Structured Debt for Subnational Entities

Credit Rating Agency

September 5, 2024

Roberto Ballinez
roberto.ballinez@hrratings.com
Public Finance and Infrastructure Sr. Executive Director

Ricardo Gallegos
ricardo.gallegos@hrratings.com
Deputy Chief Economic Analysis Officer

Natalia Sales
natalia.sales@hrratings.com
Structured Public Finance Manager

Mauricio Prieto
mauricio.prieto@hrratings.com
Methodological Criteria Associate

Manuel Villaseñor
manuel.villaseñor@hrratings.com
Methodological Criteria Analyst

This methodology focuses on the bank and stock market structured debt of Mexico's states, municipalities, and public decentralized agencies acquired through irrevocable trusts whose source of payment is Federal Income R28 and Contributions R33, as well as any other federal or own revenues that can be used as a source of payment.

The HR Ratings model is based primarily on a quantitative exercise that measures, over a given period, the maximum reduction in allocated revenues that can be withstood by the structured debt conditional upon meeting its debt obligations. This reduction determines the credit rating, although the latter may vary in terms of positive or negative Qualitative Adjustment notches under specific circumstances.

The model starts by identifying minimum primary coverage with the allocated revenue and debt service projections in each period. Additional stress is applied to revenues over a thirteen-month period around the minimum primary coverage. The Target Stress Rate (TSR) measures the maximum revenue reduction that the structure can withstand in this period. The use of all available resources in funds or guarantees is also considered, but with the condition that the resources used will be reinstated with the operation's remaining funds at a later date.

For allocated revenue and debt service projections, this methodology uses HR Ratings-constructed macroeconomic scenarios that consider different variables such as economic growth, inflation and different interest rates. Additionally, our projection model incorporates cyclical stress factors, with the intention of simulating an unfavorable economic environment. These factors affect variables such as Federal Participatory Collection (RFP), the different funds of Ramo 28 and 33, as well as each entity's own revenues, which may be affected as a source of payment and guarantee of a structured debt. All this makes it possible to evaluate the resilience of revenues and debt service in the face of adverse economic scenarios.

The methodology allows for the incorporation of other factors in the quantitative analysis, including the monetization of derivative hedging instruments, the inclusion of secondary or substitute revenue sources, as well as cases in which a third party covers the amortizations of the period in part or in full, as well as the inclusion of secondary and/or substitute sources of payment.

The methodology also incorporates the Global Credit Facilities (GCF) analysis process, which refers to a Structured Debt that promotes access to and the taking out of bank loans under competitive financial conditions for a group of municipalities. GCFs can be structures established by the federal or state governments to enable other entities to access better credit conditions. The requirements applicable to a municipality that wishes to enroll in GCF are set forth by the states or a federal authority.

Own revenues allocated as a source of payment of the Structured Debt are projected on the basis of economic factors relating to the source of payment's sensitivity to changes in the revenue of the target population subject to the tax or duty, or to changes in consumption patterns as a result of fluctuations in the prices of different goods and services. With regard to financial factors, the source of payment's historical trend is analyzed along with its volatility and seasonality. In the case of decentralized agencies, we analyze their operational capacity to provide their services, as well as their collection capacity. The analysis also includes various operational and/or administrative factors that could impact the Structured Debt's credit rating, such as failures in the coordination mechanisms that allow the entity, or a third party, to collect the allocated revenue and transfer it to the payment trust servicing the debt. In addition, factors such as the periodic compatibility of deposits to the trust and the dates set for debt service payments are also considered.

After determining the TSR, the Credit Rating may be assigned to the structured debt to which Qualitative Adjustments may be incorporated. These adjustments may be made based on different factors such as, for example, the unsecured rating of the state, municipality or decentralized agencies, contractual affirmative and negative covenants, or any situation that could trigger an early maturity event.

HR Ratings' process for rating the structured debt of Mexico's states, municipalities and/or decentralized agencies contemplates a legal analysis of the structure as set forth in HR Ratings' General Methodological Criteria.

Introduction

This methodology outlines the analysis process to determine the credit quality of structured debt contracted by Mexico's subnational entities (states, municipalities or decentralized agencies) acquired through irrevocable trusts that serve as a payment vehicle and that have federal or own resources or guarantees allocated as a source of payment. The debt may be comprised by bank loans or securities issued as debt instruments by stock exchanges.

This methodology assumes a structured debt (SD) in which interest payments and periodic and mandatory amortizations (debt service as a whole) are required. So HR Ratings' analysis is based mainly on source of payment projections using flow analysis and considering the reserves held in the payment trust and any additional available resources that may be quantified and used to pay the debt service. This evaluation considers the performance of the debt, the source of payment and additional cash flows over the legal term of the loan or issue.

Lastly, the analysis process described in this methodology can also be applied to SDs whose source of payment comes from the collection rights of a portfolio whose underlying assets are bank loans, or even from the remnants of another SD. In both cases, it must be possible to analyze the credit quality of the underlying assets or of the senior SD.

HR Ratings' quantitative analysis as described in this methodology is based on measuring the debt structure's capacity to withstand a sudden contraction of resources available to cover debt service. In this regard, the model identifies the minimum value of the primary debt service coverage and applies an extraordinary stress to the thirteen months[1] around such coverage. This period is known as the Critical Stress Period. The minimum primary coverage represents, for the SD, the weakest from a financial point of view, and the stress will be applied to the allocated revenues through the Target Stress Rate (TSR). The reduction in revenues is conditional on there being sufficient resources to service the debt obligations, as well as on the structure being able to reinstate any reserves used in carryovers on the Critical Stress Period.

HR Ratings recognizes that not all the factors affecting the SD's credit quality are quantifiable, so the analysis process also allows for a series of Qualitative Adjustments. These are specific and their impact on the rating is limited to what is described in this methodology. HR Ratings' rating report will provide details and the rationale for the adjustments incorporated in the SD's credit rating.

Legal Strength of the Structure

The credit analysis of an SD is based on the fact that there is a legal and operational separation between the financial structure and the entity's ability and/or willingness to pay. The methodology therefore allows the SD's credit quality to be ascertained without considering the credit quality of the entity (state, municipality and/or decentralized agency). However, it should be noted that, even though this separation allows HR Ratings to prepare a quantitative analysis that does not consider the entity's credit rating, the latter may have an impact by way of Qualitative Adjustments.

The separation between the ability and/or willingness to pay a structured debt and actual payment of the debt is established through the creation of a trust, which has specific characteristics to guarantee the protection of the interests of the parties involved. These characteristics are:

1. **Irrevocability and Transparency**: The trust cannot be modified or cancelled unilaterally once it has been created. In addition, it must be transparent, affording access to information on asset management and the fulfillment of payment obligations.
2. **Third Party Management**: A management trust is created in which an independent third party (trustee) takes on the responsibility of managing the assets and/or resources that will serve as the source of payment of the debt.
3. **Established Payment Structure**: The trust defines a clear structure for debt repayment, specifying payment amounts, terms and priorities.
4. **Dedicated Payment Vehicle**: The trust works as a payment vehicle in which the debtor agrees to keep resources available at all times to cover their payment obligations.
5. **Defined Payment Priorities**: The documentation sets forth payment priorities determining the order in which obligations will be settled in the event of the debtor's insolvency.

Two situations may arise if the legal analysis finds that the documentation does not provide for a legal and operational separation. The first is when the credit agreement or debt security explicitly specifies that the entity must provide resources to pay the debt. In such cases, HR Ratings may assign the entity's unsecured credit rating to the SD. On the other hand, if the structure does not provide for the mandatory contribution of resources from the entity, HR Ratings will suspend the rating process.

Lastly, should HR Ratings detect any changes to the legal documentation of the SD, after having assigned the correspondent Credit Rating, and depending on the extent or relevance of such changes, it may put the rating on “Review in Process”. During this period HR Ratings will assess whether or not the changes have a financial impact or an impact in the legal strength of the structure that warrants an update of the legal analysis.

General Structure of the Model

The first step in HR Ratings' quantitative model is the development of the projection of the SD's source of payment and debt service using three different HR Ratings-generated macroeconomic scenarios. The first of these scenarios replicates current economic and financial conditions in the Mexican economy (Base Scenario), while the other two scenarios incorporate stress conditions: firstly, a Low Growth with Low Inflation Scenario and, secondly, a Stagflation Scenario. The rating process considers the information available at the time and uses current projections to assign the rating. In each analysis report, HR Ratings will outline the main risks for the assigned rating derived from fluctuations in macroeconomic variables.

Once the revenue and debt service projections for each Macroeconomic Scenario have been prepared, the primary debt service coverage ratio ($DSCR^{Primary}$) will be calculated at each payment date and over the remaining term of the SD. This will make it possible to identify the month in which the period with the lowest $DSCR^{Primary}$ arises and additional stress will be applied to the source of payment for a period of six months prior to and six months after said month. This exercise will determine the Target Stress Rate (TSR) that fulfills the purpose of calculating the maximum level of stress a structure can tolerate on its source of payment without defaulting in a limited period of time. The stress level will be higher if the SD includes some other liquid resource available for debt service payments. Examples of this are reserve funds and guarantee contracts.

