IHS Markit provides unique, forward-looking Sovereign Risk Credit Ratings for 205 countries. The sovereign ratings are generated in a systematic and consistent manner using a transparent analytical model. The ratings are derived principally from a detailed examination of each country's key liquidity and solvency ratios. The assessment process also incorporates the current condition and outlook for each country's economy and political situation into the ratings, including public sentiments and policymakers' attitudes toward foreign creditors. These latter factors are of particular relevance in the weaker and less stable emerging-market economies of Africa, Asia, and Latin America.
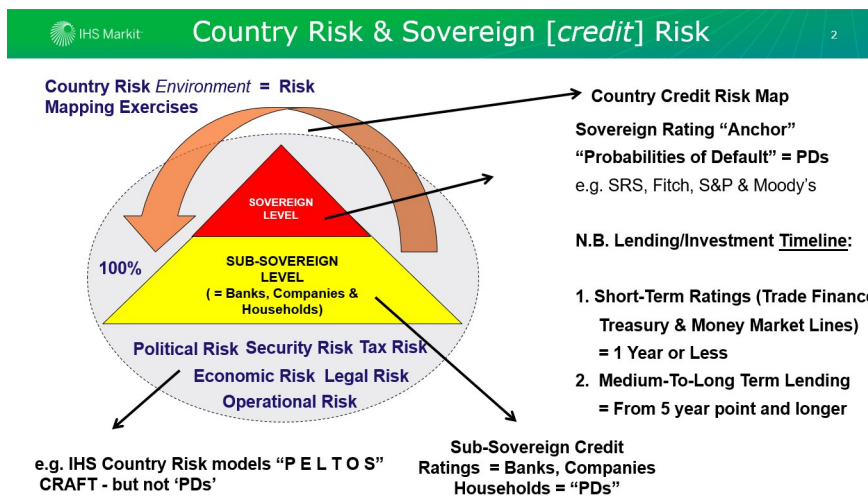
Each country has two overall ratings that are designed for different maturity groups of financial exposures: **medium term** or MT (five years or more) and **short term** or ST (one year or less) time horizons. The supporting financial data and linked credit ratios (see "Model designs" below) are fully integrated into IHS Markit's international macroeconomic forecasting model and processes. All data is reforecast at least every quarter as part of our regular review process. IHS Markit sovereign ratings are integrated with our Headline Analysis, daily event risk, and data release articles. These highlight our and other agencies' rating changes, as well as shifts in countries' financial positions and creditor relations. Our sovereign ratings are systematically benchmarked against all comparable sovereign, long-term foreign-exchange ratings from Moody's, Standard & Poor's, and Fitch IBCA. An industry consensus sovereign rating is derived through this benchmarking

process by aligning rating scales and models. This highlights common areas of agreement and divergence of ratings opinion on sovereign risk.
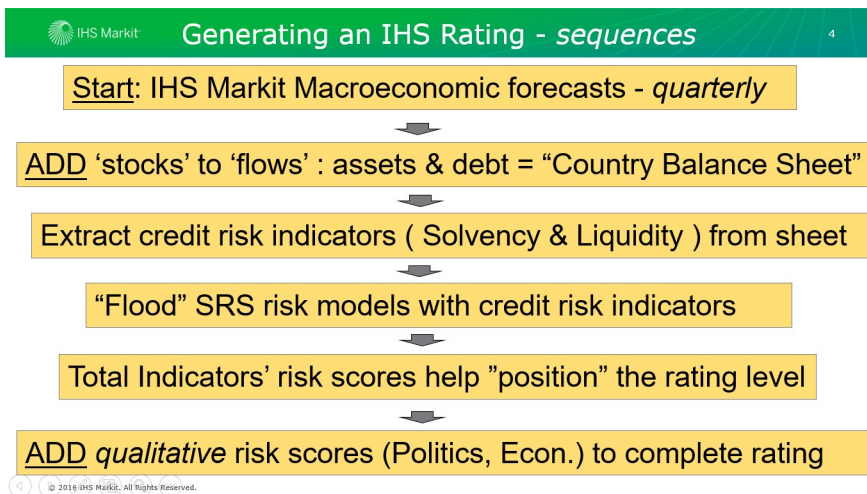

