity to face the risks to which it is exposed. The *Upper* label implies that HR Ratings considers that the bank is not exposed to a certain risk or that, even while being exposed, it has the resources and mechanisms to significantly mitigate this risk. Moreover, the *Average* label implies that HR Ratings has identified that the risk analyzed, considering its trend, may have a moderate effect on the bank's credit quality. Finally, the *Limited* label reflects that the bank is exposed to a greater risk compared to its competitors and does not have the mechanisms or policies to mitigate it.

HR Ratings considers that the bank's credit rating, incorporating the projections in both Scenarios and the evaluation of the ESG factors, reflects the bank's capacity and will to meet its payment obligations. Figure 1 shows the general structure of the methodology and explains the metrics and factors evaluated, as well as the weights assigned to each within its model.

Figure 1: General Structure of the Methodology



Source: HR Ratings.

3. Quantitative Analysis of the Bank

In its quantitative analysis, HR Ratings develops the Financial Model based on the historical financial statement information provided by the bank. The information required by HR Ratings includes quarterly reports of the Statement of Income, the Balance Sheet, and the Cash Flow Statement, preferably of the previous five-years (ended or partial) given that said period will allow HR Ratings to understand the bank's evolution and project towards the future better. In the event that the bank has a shorter history, its

commencement date of operations will be considered. The projections to be made using this information will be for the next two years (eight quarters) and the historical data that has an impact on the model shall also be taken from the last two years (eight quarters). In cases in which HR Ratings is in the process of ratings a recently-incorporated bank and there is insufficient historical information, a single year of historical information and the respective two-year projections may be weighted in the financial model. In cases in which the bank does not have historical information, the rating may be based solely on the two-year projections.

This section details the components for the development of this model. It first describes HR Ratings' analysis of the bank's assets, followed by a description of its liabilities and the interest and exchange rate risks it faces. A fourth section refers to the financial reports that provide the information necessary for the analysis. The fifth section describes the metrics, grouped in accordance with the profitability, solvency and liquidity items. The sixth section describes the assumptions typically included in the Projection Scenarios, whereas the final section explains the rating process of the Financial Model and illustrates an example of the creation of a scenario.

3.1. Analysis of the Bank's Assets

The analysis of the bank's assets is fundamental in HR Ratings' ratings process, in which the size, distribution and quality of the historically-originated assets may be identified, as well as of those acquired in markets.

This analysis will be used as a base to project the financial reports and incorporate the respective assumptions into any of the projection scenarios.

3.1.1. Analysis of Investments in Securities

In terms of the bank's investment portfolio, the analysis refers to items such as the composition of the portfolio in terms of negotiable instruments, instruments held to maturity and readily-marketable instruments. Up to a certain point, this allows the evaluation of aspects referring to the bank's liquidity. In this sense, the price of these instruments, as well as their profitability, are fundamental in HR Ratings' projections.

The other aspect evaluated in this section refers to the credit quality of the counterparties that have issued these instruments because the credit quality of the portfolio describes their capacity to maintain their value over time. The bank's strategy regarding the constitution and the future risk of the portfolio is included in the projections to the extent possible.

3.1.2. Analysis of the Bank's Portfolio

It is fundamental that the bank's portfolio is well diversified in order to avoid a greater degree of dependence on one client or group of clients. In the event that the bank reflects a high concentration on a single client or sector, its growth expectation shall be reduced from the point of view of the generation of preventive estimates against credit risks. In this vein, HR Ratings will evaluate the concentration on a sector with greater

default rates than others and in which a high concentration may reduce the bank's credit quality in the future..

HR Ratings shall consider the bank's portfolio diversification and concentration strategy. The Bank's strategy may be to seek diversification or focus on a specific sector, region or type of asset. Additionally, the bank's risk tolerance policies in terms of concentration must also be considered, not only that these policies are duly formalized by the bank in manuals or protocols, but that the risk considers the context, the macroeconomic conditions and the challenges visible in the industry or in any geographical region.

The concentration observed by HR Ratings will be necessary for its projection scenarios and in the case of the Base Scenario, the expected evolution will be incorporated given the context, whereas the probable risks to which the bank could be exposed to be incorporated into the Stress Scenario.

Moreover, HR Ratings will evaluate the growth or contraction trend of the different captions of the portfolio. This analysis must include the evaluation of whether the trends observed in the bank's portfolios are due to macroeconomic variables, to the challenges of specific industries or to policies implemented by the bank. The analysis report will explain HR Ratings' evaluation and will propose the bases to develop its projection assumptions.

Lastly, an analysis of late payment of the bank's portfolio will be included, which seeks to identify the quality of the assets generated by the bank, considering all the business lines in which it may specialize. It also reflects the bank's capacity to deal with clients who fall into the different ranges of default and the tools available to mitigate possible increases in past-due portfolio, as well as the tools in place for its recovery.

The factors evaluated by HR Ratings include the criteria applied to grant credit, the level of tolerance to risk and the bank's capacity to correct unfavorable trends. The formalization of credit policies and the existence of mechanisms to constantly evaluate them will be reflected in better conditions in the light of the assumptions for the development of its projections.

3.2. Analysis of the Bank's Liabilities

This section refers to the analysis of the bank's funding tools, which to a great extent determine the institution's capacity to obtain or acquire liquidity.

The analysis of this section is similar to the analysis used in the assets section in the sense that it evaluates the historical trends that show the bank's liabilities, not only in terms of the growth or decrease of the accounts, but also the composition of the different deposit sources and funding tools. For example, in the case of traditional deposits, an evaluation is conducted to establish whether or not funding comes from immediately on-demand deposits or term deposits. The analysis also considers whether or not the issue of credit or bonds is used. The interest rates associated to these tools are fundamental in the calculation of the bank's future expenditure.

Another aspect analyzed is the concentration of the main savers and the implications that may be generated in terms of interest rates and the availability of liquidity. The

concentration also extends to the liabilities with other banking institutions and specific banking sectors.

In its projections, HR Ratings also evaluates the bank's reputation and any other factor that enables it to consider the bank's participation in the financial sector in which it operates. These factors describe the institution's access to sources of liquidity. The bank's mechanisms to identify and correct any unfavorable trends observed are also considered. The formalization of funding policies and the existence of mechanisms to constantly evaluate them will be reflected in better conditions in the light of the assumptions for the development of the projections of the financial model.

It is important to clarify that in cases in which HR Ratings identifies strengths or weaknesses associated with the bank's assets or liabilities, and that the projections financial model cannot incorporate the risk or strength that they imply for the bank's credit quality. These factors may be incorporated through qualitative adjustments in any direction, which will be limited to three notches.

3.3. Interest Rate Risk and Exchange Rate Risk

This section evaluates the extent to which the bank is exposed to an exchange risk or several interest rate risks. On the one hand, the risk is associated to a macroeconomic context, in which the bank may be more exposed depending on its access to foreign markets. This risk also refers to the Central Bank's reference interest rates and the strategies that the bank has in place that have an effect on the rates it receives, both assets and liabilities.

The macroeconomic risks are captured for a Base Scenario and a Stress Scenario through the variables projected by HR Ratings' Economic Analysis Department; however, the risk is also associated with the quality of the bank's management and the tools it has to mitigate these risks.

In terms of mitigation and hedging, the analyzed consider whether or not the bank has different financial instruments, such as CAPS or SWAPs, which allow it to acquire countercyclical positions. In terms of the bank's derivative instrument position, the extent to which they are acquired and/or used to mitigate the risk associated to this transaction or to hedge its positions is also measured.

In the cases in which the bank uses its derivative financial instrument position as a business line, the profitability and sustainability of this strategy will be evaluated in the assets section. It is also important to emphasize that the costs associated to these instruments, both current to those planned to be acquired by the bank, will be incorporated into the financial model.

3.4. Financial Reports

The metrics to be used by HR Ratings to determine the bank's credit rating will be estimated using variables based on the information reflected in the financial statements. HR Ratings' quantitative analysis consists of making projections of these reports to determine the profitability, efficiency, solvency and liquidity of the bank evaluated.

Methodology for Rating Banks

Financial Institutions
February 2020

It is important to clarify that, in its analysis, HR Ratings establishes an assumption to develop its projections that must consider the historical performance of these reports, the plans that the bank has in place to operate in the future and the macroeconomic context it faces. The projections of the quantitative analysis consider the following financial reports:

3.4.1. Balance Sheet

A bank's balance sheet reflects its capacity to generate revenue and the source of future obligations; therefore, it is fundamental to estimate the assets and liabilities to be able to project the free cash flow. Within the analysis of the balance sheet, HR Ratings will identify the quality of the assets to establish adequate growth trends considering the quality of the credit portfolios and the specialization in different lines of business.

It is fundamental to classify liabilities in accordance with the characteristics to determine the cost and establish an approximate amount of interest expense. In this sense, the analysis of the variation of the amount of assets and liabilities allows an estimate of the bank's income and expenditure, which reflects its profitability. HR Ratings' quantitative analysis must consider the bank's historical trends and plans implemented for the coming periods. This will be the base to project the financial metrics and will reflect the expectations of the bank's financial evolution in the coming periods.

3.4.2. Income Statement

The bank's Statement of Income is based on the amount earned or collected by the bank's assets and liabilities. The bank's income is based on the quality of its financial assets, particularly the quality of its current credit portfolio, although the performance of different investment portfolios and the terms generated from repurchase transactions are also considered.

The interest income projection is based on the projection of the balance sheet and HR Ratings' expectations on the bank's lending rate. Moreover, once the liabilities are projected with a cost on the balance sheet, HR Ratings establishes an approximate passive interest rate for each one of the liabilities and obtains the total interest expense. On analyzing and projecting the bank's financial statements, HR Ratings' Analysis Team will consider the prevailing macroeconomic situation and the current business plan.

3.4.3. Cash Flow

This financial statements reflects the cash movements following the bank's operation, financial activities and the investing activities in the period represented. The analysis of this financial statement is fundamental for HR Ratings to be able to determine and project the bank's liquidity and the insolvency of the balance sheet because the credit strength is reflected in the capacity to generate and make use of cash in order to meet debt obligations, both in the long and short terms.

3.5. Financial Metrics

This section explains the metrics obtained by HR Ratings on projecting the financial statements of the bank evaluated. These are divided in order that they may represent first the profitability and efficiency that arise from the bank's capacity to generate high-quality assets and to operate in such a manner so as to mitigate credit risks. Secondly, metrics are incorporated that reflect the bank's capacity to manage unexpected losses adequately in order to ensure that the operation does not deteriorate to an extent that it affects the risk perception and therefore, its credit rating. These metrics seek to establish the bank's solvency. The last group of metrics evaluates liquidity through the indicators proposed by Basel III, the Liquidity Coverage Ratio and the Net Stable Funding Ratio.

3.5.1. Profitability and Efficiency Metrics

The bank's profitability projections accumulate a weight of 34.0% in the bank's quantitative analysis and are focused on the capacity of the bank's assets and operations to generate income. These metrics capture both the quality of the assets and the market position of the bank and thus enable it to set its prices.