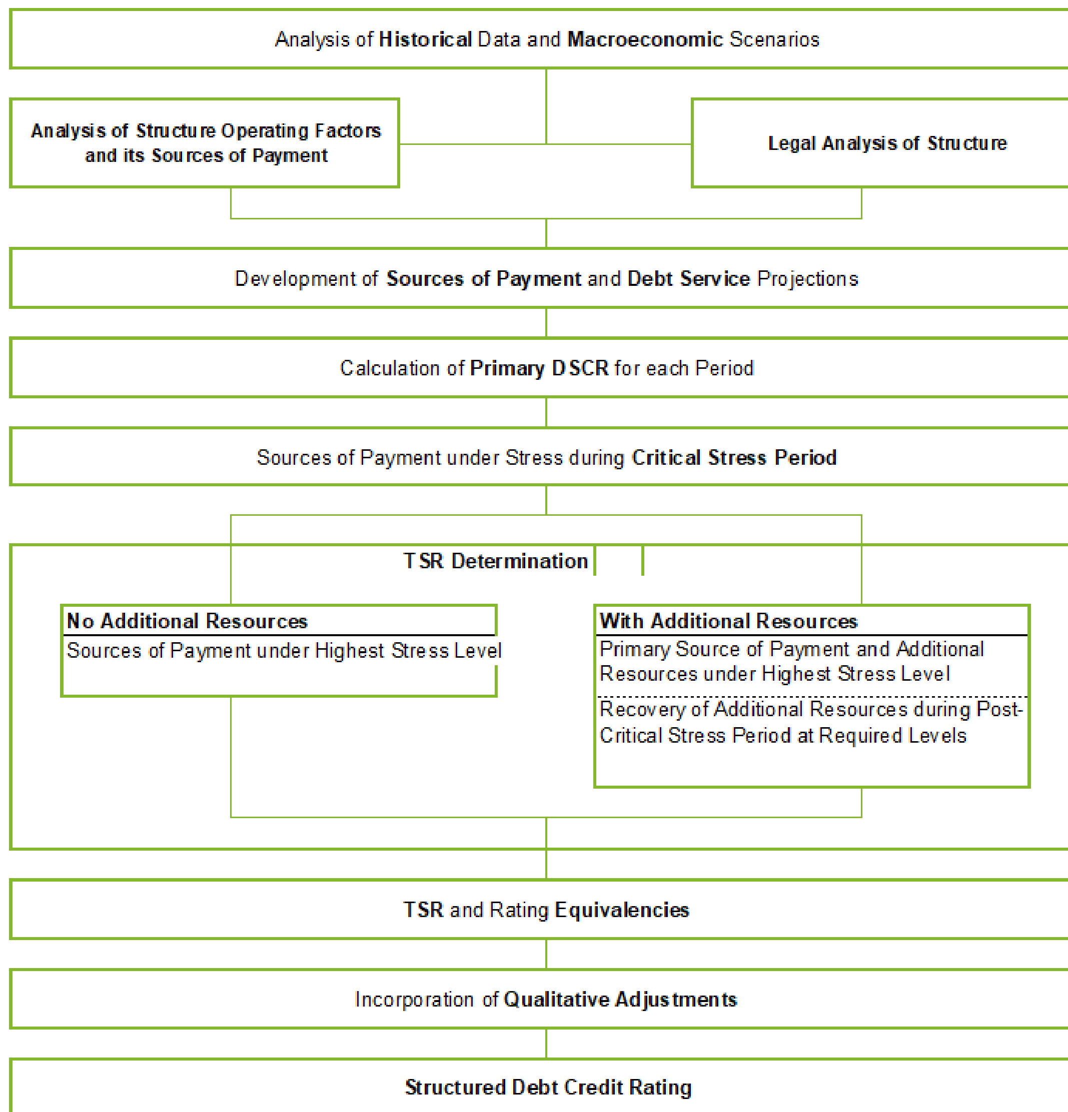
The emphasis on the calculation and value of the TSR is based on the assumption that the SD's payment capacity is as strong (in financial terms) as its performance at the weakest point, which is represented by the projected minimum $DSCR^{Primary}$ throughout the legal maturity term.

If the SD has a reserve fund, the TSR must comply with the additional condition that the remainder of the future flows from the payment source must be sufficient to reinstate the reserve's target amount, as set forth in the legal documentation and after the conclusion of the Critical Stress Period.[2] In technical terms, if the SD does not have additional resources, the maximum stress level will be the level at which the minimum $DSCR^{Primary}$ is equal to 1.0x (times). However, if there is a reserve fund, it is feasible to obtain a $DSCR^{Primary}$ of less than 1.0x. But the level of this coverage must be such that, once this additional the Critical Stress Period is over, there are sufficient resources to replenish the reserves in the Post-Critical Stress Period.

The credit rating is determined on the basis of the TSR value obtained and may be adjusted in terms of notches, either positively or negatively, if there are Qualitative Adjustments. The type of factors evaluated in these adjustments usually relates to the analysis of the financial transaction's terms and conditions and whether their existence entails an improvement or an additional credit risk. These adjustments will be outlined below. Figure 1 shows the structure of the model described in this section:

[2] This period is defined as the Post-Critical Stress Period and its duration, in the case of reserve funds, will depend on the applicable legal documentation or, in its absence, the amount of resources available for debt service in terms of periods.

Figure 1. General Structure of the Model



Source: HR Ratings

While this methodology explains how sources of payment with federal revenues subject to the Fiscal Coordination Act may be analyzed and forecasted, any future modifications affecting the origin, criteria or calculation of subnational revenues (established on the LCF and state laws) will be assessed using the same framework. HR Ratings may adjust its analysis and forecasts if any substantial changes are made to the nature of these revenues.

Sources of Payment

For the purposes of this methodology, source of payment refers to future cash flows available to service the debt and cover certain expenses. These flows must be transferred directly to the trust whose purpose is to service the debt. The flow is assigned by the entity during the term of the SD and may come from a federal or own source. Federal sources come mainly from Federal Income R28 and Contributions R33, which will be examined in detail below.

HR Ratings' evaluation process involves a temporal and structural analysis of payment sources. The temporal analysis focuses on trends, volatility and seasonality, while the structural analysis covers aspects such as the type of tax, demographic characteristics of the tax base, aliquots, taxable events, collection mechanisms and the frequency of payments.

The process begins by verifying whether the revenues are properly allocated to the trust in order to ensure their legal separation from the issuer. If this fundamental requirement is not met, this methodology cannot be used to calculate its rating and the analysis would need to be conducted using some other methodological threshold. Subsequently, the type of entity that allocated the revenues must be identified. There are three types of entities: state, municipal or a decentralized agency. Once the type of entity has been identified, it is necessary to identify which payment source is the primary one and, as applicable, which is the secondary or substitute source, should there be one.

It should be noted that the Allocated Revenues used by HR Ratings in its model consider the different stress scenarios described in the previous section. The stress scenarios are applied to the payment sources to incorporate the movements and stress that may occur in reality due to different circumstances such as macroeconomic factors.

Federal Resources

Each year the Mexican Congress analyzes and approves the Federal Expenditure Budget (PEF – acronym in Spanish), which is proposed by the federal executive and complies with the provisions of the Federal Revenue Act. In other words, this is the official document that defines how public resources will be used the following year. HR Ratings uses this official information as the main input to build its model as it enables us to analyze and project the behavior of fiscal variables throughout the tax year in question using this information as a base year.

Once this allocation of resources has been approved, HR Ratings uses the information to make the relevant calculations for the projections which are then used to calculate the expected expenditures of several fiscal accounts such as Federal Participable Revenue, the Federal Fund of Participations, other 28R funds, Contributions 33R, among others.

Federal Participable Collection

Federal Participable Collection (FPC) is the set of resources that the federal government collects from federal taxes and mining duties, less total rebates for such items, as well as a portion of the revenues derived from the Mexican Petroleum Fund (Fondo Mexicano del Petróleo, FMP). In simpler terms, FPC represents the amount of money that the federal government shares with the states and municipalities to support their public spending. This sharing among the states is made on the basis of formulas

set forth in the Fiscal Coordination Act, considering factors such as population, economic activity and collection efficiency in each entity.

The FPC comprises all the resources collected by the federal government through federal taxes, a large part of which can be shared with the states and municipalities. This suggests that national economic activity, to a large extent, determines the amount approved each year under this item in the Federal Revenues Act.

FPC projections are therefore based on the historical proportion shown with respect to the country's nominal GDP. In the Base Scenario, the projection of this percentage is made using the weighted average of the last five observed years plus the current year (and/or base year): $\{t_{-5}, ..., t_0\}$; year zero (t_0) is the last year in which a Federal Expenditure Budget was approved by Congress or, as the case may be, the year in which one is undergoing analysis for approval[3] .

In the Macroeconomic Stress Scenarios, the calculation of the historical FPC to GDP ratio will consider additional adjustments. The first one refers to stress that will be applied to the projected period between years t_1 and t_5; the second adjustment refers to stress of a different magnitude that will be applied between years t_6 and t_{10}, and a last fixed stress is applied from year t_{11}. In addition, cyclical stress (Cyclical Stress) referring to a reduction in the years t_2 and t_3 will be applied. This cycle will be repeated every six years, so the second cycle will occur in the years t_8 and t_9, with the third cycle applied in t_{14} and t_{15} and so on. It should be noted that the value of this reduction may change in accordance with prevailing economic conditions.

Figure 2 shows how HR Ratings applies its stress to the FPC to Nominal GDP ratio. The Nominal GDP series are prepared by the Economic Analysis Area of HR Ratings, while the FPC for each scenario corresponds to the method described here.

[3] Prior to the approval of the Federal Expenditure Budget, the federal executive sends the Expenditure Budget Bill to Congress. This document is public and can be consulted on the website of the Ministry of Finance and Public Credit (SHCP).

Figure 2. Applying Stress to FPC Projection

	BASE SCENARIO			STRESS SCENARIO				
Year	Nominal GDP	FPC	FPC % of GDP	Nominal GDP	FPC	FPC % of GDP	Regular Stress	Cyclical Stress
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%	0.095%	t_1
t_2	$ 659,227	$ 242,479	36.78%	$ 494,420	$ 179,931	36.39%	0.095%	t_2 -0.20%
t_3	$ 692,188	$ 254,603	36.78%	$ 519,141	$ 188,954	36.40%	0.095%	t_3 0.10%
t_4	$ 726,798	$ 267,334	36.78%	$ 545,098	$ 198,429	36.40%	0.095%	t_4
t_5	$ 763,139	$ 280,700	36.78%	$ 572,353	$ 207,806	36.31%	0.095%	t_5
t_6	$ 801,295	$ 294,735	36.78%	$ 600,971	$ 217,746	36.23%	0.075%	t_6
t_7	$ 841,359	$ 309,472	36.78%	$ 631,020	$ 228,160	36.16%	0.075%	t_1
t_8	$ 883,427	$ 324,946	36.78%	$ 662,571	$ 237,746	35.88%	0.075%	t_2 -0.20%
t_9	$ 927,599	$ 341,193	36.78%	$ 695,699	$ 249,807	35.91%	0.075%	t_3 0.10%
t_{10}	$ 973,979	$ 358,253	36.78%	$ 730,484	$ 262,480	35.93%	0.075%	t_4
t_{11}	$ 1,022,678	$ 376,165	36.78%	$ 767,008	$ 275,182	35.88%	0.055%	t_5
t_{12}	$ 1,073,811	$ 394,973	36.78%	$ 805,359	$ 288,499	35.82%	0.055%	t_6
t_{13}	$ 1,127,502	$ 414,722	36.78%	$ 845,627	$ 302,458	35.77%	0.055%	t_1
t_{14}	$ 1,183,877	$ 435,459	36.78%	$ 887,908	$ 315,317	35.51%	0.055%	t_2 -0.20%
t_{15}	$ 1,243,071	$ 457,231	36.78%	$ 932,303	$ 331,503	35.56%	0.055%	t_3 0.10%
t_{16}	$ 1,305,225	$ 480,093	36.78%	$ 978,918	$ 348,518	35.60%	0.055%	t_4
t_{17}	$ 1,370,486	$ 504,097	36.78%	$ 1,027,864	$ 365,379	35.55%	0.055%	t_5
t_{18}	$ 1,439,010	$ 529,302	36.78%	$ 1,079,258	$ 383,054	35.49%	0.055%	t_6
t_{19}	$ 1,510,961	$ 555,767	36.78%	$ 1,133,220	$ 401,584	35.44%	0.055%	t_1
t_{20}	$ 1,586,509	$ 583,556	36.78%	$ 1,189,881	$ 418,629	35.18%	0.055%	t_2 -0.20%

Source: HR Ratings

Throughout the Base Scenario projections, the FPC to Nominal GDP ratio is kept fixed based on a weighted average of the percentages obtained between $\{t_{-5}, ..., t_0\}$. For the Stress Scenario, this percentage is taken but the reductions given in the two columns on the right – regular stress and cyclical stress – are applied.

