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## Methodology for assigning Credit and Market Ratings to Investment Funds

This methodology establishes the procedure and the main factors to be considered by HR Ratings to assign Credit and Market Ratings to investment funds. The methodology incorporates a process that evaluates the factors that affect the Credit and Market Rating separately and includes a qualitative assessment of six factors that weigh over the assigned rating.

In the evaluation process to determine the Credit Rating, HR Ratings uses a matrix that assigns a risk factor to each instrument that forms part of the Investment Fund's portfolio considering its credit rating and its remaining term. This quantitative analysis weighs the risk factor according to the value of the instrument. The Credit Rating of the Investment Fund will depend on the result of the weighted average of the credit ratings within the portfolio, as well as aspects such as whether the instruments are issued by government entities.

For the Market Rating, the quantitative analysis considers the duration of each instrument within the portfolio and weights it according to the value represented by each instrument in the portfolio. The Market Risk Rating will be assigned in one of two scales, which are associated with the term prospectus defined for each Investment Fund. The ST scale corresponds to the funds referred to as short- or medium-term funds, while LT corresponds to the funds referred to as long term funds.

Once the quantitative credit and market evaluation is obtained, HR Ratings considers six additional factors that are weighted with 20% of the total of each rating. The factors considered in this section are: (i) the history and profile of the senior executives, (ii) the internal control mechanisms, (iii) the structure and decision-making process (iv) the remuneration policy, (v) the historical analysis of the portfolio and, (vi) the use of derivatives, among other factors.

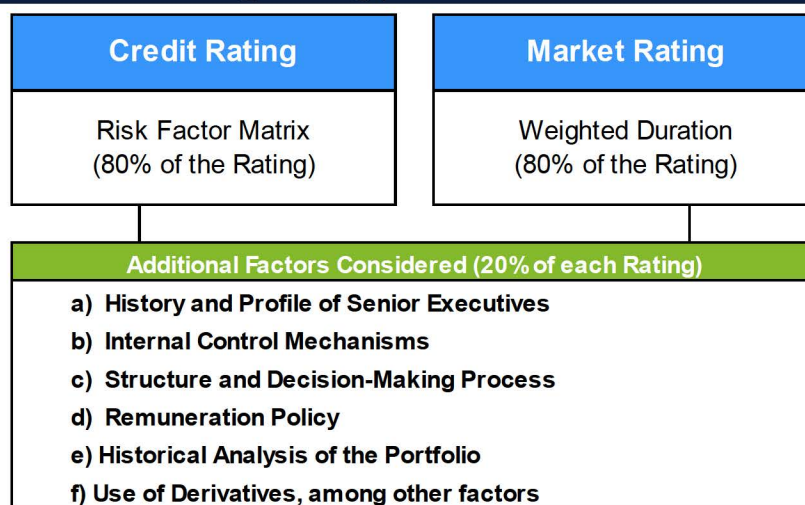
The methodology also incorporates the procedure for changes in the credit rating of an instrument of the fund, where HR Ratings will allow a grace period of up to three months in which the administrator may replace the instrument or carry out a strategy to rebalance the portfolio. This will be applied considering that there may be situations where the operator has contemplated the modification of the composition of the portfolio but due to market conditions they may not carry it out with the minimum possible impact.

## 1. Introduction

The HR Ratings Investment Funds Methodology establishes the procedure and the main factors to be considered by HR Ratings to assign credit and market ratings to investment funds. In the evaluation process to assign the Credit Rating, HR Ratings uses a matrix that assigns a risk factor to each instrument according to its credit rating and its remaining term. In the quantitative analysis, the risk factor is weighted according to the value of the instrument and a score is obtained. In the case of the Market Rating, the duration of each instrument is calculated and weighted by its value.

Both quantitative analyses receive an 80% weight and the remaining percentage corresponds to the analysis of six additional factors. This analysis impacts both processes, according to the details included in Table 1:

**Table 1: HR Ratings' rating process**



Source: HR Ratings.