3.5.1.a. Adjusted Net Interest Margin ***(4.0% of the Financial Model / 2.8% of the Credit Rating)***

This metric measures the brokerage margin adjusted for the credit risks of a bank. In particular, it offers the advantage of being an indicator of the capacity with which the institution brokers resources through its operations. This indicator captures the difference between the interest income generated and the amounts of interest paid by its debt obligations adjusted for credit risks in relation to the value of its productive assets.

$$\text{Adjusted NIM} = \frac{\text{Sum of the (Interest Income} - \text{Interest Expenses} - \text{Loan Loss Provisions) in the LTM}}{\text{LTM Average Productive Assets}}$$

Moreover, the productive assets are formed in accordance with the following equation:

$$\begin{aligned} \text{Productive Assets} \\ = \text{Cash and Equivalents} + \text{Investment Values} + \text{Derivative Hedging} \\ + \text{Tatal Loan Portfolio} - \text{Loan Loss Provisions} \end{aligned}$$

Figure 2 illustrates the values typically shown by entities rated in different ranges:

Figure 2: Adjusted Net Interest Margin range by rating

HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
(∞, 4.5%]	(4.5%, 3.1%]	(3.1%, 2.0%]	(2.0%, 1.2%]	(1.2%, 0.6%]	(0.6%, 0.3%]	(0.3%, -∞)

Source: HR Ratings.

3.5.1.b. Interest Rate Spread

(3.0% of the Financial Model / 2.1% of the Credit Rating)

The purpose of this metric is to measure the bank's brokerage margin through the difference between the rate at which the portfolio is placed and the investments (referred to collectively as productive assets) and the rate at which deposits and other funding mechanisms are agreed. It also measures the exposure of the bank's interest income to adverse movements in interest rates.

This metric is formed in the following manner:

$$\text{Interest Rate Spread} = \frac{\text{Sum of all Interest Income in the LTM}}{\text{LTM Average Productive Assets}} - \frac{\text{Sum of all Interest Expenses in the LTM}}{\text{LTM Average Productive Assets}}$$

Figure 3, below, shows the difference ranges of rates typically shown by the banks evaluated in the different rating ranges:

Figure 3: Interest Rate Spread range by rating

HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
(∞, 5.5%]	(5.5%, 3.9%]	(3.9%, 2.6%]	(2.6%, 1.6%]	(1.6%, 0.9%]	(0.9%, 0.6%]	(0.6%, -∞)

Source: HR Ratings.

Among the variables that will be considered when projecting this metric, as well as the historical trends and the bank's strategy, inflation and the expected interest rates stand out in macroeconomic terms, as well as the bank's position in the market, the type of portfolio, and the derivative financial instruments hedging it maintains.

3.5.1.c. Return on Assets (ROA)

(11.0% of the Financial Model / 7.7% of the Credit Rating)

This metric captures the profitability of a bank based on its assets. In cases where necessary, HR Ratings may add the income from assets off the balance sheet; therefore, the following equation shows how this metric is calculated:

Methodology for Rating Banks

Financial Institutions
February 2020

$$ROA = \frac{\text{Sum of all (Net Result – Minority Contributions) in the LTM}}{\text{LTM Averaged Productive Assets – LTM Average Repo Debt Balance of Operations}}$$

It is important to mention that even though the Return on Equity (ROE) metric may be considered as the most common profitability metric, HR Ratings considers that this metric may be significantly influenced by the bank's solvency position and risk appetite through it over a specific period of time. Figure 4 illustrates the values typically shown by entities rated in different ranges:

Figure 4: Return on Assets (ROA) range by rating

HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
(∞, 2.0%]	(2.0%, 1.4%]	(1.4%, 0.8%]	(0.8%, 0.4%]	(0.4%, 0.2%]	(0.2%, 0.03%]	(0.03%, -∞)

Source: HR Ratings.

3.5.1.d. Delinquency Ratio

(8.0% of the Financial Model / 5.6% of the Credit Rating)

This indicator is of great importance because it reflects the quality of the assets originated by the bank, which in turn shows how the controls and criteria to grant credit have an impact on factors such as profitability and the capacity to generate constant cash flow.

$$\text{Delinquency Ratio} = \frac{\text{Delinquent Loan Portfolio}}{\text{Total Loan Portfolio}}$$

The projection of this metric is of particular relevance for this methodology. In it, HR Ratings considers the current macroeconomic situation to evaluate both the growth of the portfolio and the increase of the proportion of the delinquent portfolio. The bank's criteria to grant credit and tolerance to risk will also be considered, as well as the historic management of the delinquent portfolio. One of the most important factors when analyzing this metric refers to the portfolio of different products because a default that are typical to one product may differ from the default commonly observed in another product. Figure 5 shows the values of this metric that HR Ratings expects to observe for each rating range:

Figure 5: Delinquency Ratio range by rating

HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
(0, 3.0%]	(3.0%, 4.8%]	(4.8%, 6.3%]	(6.3%, 7.5%]	(7.5%, 8.2%]	(8.2%, 8.7%]	(8.7%, 100%)

Source: HR Ratings.

3.5.1.e. Adjusted Default Ratio (8.0% of the Financial Model / 5.6% of the Credit Rating)

This metric incorporates the losses of the delinquency ratio, which are estimated through the change in the preventive estimates, considering those generated in each period and deducting the income for the releases also made in the 12-month period for which the metric is estimated. This metric allows the bank's complete credit activity to be analyzed without being distorted by policy, or determination or the requirement to apply write-offs. The metric is expressed as:

$$\text{Adjusted Delinquency Ratio} = \frac{\text{Delinquency Loan Portfolio} + \text{LTM accumulated Losses}}{\text{Total Loan Portfolio} + \text{LTM accumulated Losses}}$$

The projection of the delinquent portfolio and the losses requires multiple elements, as in the previous metric. The first refers to the distinction of credits for different purposes; diverse assets show specific behavior and are, to a greater or lesser extent, prone to different trends. The second element measures the historical capacity shown by the Bank to originate credit.

Figure 6 illustrates the values typically shown by entities rated in different ranges:

Figure 6: Adjusted Delinquency Ratio range by rating						
HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
(0,5.0%]	(5.0%,7.4%]	(7.4%,9.4%]	(9.4%,10.8%]	(10.8%,11.9%]	(11.9%,12.4%]	(12.4%,100%)

Source: HR Ratings.

The increase of the delinquent portfolio and the losses shall have negative consequences on the bank's liquidity, profitability and capitalization projections. It is important to mention that when the amount of delinquent or past-due portfolio is greater, the need for preventive estimates will also be greater, but the profit at the end of the period will be lower.

3.5.1.f. Efficiency Ratio (5.0% of the Financial Model / 3.5% of the Credit Rating)

This indicator measures the bank's efficiency to compare administration expenses with total operating income, including the credit risk estimates in a single period. In other words, the costs generated by the bank's operation are evaluated in proportion to income earned. This indicator is constructed in the following manner:

$$\text{Efficiency Ratio} = \frac{\text{LTM Sum of the Administration and Promotion Expenses}}{\text{Sum of all (total income + loan loss provisions) in the LTM}}$$

Figure 7 illustrates the values typically shown by banks rated in different ranges:

Figure 7: Efficiency Ratio range by rating						
HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
(0,46.0%]	(46%,56%]	(56%,65%]	(65%,75%]	(75%,84%]	(84%,94%]	(94%,∞)

Fuente: HR Ratings.

3.2.2. Solvency and Capital Metrics

The solvency metrics calculated by HR Ratings reflect the bank's capacity to manage unexpected losses adequately in order to ensure that the operation does not deteriorate to an extent that it affects the risk perception and therefore, its credit rating. On evaluating these metrics, the elevated values must be identified as being due to a recent capital increase or an improvement in profitability levels. HR Ratings also considers the administration practices and strategy in terms of the acceptable level of capitalization and its response capacity to increase capital, if required.

3.5.2.i. Basic Capitalization Ratio (15.0% of the Financial Model / 10.5% of the Credit Rating)

For HR Ratings, the capitalization ratios (ICAPs) are the most important metrics in the analysis of a bank's risks. This is because said indicators allow a measure of available capital to face possible losses of assets to be established. In particular, the amount of assets considered for these indicators is as determined by the Risk-Weighted Assets (RWA). This metric weighs the credit risk inherent to each of the bank's assets.

Basic Capital, pursuant to the terms of this methodology, is constructed of items such as capital reserves, income from prior years, net income and shares representative of capital stock. This indicator is constructed in the following manner:

$$\text{Basic ICAP} = \frac{\text{Basic Capital in the last trimester}}{\text{RWA in the last trimester}}$$

The Capitalization Ratio (ICAP) is a common regulatory metric and, regardless of the regulations applicable to each country, in Figure 8 HR Ratings shows the values of the Basic ICAP typically observed for the different rating ranges:

Figure 8: Basic Capitalization Ratio range by rating

HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
(∞,14.5%]	(14.5%,12.2%]	(12.2%,10.3%]	(10.3%,9.0%]	(9.0%,8.3%]	(8.3%,8.0%]	(8.0%,0)

Source: HR Ratings.

Only the amount of the last quarter of the year is used for the construction of this metric, both for the construction of the basic capital and for the risk-weighted assets. This also applies to the construction of the following indicator.

3.5.2.j. Net Capitalization Ratio

(18.0% of the Financial Model / 12.6% of the Credit Rating)

This metric presents a broader measurement of capital in its numerator. The complementary capital is added to the basic capital measure, which includes items such as general reserves and subordinate obligations in order to capture the capital available to face the bank's RWA. This indicator is shown as follows:

$$\text{Net ICAP} = \frac{\text{Sum of all Basic and Complementary Capital in the last trimester}}{\text{RWA in the last trimester}}$$

For this methodology, Figure 9 shows the values that HR Ratings expects to observe for the different rating ranges:

Figure 9: Net Capitalization Ratio range by rating

HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
(∞,16.5%]	(16.5%,14.3%]	(14.3%,12.7%]	(12.7%,11.5%]	(11.5%,10.7%]	(10.7%,10.5%]	(10.5%,0)

Source: HR Ratings.

In the projection of these indicators, HR Ratings will consider the bank's strategy to maintain its level of capitalization against adverse scenarios. The projection in the Stress Scenario may consider said strategies to the extent that they are clearly detailed and explained.

3.5.2.k. Adjusted Leverage Ratio

(3.0% of the Financial Model / 2.1% of the Credit Rating)

The Adjusted Leverage Ratio is one of the most common metrics in the financial analysis because it reflects the ratio between the bank's liabilities and capital. In the particular case of HR Ratings, the adjusted leverage ratio is measured as shown in the following formula:

$$\text{Adj. Leverage Ratio} = \frac{\text{LTM Average Liabilities} - \text{LTM Average Repurchase Agreements}}{\text{LTM Stockholder's Equity}}$$

This ratio measures the number of times that the capital is represented by the bank's liabilities. Immediate on-demand deposits, loans from banks and other bodies, securities transactions, other accounts payable, outstanding subordinate obligations, deferred taxes payable, deferred credits and advanced collections are considered in the numerator. The reference to the adjustment is because the credit balance of repurchase transactions is excluded in order to deduct temporary movements on the balance sheet, which on occasions, are significant.