Federal Fund of Participations

The FFP is part of the Federal Income, which is one of the main sources of payment for the SD of state and local governments. The FFP is calculated as a percentage of the FPC. The FFP is shared using formulas set forth in the Fiscal Coordination Act and considering factors such as population, economic activity and collection efficiency in each entity. Its correct application contributes to territorial fairness, regional development and public wellbeing.

The Fiscal Coordination Act currently in force sets forth mechanisms for transferring FPC resources to the states and municipalities. In the case of the FFP, the Fiscal Coordination Act indicates that it will be calculated in the Federal Expenditure

Budget each year considering a proportion equivalent to 20.0% of the FPC. As a result, this proportion can be applied to obtain the national FFP[4] projection based on the FPC series under the Base Scenario and the Stress Scenarios.

To project each state's share of national FFP, HR Ratings will also weight the historical share of the last five years plus the current year between each state's FFP and the national FFP. For the current year, information that is public at the time of making the projections will be used as a reference. This process is for the Base Scenario projection[5] .

An additional adjustment will be made for the Macroeconomic Stress Scenarios. This process is the same as the one described for the FPC to GDP ratio, apart from the application of Cyclical Stress. These adjustments will be applied in the same years for all the states.

Lastly, the projected monthly series for each of the states will be constructed based on the state FFP series. These will consider the historical seasonality factor of each state, which will be obtained from the weighted average of the last ten years observed.

Although the Fiscal Coordination Act currently in force sets forth the percentage that each state must transfer to its municipalities from each of the funds comprising R28, there is no established proportion of total state revenue sharing.

In this regard, according to the Fiscal Coordination Act, the revenue sharing that municipalities will receive from the total state FFP should not be less than 20.0% of the amount received by the state, which will have to share it in accordance with its applicable legislation. Local legislatures will define their sharing among municipalities based mainly on collection incentives and compensatory principles on the municipal level[6]. In fact, each state publishes annually the information related to the municipal distribution of this fund. However, according to HR Ratings' experience, this distribution may change from one year to another, so these publications are reviewed periodically. Finally, it should be considered that, in the case of the Municipal Development Fund, 100% of the fund corresponds to and is transferred to the municipalities.

R28 (Ramo 28)

Federal Income R28 refers to federal resources transferred to Mexico’s states and municipalities, pursuant to the provisions of the Fiscal Coordination Law and the Agreements for Accession to the National Fiscal Coordination System. The purpose of these resources is to compensate the states for their contributions to the national economy and to strengthen their fiscal capacity to meet the needs of their inhabitants.

---

[4] Although there is a legal reference of 20.0%, HR Ratings recognizes that there may be small historical deviations. Therefore, it will review the observed proportions to verify this ratio and, if there is a deviation, it may propose to the Analysis Committee a ratio calculation process similar to that of the GDP / FPC. In other words, the ratio used in the national FFP projection would be the result of the weighted average of the last five years observed (FPC / national FFP) plus the year considered as the base year.

[5] In general terms, the same weightings would be used for the five observed years plus the current year in each state. In extraordinary cases, the weighting applied to a particular state(s) could be modified.

[6] Some states currently transfer more than 20.0% to their municipalities.

R28 projections will be based on their historical percentage with respect to national nominal GDP. In the Base Scenario, the expected share throughout the series would once again be the weighted average of the last five years plus the current year[7] .

The process for applying the reductions in the Stress Scenarios is the same as the one used for calculating the FPC to GDP ratio shown in Figure 2. This includes the second adjustment referred to in that section for the Cyclical Stress scenario in the projections of the national R28 as a percentage of national GDP.

State level revenues will be determined using national level Federal Income projections for the different macroeconomic scenarios. The percentage of R28 that each state will receive in future years is projected based on the historical ratio between its own R28 and national R28[8]. The ratio applied for all projected years will be the weighted average of the previous five years plus the current year. This ratio will remain unchanged in the Base Scenario. For the stress scenarios and for calculating the series of Federal Income by state, the process described in Figure 2 will be used again without applying the Cyclical Stress.

Lastly, monthly series will be projected for each of the states based on the annual series of state-level R28. These will consider the historical monthly seasonality factor for each state, which will be obtained from the weighted average of the previous six years[9] .

R33 (Ramo 33)

Contributions R33, also known as Federal Contributions for States and Municipalities, are financial resources that the federal government transfers to the states and, in some cases, to the municipalities to help them perform their functions and attend to their needs in the fields of education, health, infrastructure, security, among others. The contribution amounts are distributed into specific purpose funds, each with resources allocated to clearly defined expenditure items.

Mexican federal legislation allows an entity to allocate up to 25.0% of the revenues to which it is entitled annually to an SD (this applies for both FAFEF[10] and FAIS[11]). As a result, this rule stipulates that for future years the entity may allocate a minimum amount equal to 25.0% of the revenues allocated to it in the year of contracting. Therefore, if the total amount of resources received by the entity through the FAIS program in a future year (for example, t_1) is less than the total amount received in the year of contracting (t_0), the structure will receive an amount of resources equal to at least 25.0% of the year of contracting. According to HR Ratings' analysis, a one-notch negative qualitative adjustment may be applied to the SD of an entity whose payment source is a percentage of FAFEF or FAIS if the amount of the contracting year fails to cover debt service during the following three projected years[12] .

[7] The process for projecting the amount of national R28, R33 and for the states may use the amounts budgeted year by year in the Federal Revenues Act as a reference. Additionally, HR Ratings could make adjustments to reflect the specific performance of each of the states for the period t_0.
[8] The Fiscal Coordination Act sets forth the criteria for the sharing of national R28 among Mexico’s 32 states.
[9] If there is an extraordinary event in the amount or sharing of a particular state's R28, the six-year period may be extended.
[10] Contribution Fund for the Strengthening of the States (FAFEF).
[11] Contribution Fund for Social Infrastructure (FAIS).
[12] This negative qualitative adjustment will not be applied if the amount of FAFEF or FAIS in the current year is at least 30.0% greater than the amount in the year the SD was contracted.

For the projection of FAIS and FAFEF, funds pertaining to R33, the mechanism for transferring resources to the states set forth in the Fiscal Coordination Act will be applied. In the case of national FAIS, it will be determined annually in the Federal Expenditure Budget with federal resources for an amount equivalent to 2.5294% of FPC, while for the FAFEF, it will be 1.4% of FPC. These amounts are determined based on the FPC budgeted in the economic package in question and will therefore not vary in the respective tax year.

The FAIS is comprised of two funds. Of the total FPC, 0.3066% will pertain to the Fund for Social Infrastructure of the States (FISE) and 2.2228% to the Fund for Social Infrastructure of the Municipalities and Territorial Districts of the Federal District (FISM). This fund will be paid monthly to the states in the first ten months of the year in equal installments through the Federation and to the municipalities and territorial districts through the states. Considering the different FPC series projected for each scenario, these percentages will be applied and the series (base and stress) for both funds at the national level will be obtained. The state series will then be constructed on the basis of this.

The process for obtaining these series will be the same as for the state FFP. In other words, the historical share of the last five years plus the current year between each state's FAIS and national FAIS, or the FAFEF depending on the case, will be calculated. The weighted average of these years will be used to make projections for each state in each scenario. The process for applying the stress in each scenario is the same as for the other variables described in this document.

Lastly, regarding the series' seasonality, the Fiscal Coordination Act sets forth a specific monthly transfer mechanism for these funds. In the case of FAIS (FISE and FISM), it will be paid monthly to the states in the first ten months of the year in equal installments through the Ministry of Finance and Public Credit (SHCP) and to the municipalities through the states[13]. In the case of FAFEF, the resources from this fund will be paid monthly to the states in twelve equal installments[14].

Sources of payment with own resources

In the previous section, it was assumed that the allocated revenues came from federal sources. However, in some cases own resources are provided as a source of payment. In this case, the revenues do not come from Revenue Sharing or Contributions but from all the resources the entity can levy or collect, such as taxes or duties, considerations for the operation of a decentralized agency, and even the distribution of state resources to the municipalities. These sources of revenue that can be evaluated include the following common cases:

- Payroll Tax;
- License Plate Renewal Charges;
- Revenues from the operations of a federal or state concession;
- State Funds for Municipal Strengthening.

[13] The states must deliver to their respective municipalities and the territorial districts of Mexico City, the resources they are entitled to based on the calendar under which the federation delivers them to the states. This calendar must be published by the states no later than January 31 each tax year, in their respective official publication.

[14] If the federal payment source has different characteristics from the ones analyzed in this methodology, the analysis team may determine a process for its projection.

The difference with respect to federal revenues refers to the process by which HR Ratings projects and evaluates the revenues earmarked for debt service. This section outlines some of the factors that could have a direct impact on the flow of resources that the payment trust receives directly.

Operating Factors

Operating factors in an SD are elements or conditions inherent to an activity of a state, municipality or decentralized agency that directly influence its ability to generate sufficient cash flows to meet its financial obligations. These factors may be internal or external to the entity. This section will list some examples, but it should be noted that this list is illustrative and not limitative.

For example, the mechanisms for collecting the source of payment will be evaluated; these are particularly relevant in cases where a party outside the entity generates the revenue or if the source of payment is originated and/or collected by more than one entity. Operational and administrative coordination mechanisms should be clearly documented and formalized, along with the path that the source of payment will follow. If HR Ratings considers that the mechanisms are not viable in operational and administrative terms, or are not clearly stipulated in the legal documentation, it may project the source of payment's performance with an unfavorable bias.

Similarly, the rules, legislation or contracts that allow resources to be generated will be continuously monitored to determine whether any changes could affect the volume or flow of the payment source. This refers to the entity's governance factors that can be quantified in HR Ratings' projections.

Compatibility between collection periods and debt service periods is also relevant. If the trust receives the funds in question sufficiently in advance, it will be possible to mitigate operational risks related to the flow of the source itself. This is particularly important in cases where one or more third parties, external to the entity, are in charge of collecting the source of payment.

For cases in which the revenue originates from a decentralized agency, its capacity to generate profits must be evaluated, including efficiency in both collection and coverage of the target population. The analysis report will list each factor included in the source of payment's projection and outline the impact that each one may have on the corresponding scenario.

In the case of charges or taxes that users can pay through financial institutions or self-service establishments, the feasibility of the source of payment reaching the trust that will service the SD on time and in full should be evaluated, based on the historical performance and operating capacity of these institutions.

State Funds for Municipal Strengthening

In Mexico a state may create a fund to share resources with its municipalities. The purpose of these funds is usually to strengthen the municipalities' ability to respond to the needs of their populations. The revenue from these funds can be used to build works or projects that comply with certain guidelines in order to help improve the quality of life of the municipality and, consequently, of the state in general.