## 2. Quantitative Analysis of the Investment Fund's Credit Risk Rating

Through the quantitative analysis, HR Ratings assigns a risk score. This process uses a credit risk matrix with which a factor is established based on the credit rating of the instruments of the Investment Fund and on its remaining term. These factors will be weighted considering the percentage that each instrument represents in the portfolio to obtain a score. The last step is to assign a rating with that score. The matrix shown in Table 2 shows the corresponding risk factor. The risk factors shown in the matrix grow as the remaining maturity term increases and as the credit quality of the instruments decreases.



**Table 2: Risk Factors for Instruments**

Ratings		[0,1) year	[1,2) years	[2,3) years	[3,4) years	[4,5) years	[5,6) years	(6,∞) years
Long-T	Short-T							
HR AAA	HR+1	1	2	5	10	25	50	95
HR AA+	HR1	5	10	15	25	55	115	190
HR AA	HR1	5	20	35	50	95	195	300
HR AA-	HR1	5	40	65	85	145	290	425
HR A+	HR2	15	70	105	130	205	400	565
HR A	HR2	15	110	155	185	275	525	720
HR A-	HR2	15	160	215	250	355	665	890
HR BBB+	HR3	75	220	285	325	445	820	1,075
HR BBB	HR3	75	290	365	410	545	990	1,275
HR BBB-	HR3	75	370	455	505	655	1,175	1,490
HR BB+	HR4	550	870	1,395	1,945	2,520	3,120	3,745
HR BB	HR4	557	952	1,427	1,977	2,602	3,302	4,077
HR BB-	HR4	664	1,184	1,859	2,659	3,584	4,634	5,809
HR B+	HR5	846	1,616	2,616	3,866	5,366	7,116	9,116
HR B	HR5	1,028	2,298	3,798	5,798	8,298	11,298	14,798
HR B-	HR5	1,410	3,280	5,180	7,680	10,780	14,480	18,780
HR C+	HR5	2,092	4,512	6,612	9,262	12,462	16,212	20,512
HR C	HR5	3,274	6,194	8,694	11,694	15,194	19,194	23,694
HR C-	HR5	4,956	8,876	12,876	17,876	23,876	30,876	38,876
HR D	HRD	7,138	12,558	18,058	25,058	33,558	43,558	55,058
<b>Government</b>		0	1	2.5	5	12.5	25	47.5

Source: HR Ratings.

This matrix shows that an instrument with an HR AA- rating, with a remaining term of one to two years, will be assigned a 40-point factor. While the risk associated with instruments with an HR BB- rating and a maturity term between four and five years corresponds to a 2,659 points factor. The matrix also considers a risk factor for government instruments and for instruments that have received an explicit or implicit guarantee from the federal government.<sup>1</sup> These instruments, as it may be seen, will receive a risk factor with a discount of 50% with respect to the instruments rated as HR AAA.

The score determined, after calculating the weighted average of the risk factors of the instruments of the portfolio, will correspond to a score according to what is established in Table 3, which is shown below:

<sup>1</sup> For the Mexican case, the governmental instruments refer to several Federal Government instruments, such as BONDES, UDIBONOS and UMS, among others. The special treatment assigned to these instruments is due to their high liquidity.

**Table 3: Scores and Ratings**

Score	Rating	Score	Rating
10.0	HR AAA	1,411.0	HR BB+
25.0	HR AA+	1,643.0	HR BB
50.0	HR AA	2,237.5	HR BB-
85.0	HR AA-	3,207.0	HR B+
130.0	HR A+	4,489.0	HR B
185.0	HR A	5,896.0	HR B-
250.0	HR A-	7,653.0	HR C+
325.0	HR BBB+	10,785.0	HR C
410.0	HR BBB	15,467.0	HR C-
925.0	HR BBB-	>15,467	HR D

Source: HR Ratings.