As with the preceding metrics, the analysis is based on the relative positioning of the bank in the territory in which it operates. However, Figure 10 shows the values that HR Ratings typically observes banks in the different rating ranges:

Figure 10: Adjusted Leverage Ratio range by rating

HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
$(-\infty, 6.0]$	$(6.0, 8.1]$	$(8.1, 9.9]$	$(9.9, 11.3]$	$(11.3, 12.2]$	$(12.2, 12.8]$	$(12.8, \infty)$

Source: HR Ratings.

3.5.2.I. Current Portfolio to Net Debt Ratio (15.0% of the Financial Model / 10.5% of the Credit Rating)

This metric measures of the bank's capacity to meet its debt obligations. Ideally, this indicator must be above 1.0x and how it is formed is shown as follows:

$$\text{Current Portfolio Ratio} = \frac{\text{Current Loan Portfolio in the last trimester}}{\text{Debt Net in the last trimester}}$$

Moreover, net debt is constructed in accordance with the following equation:

$$\begin{aligned} \text{Net Debt} = & \text{Traditional Deposits} + \text{Loans from other Banks} \\ & + \text{Net liabilities from Derivative Hedging} - \text{Cash and Equivalents} \\ & - \text{Investment in Values} \end{aligned}$$

Figure 11 shows the values of this metric that HR Ratings expects to observe for each rating range:

Figure 11: Current Portfolio to Net Debt Ratio range by rating

HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
(∞,1.70]	(1.70,1.41]	(1.41,1.18]	(1.18,1.00]	(1.00,0.89]	(0.89,0.77]	(0.77,0)

Fuente: HR Ratings.

3.5.3. Liquidity Metrics

In HR Ratings' opinion, the measure of the quality for a financial institution must focus on two concepts which are put forward in the regulation proposed by the Basel Committee on Banking Supervision (BCBS)¹. However, the metrics proposed by this Committee do not apply in all countries, and in those in which they do, they are not necessarily weighted using the same parameters. HR Ratings considers that these concepts are adequate to measure the liquidity risks and proposes in this methodology to metrics to adapt these concepts so as they may be comparable between institutions from different countries.

In this vein, the first metric used by HR Ratings in its analysis allows the transversal cut-off to evaluate the bank's liquidity condition at a specific point. This metric refers to the capacity of the assets to be transformed into cash and meet the immediately enforceable liabilities of the bank. The second metric proposes to allow the evaluation of the bank's capacity to fund itself through mechanisms that allow the mitigation of liquidity crisis scenarios, which implies maintaining the enforceability of its liabilities in longer terms.

3.5.3.m. Liquidity Coverage Ratio

(6.0% of the Financial Model / 4.2% of the Credit Rating)

The Liquidity Coverage Ratio (LCR) is one of the main metrics proposed by the BCBS to measure the liquidity of financial institutions. The ratio is focused on the bank's capacity to pay its immediately-enforceable liabilities in a Stress Scenario that lasts for 30 days. Despite the Basel III agreements, this indicator does not apply in all countries. However, in HR Ratings' opinion, the concept it represents has a great impact on the measurements of a financial institution's credit quality. This section first explains the construction of this metric and then the manner in which HR Ratings will apply this concept to evaluate banks in different countries.

Through the proposal put forward by the Basel Committee on Banking Supervision, this metric and its desired position can be summarized as follows:

$$\frac{\text{Stock of High Quality Liquid Assets}}{\text{Total net cash outflows over the next 30 calendar days}} \geq 1$$

¹ The regulation proposed by the Basel Committee on Banking Supervision is explained at the following link: https://www.bis.org/bcbs/basel3_es.htm

The numerator, the High Quality Liquid Assets (HQLA) identifies the bank's assets that may be transformed immediately into cash without losing their value. The monetary value of these assets depends on the Stress Scenario under which they are liquidated, the volume of assets to be liquidated and the period available for liquidation. The desirable characteristics consider two aspects:

1) Fundamental Characteristics:

- a. Lower-risk assets tend to be the most liquid.
- b. Assets must not be correlated to other risky assets.
- c. There must be a market consensus with regard to the evaluation of the asset.
- d. The asset must be quoted on a market.

2) Market Characteristics:

- a. The market in which the asset is traded must have an adequate infrastructure and must be broad and deep.
- b. The asset must reflect scarce historical volatility.
- c. The asset must be a highly secure destination or not be substituted when greater security is demanded.

Moreover, the denominator measures the amount of immediate liabilities that may be enforced from the bank in a stress period of 30 days. This scenario is very specific and to a great extent replicates the financial crisis that started in 2007. However, these stress parameters may differ from those that HR Ratings considers in its projection scenarios.

For HR Ratings, the metric that will be used in this methodology consists of an estimation of the bank's immediate capacity to acquire cash through its assets. The difference with the LCR numerator follows that the assumptions that will be used to determine the market value of the assets will reflect the Base Scenario and the Stress Scenario considered by HR Ratings in its evaluation. The projection of immediately-enforceable liabilities is based on the same assumptions; therefore, HR Ratings' evaluation may be summarized in the following metric:

$$LCR = \frac{\text{Available Assets}}{\text{Enforceable Liabilities in the short term}}$$

The stress assumptions constructed in the projection scenarios follow macroeconomic factors inherent to the markets in which the bank operates. The same assumptions to project this metric will be applied among the institutions of the same country. Notwithstanding, each bank has different strategies to acquire assets is different liquidities, liabilities and degrees of enforceability. For this metric, greater values will be evaluated favorably, regardless of the country in which the bank operates commercially. In general, the values that HR Ratings seeks to observe for each rating range are shown in Figure 12:

Figure 12: Liquidity Coverage Ratio range by rating

HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
(∞,1.50]	(1.50,1.24]	(1.24,1.08]	(1.08,1.00]	(1.00,0.83]	(0.83,0.67]	(0.67,0)

Source: HR Ratings.

3.5.3.n. Net Stable Funding Ratio (NSFR)

(4.0% of the Financial Model / 2.8% of the Credit Rating)

The second metric proposed by the Basel III agreements is the Net Stable Funding Ratio, which measures the funding risk on a broader horizon. This indicator expresses an institution's capacity to acquire funding from stable sources in order to mitigate the risk in future stress scenarios.

This section has a similar structure to the previous section. It first describes the metric proposed by the BCBS and then goes on to describe the metric used by HR Ratings. With regard to the first point, the requirement for the Stable Funding Ratio may be summarized with the following inequality:

$$\frac{\text{Available Stable Funding}}{\text{Required Stable Funding}} \geq 1$$

The numerator adds the bank's liabilities and capital and weights them based on their enforceability. Greater weight is given to those items that should or may be liquidated in a period greater than one year. For example, the regulating capital or the liabilities secured with residual maturities greater than one year receive a higher weighting, whereas liabilities with no specific maturity or funding with a residual majority of less than six months receive a weighting of nullity.

The denominator weights the bank's assets based on their availability. Greater weight is given to assets constituted by cash reserves, such as coins, bills and reserves in the Central Bank, whereas assets, such as those payable in a period greater than one year receive a weighting of nullity.

For HR Ratings, the metric that will be used in this analysis consists of an estimation of the value of the liabilities that cannot be enforced within a period of less than one year and contrasts them with the assets available and monetizable, as shown in the following equation:

$$NSFR = \frac{\text{Equity and Liabilities enforceable past one year}}{\text{Available Assets}}$$

This metric offers a longer-term vision on the liquidity standards of a financial institution. The calculation of the denominator of this metric, which is the numerator of the previous metric, depends to a great extent on the assumptions associated with HR Ratings'

projection scenarios. The historical information, and above all, the bank's future strategy for the management of its liabilities and capital must be considered for the numerator of this metric. Figure 13 illustrates the values that HR Ratings typically observes in entities rated in different ranges:

Figure 13: Net Stable Funding Ratio range by rating

HR AAA	HR AA	HR A	HR BBB	HR BB	HR B	HR C
(∞ ,1.5]	(1.5,1.25]	(1.25,1.07]	(1.07,0.90]	(0.90,0.73]	(0.73,0.57]	(0.57,0)

Source: HR Ratings.

The metric is developed using the data available in the bank's historical information, as well as with HR Ratings' projections. In its Analysis report, HR Ratings will explain the liabilities, capital and assets used and weighted in the measurement of this metric.

3.6. Projections Scenarios

HR Ratings' analysis is based on the projection of its financial metrics under two scenarios: the Base Scenario and the Stress Scenario. These consider in the first instance the current macro economic situation, as reflected in HR Ratings' Macroeconomic Scenarios. The assumptions incorporated into each scenario will be adapted on a case-by-case basis depending on the bank evaluated with regard to factors such as the bank's operation, the value and downgrade of portfolio assets, the portfolio concentration the risk, etc.

In this vein, HR Ratings' Analysis report will explain the assumptions incorporated into each scenario and will show the value of its metrics in each one. This section explains the assumptions typically observed in each Projection Scenario.

3.6.1. Base Scenario Assumptions

The projections in this scenario result from the application of the assumptions that consider the most likely performance of the operational, financial and macroeconomic variables that allow the metrics described in the preceding section to be calculated. Each bank mainly faces three areas of endogenous risk. The first area of risk refers to operational risks, such as fraud, computer system crashes, processing errors and the demands of employees, customers, investors or authorities. HR Ratings will evaluate the controls implemented by the bank to identify, prevent and mitigate these risks. However, the strategy in these ambits may expose the bank to a greater or lesser extent despite its controls.

The second area of risk refers to the bank's policies to grant credit. Default of the different portfolios will be projected based on its strategy, its historical performance, macroeconomic trends of consumption and saving, as well as the expectation of the interest rate.

The last factor refers to market risks, from the value of certain readily-marketable assets, the derivatives and futures positions or the price of shares and other instruments within the bank's portfolios.

In terms of exogenous risks, HR Ratings mainly identifies three areas: macroeconomic factors, regulatory factors and accounting factors. In terms of the Macroeconomic Scenarios, HR Ratings maintains projections for variables such as growth in the nominal and actual GDP, with the respective deflator, as well as for inflation, exchange rate, interest rate, certain accounts within the balance of payments and levels of consumption and savings of the economy.

Moreover, the banking sector is one of the most regulated and supervised by the authorities in the world. HR Ratings will analyze the bank's adherence to the regulatory measures in the market in which it operates, placing emphasis on the minimum capital required by the regulator, the amount of reserves against the risk of default and the standards related to banking entities' operations, including the types of transactions permitted and forbidden.

The bank's adherence to the accounting standards stipulated by each regulator will also be analyzed. Constant changes in accounting and financial reporting policies with unreliable information are considered as negative factors. In the same manner, the disclosure of assets, income capitalization, as well as the lack of adherence to the accounting standards will be evaluated negatively and may result in conservative projections.