In contrast to R28 and/or R33 resources, which are transferred by the Mexican Federal Government (HR AAA, local scale) to the 32 states, the resources from these funds are originated, allocated and transferred by a state to its municipalities. The origin of the resources and the distribution method are determined by the state itself according to internal rules and criteria that may change from year to year. Therefore, no municipality has total control over the amount or sharing of these resources.

HR Ratings may incorporate consideratings (quantitative or qualitative) so that the analysis includes the risks of receiving funds from a guarantor with a lower credit rating than the federal government. These risks include diminished transparency in the allocation of funds, the state's credit quality, as well as legal and regulatory risks. The section outlining TSR calculation looks at the quantitative effects incorporated in the model to reflect this risk.

Additional Sources of Payment

In the context of the current methodology there are different types of payment sources. A Primary Payment Source is defined as the main source of future cash available and earmarked specifically for the payment of an obligation when there are multiple payment sources. This source has priority in the order of payment and is regarded as the first revenue to cover the obligation.

An additional source of payment, on the other hand, refers to any allocated revenue that an entity can use to meet its financial obligations in addition to its primary source of payment. These additional sources can be used to cover regular expenses, pay debts, finance investments or simply boost the structure's financial security. They can be divided into two groups: secondary payment sources and substitute payment sources. HR Ratings has a special technical treatment for each of them.

As part of its analysis, HR Ratings will evaluate the nature and characteristics of the additional payment sources, determining whether their use and availability into the trust is automatic or conditional. A payment source that flows directly to the trust and does not require legal or administrative processing for activation by the trustee is considered more secure than those that do not, since it is legally earmarked. The existence or lack of the correct earmarking and instrumentation for the use on an additional source of payment may result in an adjustment consideration. In cases where a qualitative adjustment is used for this reason, the rating report will expose it. Lastly, its important to mention that both a Secondary Source of Payment and a Substitute Source of Payment may be related to a federal source or be an own revenue.

Secondary Source of Payment

The secondary source of payment is a flow of resources that are fully available to the trustee for debt service payment as well as for replenishing the SD reserve fund[15]. In this regard, this source of payment is used at any time in the event of a partial or total lack of liquidity in the primary source of payment.

The secondary source of payment can be considered on evaluating the financing structure in different ways. If it is determined that this source can be used by the fiduciary prior to drawing on reserve funds, it will be considered to calculate $DSCR^{Primary}$ throughout the SD's term as well as to calculate TSR. If it is determined that his source of payment can be used by the trustee after drawing on reserve funds or in acceleration or early maturity events, it will not be considered for the calculation of the

[15] HR Ratings considers that the flow's circulation through the trust provides greater credit soundness; otherwise, the trustee's access (operational and administrative) to this resource will be analyzed. A qualitative adjustment may be assigned if any limitations are identified.

$DSCR^{Primary}$. However, these resources would have an impact on the calculation of secondary hedges, since they can be considered as an additional reserve, Consequently, this consideration would indirectly affect the TSR calculation.

Substitute Source of Payment

The main characteristic of a Substitute Source of Payment is that it is only available to meet debt service payments if the primary source of payment is canceled or substantially modified. In such cases, from a legal point of view, a cancelation or change will provide sufficient grounds to annul the original allocation made by the entity in favor of the SD[16]. In such circumstances, the fiduciary or any other entity with the faculty could ask, through an administrative process, la release of this resources to use as source of payment.

Given these characteristics, it is common that the resources associated with this payment source do not flow within the trust, although they may be legally affected. HR Ratings may perform the exercise of projecting the flows of the substitute source, in order to determine its financial strength. However, they will not be considered in the calculation of the $DSCR_t^{Primary}$, in the secondary hedges, nor in the calculation of the TSR.

Additional Liquid Resources

Additional resources refer to those resources that are not part of the SD's sources of payment but can be used to cover debt service in the event that assigned revenues are insufficient or their availability is compromised. In other words, they are resources that are available at any time to cover, in whole or in part, an SD's financial obligations. These resources may take the following forms: liquid reserve funds with a contractually defined target balance, partial guarantees, letters of credit, etc.

At this point, let us remember that the TSR analysis can be extended beyond the Critical Stress Period. This is to ensure that the projected future flows of the SD are capable of meeting other financial obligations of the structure, such as the reconstitution of the reserve fund balance in case of its use and/or, in the case of a GPP or derivative instrument, any payment required by a third party guarantor.

Reserve Fund

Reserve funds are established as credit enhancements to support the payment of an SD's financial obligations. A reserve fund is an amount of liquid resources set aside to meet shortfalls, in whole or in part, in a SD's assigned source of payment.

Liquid reserves are part of the TSR calculation, as long as the technical condition that at the end of the Critical Stress Period all used resources are restored is included. This has to be fulfilled within a certain period of time called the Post Critical Stress Period. The size of the Post Critical Stress Period and the reconstitution mechanism will be in accordance with the legal documentation. In the event that the legal documentation does not establish a specific mechanism for the reconstitution of the

[16] Some trust agreements contain clauses setting forth mechanisms or actions to be implemented if the primary source of payment ceases to be allocated.

reserve fund, an alternative method based on the calculation of the fund balance equivalent to months of debt service may be used.

GPP

In the context of the credit evaluations performed by HR Ratings, Guarantees of Prompt Payment (GPP) are defined as contractual or legal mechanisms setting forth a third party's obligation to unconditionally and irrevocably pay the debt service of a securities issue if the original issuer is unable to meet their payment obligations. It is important to mention that, generally, these guarantees are not usually liquid; on the contrary, their activation is always associated with the execution of an administrative and/or operational process. In this sense, the terms and conditions of the GPP contract must be provided by the trustor, so that the modeling can be attached to the financial conditions established in the legal documents.

The GPP analysis process should always consider all its characteristics and legal and operating conditions. Highlighting the following:

- **Guarantee mechanism:** freezing or revocation of the warranty.
- **Guaranteed amount:** Calculated over the debt service, contracted amount or outstanding balance.
- **Mechanisms for calculating amount exposed.**
- **Level of consideration.**
- **Guarantor's credit rating.**

This last one is of great importance as it determines the GPP's effectiveness and ability to meet the entity's obligations under stress conditions[17] .

Provided that the legal documentation allows the flows provided by a GPP to be monetized within the financial model, their existence from a technical point of view will be considered as additional resources to meet the debt repayment. Under these circumstances, the analysis would be similar to a typical reserve fund and consequently the additional periods beyond the Post-Critical Stress Period, considered to cover the financial obligations of the GPP, would have an effect on the value of the TSR.

Hedging Derivative Financial Instruments

In cases where the SD's legal documentation sets forth the obligation of executing a hedging financial instrument, specifically a CAP or a SWAP, HR Ratings will include all expenses (premiums or any other expenses associated with said contracting) and, as applicable, any gains or losses generated by these instruments in the financial projection model.

Hedging Contracts generally set the value of a financial variable (CAP) or exchange its value for another (SWAP). Hedging applies for a given period of time and may involve payment of a premium. The variables subject to hedging are, among others: interest rate, UDI or exchange rate. The purpose of hedging contracts associated with an SD is usually to hedge interest rate

[17] For further details on the GPP monetization process, please refer to the document "Partial Guarantees for Structured and Unsecured Debt Issues".

risk. The expenses associated with a CAP-type contract will be deducted from the SD's source of payment, while its gains will be reflected in the debt service. At the same time, any gains or losses generated by a SWAP-type contract will be included in the SD's interest payment.

The terms and conditions of the contracts must be provided by the trustor to ensure that the modeling meets the financial conditions set forth in the legal documents, otherwise HR Ratings may perform its projections based on current market conditions.

The credit rating of the financial institution offering and backing the derivative is important and should be considered by HR Ratings. In general terms, if the financial institution's credit rating is higher than or equal to the SD's rating, the effect of the hedge will be considered in the analysis. If, on the other hand, the Institution's credit rating is lower than the rating given to the SD, HR Ratings will not consider this credit enhancement in its analysis[18] .

Zero Coupon Bonds

When an entity contracts an SD with a banking institution, usually a Development Bank, and the principal payment is backed by a Zero Coupon Bond or any other instrument (generally issued by the Federal Government), HR Ratings considers that the entity will only acquire the interest payment obligation.

In such cases, both the TSR calculation and the determination of the Critical Stress Period will remain unchanged. However, only the amount of interest accrued for the SD's term will be considered in calculating the debt service in each period.

If the Zero Coupon Bond associated with this financial transaction, or any other instrument that covers the amortization in full, is issued by a public or private entity other than the Federal Government, HR Ratings must consider the credit quality of the issuer[19]. If a risk is identified, a qualitative adjustment to the SD's rating may be proposed.

[18] The consideration of Relevant Ratings may be extended to insurance contracts or surety bonds, if there are any. Once again, the financial institution's rating should preferably be issued by HR Ratings, otherwise HR Ratings may consider the lowest rating available in the market.
[19] If HR Ratings has not rated the issuer of the Zero Coupon Bond, the lowest market rating will be used.

Macroeconomic Scenarios

In order to evaluate the financial soundness of a loan or stock market debt issuance under stress situations, HR Ratings is preparing several Macroeconomic Scenarios: 1) the Base Scenario, 2) the Stagflation Scenario and 3) the Low Growth with Low Inflation Scenario. The Macroeconomic Scenarios also allow us to make projections for financial expenses, as well as the cost of debt, as they provide a series for different interest rates (TIIEs), exchange rates, inflation levels, Investment Unit (UDI) value and the National Consumer Price Index (INPC).

In order to project certain key variables such as Federal Participable Collection (FPC), as well as federal funds from R28 and R33 that may be allocated[20], HR Ratings considers nominal Gross Domestic Product (GDP) estimates in each scenario as a reference point. In general terms, the calculation of a specific fund's projection may consider the historical percentage with respect to GDP.

HR Ratings makes estimates for Federal Participable Collection (FPC) and other revenue funds considering GDP projections under different Macroeconomic Scenarios. These estimates are obtained from detailed calculations based on specific time series for each fund. These calculations make it possible to model the sharing of different resources among the different states and municipalities.

Historical information will be used to project these series while, for the Base Scenario, the shares will be kept constant. In the case of the stress scenarios, multiple stress levels will be incorporated, details of which will be provided below. In addition, their historical trend will be analyzed in particular to identify the source's behavior in previous stress periods. Also, the revenue's volatility is analyzed with two factors standing out: growth in different periods (monthly, quarterly, six-monthly or annual) and the predictability of seasonal factors.

Lastly, as for the SD's expected financial cost, HR Ratings also uses the different macroeconomic scenarios it generates for cases in which the cost of debt is referenced to a variable interest rate or to the UDI.

Additional Stress Applied to Federal Revenue Resources for Municipalities

There is an assumption for applying additional stress for the SD of municipalities whose source of payment comes from federal resources. This stress refers to cases in which the percentage assigned to the municipality in question is reduced compared to the percentage assigned in the Base Scenario. This scenario reflects the risk of a situation where the revenue from state level sharing does not change, but at the municipal level revenue could be less than expected is received.