This table shows that if the portfolio obtains a score of less than 10 points, it is assigned an initial HR AAA credit rating, or if the score is between 410 and 925 points the rating of the fund would correspond to HR BBB-.

However, several factors must be considered after performing the quantitative analysis. For example, if HR Ratings has not assigned a rating to any instrument, it may use the rating assigned to the counterpart. However, if HR Ratings has not assigned a rating to the instrument or to the counterpart, it may use the rating assigned by another rating agency, in accordance with the provisions of the section on Influential Ratings in the HR Ratings General Methodological Criteria. If there are multiple ratings in the market, the rating that best represents the market consensus will be used. If there is no market rating for some instrument, HR Ratings may perform an internal analysis to assign the corresponding risk factor.

The methodology also incorporates the procedure for changes in the credit rating of an instrument of the fund, where HR Ratings will allow a grace period of up to three months in which the administrator may replace the instrument or carry out a strategy to rebalance the portfolio. This will be applied considering that there may be situations where the operator has contemplated the modification of the composition of the portfolio but due to market conditions they may not carry it out with the minimum possible impact.

For cases where it is identified that the Investment Fund has a cash balance in a bank deposit, HR Ratings will apply the corresponding credit rating to the custodian bank.

Additionally, HR Ratings will consider as a factor the investment regime presented in the fund's investment prospectus. This factor has a subjective basis. If the investment prospectus includes the possibility of incorporating assets whose credit risk is greater than that observed in the portfolio, the Analysis Committee might justify a qualitative "adjustment" in terms of the rating of such fund. This adjustment is justified because an investment regime that is too open, and / or flexible and it allows the fund to change the composition of its portfolio to the extent that it affects its risk profile.



## 3. Quantitative Analysis of the Investment Fund's Market Rating

HR Ratings analysis of the specific market risk measures the sensitivity of the assets of the Investment Fund with respect to its term and to possible changes in the market interest rate. In contrast with the Credit Rating, the Market Rating is measured by a range of 1 to 7, and the nomenclature "ST" is incorporated in case the Investment Fund is referred to as Short- or Medium-Term Fund and "LT" if the Investment Fund is referred to as Long Term Fund. If the Investment Fund Prospectus does not specify the investment horizon for the investors, or if it is determined as a Discretionary Fund, HR Ratings will opt for the most conservative rating scale to evaluate the fund and will therefore use the Short-Term rating bands.

HR Ratings measures the sensitivity of the portfolio by using the Macaulay duration, or simply called duration. This type of duration assumes that the value of the bond will be covered by the periodic flows paid, and the rate at which all of these flows are discounted (including the nominal value) is the yield to maturity of the instrument (Yield to Maturity or YTM ).

Duration has the advantage of reflecting the sensitivity of the price of an asset during its term and regarding the type of market rate to which it is associated. In other words, this type of duration provides a measure of the sensitivity of the price of a security to a variation of the interest rate. The calculation of portfolio's duration is made from the duration of each one of the instruments that comprise such portfolio. Finally, a weighted average duration of a portfolio is calculated. In this sense, the longer the duration of the portfolio, the lower the rating (in terms of risk level).

To obtain the duration, the present value of each flow is calculated in the first place. Then, the contribution of the present value of each payment to the total present value of the instrument (equivalent to its dirty price) is calculated. Finally, these contributions are weighted by time, multiplying each one by the number of days (or fractions of years) remaining for payment. The sum of these is the number of years in which the present value of the bond will be received. In this sense, a bond with a shorter duration may be preferable<sup>2</sup>.

In fixed-rate instruments, the ratio between duration and change of one hundred basis points in the market rate is close to one, that is, before an increase of 100 basis points in the YTM, the change in the price of the instrument will fall within a percentage amount similar to the duration of the instrument. On the other hand, the lower the coupon rate of a fixed-rate bond, the longer its duration for instruments with equal maturities, so the greater the sensitivity of the asset to a change in the market interest rate. In such a way that the ratio between duration and coupon rate is an inverse ratio. While the duration-price ratio is a constant ratio.