3.6.2. Stress Scenario Assumptions

HR Ratings incorporates various risk factors into a Stress Scenario. Due to the complexity of the bank, stress must always consider the specific characteristics of the entity evaluated. However, certain factors will be common in the development of this scenario. The sources of stress that are usually evaluated in this scenario refer to: (i) losses related to operational risks, (ii) loss of value of portfolio assets, (iii) loss of value of market assets and (iv) macroeconomic stress. Any of these factors may have an adverse effect on the projections of the financial metrics.

With regard to losses related to operational risks, the factors identified may be reflected in the operating expense caption and on some occasions, in the capacity of the rated entity to receive income. Moreover, operational risks may also hinder the growth of certain assets, and on occasions, of liabilities and even the generation of capital.

Two aspects must be considered initially with regard to stress on the current portfolio. The first is the size and growth of the different portfolios and the second is the increase of the past-due portfolio.

In terms of the first factor, the stress conditions typically consider the scope of the bank's market, the demand for credit, current interest rates and the entity's ability to manage the portfolio. Macroeconomic factors, the tolerance to risk and the criteria to grant credit, the management history and the size of the past-due portfolio are considered for the growth of past-due portfolio. Lastly, if there is a risk of concentration, whether by main customers or by industry, sector or geographical region, HR Ratings

will review the concentration of the portfolio on an on-going basis at least in terms of the first ten main customers.

It is important to emphasize that these factors are only those that may be considered when preparing the Stress Scenario given that each bank will display its own risks and HR Ratings will explain the assumptions to be incorporated into the scenario in its report.

The evaluation of the counter-parties or the underlying assets in which the portfolio components are based is required in terms of market losses. The bank evaluated must not only show analytical capacity, but also administrative capacity to maintain the value of its investments. HR Ratings will evaluate the portfolios held to maturity, readily-marketable assets and the evolution of the net derivative financial instruments position.

3.6.3. Macroeconomic Assumptions

When preparing its scenarios, HR Ratings' ratings are supported by the Macroeconomic Scenarios developed by the Economic Analysis Department. The aspects considered in these scenarios typically refer to economic growth, inflation, interest rates and the exchange rate:

- a) HR Ratings' economic growth considers the most recent trends in private consumption, government spending, industrial production, the investment matrix and the trade balance. It also considers the historical difference between the information and the GDP deflator. In a stress scenario, growth may be hindered by a restrictive monetary policy, which will have an adverse effect on consumption and banks' portfolios, not only in terms of default, but also when considering the creation of new portfolios.
- b) HR Ratings' inflation considers its different components; first the underlying component, which is directly affected by monetary policy and by movements in the prices of other currencies. For the projection of the non-underlying component, HR Ratings also considers movements in fiscal policy that affect the sub-component of prices set by the government. In the stress scenario, inflation will be considerable greater than that expected in the base scenario, regardless of the monetary policy stand.
- c) In order to determine the projection of interest rates, HR Ratings seeks to anticipate monetary policy movements based on current macroeconomic conditions. Interest rates may be increased in the stress scenario, not only to seek to control greater inflation, but also to maintain the interest of the international investing community that, above all, evaluates rate differentials.
- d) To determine the movement in the prices of other currencies, despite the high volatility of these metrics, HR Ratings projects the exchange rate in real terms to disregard the inflationary component of the relevant economies and thus evaluate the most stable trends. In the stress scenario, inflation affects the nominal movements in the prices of other variables and in the values of certain assets and liabilities.

3.7. Construction of the Financial Model

HR Ratings' credit rating assigns a weight of 70.0% to the value obtained in the Financial Model. This process consists of three steps and will be maintained in each bank evaluated.

The first step is based on the calculation of the financial metrics for each scenario. In this step, it is important to clarify that each metric is calculated for the last two years of historical information and for the following two years projected, each year, for each metric, has a weight. These yearly weightings will be set for any bank rated using this methodology. Figure 14, below, shows the weight and the quarters of each year evaluated.

The figure also considers the cases in which HR Ratings must proceed with its rating process even if the bank does not have at least two years of historical information. Only a single historical year or none at all, and how the two years of projections for each scenario will be weighted in these cases.

Figure 14: Weights by year

Year	Trimesters and Years Considered (with <u>at least two years</u> of historical information)	weight
t ₋₁	The penultimate year of available historical information.	22.0%
t ₀	The last year of available historical information.	38.5%
t ₁	The first year of projections.	22.0%
t ₂	The second year of projections.	17.5%
Year	Trimesters and Years Considered (with <u>only one year</u> of historical information)	weight
t ₀	The last year of available historical information.	49.4%
t ₁	The first year of projections.	28.2%
t ₂	The second year of projections.	22.4%
Year	Trimesters and Years Considered (with <u>no historical information</u>)	weight
t ₁	The first year of projections.	63.6%
t ₂	The second year of projections.	36.4%

Source: HR Ratings.

The second step in the Financial Model rating process consists of assigning an integer value between 1 (lower credit rating) and 19 (greater credit rating) to the weighted average of the years of each metric. These assignment curves are those that have been shown in the section in which each metric was described. These figures show the rating range that applies to the value of each metric; whereas the following figure shows the possible integer values that may be taken by a metric given its rating range.

Figure 15: Value to Range

Rating Range	Integer Values
HR AAA	{19}
HR AA	{16,17,18}
HR A	{13,14,15}
HR BBB	{10,11,12}
HR BB	{7,8,9}
HR B	{4,5,6}
HR C	{1,2,3}

Source: HR Ratings.

The third step consists of calculating a weighted average of these integer values to assign a rating to each scenario in accordance with the weights proposed in this section in which the metrics are described. Lastly, both scenarios will be weighted, where the Base Scenario receives a weight of 65.0% and the Stress Scenario receives the remaining weight of 35.0%. Once again, each bank evaluated with this methodology will receive the weights proposed. Figure 18 offers an example of how the value of both scenarios and the Financial Model is calculated, showing the weights and the value of the curves relating to years and metrics.

Methodology for Rating Banks

Financial Institutions
February 2020

Figure 16: Example of the application of the Financial Model

Base Scenario	Weights by Year	22.0%	38.5%	22.0%	17.5%	Weighted Average by Year	Integer Value	Wight by Metric	
	Year	t-1	t0	t1	t2				
Profitability and Efficiency Metrics									
Adjusted Net Interest Margin		3.24%	3.17%	3.33%	3.39%	3.26%	16	4.0%	
Interest Rate Spread		4.10%	4.08%	4.46%	4.54%	4.25%	16	3.0%	
Return on Assets		1.79%	1.85%	1.89%	1.91%	1.86%	18	11.0%	
Delinquency Ratio		2.73%	3.21%	2.85%	2.90%	2.97%	18	8.0%	
Adjusted Delinquency Ratio		4.33%	5.54%	5.84%	5.61%	5.35%	18	8.0%	
Efficiency Ratio		66.96%	69.36%	58.43%	56.02%	64.09%	13	5.0%	
Solvency and Capital Metrics									
Basic Capitalization Ratio		11.39%	10.66%	10.65%	12.10%	11.07%	14	15.0%	
Net Capitalization Ratio		12.82%	13.15%	14.15%	15.87%	13.77%	15	18.0%	
Adjusted Leverage Ratio		9.82	9.74	9.34	9.54	9.63	13	3.0%	
Current Portfolio to Net Debt Ratio		1.61	1.56	2.11	2.15	1.80	19	15.0%	
Liquidity Metrics									
LCR		1.41	1.56	1.39	1.35	1.45	18	6.0%	
NSFR		1.02	1.08	1.12	1.16	1.09	13	4.0%	
Stress Scenario	Weights by Year	22.0%	38.5%	22.0%	17.5%	Weighted Average by Year	Integer Value	Wight by Metric	
	Year	t-1	t0	t1	t2				
Profitability and Efficiency Metrics									
Adjusted Net Interest Margin		3.24%	3.17%	3.12%	3.08%	3.16%	16	4.0%	
Interest Rate Spread		4.10%	4.08%	4.20%	4.12%	4.12%	16	3.0%	
Return on Assets		1.79%	1.85%	1.71%	1.76%	1.79%	18	11.0%	
Delinquency Ratio		2.73%	3.21%	5.56%	6.12%	4.13%	17	8.0%	
Adjusted Delinquency Ratio		4.33%	5.54%	7.11%	7.23%	5.92%	17	8.0%	
Efficiency Ratio		66.96%	69.36%	71.12%	83.30%	71.66%	10	5.0%	
Solvency and Capital Metrics									
Basic Capitalization Ratio		11.39%	10.66%	10.51%	11.34%	10.91%	14	15.0%	
Net Capitalization Ratio		12.82%	13.15%	14.01%	15.11%	13.61%	14	18.0%	
Adjusted Leverage Ratio		9.82	9.74	11.02	11.23	10.30	12	3.0%	
Current Portfolio to Net Debt Ratio		1.61	1.56	1.76	1.71	1.64	18	15.0%	
Liquidity Metrics									
LCR		1.41	1.56	1.21	1.18	1.38	18	6.0%	
NSFR		1.02	1.08	0.89	0.71	0.96	10	4.0%	
Ratings by Scenario		Base Average		Stress Average		Base Weight		65.0%	Final R.
		16.27		15.48		Stress Weight		35.0%	15.99

Source: HR Ratings.

This figure shows an example in which the metrics of each year are averaged. All the relative weightings, weight per year, metric and scenario are shown in green. HR Ratings constructs the metrics for each year and obtains the weighted average that is shown in the "Intertemporal Average" column. The value obtained in this column for each metric has a integer equivalent value between 1 (lowest) and 19 (highest). These are shown in the "Integer Value" column. These curves are those shown in the section of each metric.

The next step is based on estimating the weighted average of the metrics considering the weights shown in the "Weight by Metric" column. In this example, the whole values of the Base Scenario average 16.27; whereas the average is 15.48 in the Stress Scenario. Considering the weights of 65.0% and 35.0% of these scenarios, the Financial Model provides a value of 15.99, which will eventually be averaged (with a weight of 70.0%) with the value obtained in the bank's ESG analysis (weight of 30.0%).

4. Environmental, Social and Corporate Governance (ESG) Analysis

The purpose of this section is to incorporate into the rating of any bank the impact of environmental, social and corporate governance factors may have on its credit quality. Previously, HR Ratings' methodology for banks used to incorporate qualitative evaluation factors, which we now consider to be included, updated and enhanced in the ESG factors evaluated. The multiple factors that will be evaluated in this section may have a quantitative impact; therefore, to a certain extent, they may be incorporated into the projections made by HR Ratings in the Financial Model. Notwithstanding, the ESG factors are usually measured against criteria related to social trends and new market and corporate governance standards that change over time; therefore, they must be treated qualitatively.

Not all entities are exposed to the same ESG risks; therefore, HR Ratings' analysis is focused on identifying said risks and considers the extent to which the entity is capable of mitigating and/or managing them.