[20] These two branches include the main funds used for the payment of debt obligations by states and municipalities. The source of payment of around 94% of the subnational debt rated by HR Ratings currently is the Federal Fund of Participations (FFP) and the Municipal Development Fund (MDF).

Additional Stress applied to Sources of Payment from Own Revenues

Certain aspects may be specific to a given source of payment. In the case of a tax or charge on a good or service, the sensitivity of the consumption pattern to changes in target population income or to changes in the population itself should be identified, as well as if the change in the price of certain goods that could emerge as substitutes or complements has any impact on collection.

The scenarios also include assumptions regarding the growth of the affected payment source. Given the diversity of available payment sources, HR Ratings does not provide a mechanism for projecting each possible source in this document. Instead, it describes the analysis of the characteristics and process that makes it possible to establish the assumptions it uses to develop its projections.

Debt Service

For the purposes of this methodology, debt service refers to the periodic payment of the structure's financial costs that must be covered with the Allocated Revenue or other financial instruments through the trust in order to avoid default. HR Ratings will therefore consider in the financial cost any payments of interest, principal and/or expenses indicated in the structure payment priority.

Since the evaluation is performed under different macroeconomic scenarios, the financial cost of the debt may consider a surcharge (additional basis points), which is usually linked to the credit rating obtained and maintained by the SD. In this case, the base financial scenario would consider the surcharge associated with the lowest (or highest risk) credit rating in the market. In the case of the stress scenarios, the surcharge for a credit rating lower than the Base Scenario[21] will be the one considered.

HR Ratings analyzes the stress that the structure may face at the time of servicing its debt in two ways. The first way considers only the affected revenues that the structure has for meeting its payment obligations; in this way, a relationship is achieved between the flows received each period against the structure's periodic obligations. The second, on the other hand, also considers any type of additional resources that are optimally prepared to meet its payment obligations, with the condition that they be reinstated as per the legal requirements in a given period, as applicable.

HR Ratings may consider the observed reserve balance as the basis for its projections in cases where the discrepancy between this and the contractual balance is in excess of 20.0%. This consideration will be made so long as the difference continues for a minimum period of twelve months. Furthermore, an assessment may be made as to whether or not there is a discrepancy in the rates and surcharges for a minimum period of twelve months. To make this adjustment, the active clauses related to fund reserves will be reviewed to determine whether their consequences impact the quantitative model. If this difference disappears during the debt's evolution, HR Ratings may review the contractual balance to prepare its projections.

Given the extensive range of financing structures available in the market, it is not feasible to outline each adjustment and treatment that HR Ratings could apply to each particular case. However, we believe that a general description of the process, supplemented with examples of the most common cases, will provide a clear and sufficient idea of our methodology. Therefore, below we outline the characteristics of one of the most common types of municipal financing in the market for this type of structure.

Global Credit Facility

The Global Credit Facility (GCF or Program) is a structure that fosters access to and the contracting of bank loans under competitive financial conditions to a group of municipalities of a state[22]. These programs will be analyzed from the perspective

[21] In some cases, the SD's legal documents set forth that the surcharge depends on the credit rating with the highest risk and its remaining term. In other cases, the surcharge is set throughout the SD's term.
[22] GCFs can be established by the federation or by a state, so they are considered federal or state programs.

of the entity promoting them and structuring the payment vehicle of the financing provided under the GCF. The primary source of payment loans taken out under a GCF will be resources from revenue sharing and/or contributions (FFP, MDF, FAIS) allocated to a master management trust by the municipalities that opt to join the program[23]. Municipalities contracting debt through this mechanism must execute an adhesion contract that establishes them as Adherent Trustors to the Payment Trust in question.

The evaluation of a Global Credit Facility (GCF) involves an in-depth analysis of debt characteristics, payment sources, debt service and reserve fund performance, as well as the existence of other available resources to cover payment obligations, considering both the base and stress scenarios to assess the financial structure's resilience to adverse conditions.

In most cases, the GCFs' legal documents set forth the characteristics of capacity, maximum contract amounts, terms, amortization profile, interest rate, applicable surcharges, reserve fund target amount, affirmative and negative covenants, among others, that all financing registered in the GCF must comply with. HR Ratings will analyze and model each of the requirements to be met by the municipal financings that will join the program. Under these circumstances, the program's financial and credit analysis will take into account these general characteristics, perform the same analysis process under a cyclical and critical scenario, as specified in the corresponding methodology, and obtain a TSR.

HR Ratings may evaluate both the financing program as a whole and each potential financing individually. The program's analysis will consider the general financial terms and conditions, including a detailed projection of future payment source flows, but the projection method will be tailored to the specific characteristics of each payment source and/or additional resources that may exist within a GCF.

Given that each municipal financing may have its own particular characteristics, it is possible that limits may be set on the maximum amount each municipality can request, given as a percentage of its source of payment. For example, a municipality could have a limit of 35.0% of its authorized revenues to offer as a source of payment for an SD registered in a GCF.

The rating assigned to a GCF will depend on the level related to the lowest TSR once HR Ratings generates the quantitative models considering all the possible characteristics that the loans involved could have in accordance with the legal documentation. However, the program's final rating may be adjusted qualitatively considering positive or negative factors specific to each SD analyzed.

Additionally, the states or a federal public agency may set different requirements or restrictions for municipalities seeking to join the program. In the case of R33, these restrictions are subject to the provisions of the applicable legislation, as well as the ones specified in this methodology. In the case of R28, the factors to be evaluated refer to how minimum coverage is determined along with other factors such as the existence of a technical committee, and whether or not there is solidarity among borrowers, etc.

[23] SDs whose source of payment comes from own income may also be considered.

In certain cases, a GCF may be guaranteed by the government of the entity in question. If this is the case, the minimum rating of a GCF may be assigned at the same credit rating level as its guarantor.

Debt Service Measurement Metrics

HR Ratings' quantitative model is based on the calculation of the Target Stress Rate, which identifies the maximum reduction in revenue that an SD can withstand in a given period of time without defaulting on its payment obligations. This section first defines the main variables, items and metrics used to calculate the TSR; it then provides a description of the model as well as the formal definition of this rate and the problem of optimization that determines it. Lastly, this section provides an example of how it is calculated and how it is translated into a credit rating.

Definition: Primary Coverage.

This is expressed in terms of times (x), reflects the capacity of the available future cash flow to service debt obligations, and is calculated for the SD's full term using the following formula:

$$DSCR_t^{Primary} = \frac{Allocated\ Revenue_t - Trust\ Expense_t}{Debt\ Service_t}$$

Definition: Secondary Coverage.

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

$$DSCR_t^{Secondary} = \frac{Allocated\ Revenue_t - Trust\ Expense_t + Available\ Reserves_t}{Debt\ Service_t}$$

Definition: Critical Stress Period.

The critical stress period is a thirteen-month period[24] around the minimum $DSCR_t^{Primary}$ in which additional stress will be applied to the Allocated Revenue. The Critical Stress Period (CSP) is a tool used by HR Ratings to evaluate the financial soundness of a financing structure. In this period the structure's ability to service the debt with its allocated cash flows only is analyzed.

The period is defined as follows:

$$\{t_{m-6}, \dots, t_{m-1}, t_m, t_{m+1}, \dots, t_{m+6}\}$$

Where: m = Month that includes the projected minimum $DSCR_t^{Primary}$

Ideally, the CSP covers the six months before and the six months after the period of lowest primary debt service coverage ($DSCR_t^{Primary}$) provided for in the structure's projections, for a total of thirteen months. The application of this stress makes it possible to evaluate the structure's financial soundness based on the TSR.

[24] This period will be constructed considering projected periods of the stress scenario only. At the same time, the length of this period may be reduced if SD maturity does not allow the thirteen-month period to elapse, in addition to the fact that base scenario periods may also be considered in this case.

In some cases, the period with the lowest $DSCR_t^{Primary}$ may occur at the end of the debt's term, thereby limiting the construction of the CSP and consequently result in a period smaller than thirteen months. However, under this situations constructing a TSR will still be possible.

Definition: Post-Critical Stress Period

The Post-Critical Stress Period refers to the period after the Critical Stress Period in which the SD, using the remaining funds in the trust, must reinstate the resources of the reserves and/or financial instruments used for Debt Service payment. For example, in the case of a reserve fund, it entails reinstating the target balance; in the case of using a financial resource, it refers to reinstating the resources used considering the applicable interest.

The reinstatement period will always depend on the applicable legal documentation describing the terms of any reserve fund, guarantee or other instrument. If the applicable documentation does not mention any period for reinstatement, the length of the period will be defined in terms of the available resources; for example, in the case of a reserve fund, it will depend on the number of months represented by the existing resources in the fund in terms of Debt Service.

Definition: Target Stress Ratio (TSR).

The Target Stress Ratio is the maximum stress that the Revenue Allocated to the SD can withstand during the Critical Stress Period, complying with the Debt Service and the condition of replenishing the reserves used during the Post-Critical Stress Period. In this regard, the TSR is the outcome of an optimization process subject to fulfillment of the conditions shown in the following formula:

Determine: TSR

Subject to:

$$(1 - TSR)\sum_{t=1}^{C=13} Allocated\ Revenue_t - Trust\ Expenses_t + Available\ Reserves_1 \geq \sum_{t=1}^{C=13} Debt\ Service_t$$

$$Available\ Reserves_{C+n} = Reserve\ Fund\ Target\ Balance_{C+n}$$

Where:

TSR represents the Target Stress Rate that solves the optimization problem.

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 obtained after applying the TSR to the Allocated Revenue is defined as the Critical Revenue and is calculated as shown below:

$$Critical\ Revenue_{t_i} = Allocated\ Revenue_{t_i}\ (1\text{-}TSR)$$

Where: i = {m-6, ..., m, ..., m+6} and represents the months of the Critical Stress Period.

TSR calculation

The first step of the quantitative model consists of identifying the minimum Primary Coverage throughout the structure's term. Once this minimum value has been identified, the Critical Stress Period is constructed with additional stress being applied to the Allocated Revenue that must comply with multiple conditions. It should be noted that the HR Ratings model will be applied in one of the two stress scenarios, which means it will incorporate the projections of the corresponding macroeconomic variables. The stress scenario with the lowest minimum Primary Coverage will be selected for application.

In the absence of reserves, the stress applied to Allocated Revenue in this period would consider the constraint that the $DSCR_t^{Primary} \geq 1.0x$. Nonetheless, the SD evaluated with this methodology usually has access to reserves, so its use would allow for $DSCR_t^{Primary}$ of less than one in the Critical Stress Period. However, under these circumstances, the additional stress must meet the condition of reinstating the reserves used in the Post-Critical Stress Period. This means that the stress applied in the Critical Stress Period must always take into account the ability of the remnants, within the Post-Critical Stress Period, to reinstate the reserves used.