In the case of instruments with a variable rate, the duration is shorter because it is calculated with respect to the payment of the following coupon. This is due to the fact that these instruments are assets that adjust their price based on the change in interest rates, so the ratio between duration and change in asset price, before changes in this rate has

<sup>2</sup> Unlike the Macaulay duration, the modified or adjusted duration is not measured in years, although the word "years" is often and erroneously added. Modified duration = Macaulay duration / (1 + periodic type), where the periodic rate is the annual discount rate (or yield) divided by the assumed number of times the compound interest is applied.

no validity. Keeping all variables constant, a change in the market interest rate only affects the present value of the next coupon payment; however, the additional flows will adjust their present value before the change of rates.

Another adjustment made to the calculation process of the weighted duration refers to the repurchase agreements or any other instrument with a one-day maturity. HR Ratings will consider that the duration for this type of assets and / or financial instruments is equal to one day. Although this is not restrictive to instruments with a one-day maturity, because if there is a repurchase agreement with a longer maturity in the portfolio, the calculation can be adjusted.

Finally, the ranges to establish the Market Risk Rating from the weighted average duration of a portfolio can be seen below, in Table 4. The range changes depending on the duration level and the investment horizon.

Tabla 4: Market Risk			
Period		Long Term	Short Term
Days	Years		
28	n/a	n/a	1CP
91	n/a	n/a	1CP
182	n/a	n/a	2CP
365	1	1LP	3CP
730	2	2LP	4CP
1,095	3	3LP	5CP
1,460	4	4LP	6CP
1,825	5	5LP	7CP
3,650	10	6LP	7CP
Over 10 years		7LP	7CP

Source: HR Ratings.

Table 4 states that if a short-term Investment Fund has a weighted duration of less than 91 days, it will receive a 1CP rating, whereas if the duration is greater than 5 years, it will receive a 7LP rating. In the case of funds referred to as Long Term Funds, it is required that the average duration be between one and two years to receive the 1LP rating, and more than ten years to receive the 7LP rating.

## 4. Additional Factors Considered

Ratings considers six additional factors; this analysis is included within both ratings and it will have a 20% weight.

For these factors, HR Ratings will assign a label to the evaluation of the factors that goes from "Very good" to "Very Bad" to obtain the final rating. These labels in turn will be linked to an alphabetical rating that, to calculate the weighted average of the final rating, will be converted into a numerical rating.

The numerical rating will be the average of the rating ranges already established by HR Ratings. The labels assigned to each of the additional factors will depend directly on the



analyst in charge of the Investment Fund and will be based on its experience in the sector and the risk level represented by each factor. Table 5 below shows the equivalence between the labels and the alphabetical rating, as well as an allocation curve for the weighted average. This curve belongs exclusively to the analysis corresponding to the Credit Risk Rating. The weighted average to assign the Final Market Risk Rating corresponds to the values between 1 (higher quality) and 7 (lower quality).

Table 5: Labels and Ratings			
Label	Credit Risk		Market Risk
	Rating	Score	
Very Good	HR AAA	0.900	1
Good	HR AA+	0.745	2
	HR AA	0.670	3
	HR AA-	0.625	4
Regular	HR A+	0.585	5
	HR A	0.555	6
	HR A-	0.515	
Bad	HR BBB+	0.465	7
	HR BBB	0.415	
	HR BBB-	0.365	
Very Bad	HR BB+	0.303	
	HR BB	0.228	
	HR BB-	0.175	
	HR B+	0.145	
	HR B	0.115	
	HR B-	0.088	
	HR C+	0.065	
	HR C	0.042	
	HR C-	0.025	
	HR D	0.015	

Source: HR Ratings.

## 4.1. Additional Factors Considered

In this section the additional factors are detailed. The first four describe the quality of the administration and each weigh 12.5%. The remaining factors weigh 25% each.