HR Ratings' methodology grants a weight of 30.0% of the credit rating to the ESG evaluation. The process to incorporate this evaluation into the credit rating consists of three steps (i) a label is assigned to each factor between : {*Upper, Average and Limited*}, in accordance with the policy applicable to it and the level of risk perceived, (ii) a value of {3, 2, 1} applies to each label, which is then used to calculate the weighted average of these values, and (iii) an integer value between 1 (lowest) and 19 (highest) is estimated based on a relationship with the weighted average of the values of the labels. This curve will be shown later.

In the meantime, the following sections describe the environmental, social and corporate governance factors analyzed for each bank and the criteria used to assign the weight to the ESG evaluation and how this affects the credit rating will be explained later.

4.1. Environmental Factors

These factors will be evaluated based on the commitment that HR Ratings identifies that the bank has to finance activities that are considered to have a favorable effect on the environment. A label with a greater value may be assigned to the extent to which these policies are formalized and have a history. The bank's exposure to natural phenomena will also be evaluated, and refer mainly to the concentration of the credit portfolio or the operation in high-risk regions.

4.1.a. The Bank's Environmental Policies and Approach ***(6.0% of the ESG Analysis / 1.8% of the Credit Rating)***

HR Ratings will identify the extent to which priority is given to the environment within the bank's policies in terms of its acquisition of assets. This refers to whether or not its policies to grant credit favor corporations, sectors or companies with an environmental approach. HR Ratings also considers whether or not its portfolio investment favors activities or counter-parties with the same approach.

To a great extent, the bank is evaluated to establish if it shows an interest in offering financing to the environmental sector and if these policies are promoted from Upper Management and are formalized through protocols and/or manuals. Lastly, if the bank has internal policies on the use of resources in terms of paper, recycling or the moderated use of electricity, etc., will also be weighted.

4.1.b. Exposure to Natural Phenomena and Environmental Regulation ***(9.0% of the ESG Analysis / 2.7% of the Credit Rating)***

HR Ratings will identify the risk of exposure to environmental phenomena in two ways: (i) the first refers to whether or not its investments and portfolio are focused on multiple areas of environmental development of sustainability, (ii) the second refers to the exposure of its credit portfolio, investment derivatives or other instruments, as well as the measured operational exposure, for example, through branches exposed to these phenomena. On the regulation side, and evaluation will be conducted as to whether the bank must follow costly regulation in the short or long term in order to mitigate environmental impacts.

The criteria to assign the labels to the factors described in this section are explained in Figure 17 below:

Figure 17: Assignment of a Labels to each Environmental factor

Concept / Label	Upper	Average	Limited
Environmental Policies and Approach	This label will be assigned in those cases in which the Bank's portfolio, or its assets, are funding activities that favors the environment or are promoting sustainable development. Additionally, these policies must be formalized in the Bank's credit policies.	This label will be assigned in those cases in which part of the Bank's portfolio, or its assets, are funding activities that favors the environment or are promoting sustainable development. This label considers that these policies are not formalized, but the Bank is on its way to do so.	This label will be assigned in those cases in which only a small part of the Bank's portfolio, or its assets, are funding activities that favors the environment or are promoting sustainable development. Additionally, the Bank has no intention to formalize environmental policies.
Exposure to Natural Phenomena and Environmental Regulation	The bank has a policy for diversifying assets to cover different areas of development and sustainability. Also for the assets to hold their value in cases of distress by natural phenomena. In cases in which environmental regulations must be obeyed, a plan for minimizing the costs of implementing it should exist.	The bank has no policy for diversifying assets to cover different areas of development and sustainability. Also, the protocol for the assets and operating system to hold their value and capacity in cases of distress by natural phenomena may not be sufficient. The plan for minimizing the costs of implementing environmental regulation could not minimize cost.	The Bank has offered little funding to environmental sectors. The value of its assets and its operating capabilities are vulnerable to natural phenomena. In cases in which any environmental policy is to be implemented, there is no plan for minimizing costs.

Source: HR Ratings.

4.2. Social Factors

The social factors analyzed in this section evaluate the extent to which the bank adopts policies with a focus on social development. In this vein, the bank's capacity to generate a significant impact will depend on its market positioning and share. This section also evaluates the human capital attraction, retention and development policies.

4.2.a. Social Approach of the Business (6.0% of the ESG Analysis / 1.8% of the Credit Rating)

HR Ratings will identify if the bank's origination policies have a social integration approach. This implies that its products favor the integration of isolated communities into the market and they are accompanied by competitive prices.

4.2.b. Human Capital and Reputational Risk (9.0% of the ESG Analysis / 2.7% of the Credit Rating)

Employee benefits, the training programs available and career plans are evaluated in this factor. In this vein, the quality and formality of the human resources policies will be analyzed. The turnover level must also be identified because lower turnover is an indicator of efficient operation. This last point is relevant to identify the capacity to retain talent, which is correlated with better operational and administrative practices. Gender inclusion and equality policies will also be considered. In this sense, the bank's policies will be evaluated to ensure that they favor equality at all levels within the institution.

In terms of reputational risk, the bank must be identified as having an adequate reputation achieved by the treatment of its employees, its credit policies and collection of commissions.

The criteria to assign the labels to the factors described in this section are explained in Figure 18 below:

Figure 18: Assignment of a Labels to each Social factor

Concept / Label	Upper	Average	Limited
Business Social Approach	The Bank must have policies that incentivize the search for new products and markets that are not integrated in the financial system. It will be desirable that the Bank holds a social approach that leads to formal policies to give credit or acquire investment assets.	The Bank is involved in activities that extends the size of the local financial market to marginalized communities; However, these activities haven't been formalized within the institution.	The Bank has not been involved in activities to extending the local financial market. The Bank has not implemented any social policies, in regards to giving credit or acquiring investment assets.
Human Capital and Reputational Risk	The benefits that the Bank gives to its employees comply with the minimum required by law; the Bank offers programs for employee capacitation and training, according to each department technical and operating needs; and the rotation level is typically below 10%.	The benefits that the Bank offers to its employees comply with the minimum stipulated by law; the Bank does not offer enough capacitation programs to comply with the technical and operating needs; and the level of employee rotation is variable from one year to another.	The benefits that the Bank offers to its employees are below the minimum stipulated by law; the Bank does not offer enough capacitation programs to comply with the technical and operating needs; and the level of employee rotation is above 10%.

Source: HR Ratings.

4.3. Corporate Governance Factors

The factors evaluated in this section are focused on the corporate policies that promote transparency in decision-making, including those taken during transactions and negotiations. To do this, the bank's formal tools to identify, mitigate, and resolve risks arising from multiple sources will be evaluated.

4.3.a. Internal Standards and Integrity Policies (15.0% of the ESG Analysis / 4.5% of the Credit Rating)

This factor is of particular importance because it measures multiple concepts, among them, whether or not the bank has a compliance department, if there are manuals that set out the internal standards policies, with clear processes to identify and implement any changes necessary. A factor that must be considered is whether or not the bank has a control to protect itself against possible corruption schemes, as well as a matrix of major risks that also identifies risks related to the operational and administrative processes and that it evaluates the profitability levels of its credit policies. Lastly, an evaluation is conducted to ensure that the internal standards define and offer solutions to possible conflicts of interest, both internal and with third parties.

4.3.b. Quality of Management's Administration ***(20.0% of the ESG Analysis / 6.0% of the Credit Rating)***

HR Ratings also considers the history of the bank's Upper Management in terms of initiatives for growth, debt and the capacity to achieve goals. HR Ratings analyzes the bank's strategy in terms of markets and growth in detail. It is important to consider the competence of Upper Management in terms of the composition of the management team and decision-making. This factor evaluates the existence of a well-structured business plan and strategic plans.

The *Upper* label indicates a policy that fosters a low turnover of Upper Management, that it has broad experience and a conservative management style. Upper Management tends to comply with the bank's risk profile and with the manuals and protocols applicable to different processes and the generation of assets. The historical reaction to exogenous shocks discloses the technical capacity of Management and its ability to comply with the aforementioned protocols.

4.3.c. Operational and Technological Risks ***(13.0% of the ESG Analysis / 3.9% of the Credit Rating)***

This section evaluates the bank's propensity to take risky or speculative decisions and operate with counter-parties with low credit ratings. To a great extent, the bank's specific sensitivity to market, credit and operating risk will be captured in the Financial Model; therefore, the objective of this factor is to identify and measure if the mechanisms available are capable of offering an adequate reaction to stress situations. This refers to the technical capacity of the bank.

It also examines the controls and processes established by the bank to measure and control risks. This includes restrictions in the granting of credit and the position in foreign investments, especially in stock market transactions, including derivatives. The credit placement policy is also examined in terms of the exposure limits of a customer, the main customers, sector or type of instrument. It is important to clarify that the factors described hereinbefore seek to identify the existence and formality of these criteria; whereas this section evaluates their approach and whether or not they meet the bank's needs.

Lastly, this factor evaluates whether or not the bank has the technological tools to streamline and optimize its operation, as well as if it has sufficient tools to ensure its security and to adapt to new risks.

4.3. Transparency and Default History ***(13.0% of the ESG Analysis / 3.9% of the Credit Rating)***

This factor refers to the information produced by the bank on its operation. This factor evaluates the extent to which the financial statements comply with the accounting standards pursuant to their applicable legislation. With regard to the default history, it is important to mention that HR Ratings' *General Methodological Criteria* propose the treatment of recent defaults; whereas this section will evaluate the treatment given to

prior defaults and the mechanisms adopted to prevent similar situations and mitigate credit risk.

In order to be able to assign an *Upper* label to this factor, the bank must submit information periodically with regard to HR Ratings' follow-up processes. The information must comply with the accounting standards and must have the transparency necessary in order to be able to perform the credit evaluation with a degree of certainty. This factor will also consider that the information is available to the regulators and in the cases applicable by regulation, to the public.

4.3.e. Regulatory Framework and Macroeconomic Risk ***(9.0% of the ESG Analysis / 2.7% of the Credit Rating)***

This section evaluates the extent to which the current macroeconomic trends may have an unfavorable impact on the value of the bank's assets. In terms of regulation, the bank's adherence to the relevant regulatory measures will be analyzed, placing emphasis on the minimum capital required, the amount of reserves against the risk of default and the standards related to banking entities' operations, including the types of transactions permitted and prohibited.

It is important to clarify that to a certain extent this analysis is also considered in the Financial Model. Notwithstanding, in this section, the analysis will be focused on the capacity perceived by HR Ratings that the bank has to adapt its counter-cyclical policy to adverse circumstances that due to their nature, may be extremely varied.