Time Horizon

The analysis process is performed throughout the period during which the acquired debt has an outstanding unpaid balance[25]. However, in order to incorporate lender sensitivity to the weakness of a structure in upcoming periods, the time horizon in which the payment period with the minimum $DSCR^{Primary}$ will be sought is reduced. This horizon extends over the following two macroeconomic cycles, in accordance with the Cyclical Stress generated by HR Ratings and described in previous sections.

However, HR Ratings takes into account the possibility that the amortization structure may entail a credit risk upon applying the time horizon criterion that would be overlooked in the analysis, especially if the amortization curve is increasing. In the stagflation scenario, if the debt structure is approaching maturity and greater weakness associated with a lower Primary DSCR than expected in the next two macroeconomic cycles is estimated, HR Ratings will take that period into account to determine the critical stress period.

However, some amortization curves could imply a credit risk that, applying the time horizon criterion, would not be captured within the analysis. In particular, this would occur if the amortization curve is increasing. In other words, if the amortization curve is loaded at maturity and, therefore, a greater weakness is estimated in that period; it is possible to find a lower $DSCR^{Primary}$ compared to the values of $DSCR^{Primary}$ within the following two macroeconomic cycles. Under such circumstances, HR Ratings will take into account the type of amortization curve, the difference between the minimum projected minimum $DSCR^{Primary}$ (within and outside the two macroeconomic cycles) and the existence of any relevant percentage of Debt Service to be covered at (or close to) the maturity date to determine the PEC.

[25] Regarding the determination of the SD's outstanding balance, HR Ratings must confirm with the borrower whether the contracted amount was equal to the amount actually drawn. If no information is available, for purposes of the model it will be assumed that 100.0% of the contracted amount was drawn down on the due date for such drawdown as per the SD's legal documentation. If it is confirmed that the amount drawn down is less than the contracted amount, future drawdowns should be monitored if the drawdown period is still in effect.

If the debt structure's source of payment has particular characteristics in its year-on-year sharing, or if a relevant percentage of the debt needs to be covered on the maturity date (or close to it), HR Ratings may define the critical stress scenario as whichever one provides the greatest stress for the structure.

Calculation of TSR with R33 funds

This section outlines the TSR calculation process for state debt backed by specific R33 revenue flows: FAFEF and FAIS. Unlike R28 funds, FAFEF and FAIS have certain rules that determine how the resources available for payment of an entity's debt obligations are calculated.

As mentioned above, Mexican federal legislation allows states to allocate up to 25.0% of the revenues they are entitled to annually, both for FAFEF and FAIS, in favor of a SD. This provision sets forth that, for obligations payable in two or more tax years, the entity may in future years allocate a minimum amount equal to 25.0% of the revenues received in the year the SD is contracted.

The following example has been developed to illustrate the foregoing. Let us assume that the FAFEF in a future year (t_1) drops 30.0% compared to the year of contracting (t_0), in other words, the fund's resources in t_1 account for only 70.0% of the amount of t_0. If the entity initially allocated 25.0% of this fund, the equivalent amount of resources to be used for the SD in t_1 would be 25.0% of 70.0%, which comes to 17.5% of the original amount in t_0. In this scenario, the amount of resources received by the structure would be 35.7% of the current year's FAFEF (t_1).

For the calculation of the TSR, if there is an amount in excess of the absolute minimum guaranteed by the FAFEF or FAIS program (25.0%), it will be considered as an available resource in the SD analysis. The reason why an excess amount could exist is the result of the projected growth of both FAFEF and FAIS in the long term. The calculation of the TSR is based on the available resources of the payment source for the year in question and other liquid resources that are part of the SD.

Rating Equivalencies

The SD rating is related to the TSR value through an equivalence. The correspondence between the TSR calculated in the flow financial model and the rating level is determined on the basis of Figure 3.4.5.2. This figure shows the intervals or ranges in a curve, on a scale from 0% to 100%, with which HR Ratings will determine the credit rating based on the value of the TSR.

The rating equivalence of a TSR value is changed depending on the origin of the primary payment source and the entity. As mentioned in the section on sources of payment, there are two types of origin: federal and own sources. If the primary revenue is of federal origin and the contracting entity is a state, the ranges set forth in the "Federal Source (States)" column is used to obtain a rating value. In any other case, the ranges set forth in the second column are used.

Figure 3. Rating Equivalence to TSR

Rating	TSR Range	
	Federal Source (States)	Own Source (Subnationals)
HR AAA (E)	[75.0% , 100%]	[85.0% , 100%]
HR AA+ (E)	[69.0% , 75.0%)	[78.0% , 85.0%)
HR AA (E)	[63.0% , 69.0%)	[71.0% , 78.0%)
HR AA (E)	[57.0% , 63.0%)	[64.0% , 71.0%)
HR A+ (E)	[51.0% , 57.0%)	[56.4% , 64.0%)
HR A (E)	[45.0% , 51.0%)	[48.8% , 56.4%)
HR A- (E)	[39.0% , 45.0%)	[41.2% , 48.8%)
HR BBB+ (E)	[32.0% , 39.0%)	[33.6% , 41.2%)
HR BBB (E)	[25.0% , 32.0%)	[26.0% , 33.6%)
HR BBB- (E)	[18.0% , 25.0%)	[18.4% , 26.0%)
HR BB+ (E)	[16.0% , 18.0%)	[16.0% , 18.4%)
HR BB (E)	[14.0% , 16.0%)	[14.0% , 16.0%)
HR BB- (E)	[12.0% , 14.0%)	[12.0% , 14.0%)
HR B+ (E)	[10.0% , 12.0%)	[10.0% , 12.0%)
HR B (E)	[8.0% , 10.0%)	[8.0% , 10.0%)
HR B- (E)	[6.0% , 8.0%)	[6.0% , 8.0%)
HR C+ (E)	[4.0% , 6.0%)	[4.0% , 6.0%)
HR C (E)	[2.0% , 4.0%)	[2.0% , 4.0%)
HR C- (E)	[0.0% , 2.0%)	[0.0% , 2.0%)

Source: HR Ratings

However, if an annual review or the follow-up process identifies that the TSR has changed to another rating range as a result of the analysis performed, HR Ratings may maintain the rating or modify it considering the TSR's expected evolution.

In the following sections HR Ratings provides examples of how the TSR is calculated, considering the variables, items, metrics and process defined in the previous section. Figure 4 shows a structure in which the minimum Primary Coverage at t_m is 2.43x; and it is around this month that the Critical Stress Period is built.

In this particular example, the Post-Critical Stress Period is comprised by five periods and the reserve fund's target balance is P$25.0 million (m). As can be seen, the TSR is 80.62% and allows for the $DSCR_{tm+6}^{Primary} = 0.49\text{x}$ and the $DSCR_{tm+6}^{Secondary}$= 1.0x. In this case, the entire reserve fund is used during the Critical Stress Period, and the remnants during the Post-Critical Stress Period are sufficient to fully replenish the reserve fund.

Figure 4. Model for determining TSR (five postcritical periods)

	Cyclical Allocated Revenue	Debt Service	Primary Cyclical DSCR	Critical Stress Period.	Critical Revenue (TSR)	Debt Service	Primary DSCR	Balance without Reserve Fund	Initial Reserve Fund Balance	Secondary DSCR	Remnants	Reserve Fund Final Balance
				2.43x	**(80.62%)**							
	9,126,966	3,285,468	2.78x		9,126,966	3,285,468	2.78x	5,841,498	25,000,000	10.39x	5,841,498	25,000,000
	9,128,335	3,334,750	2.74x		9,128,335	3,334,750	2.74x	5,793,585	25,000,000	10.23x	5,793,585	25,000,000
	9,129,704	3,384,771	2.7x		9,129,704	3,384,771	2.70x	5,744,933	25,000,000	10.08x	5,744,933	25,000,000
	9,131,074	3,435,543	2.66x		9,131,074	3,435,543	2.66x	5,695,531	25,000,000	9.94x	5,695,531	25,000,000
	9,132,442	3,487,076	2.62x	**t m-6**	1,769,754	3,487,076	0.51x	-1,717,322	25,000,000	7.68x	0	23,282,678
	9,133,813	3,539,382	2.58x	t m-5	1,770,019	3,539,382	0.50x	-1,769,363	23,282,678	7.08x	0	21,513,315
	9,156,648	3,592,473	2.55x	t m-4	1,774,444	3,592,473	0.49x	-1,818,028	21,513,315	6.48x	0	19,695,287
	9,179,539	3,646,360	2.52x	t m-3	1,778,881	3,646,360	0.49x	-1,867,479	19,695,287	5.89x	0	17,827,808
	9,202,488	3,701,055	2.49x	t m-2	1,783,328	3,701,055	0.48x	-1,917,728	17,827,808	5.3x	0	15,910,080
	9,225,495	3,756,571	2.46x	t m-1	1,787,786	3,756,571	0.48x	-1,968,785	15,910,080	4.71x	0	13,941,295
Critical Stress Period	9,248,558	3,812,920	**2.43x**	**t m**	1,792,256	3,812,920	0.47x	-2,020,664	13,941,295	4.13x	0	11,920,631
	9,271,680	3,812,939	2.43x	t m+1	1,796,736	3,812,939	0.47x	-2,016,203	11,920,631	3.6x	0	9,904,428
	9,294,859	3,812,958	2.44x	t m+2	1,801,228	3,812,958	0.47x	-2,011,730	9,904,428	3.07x	0	7,892,698
	9,373,865	3,812,977	2.46x	t m+3	1,816,539	3,812,977	0.48x	-1,996,438	7,892,698	2.55x	0	5,896,260
	9,453,543	3,812,996	2.48x	t m+4	1,831,979	3,812,996	0.48x	-1,981,017	5,896,260	2.03x	0	3,915,243
	9,533,898	3,813,015	2.5x	t m+5	1,847,551	3,813,015	0.48x	-1,965,464	3,915,243	1.51x	0	1,949,779
	9,614,936	3,813,034	2.52x	**t m+6**	1,863,255	3,813,034	**0.49x**	-1,949,779	1,949,779	**1.00x**	0	0
	9,696,663	3,813,053	2.54x		9,696,663	3,813,053	2.54x	5,883,610	0	2.54x	0	5,883,610
	9,779,085	3,813,072	2.56x		9,779,085	3,813,072	2.56x	5,966,013	5,883,610	4.11x	0	11,849,623
Post-Critical Stress Period	9,925,771	3,813,091	2.6x		9,925,771	3,813,091	2.60x	6,112,680	11,849,623	5.71x	0	17,962,303
	10,074,658	3,813,110	2.64x		10,074,658	3,813,110	2.64x	6,261,547	17,962,303	7.35x	0	24,223,850
	10,225,778	3,813,129	2.68x	**t m+6+5**	10,225,778	3,813,129	2.68x	6,412,648	24,223,850	9.03x	5,636,498	**25,000,000**
	10,379,164	3,813,149	2.72x		10,379,164	3,813,149	2.72x	6,566,016	25,000,000	9.28x	6,566,015	25,000,000
	10,379,745	3,813,168	2.72x		10,379,745	3,813,168	2.72x	6,566,578	25,000,000	9.28x	6,566,577	25,000,000
	10,380,327	3,813,187	2.72x		10,380,327	3,813,187	2.72x	6,567,140	25,000,000	9.28x	6,567,140	25,000,000

Source: HR Ratings

With these characteristics, and with a TSR = 80.62%, the credit rating for this example is "HR AAA (E)". However, and as will be shown in Figure 5, the TSR value is sensitive to the extension of the Post-Critical Stress Period. In this case, for the same SD, this period is reduced to three periods.