- History and profile of senior executives** of the fund administrator, including the Investment Fund's Chief Executive Officer and staff in charge of defining and implementing the investment strategy. Their preparation and history in relation to previous job positions will be of the utmost importance to identify the weaknesses and management of the administration in situations of high volatility in the financial markets.
- HR Ratings evaluates the **internal control mechanisms** to reduce the operational risks of the fund. This includes information systems, technology in the operation of instruments, information management, number of people in charge of the administration due to the number of funds managed and the *back office* operation process.

- c. HR Ratings evaluates **the structure and decision-making process**. If the investment strategy is established individually or through an investment committee, the members of the committee and the review period of said strategy must be informed. We must mention the flexibility in terms of establishing temporary strategies adjusted to market conditions in general and to the fund's performance. HR Ratings evaluates the decision-making procedures and assesses the existence of behavior guidelines situations of high volatility and stress for the financial markets. It also analyzes whether the funds administrator has diversification and duration parameters and compliance therewith. It is important to establish the yield volatility and the position of the fund at the end of each week to verify the follow-up of investment policies and compliance with restrictions related to instruments holding. The position in instruments must not change for speculative reasons, but according to the investment horizon established by the fund.
- d. **Evaluation of the compensation policy of the fund administrator**. If it is based on the fund's yield, on the risk-adjusted yield (compensation that improves the rating granted by HR Ratings), on the amount of assets administered or by operation (which would represent a negative factor for the rating if it is very high in relation with the fund administrator's staff). The transparency in the administration is evaluated, in terms of the operation of the fund, as well as the costs related to the administration of the Investment Funds.
- e. HR Ratings will perform a **historical analysis of the ratings** assigned to the Investment Funds to identify the volatility of the factors relevant to each rating. Among these factors, the credit rating and the duration of the instruments that make up the portfolio are considered.
- f. In the analysis of the **use of derivative instruments and other factors**, it is assessed to what extent the fund is exposed to reaching certain yields or certain prices. The **use of derivatives** might be favorable if derivatives for hedging purposes are used to reduce risk or volatility. It will be possible to identify exposure to foreign currencies, which will depend on macroeconomic trends and the level of exposure of the fund. Additionally, other factors may be considered in this section.

**Table 6: Weights and Factors**

Factors	Weight
a) History and Profile of Senior Executives	12.5%
b) Internal Control Mechanisms	12.5%
c) Structure and Decision-Making Process	12.5%
d) Remuneration Policy	12.5%
e) Historical Analysis of the Portfolio	25.0%
f) Use of Derivatives, among other factors	25.0%

Source: HR Ratings.



## 5. Current Rating Evaluation, Monitoring, Surveillance and Withdrawal

Once the Investment Fund's Ratings have been issued, HR Ratings will periodically review the possible changes in the conditions of the Investment Fund. The rating control, surveillance and withdrawal measures to which the funds will be exposed are the following:

- a) HR Ratings will review information relevant to the assets of the investment portfolio. HR Ratings will be based on information obtained by the Investment Fund operator and by the available public sources.
- b) HR Ratings will request at least monthly reports from the Investment Fund specifying the last scheme of the portfolio. In addition, an annual review will be carried out detailing the source of the fund's resources and to verify that the instruments included in the fund correspond to the assets subject-matter of investment established by the fund.
- c) HR Ratings will evaluate, at least monthly, that the risk score of the assets included in the portfolio is maintained within the rating bands established for the rating assigned to the Investment Fund.
- d) If the fund obtains a risk score that is not within the bands of its rating, the administrator will have a maximum term of three months to rebalance the assets of their portfolio and thus return their risk score to the pertinent rating bands. Otherwise, the commissioned analyst will perform an evaluation to establish if the rating can go up or down, depending on the case of the specific Investment Fund.