The criteria to assign the labels to the factors described in this section are explained in Figure 19 below:

Figure 19: Assignment of a Labels to each Corporate Governance factor

Concept / Label	Upper	Average	Limited
Internal and Integrity Policies	The internal policies are formalized through manuals that are clear and accessible to all employees. The Bank has a risk matrix that, beside identifying risks, it offers a process or a protocol for treating each risk. The internal policies have a formal and periodical committee that keeps each policy current, facilitating its adaptability.	Despite having Internal Policies formalized, these policies have not permeated the institution. The risk matrix has some areas of opportunity and the process to actualize and adapt these policies are not formalized and they not cover all the need of the Bank.	The Internal Policies are not formalized. The risk matrix is not existent, or it is not capable of identifying or offering contention strategies against risks. Besides, there are no committees or any process for discussing or reviewing the content of these policies.
Quality of Management's Administration	The Bank exhibits low rotation in its high administration, that is experienced and has a conservative approach. The administration tends to comply with the Bank's risk profile, as well as with the institutions manuals and protocols for generating assets. The historical approach to face market shocks reveals technical skills and its ability to comply with its own policies.	Despite having a high rotation in administrative positions, the Bank has clear policies regarding the tolerance for risk. The historical performance against external shocks reveals inconsistencies in the way that existing protocols have been implemented, and the performance shows mixed results as a consequence.	The Bank has high rotation in its administrative positions, and as a consequence the risk tolerance and other internal policies change constantly. The performance against external shocks reveal the lack of planning and the inconsistency in applying existing protocols.
Operational and Technological Risks	The Bank must have the technological resources to face high levels of exposition to different risks. It also needs a manual or protocol that states the level of tolerable risks, and that these levels, as well as the implementation of the surrounding policies, contribute to credit quality.	The technological resources of the Bank are sufficient to hold the operational capacities; however, these could be insufficient to identify and mitigate risks. The strategies of the Bank to handle risks are not clear and risk tolerance are not established.	The Bank does not have the technological resources to face high levels of exposition to different risks. It also lacks a manual or protocol that states the level of tolerable risks, as well as the implementation of the surrounding policies.
Transparency and Default History	The Bank must deliver information periodically, as stated with HR Ratings own monitoring process. The financial information should comply with the accounting standards and with the transparency needed for granting certainty in the rating process. The banks must also have a history of complying with its obligations, not only with those related to debt.	The information delivered to HR Rating for its review and rating process does not hold to accounting standards or it has not been delivered with the required frequency. Additionally, the Bank has no history of default with its debt obligations, and even non-debt obligations.	The Bank has not delivered information periodically, as stated with HR Ratings own monitoring process. The financial information does not comply with the accounting standards and with the transparency needed for granting certainty in the rating process. The banks has a history of not complying with its debt obligations.
Regulatory Framework and Macroeconomic Risk	The bank has the technical capacity to adapt to regulations in the less costly manner, as well with counter-cyclical strategies for mitigating macroeconomic shocks; these without having the banks assets loose values or by gaining liabilities that could lead to a diminished capacity to pay debt service in the future.	The Bank has the resources to confront these risks; however, it does not have clear strategies. Inversely, the Bank might have the correct strategies, but these do not comply with the available resources.	The bank lacks the technical capacity to adapt to regulations in the less costly manner, as well with counter-cyclical strategies for mitigating macroeconomic shocks; these without having the banks assets loose values or by gaining liabilities that could lead to a diminished capacity to pay debt service in the future.

Source: HR Ratings.

4.4. The ESG Model

This section explains the criteria that HR Ratings will consider when applying the labels to the ESG factors. However, this is only the first step to incorporate this evaluation into the bank's credit rating. It has always been mentioned that the labels between {*Upper*, *Average*, *Limited*} have values of {3, 2, 1}, which will be weighted to obtain a integer value of between 1 (lower) and 19 (higher). Figure 20 shows how the weighted average obtained following the assignment on the labels is translated into this integer value between 1 and 19.

Figure 20: ESG Relation			
ESG Weighted Average Range	Integer Value	ESG Weighted Average Range	Integer Value
[1.00 , 1.11]	1	(2.06 , 2.16]	11
(1.11 , 1.21]	2	(2.16 , 2.27]	12
(1.21 , 1.32]	3	(2.27 , 2.37]	13
(1.32 , 1.42]	4	(2.37 , 2.48]	14
(1.42 , 1.53]	5	(2.48 , 2.58]	15
(1.53 , 1.63]	6	(2.58 , 2.69]	16
(1.63 , 1.74]	7	(2.69 , 2.79]	17
(1.74 , 1.84]	8	(2.79 , 2.90]	18
(1.84 , 1.95]	9	(2.90 , 3.00]	19
(1.95 , 2.06]	10		

Source: HR Ratings.

Figure 21 shows an example of how HR Ratings will apply its ESG evaluation:

Methodology for Rating Banks

Financial Institutions
February 2020

Figure 21: Example of the ESG Model

Environmental Factors	Label	Value	Weight
Environmental Policies and Approach	Upper	3	6.0%
Exposure to Natural Phenomena and Environmental Regulation	Average	2	9.0%
Social Factors			
Business Social Approach	Upper	3	6.0%
Human Capital and Reputational Risk	Limited	1	9.0%
Corporate Governance Factors			
Internal and Integrity Policies	Limited	1	15.0%
Quality of Management's Administration	Limited	1	20.0%
Operational and Technological Risks	Upper	3	13.0%
Transparency and Default History	Average	2	13.0%
Regulatory Framework and Macroeconomic Risk	Upper	3	9.0%
Factors Weighted Average 1.90	Integer Value	10	

Source: HR Ratings.

This example shows how each label has a value of {1,2,3} and how they are averaged based on the weight of each factor in the "Weight" column marked in green. The weighted average of the factors is 1.90 and this relates to a integer value between 1 (lower) and 19 (higher). In this example, the integer value is 10 and will be averaged with a weight of 30% with the result of the Financial Model in order to obtain the bank's credit rating.

5. The Bank's Credit Risk Rating and Additional Considerations

The result of the Financial Model, which is between 1 and 19, and the ESG result, which is also a value between 1 and 19, are averaged to obtain a value which will be translated into the credit rating of the bank evaluated. The value of the Financial Model has a weight of 70.0%; whereas the ESG value has the remaining weight of 30.0%.

Considering the example given in Figures 16 and 20 of this methodology, the final values result in a weighted average of 14.38. This value is rounded to its nearest whole number and gives a credit rating of HR A. In this methodology, the weighted value of the Financial Model and the ESG Evaluation is always rounded to the nearest integer

Methodology for Rating Banks

Financial Institutions
February 2020

number to assign the credit rating. This value is set between 1 (the value that would relate to a rating of HR C-) and 19 (the value that would relate to a rating of HR AAA).

HR Ratings may assign a favorable adjustment of up to three notches to the bank's credit rating in cases in which any of the following circumstances are identified: (i) the downgrade of the bank's credit rating would imply a systemic risk; therefore, it is highly likely that the jurisdictional authorities may provide direct support for the bank to be able to meet its debt obligations, or (ii) the credit granted by any asset, liability or source of income cannot be fully Incorporated into the financial model and requires an adjustment to capture its impact on the credit rating.

Conversely, a disfavorable adjustment may be assigned of up to three notches to the bank's credit rating in cases in which any of the following circumstances are identified: (i) The bank's historical information may not be representative of its historical operation. (ii) The credit weakness that refers to any asset, liability, expense or source of income cannot be fully incorporated into the financial model and requires an adjustment to capture its impact on the credit rating.

Appendix 1: Financial Projection Processes

This section describes the process implemented by HR Ratings to project the accounts on the balance sheet, the statement of income and the cash flow statement, including an example through various figures. It is important to clarify that the projections are based mainly on the bank's historical profile, as disclosed in its financial information. Several financial assumptions are incorporated into this exercise that are based on the bank's strategies and the macroeconomic framework that HR Ratings observes and projects.

A.1.1. Balance Sheet Accounts

The bank's balance sheet represents the source of income generation (as already mentioned); therefore, it is fundamental to estimate the bank's assets and liabilities in the flow projection. HR Ratings includes the quality of the assets as part of the analysis of the balance sheet; therefore it will establish growth trends for each one considering the characteristics and specialization in each of the different market niches. It is fundamental to analyze the types of liabilities referred to in accordance with the characteristics to determine the cost and establish an approximate amount of interest expense.

In order to make the projections in accordance with the bank's historical conditions, HR Ratings considers the trends in the financial information provided, as well as the growth expectations for the bank in terms of the factors detailed in the Base Scenario and Stress Scenario section.

HR Ratings projects the growth rates of the following accounts and the balance expected for the next eight quarters. The following figure shows an example of how the information is broken down in the Financial Model:

Figure A1: Asset Projection in Financial Model

Asset Accounts on the Balance Sheet	Quarters in Financial Model							
	First Year of Historical Data				First Year Projected			
	1T(t ₀)	2T(t ₀)	3T(t ₀)	4T(t ₀)	1T(t ₁)	2T(t ₁)	3T(t ₁)	4T(t ₁)
A. Assets	274,934	290,348	312,481	330,774	340,996	350,642	355,927	368,489
<i>A.1. Cash and Equivalents</i>	41,599	39,792	41,684	45,848	52,310	57,283	58,796	63,219
<i>A.2. Financial Assets</i>	18,700	23,775	25,814	25,924	25,000	26,000	26,000	30,000
<i>A.3. Hedging Derivative Assets</i>	2,332	2,417	4,557	2,648	2,648	2,648	2,648	2,648
<i>A.4. Total Loan Portfolio</i>	188,234	195,456	213,289	226,197	230,781	234,431	238,181	242,281
<i>A.4.1. Net Loan Portfolio</i>	184,574	191,918	209,914	222,965	227,549	231,199	234,949	239,049
<i>A.4.1.a. Current Loan Portfolio</i>	185,538	193,151	211,004	223,916	228,000	231,250	234,500	238,000
<i>Commercial Loans</i>	121,102	125,843	139,458	148,825	152,000	154,000	156,000	158,000
<i>Consumer Loans</i>	27,220	28,262	30,376	31,409	31,000	31,250	32,000	33,000
<i>Housing Loans</i>	37,216	39,046	41,170	43,682	45,000	46,000	46,500	47,000
<i>A.4.1.b. Non-Performing Loans</i>	2,743	2,743	3,063	3,840	4,890	5,840	6,890	8,040
<i>A.4.1.c. Allowance for Loan Losses</i>	-3,707	-3,976	-4,153	-4,791	-5,341	-5,891	-6,441	-6,991
<i>A.4.2. Receivables</i>	3,660	3,538	3,375	3,232	3,232	3,232	3,232	3,232
<i>A.5. Other Assets</i>	24,069	28,908	27,137	30,157	30,257	30,280	30,302	30,341

Source: HR Ratings example

Figure A1 shows the historical information of the last four quarters, as well as the projection for the next four quarters. HR Ratings makes estimates for the different types of assets and thus projects the cash flow generated for the next eight quarters. The information shown in yellow represents the accounts projected to obtain the total of the assets and establishes the interest income generated by the bank. On the liabilities side, the projections are made based on the following accounts:

Figure A2: Liabilities Projection in Financial Model

Liabilities Accounts on the Balance Sheet	Quarters in Financial Model							
	First Year of Historical Data				First Year Projected			
	1T(t ₀)	2T(t ₀)	3T(t ₀)	4T(t ₀)	1T(t ₁)	2T(t ₁)	3T(t ₁)	4T(t ₁)
B. Liabilities	244,025	258,708	277,754	295,431	303,218	312,250	316,096	327,144
B.1. Deposits	203,533	197,144	221,470	241,719	247,107	257,101	260,102	268,103
B.1.1. Short-term deposits	111,114	103,173	106,724	107,707	107,107	118,000	120,000	123,000
B.1.2. Long-term deposits	92,419	93,971	114,746	134,012	140,000	139,000	140,000	145,000
B.1.3. Banks	0	0	0	0	0	101	102	103
B.2. Interbank Transactions, Loans and Onlending	14,094	27,753	17,691	15,173	16,000	16,000	17,000	20,000
B.3. Assigned Values Pending Settlement	10	1,745	1,570	1,486	1,486	1,486	1,486	1,486
B.4. Derivative Financial Instruments	2,924	3,408	4,996	3,483	5,000	4,000	3,800	3,800
B.5. Other Accounts Payable	12,470	13,174	14,007	14,436	14,436	14,436	14,436	14,436
B.6. Subordinated Notes	10,210	14,561	16,932	17,923	17,923	17,923	17,923	17,923
B.7. Deferred Taxes	0	0	0	0	55	93	138	185
B.8. Deferred Loans and Advanced Collections	784	923	1,088	1,211	1,211	1,211	1,211	1,211

Source: HR Ratings example.