Figure 5. Model for determining TSR (three postcritical periods)

	Cyclical Allocated Revenue	Debt Service	Primary Cyclical DSCR	Critical Stress Period.	Critical Revenue (TSR)	Debt Service	Primary DSCR	Balance without Reserve Fund	Initial Reserve Fund Balance	Secondary DSCR	Remnants at end of period	Reserve Fund Final Balance
				2.43x	**(74.80%)**							
	9,126,966	3,285,468	2.78x		9,126,966	3,285,468	2.78x	5,841,498	25,000,000	10.39x	5,841,498	25,000,000
	9,128,335	3,334,750	2.74x		9,128,335	3,334,750	2.74x	5,793,585	25,000,000	10.23x	5,793,585	25,000,000
	9,129,704	3,384,771	2.7x		9,129,704	3,384,771	2.70x	5,744,933	25,000,000	10.08x	5,744,933	25,000,000
	9,131,074	3,435,543	2.66x		9,131,074	3,435,543	2.66x	5,695,531	25,000,000	9.94x	5,695,531	25,000,000
	9,132,442	3,487,076	2.62x	**t m-6**	2,301,706	3,487,076	0.66x	-1,185,370	25,000,000	7.83x	0	23,814,630
	9,133,813	3,539,382	2.58x	t m-5	2,302,051	3,539,382	0.65x	-1,237,331	23,814,630	7.38x	0	22,577,299
	9,156,648	3,592,473	2.55x	t m-4	2,307,806	3,592,473	0.64x	-1,284,667	22,577,299	6.93x	0	21,292,632
	9,179,539	3,646,360	2.52x	t m-3	2,313,576	3,646,360	0.63x	-1,332,784	21,292,632	6.47x	0	19,959,848
	9,202,488	3,701,055	2.49x	t m-2	2,319,360	3,701,055	0.63x	-1,381,696	19,959,848	6.02x	0	18,578,152
	9,225,495	3,756,571	2.46x	t m-1	2,325,158	3,756,571	0.62x	-1,431,413	18,578,152	5.56x	0	17,146,739
Critical Stress Period	9,248,558	3,812,920	**2.43x**	**t m**	2,330,971	3,812,920	0.61x	-1,481,949	17,146,739	5.11x	0	15,664,790
	9,271,680	3,812,939	2.43x	t m+1	2,336,799	3,812,939	0.61x	-1,476,140	15,664,790	4.72x	0	14,188,650
	9,294,859	3,812,958	2.44x	t m+2	2,342,641	3,812,958	0.61x	-1,470,317	14,188,650	4.34x	0	12,718,333
	9,373,865	3,812,977	2.46x	t m+3	2,362,553	3,812,977	0.62x	-1,450,424	12,718,333	3.96x	0	11,267,909
	9,453,543	3,812,996	2.48x	t m+4	2,382,635	3,812,996	0.62x	-1,430,361	11,267,909	3.58x	0	9,837,548
	9,533,898	3,813,015	2.5x	t m+5	2,402,887	3,813,015	0.63x	-1,410,128	9,837,548	3.21x	0	8,427,420
	9,614,936	3,813,034	2.52x	**t m+6**	2,423,312	3,813,034	**0.64x**	-1,389,723	8,427,420	**2.85x**	0	7,037,697
	9,696,663	3,813,053	2.54x		9,696,663	3,813,053	2.54x	5,883,610	7,037,697	4.39x	0	12,921,307
Post-Critical Stress Period	9,779,085	3,813,072	2.56x		9,779,085	3,813,072	2.56x	5,966,013	12,921,307	5.95x	0	18,887,320
	9,925,771	3,813,091	2.6x	**t m+6+3**	9,925,771	3,813,091	2.60x	6,112,680	18,887,320	7.56x	0	**25,000,000**
	10,074,658	3,813,110	2.64x		10,074,658	3,813,110	2.64x	6,261,547	25,000,000	9.2x	6,261,547	25,000,000
	10,225,778	3,813,129	2.68x		10,225,778	3,813,129	2.68x	6,412,648	31,261,547	10.88x	6,412,648	25,000,000
	10,379,164	3,813,149	2.72x		10,379,164	3,813,149	2.72x	6,566,016	37,674,195	12.6x	6,566,016	25,000,000
	10,379,745	3,813,168	2.72x		10,379,745	3,813,168	2.72x	6,566,578	44,240,211	14.32x	6,566,578	25,000,000
	10,380,327	3,813,187	2.72x		10,380,327	3,813,187	2.72x	6,567,140	50,806,789	16.05x	6,567,140	25,000,000

Source: HR Ratings

Consequently, $DSCR_{tm+6}^{Primary} = 0.64\text{x}$ and $DSCR_{tm+6}^{Secondary}$ = 2.85x, both greater than in the case where the Post-Critical Stress Period was five periods. Given that the example now considers only three periods to reinstate the reserve fund's target balance, the structure cannot use the entire fund during the Critical Stress Period and the TSR dropped to 74.80%, which corresponds to a credit rating of "HR AA+ (E)".

It should be noted that the TSR calculation and the analysis in general may be subject to additional constraints if there are legal limitations set out in the structure's legal documentation. For example, if a clause stipulates that the coverage of a specific payment source must not fall below a certain threshold, such a restriction must be considered in the calculation process.

Calculation of TSR with State Funds for Municipal Strengthening

Given that funds originated by a state have a greater potential risk than the ones generated by a federal entity, the funds created by the state receive a discount in their flow. HR Ratings incorporates an additional stress factor in the TSR calculation method for municipal debt backed by these resources. This procedure is outlined below.

The TSR is the only result that resolves an optimization process subject to compliance with an additional stress factor and a reduction in the state fund source. The complete process for determining the TSR is shown using the formulas below:

Determine TSR

Subject to:

i) $(1 - TSR)\sum_{t=1}^{13} FFP_t + (1 - Z)\sum_{t=1}^{13} FEFM_t + RF_{t=1} \geq \sum_{t=1}^{13} DS_t$

ii) $Y = f(TSR)$

iii) $Z = TSR + Y$

iv) $RF_{T+n} = TB_{T+n}$

Where:

TSR: Percentage reduction applicable to the primary source of payment.

Y: Additional stress factor of the state fund source.

Z: Percentage reduction applicable to the state fund source.

PPF_t: PPF_t allocated income in month t.

$FEFM_t$State Fund for Municipal Strengthening in month t.

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

RF_t: Reserve Fund in month t.

DS_t: Debt Service in month t.

TB_T: Target Reserve Fund Balance at month T.

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

In the same way as for the rest of the structures, the month with the expected minimum $DSCR^{Primary}$ will be determined within the cyclic stress period. The Critical Stress Period will be set around this month and a differentiated reduction will be applied in this period as follows:

- The reduction for the primary source of payment will be calculated using the TSR model. This reduction will determine the additional stress factor to be applied to the state fund source.
- Once the additional stress factor has been determined, the reduction on the state fund will be defined as the sum of the primary payment source's reduction level plus the additional stress factor. The reduction in the state fund will therefore depend on the reduction in the primary source of payment.

In view of the foregoing, the SD's credit rating will depend on the differentiated reduction applied to all the payment sources, including the state fund. The value of "$Y = f(TSR)$" may vary depending on the value of the TSR, as shown in Figure 6.

Figure 6. Allocation of the TSR calculation

Own Source TSR Range	Y=f(TSR)
[85.0% , 100%]	0.07
[78.0% , 85.0%)	0.07
[71.0% , 78.0%)	0.07
[64.0% , 71.0%)	0.07
[56.4% , 64.0%)	0.076
[48.8% , 56.4%)	0.076
[41.2% , 48.8%)	0.076
[33.6% , 41.2%)	0.076
[26.0% , 33.6%)	0.076
[18.4% , 26.0%)	0.076
[16.0% , 18.4%)	0.024
[14.0% , 16.0%)	0.02
[12.0% , 14.0%)	0.02
[10.0% , 12.0%)	0.02
[8.0% , 10.0%)	0.02
[6.0% , 8.0%)	0.02
[4.0% , 6.0%)	0.02
[2.0% , 4.0%)	0.02
[0.0% , 2.0%)	0.02

Source: HR Ratings

Qualitative Adjustments

The SD’s credit rating is based on the value of the TSR, and if any factors that cannot be incorporated into the quantitative model are identified, they will be incorporated through Qualitative Adjustments. These factors are atypical and this section describes which ones may be considered and the potential impact each one may have on the credit rating.

Unsecured Rating of the Entity

The entity's credit rating may be relevant under certain conditions. If the entity in question offers a guarantee for the SD, it should be evaluated whether it is a secondary or substitute source in order to determine whether it could affect the quantitative model. If the guarantee is comprised by federal transfers, the entity's rating should be higher than or equal to “HR BBB-”, and “HR BBB” if the guarantee is comprised by own revenues. If the entity's unsecured rating is lower than these levels for each type of payment source, the SD’s rating may be downgraded.

Entity Guarantee

The SD's credit rating is affected by whether or not there is a guarantee. If there is a guarantee, HR Ratings considers the contracting entity’s credit rating to determine its value. For these adjustments, a base rating is established that varies according to the origin of the revenues: “HR BBB-” for federal revenues and “HR BBB” for own revenues. There are three possible combinations of these scenarios:

Scenario 1: Entity's unsecured rating higher than or equal to the unsecured base rating:
If the entity's credit rating is higher than or equal to the base rating and the SD does not have any guarantees from the entity, the SD's credit rating will not be affected by the entity's rating. This is because the entity with a high rating is deemed unlikely to default on its obligations, so the SD does not require additional support. In this case, no qualitative adjustment will be made to the SD’s rating.

Scenario 2: Entity's unsecured rating higher than or equal to the base rating with a guarantee:
If the entity's credit rating is higher than or equal to the base rating and the SD has a guarantee from the entity, the entity's credit rating sets a floor for the SD's rating. This means that the SD cannot have a lower credit rating than the entity. In this case, the SD's credit rating will be based on the analysis of the SD itself and the guarantee provided by the entity.

Scenario 3: Entity's unsecured rating lower than the base rating:
If the entity's credit rating is lower than the base rating, the guarantee from the entity is considered irrelevant. This is because, with a low rating, it is unlikely that the entity will be able to meet its obligations in the event of financial difficulties. In addition, it is considered that the low-rated entity could restructure its debt or modify the legal documentation to access trust funds, which would weaken the SD's credit quality. In this case, HR Ratings could make a one-notch downgrade to the SD's rating.