For those Investments Funds that are yet to start operating, HR Ratings will do its evaluation basing its analysis upon the prospectus and the assets available to the Fund. HR Ratings will continue to monitor the Fund as it acquires its instruments to asses if they comply with the prospectus and the expected portfolio. By the end of the third month, and if HR Ratings identifies that the Investment Fund has deviated from what was stipulated in search for a new strategy, it will adjust its rating to reflect the corresponding credit and market rating.

## Annex. Rating Scales for Investment Funds

Credit Rating Scales	
Rating Scales	Definition
HR AAA	The Investment Fund with this rating is considered to have the <b>highest credit quality</b> , and has a credit risk similar to an instrument with the <b>minimum credit risk</b> .
HR AA	The Investment Fund with this rating is considered to have <b>high credit quality</b> , and has a credit risk similar to an instrument with a <b>very low credit risk</b> .
HR A	The Investment Fund with this rating is considered to have an <b>adequate credit quality</b> , and has a credit risk similar to an instrument with a <b>low credit risk</b> .
HR BBB	The Investment Fund with this rating is considered to have a <b>moderate credit quality</b> , and has a credit risk similar to an instrument with a <b>moderate credit risk</b> .
HR BB	The Investment Fund with this rating is considered to have an <b>inadequate credit quality</b> , and has a credit risk similar to an instrument with a <b>high credit risk</b> .
HR B	The Investment Fund with this rating is considered to have a <b>low credit quality</b> , and has a credit risk similar to an instrument with a <b>very high credit risk</b> .
HR C	The Investment Fund with this rating is considered to have a <b>very low credit quality</b> , and has a credit risk similar to an instrument with an <b>extremely credit risk</b> .
HR D	The Investment Fund with this rating is considered to have the <b>lowest credit quality</b> , and has a credit risk similar to an instrument in <b>default</b> .

Source: HR Ratings.



Short-Term Market Risk Scale	
Rating Scales	Definition
1CP	The asset portfolio has extremely low sensitivity to changes in market conditions.
2CP	The asset portfolio has low sensitivity to changes in market conditions.
3CP	The asset portfolio has low to moderate sensitivity to changes in market conditions.
4CP	The asset portfolio is moderately sensitive to changes in market conditions.
5CP	The asset portfolio has moderate to high sensitivity to changes in market conditions.
6CP	The asset portfolio is highly sensitive to changes in market conditions.
7CP	The asset portfolio is extremely sensitive to changes in market conditions.

Long-Term Market Risk Scale	
Rating Scales	Definition
1LP	The asset portfolio has extremely low sensitivity to changes in market conditions.
2LP	The asset portfolio has low sensitivity to changes in market conditions.
3LP	The asset portfolio has low to moderate sensitivity to changes in market conditions.
4LP	The asset portfolio is moderately sensitive to changes in market conditions.
5LP	The asset portfolio has moderate to high sensitivity to changes in market conditions.
6LP	The asset portfolio is highly sensitive to changes in market conditions.
7LP	The asset portfolio is extremely sensitive to changes in market conditions.

Source: HR Ratings.



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The ratings and / or opinions issued by HR Ratings take into account an analysis of the relative credit quality of an entity, issuing company and / or issuance, and therefore they do not necessarily reflect a statistical non-payment probability, which is understood as the impossibility or lack of intention of an entity or issuing company to comply with their contractual payment obligations, so creditors and / or holders are forced to take measures to recover their investment, including restructuring the debt due to a stress situation faced by the debtor. Notwithstanding the above, in order to give greater validity to our credit quality opinions, our methodology considers stress scenarios as a complement to the analysis prepared on a baseline scenario. The fees HR Ratings receives from issuing companies generally range from US\$ 1,000 to US\$ 1,000,000 (or the equivalent amount in another currency) per issuance. In some cases, HR Ratings will provide a rating for all or some of the issuances of a particular issuing company for an annual fee. It is estimated that annual fees may vary between US\$ 5,000 and US\$ 2,000,000 (or the equivalent amount in another currency).