As in the projection of assets, the projection of liabilities is based on the historical information provided by the bank and the accounts marked in yellow represent the estimates made by HR Ratings in accordance with the historical interest rate, as well as certain macroeconomic and financial factors that have already been mentioned.

HR Ratings must also consider the funding sources for the projections of liabilities. Deposits are the main source of financing of banking entities. However, if there are alternative sources of financing, such as loans from other banks or financial institutions, HR Ratings will analyze said sources and perform a detailed analysis. If a high concentration is found in a single source of funding, a greater stress will be applied to reflect the cost on debt and the passive interest rate in these cases.

The analysis of the concentration of the sources of funding includes a detailed evaluation of the maturity of liabilities in accordance with the term and cost of the debt. The impact of a high concentration by an entity will be reflected in a higher cost of debt and an eventual downgrade of its capitalization. An scenario of said analysis is presented as follows in five steps, specifically related to bank loans:

Step 1. Liabilities are analyzed depending on the maturity over time (long or short term) and the balance at the end of each quarter is included. The estimate of liabilities considers the macroeconomic and financial conditions of each of HR Ratings' projection scenarios.

Figure A3, below, shows how HR Ratings projects the maturities and interest that must be settled in each period for each liability based on the provisions that have been observed and eventually projected.

Figure 3 Appendix 1: Liabilities in the Financial Model

Loans from other Banks and other Organisms		1T(t ₀)	2T(t ₀)	3T(t ₀)	4T(t ₀)	1T(t ₁)	2T(t ₁)	3T(t ₁)	4T(t ₁)
Short Term Balance of loans from other Banks		5,557	5,577	5,604	5,636	5,678	5,708	5,740	5,777
1T(t ₀)		5,557	4,167	2,778	1,389	0	0	0	0
2T(t ₀)			1,410	1,058	705	353	0	0	0
3T(t ₀)				1,768	1,326	884	442	0	0
4T(t ₀)					2,216	1,662	1,108	554	0
1T(t ₁)						2,779	2,084	1,389	695
2T(t ₁)							2,074	1,555	1,037
3T(t ₁)								2,242	1,682
4T(t ₁)									2,363
New Dispositions			1,410	1,768	2,216	2,779	2,074	2,242	2,363
Maturity			1,389	1,742	2,184	2,738	2,043	2,209	2,328
Interest paid			97	96	90	104	97	91	94
Average Interest Rate			7.00%	6.87%	6.43%	7.37%	6.83%	6.36%	6.54%
Loans from other Banks and other Organisms		1T(t ₀)	2T(t ₀)	3T(t ₀)	4T(t ₀)	1T(t ₁)	2T(t ₁)	3T(t ₁)	4T(t ₁)
Long Term Balance of loans from other Banks		9,455	9,463	9,471	9,480	9,490	9,501	9,513	9,526
1T(t ₀)		9,455	8,667	7,879	7,091	6,303	5,515	4,727	3,939
2T(t ₀)			796	729	663	597	531	464	398
3T(t ₀)				863	791	719	647	575	503
4T(t ₀)					935	857	779	702	624
1T(t ₁)						1,014	930	845	761
2T(t ₁)							1,099	1,008	916
3T(t ₁)								1,192	1,093
4T(t ₁)									1,292
New Dispositions			796	863	935	1,014	1,099	1,192	1,292
Maturity			788	854	926	1,004	1,089	1,180	1,279
Interest paid			97	95	95	95	95	95	95
Average Interest Rate			8.51%	6.96%	4.00%	4.00%	4.00%	4.00%	4.00%

Source: example by HR Ratings.

Step 2. The maturities during each quarter are analyzed in order to follow up on the need for financing and the concentration of sources of funding throughout the period projected. This is shown in Figure A4, which analyzes the maturities related to each dissipation based on the respective interest rate and its amortization curve.

Figure 4 Appendix 1: Liabilities in the Financial Model

Maturity of Short Term Loans	1T(t ₀)	2T(t ₀)	3T(t ₀)	4T(t ₀)	1T(t ₁)	2T(t ₁)	3T(t ₁)	4T(t ₁)
1T(t ₀)								
2T(t ₀)								
3T(t ₀)		1,390	1,389	1,389	1,389			
4T(t ₀)			352	353	352	353		
1T(t ₁)				442	442	442	442	
2T(t ₁)					554	554	554	554
3T(t ₁)						695	695	694
4T(t ₁)							519	518

Maturity of Long Term Loans	1T(t ₀)	2T(t ₀)	3T(t ₀)	4T(t ₀)	1T(t ₁)	2T(t ₁)	3T(t ₁)	4T(t ₁)
1T(t ₀)								
2T(t ₀)								
3T(t ₀)		788	788	788	788	788	788	788
4T(t ₀)			67	66	66	66	67	66
1T(t ₁)				72	72	72	72	72
2T(t ₁)					78	78	77	78
3T(t ₁)						84	85	84
4T(t ₁)							91	92

Source: example by HR Ratings.

Step 3. HR Ratings calculates the proportion of the amount due, including the estimate of new loans in order to calculate the possible increase in the source of funding and thus continue with the refinancing of the debt. It is important to analyze the maturities of the loan according to the term in order to detect the bank's liquidity in different periods.

Step 4. Based on the analysis of the maturities of liabilities and new lines of financing, HR Ratings calculates new interest rates that the bank may face. The analysis of the rates will reflect the impact of a high concentration on the sources of funding and therefore, a greater cost of debt.

Step 5. The interest payable on current loans and the possible increase in lines of financing are calculated to reflect the impact of a high concentration on the bank's profitability. The greater the passive interest rate and interest payable, the lower profitability will be and the the greater the downgrade of the bank's capitalization index will be.

A.1.2. Statement of Income Accounts

The bank's Statement of Income is based on the financial balance and the amount earned or collected by the bank's assets and liabilities. HR Ratings' Financial Model places an emphasis on the institution's level of lending rate and passive interest rate, always considering the historical trends of the bank and the macroeconomic outlook of the country in which it operates.

The bank's income is based on the income generated by the financial assets, particularly from the bank's current credit portfolio and the returns generated by repurchase transactions. Therefore, the projection of interest income is based on the projection of the financial balance and the bank's expectation of its lending rate. HR Ratings' analysis of a bank's financial statements is performed on a quarterly basis;

Methodology for Rating Banks

Financial Institutions
February 2020

therefore, the projections made are based on the increase of the financial assets in each period and on the expectation of rates for the different assets of the bank. The accounts projected by HR Ratings in relation to the bank's income and that are obtained from the the historical information provided by the bank are shown as follows:

Figure A5: Income Projection in the Financial Model

Income Account in Income Statement	Quarters in Financial Model							
	First Year of Historical Data				First Year Projected			
	1T(t ₀)	2T(t ₀)	3T(t ₀)	4T(t ₀)	1T(t ₁)	2T(t ₁)	3T(t ₁)	4T(t ₁)
Financial Income	11,168.7	10,895.2	11,377.2	12,593.0	12,759	11,689	11,255	11,137
Interest from Liquid Assets	633.1	571.2	552.0	643.0	674	768	842	864
Interest and Income from Investments	381.6	419.7	441.9	486.9	479	480	489	527
Interest and Income from Investment Operations	3,603.2	3,704.6	3,801.8	4,145.9	3,971	2,648	1,986	1,655
Interest from Current Loan Portfolio	5,559.5	5,862.1	6,255.7	6,919.5	7,190	7,307	7,410	7,517
Interest from Non-Performing Loan Portfolio	95.7	90.7	102.5	123.7	156	192	228	268
Comissions from Initial Loan Placement	95.3	102.9	116.1	138.3	142	146	149	152
Benefits	281.2	144.0	107.2	135.7	145	146	149	152
Premium from Loan Placement	0.0	0.0	0.0	0.0	0	0	0	0
Utility from Valuation	7.9	0.0	0.0	0.0	2	2	2	2
Gains from Interest Income Update	511.2	0.0	0.0	0.0	0	0	0	0

Source: HR Ratings example.

In the preceding Figure, the values shown in yellow represent estimates made by HR Ratings based on the historical level. The rest of the values in the projections are obtained by multiplying the balance of the assets at the end of each period (quarterly periods) by the lending rate estimated in the model. The lending rates projected and that determine the bank's level of income are the following:

Figure A6: Lending Rates Projection in Financial Model

Lending Rates	First Year Projected				Second Year Projected			
	1T(t ₁)	2T(t ₁)	3T(t ₁)	4T(t ₁)	1T(t ₂)	2T(t ₂)	3T(t ₂)	4T(t ₂)
Cash and Cash Equivalents	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%	5.9%
Finacial Assets	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
Financial Asset Lending and Repo Operations	600%	400%	300%	250%	200%	200%	200%	200%
Current Loan Portfolio	12.7%	12.7%	12.7%	12.7%	12.7%	12.7%	12.7%	12.7%
Non-Performing Loan Portfolio	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%

Source: HR Ratings example.