HR Ratings considers “HR BBB -” a minimum credit rating for these adjustments if the revenues come from federal sources, and “HR BBB” if they come from own sources of payment.

Resources from a second entity

If the SD has federal revenues as a source of payment and there are resources to the contracting entity, as well as another guarantee from a second entity, HR Ratings should proceed as follows:

1. If the resource is liquid and circulates through the payment trust accounts (i.e., there is an allocation), HR Ratings should monetize this resource in the calculation of the TSR[26].
2. If the resource is not liquid but guarantees payment of all the financial obligations of the SD contracted by the entity, an adjustment will only be proposed if the guarantor is the Federal Government. In such cases, the SD will be equal to the Federal Government's credit rating.

Qualitative Adjustment analyses usually consider the entity's unsecured rating and the possibility of the entity contributing resources directly to the trust. In the case of municipalities, it is also possible to take the existence of state resources into account, while for decentralized agencies resources from the state or a municipality, as applicable, are considered.

Structural Soundness Adjustment

If the SD's rating is the same as the entity's rating, the minimum financial conditions necessary to upgrade the rating are as follows:

1. **Favorable legal analysis**: The SD must have a legal analysis confirming the validity, enforceability and opposability of the trust before third parties, and that its implementation is adequate.
2. **Debt Service Coverage (2.0x)**: The SD must maintain a minimum annual debt service coverage of 2.0x throughout its term.
3. **Reserve fund (1.0x[27])**: The SD must have a minimum annual reserve fund equivalent to 1.0x of debt service throughout its term.

It should be noted that, in order for HR Ratings to upgrade a rating, the SD must not contain any contractual clauses that significantly increase its credit risk. It should also be noted that the upgrade outlined in this section requires that the structure's legal documentation allows the entity to provide resources in situations of financial stress.

Adjustments due to Diversification

HR Ratings recognizes that the diversification of payment sources can contribute to the stability of an entity's revenues and, in some cases, offer protection against the dissolution of a payment source. This additional stability may therefore be considered when making a qualitative rating adjustment. The diversification of payment sources may be considered as a rating upgrade factor, so long as these sources are stable, properly linked to the trust and comply with the structure's terms.

[26] In such cases it is necessary to consider whether the guarantee complies with any of the assumptions of the "Secondary or Substitute Payment Sources" section. Similarly, the fact that the second entity's unsecured rating is below HR BBB- will be considered.
[27] In cases where the SD's contracting entity is a municipality or decentralized agency, the minimum level of the reserve fund must be at least 2.0x in order to apply this qualitative adjustment.

Adjustments due to the diversification of payment sources are subject to the simultaneous fulfillment of the following two conditions:

- **Minimum share of the secondary payment source**: The secondary payment source must comprise an adequate and consistent share of the total revenues the structure has access to. Such share must be at least 20.0% of the SD's total payment sources.
- **Provider entity credit rating[28]**: Depending on which type of entity provides the secondary revenues, at least one of the following requirements must be met:
    - Federal Entities: The entity providing the revenues is the federal government.
    - States: If the entity providing the revenues is a state and they come from a federal resource, its credit rating must be equal to or higher than HR BBB-.[29] On the other hand, if the affected secondary revenues are of its own origin, the credit rating must be equal to or higher than HR BBB.
    - Municipalities and decentralized agencies: If the entity providing the revenues is a municipality or decentralized agency, its credit rating must be greater than or equal to HR BBB.

If the structure has more than two allocated sources of revenue, HR Ratings will analyze the available sources. However, the benefit of diversification is limited to one notch regardless of the number of sources available.

Adjustment related to the Reserve Fund

In the case of debt contracted by municipalities or decentralized agencies, the reliance on federal resources transferred by the state exposes the debt to operational risks. As a result, the absence of a reserve equivalent to at least two months of debt service will bring about a negative qualitative adjustment (one notch) in the rating. This is justified because the resources of a reserve are not subject to the same operational risks.

Affirmative and Negative Covenants

If, for any reason, the SD's legal documentation links the structure's credit risk to some type of risk unrelated to its operation, HR Ratings must evaluate the potential impact on the SD's credit quality. These types of risks are usually found in the credit agreement or issuance title section on Affirmative and Negative Covenants ("Covenants") and, since they have been signed by the parties involved, the latter have committed to comply with them.

For HR Ratings, the potential risks posed by these obligations are not based on their mere existence but on the possible triggering of an "Accelerated Maturity" event if the entity fails to comply with any clause[30] .

For the purposes of this methodology, an Accelerated Maturity event means that the lender (bank or public investor) is entitled to demand immediate payment of all outstanding principal and accrued interest on the debt, as well as any other obligation that

[28] In this case, the entity providing the secondary source of payment may be the same contracting entity or a secondary entity.

[29] A risk differentiation can be made between the flows transferred to a state, municipality and decentralized organism.

[30] The default of one of these obligations may not only trigger an Accelerated Maturity event, as there are also Preventive Events and Acceleration Events (partial or total). In the latter two cases, the effect on the SD's credit quality is quantifiable and is usually reflected in the value of the *TSR*.

the entity has agreed to. In the opinion of HR Ratings, if the lender decides to trigger this type of event, the SD's rating could be affected because it is likely that the entity would not have the liquidity to cover such obligation at that time.

The Affirmative and Negative Covenants identified by HR Ratings in the legal documentation of different SDs include: 1) maintaining a minimum level of debt coverage; 2) maintaining the reserve fund's target balance; 3) compliance by the entity with certain public finance metrics; 4) maintaining a minimum rating of the entity and/or the SD; 5) contracting financial hedging derivatives; 6) the requirement to send information on public finances to a third party involved in the transaction; and 7) cross maturity with other financial obligations held by the entity triggered by a default[31] .

The credit risk of noncompliance with the aforementioned clauses cannot be quantified. However, the analysis may focus on the likelihood of such an event occurring. Issuance contracts and securities usually set forth that the default of one or several of these obligations by the entity does not automatically trigger an Accelerated Maturity event, but instead the decision is taken by the lending bank or by the holders' meeting depending on the circumstances.

The qualitative adjustment will be based on HR Ratings' perception and experience regarding the likelihood of the bank or the holders' meeting triggering an Acclerated Maturity event. In such cases, different rating actions may be taken, from a change of attribute to a downgrade. This is due to the fact that the triggering of an Accelerated Maturity event usually considers cure periods or, if appropriate, would lead to the entity declaring itself unable to fully settle the obligation as demanded. Consequently, failure to pay the obligation would mean that the SD's rating at that time is equivalent to HR D (E).

Figure 7 explains how adjustments will be made if there are cross maturity clauses related to default events or even affirmative and negative covenants that, in HR Ratings' opinion, substantially increase the risk of triggering a maturity:

Figure 7. Accelerated Maturity

Affirmative and Negative Covenants

Maturity not related to a default event
- Rating may be downgraded by one notch if there are contractual clauses that substantially increase the risk of triggering accelerated maturity

Cross default related to a default event
- Rating may be downgraded by one notch if there are contractual clauses related to short-term debt instruments with the same bank, with other banks or with other financial institutions *
- Rating may be downgraded by one notch if there are contractual clauses related to liabilities that may be reported to the Credit Bureau *

Source: HR Ratings
*An adjustment is only applicable if the entity's rating is less than or equal to HR A+

[31] This type of clause refers to the fact that the default in the payment of another financial obligation in force and recognized by the entity could lead to the declaration of default of 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 type of liability, obligations within the same or different payment trusts, or with the same or different lenders.

It is important to clarify that an SD’s credit rating may be subject to a write-off of up to three notches in cases in which the risks shown in Figure 7 occur simultaneously and where the entity's rating is equal to or lower than “HR A+” or its equivalent in the market. If the rating is greater than or equal to “HR AA-”, or its equivalent in the market, the SD may only receive a one-notch write-off when there are clauses on events unrelated to a default but which increase the risk of accelerated maturity being triggered.

***For further information regarding this methodology(ies), please visit https://hrratings.com/methodology/**

**** HR Ratings de México, S.A. de C.V. ("HR Ratings"), is an credit rating agency authorized by the National Banking and Securities Commission(CNBV) and registered by the Securities and Exchange Commission (SEC) as a Nationally Recognized Statistical Rating Organization (NRSRO) for the assets of public finance, corporates and financial institutions as described in section 3 (a) (62) (A) and (B) subsection (i), (iii) and (v) of the US Securities Exchange Act of 1934 and certified as a Credit Rating Agency (CRA) by the European Securities and Markets Authority (ESMA) and the Financial Conduct Authority (FCA).**

The ratings and/or opinions of HR Ratings de México S.A. de C.V. (HR Ratings) are opinions regarding the credit quality and/or the asset management capacity, or relative to the performance of the tasks aimed at the fulfillment of the corporate purpose, by issuing companies and other entities or sectors, and are based on exclusively in the characteristics of the entity, issue and/or operation, regardless of any business activity 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 personnel and do not constitute recommendations to buy, sell or maintain any instrument, or to carry out any type of business, investment or operation, and may be subject to updates at any time, in accordance with the rating methodologies of HR Ratings.

HR Ratings bases its ratings and/or opinions on information obtained from sources that are believed to be accurate and reliable. HR Ratings, however, does not validate, guarantee or certify the accuracy, correctness or completeness of any information and is not responsible for any errors or omissions or for results obtained from the use of such information. Most issuers of debt securities rated by HR Ratings have paid a fee for the credit rating based on the amount and type of debt issued. The degree of creditworthiness of an issue or issuer, opinions regarding asset manager quality or ratings related to an entity's performance of its business purpose are subject to change, which can produce a rating upgrade or downgrade, without implying any responsibility for HR Ratings. The ratings issued by HR Ratings are assigned in an ethical manner, in accordance with healthy market practices and in compliance with applicable regulations found on the www.hrratings.com rating agency webpage. HR Ratings' Code of Conduct, rating methodologies, rating criteria and current ratings can also be found on the website.

Ratings and/or opinions assigned by HR Ratings are based on an analysis of the creditworthiness of an entity, issue or issuer, and do not necessarily imply a statistical likelihood of default, HR Ratings defines as the inability or unwillingness to satisfy the contractually stipulated payment terms of an obligation, such that creditors and/or bondholders are forced to take action in order to recover their investment or to restructure the debt due to a situation of stress faced by the debtor. Without disregard to the aforementioned point, in order to validate our ratings, our methodologies consider stress scenarios as a complement to the analysis derived from a base case scenario. The fees HR Ratings receives from issuers generally range from US$1,000 to $1,000,000 (one million dollars, legal tender in the United States of America) (or the equivalent in another currency) per offering. In some cases, HR Ratings will rate all or some of a particular issuer's offerings for an annual fee. Annual fees are estimated to vary between $5,000 and US$2,000,000 (five thousand to two million dollars, legal tender in the United States of America) (or the equivalent in another currency).

Media Contact
comunicaciones@hrratings.com