The historical information on the balance sheet once again represents the base of the analysis for the projection of the bank's expenses. Once the liabilities are projected with a cost on the balance sheet, HR Ratings establishes an approximate passive interest rate (obtained from the start trends and market conditions) for each of the accounts and obtains the total interest expense. The accounts projected by HR Ratings are the following pursuant to the interest expense accounts in the Statement of Income:

Figure A7: Expense Projection in Financial Model

Expense Accounts in Financial Statements	Quarters in Financial Model							
	First Year of Historical Data				First Year Projected			
	1T(t ₀)	2T(t ₀)	3T(t ₀)	4T(t ₀)	1T(t ₁)	2T(t ₁)	3T(t ₁)	4T(t ₁)
Financial Expense	6,128.9	5,974.6	6,309.8	7,362.4	7300.9	7047.9	6290.9	6023.9
Interest for short term deposits	204.2	207.4	461.3	302.2	215	226	238	243
Interest for long term deposits	1,323.5	1,464.6	1,339.1	2,150.9	2,175	2,215	2,215	2,262
Interest for bonds	0.0	0.0	0.0	0.0	0	0	0	0
Interest for Interbank Transactions, Loans and Onlending	331.5	350.0	398.6	284.0	284	284	284	284
Interest for Subordinated Notes	243.7	241.6	310.0	384.9	385	385	385	385
Interest and expenses from Repo Transactions	4.5	3.4	2.9	2.5	0	0	0	0
Expenses from Benefits	3,734.7	3,702.9	3,786.8	4,215.8	4,242	3,938	3,169	2,850
Prices in excess paid for financial investments	0.0	0.0	0.0	0.0				
Discounts from Loan Placement	0.0	0.0	0.0	0.0				
Costs and Expenses from Loan Placement	0.0	0.0	0.0	0.0				
Losses from Valuation	0.0	4.7	11.1	22.1				
Increment from Interest Expense Update	286.8	0.0	0.0	0.0				

Source: HR Ratings example.

For the rest of the bank's expenses and income, HR Ratings takes an average of the financial information of the last year as a base and applies a reasonable growth rate in view of the historical trends and the expected outlook. Once the Majority Net Profit is obtained, HR Ratings uses the results to obtain:

- The initial balance of the cash flow generated by the bank during the period.
- Part of the capital earned by the bank increasing the Majority Net Profit of the balance sheet and increasing the stockholders equity.

A.1.3. Projections of Past-Due (Delinquent) Portfolio and its Provisions

HR Ratings places particular emphasis on the projection of preventive estimates for credit risks and the past-due portfolio. Both accounts represent part of assets. Notwithstanding this, a distinction must be made between the two items; whereas the past-due credit portfolio represents an increase of the net credit portfolio, the preventive estimates reduce the value of the bank's portfolio.

Preventive estimates represent the bank's hedging against possible losses in its credit portfolio. When the bank considers that a part of the past-due portfolio cannot be recovered, the bank absorbs the losses and transforms that said amount of the past-due portfolio into estimated write-offs.

The projection of the amount of the past-due portfolio and the preventive estimates credit risks is based on the calculation of write-offs estimated in subsequent periods. In this vein, it is important to calculate the historical write-offs and the performance of the estimates over time, as well as having identified income through releases in the historical information. The captions calculated by HR Ratings to project the past-due portfolio and the preventive estimates for credit risks are presented as follows:

Figure A8: Portfolio Amount Projection

Projected Concepts	4T(t ₀)	Projected Quarters						
		1T(t ₁)	2T(t ₁)	3T(t ₁)	4T(t ₁)	1T(t ₂)	2T(t ₂)	3T(t ₂)
Impairment Charges in Financial Statement	1,587.2	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Impairment Estimates	949.2	950	950	950	950	950	950	950
New Non-Performing Loan in Quarter	1,726.5	2,000	1,900	2,000	2,100	2,100	2,100	2,100
New Current Loan Portfolio (cash outflow)	14,640.0	6,084	5,150	5,250	5,600	3,500	5,513	5,513

Source: HR Ratings example.

The following captions are calculated:

- Charge for Preventive Estimates to Income.* This represents the amount of preventive estimates generated during the period and charged directly to the Statement of Income.
- Estimated Write-offs.* This estimate is obtained by adding the preventive estimates in the prior period, plus the Charge for Preventive Estimates to Income less the preventive estimates accumulated in the current period.
- New Past-Due (delinquent) Portfolio in the Quarter.* This represents the sum of the past-due portfolio in the current period, less the past-due portfolio in the prior period, plus the estimated write-offs of the period.

According to Figure A8 and based on the periods marked in yellow, HR Ratings makes estimates to obtain the Past-Due Portfolio of the period and the respective amount of Preventive Estimates for Credit Risks. The past-due portfolio is calculated as follows:

- Past-Due Credit Portfolio (projected). Past-Due Portfolio of the prior period, plus New Past-Due Portfolio in the quarter less Estimated Write-offs.
- Preventive Estimates for Credit Risks (projected). Preventive Estimates in the prior period plus Charge for Preventive Estimates to Income less Estimated Write-offs.

Among the stress considerations that HR Ratings may incorporate into its projections process is determining the bank's capacity to manage different levels of hedging with assumptions also relative to the generation of new past-due portfolio and the effect of the preventive estimates on the the level of capitalization. The generation of preventive estimates has a negative effect on the bank's net income and therefore, on its level of capitalization.

Methodology for Rating Banks

Financial Institutions
February 2020

Figure 1 Appendix 2: General Structure of the Financial Model in the Methodology

I. Financial Model (70.0% of the bank's rating)	
Description	HR Ratings Financial Model is based on projected financial metrics, which are constructed taking four years into account: two historical years and two projected years. The projections are made for two scenarios, a Base Scenario, which includes the financial and macro economical factors deemed most likely; and a Stress Scenario, which incorporates: operation risks, portfolio risk, market risks and macro economical risks.
A. Years Considered	
Information incorporated in the Financial Model	Weight
The penultimate year of available historical information (t-1)	22.0%
The last year of available historical information (t ₀)	38.5%
The first year of projections (t-1)	22.0%
The second year of projections (t ₂)	17.5%
B. Projection Scenarios	
Base Scenario 65.0%	Stress Scenario 35.0%
This scenario reflects the development of financial and macro economical factors deemed most likely. The model weights the previous two years of historical data given by the bank, but considers data from at least the previous five years of operation.	In this scenario stress factors are incorporated to reflect: (i) losses related to operation risks, (ii) losses in value of portfolio assets, (iii) losses in value of market assets, (iv) macro economical stress.
C. Metrics in the Financial Model	
C.1. Profitability and Efficiency Metrics	
Adjusted Net Interest Margin 4.0%	Spread de Tasas 3.0%
$\frac{(\text{Interest Income} - \text{Interest Expenses} - \text{Loan Loss Provisions})}{\text{Productive Assets}}$	$\frac{\text{Interest Income}}{\text{Productive Assets}} - \frac{\text{Interest Expenses}}{\text{Productive Assets}}$
Return on Assets 11.0%	Delinquency Ratio 8.0%
$\frac{(\text{Net Result} - \text{Minority Contributions})}{\text{Productive Assets} - \text{Repo Debt Balance of Operations}}$	$\frac{\text{Delinquent Loan Portfolio}}{\text{Total Loan Portfolio}}$
Adjusted Delinquency Ratio 8.0%	Efficiency Ratio 5.0%
$\frac{\text{Delinquency Loan Portfolio} + \text{accumulated Losses}}{\text{Total Loan Portfolio} + \text{accumulated Losses}}$	$\frac{\text{Administration and Promotion Expenses}}{(\text{Total Income} + \text{Loan Loss Provisions})}$
C.2. Solvency and Capital Metrics	
Basic Capitalization Ratio 15.0%	Net Capitalization Ratio 18.0%
$\frac{\text{Basic Capital}}{\text{RWA}}$	$\frac{\text{Basic and Complementary Capital}}{\text{RWA}}$
Adjusted Leverage Ratio 3.0%	Current Portfolio to Net Debt Ratio 15.0%
$\frac{\text{Liabilities} - \text{Purchase Agreements}}{\text{Stockholder's Equity}}$	$\frac{\text{Current Loan Portfolio}}{\text{Debt Net}}$
C.3. Liquidity Metrics	
Liquidity Coverage Ratio (LCR) 6.0%	Net Stable Funding Ratio (NSFR) 4.0%
$\frac{\text{Available Assets}}{\text{Enforceable Liabilities in the short term}}$	$\frac{\text{Equity and Liabilities enforceable past one year}}{\text{Available Assets}}$

Source: HR Ratings.

Figure 2 Appendix 2: General Structure of the ESG Analysis in the Methodology

II. ESG Analysis (30.0% of the Bank's Rating)

Description

HR Ratings' ESG analysis is based on the assignment of a label with the levels of "Upper", "Average", "Limited" to a diverse set of Environmental, Social, and Governance factors relevant for the bank. This section is meant to identify risks which might have an impact on the bank's credit profile and which cannot be incorporated through the projections in the Financial Model.

A. Description of the Labels

<i>Upper</i>	<i>Average</i>	<i>Limited</i>
Refers to banks which are not exposed to certain factor, or that even though there is exposure, they have the capability of managing or adapting to the risk it presents.	Refers to banks that through exposure to these risks could face a moderate impact on their credit quality.	Refers to banks that through exposures to these risks could face a significant impact on their credit quality.

B. Analyzed Factors

B.1. Environmental Factors

Environmental Policies and Approach	6.0%
This factor evaluates if the bank has formalized or gives priority to the acquisition of assets which favor the environment; this refers to the credit lending policies, or the acquisition of investments.	

Exposure to Natural Phenomena and Regulation	9.0%
This factor refers to the exposure to natural phenomena faced by the bank's assets, or its operation. This analysis is based on the concentration of assets or the bank's branches. Additionally, it measures if the bank must implement costly regulation in the short or medium term.	

B.2. Social Factors

Business Social Approach	6.0%
This factor identifies if the bank's loan origination policies focus on social integration. This means that its products encourage isolated communities to become part of the market and that they have competitive pricing.	

Human Capital and Reputational Risk	9.0%
This factor evaluates the employee's benefits, available training programs and career plans. The quality and formality of the human resources policies and the level of turnover are also evaluated.	

B.3. Corporate Governance Factors

Internal and Integrity Policies	15.0%
This factor evaluates if the bank has a compliance department, the existence of manuals which outline the internal regulation policies. If the institution has a control mechanism to protect itself from possible corruption schemes, and with a risk matrix which identifies operation and administrative risks, and that it evaluates the profitability of its credit policies.	

Quality of Management's Administration	20.0%
This factor considers management's record in terms of growth initiative, debt and capability to reach set goals. HR Rating's thoroughly analyzes the bank's strategy in terms of markets and growth.	

Operational and Technological Risks	13.0%
This factor evaluates the bank's propensity to take risky or speculative positions and to operate with low credit rating counterparts. It examines the credit policy in terms of limiting exposure to a particular client, set of clients, sector or instrument.	

Transparency and Default History	13.0%
This factor evaluates how well the financial statements comply with the accounting standards set by the relevant legislation. This section evaluates the treatment given to previous defaults and the mechanisms set to avoid similar situations and manage credit risk.	

Regulatory Framework and Macroeconomic Risk	9.0%
This factor analyzes the bank's compliance with the relevant regulatory measures, with an emphasis on the minimum capital requirement, reserve amounts to face default risk and the norms related to the operation of banks, including permitted and restricted operations. It also evaluates the counter-cyclical strategies available to the bank.	

Source: HR Ratings.



Methodology for Rating Banks

Financial Institutions
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