Generating a sovereign rating

IHS Markit's sovereign risk ratings are generated using our transparent analytical model based on the experiences of global lending institutions (see diagram above). The first step in the rating determination sequence is the IHS Markit macroeconomic forecast and reforecast, undertaken each quarter. Our ratings are numeric in construction and are derived, first and foremost, from a detailed examination of each country's key liquidity and solvency ratios. Essentially, we construct a balance sheet for each country that is underpinned by the dynamics of each economy and the IHS Markit macroeconomic forecast.

The macroeconomic assumptions are taken directly from our quarterly macroeconomic forecast. The country's balance sheet contains key synthetic liquidity and solvency credit-risk indicators based on the changing financial balances and resulting changes to the asset and debt position. This is at root a basic "stock and flow" analysis, where financial flows reveal financial aggregate deficits or surpluses on the three key macroeconomic accounts for any economy:

1. The public-sector fiscal account;

2. The external current account on the balance of payments; and

3. The private-sector financial account, between households and companies on the one hand and the banking system on the other.
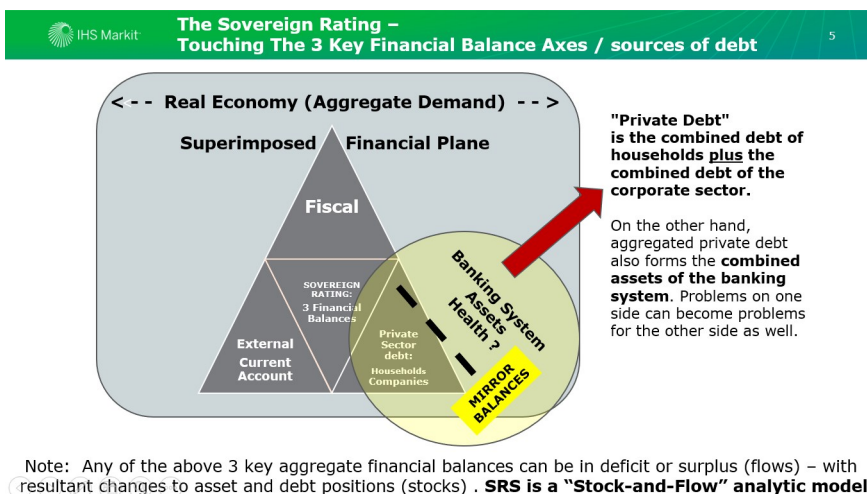
These credit risk indicators or ratios are projected into the future once forecasts have been applied to the countries' balance sheets. The IHS Markit sovereign credit risk financial model is essentially structured by a number of scoring thresholds—in steps of five risk points only—for each credit-risk indicator. The initial rating or scoring process for financial indicators, i.e., those reflecting solvency and liquidity, essentially involves flooding the model with new forward-looking credit-risk indicators as taken from the reforecast balance sheet for each country, itself based on a fresh macroeconomic forecast. At this stage in the rating process, indicative (initial) scores are generated that help position the rating, depending on how credit risk raw indicator inputs fall across the indicative scoring thresholds that make up the financial dimension to the sovereign model. Changes to indicative scores could result in rating downgrades or upgrades, although these need to be affirmed by analysts as real and valid changes in credit risk. The financial dimension to the medium-term sovereign rating model comprises 50% of all factor-weights or weighted criteria and a corresponding theoretical maximum of 50 risk scores out of a total of 100 for the overall rating, in steps of five risk points only, equivalent to one rating notch. Each quarter, the financial model is systematically reflooded with fresh five-year credit-risk indicator forecasts based on the macroeconomic forecast itself, to ascertain the current financial scoring or rating position that may be developing. This process is reviewed by the sovereign risk committee and all core changes are carefully documented.

IHS Markit IHS Sovereign Risk Model – Detailed MT SRS Model

Mother Criteria: 'Factor Weights'			MAX SCORE & % Weight	'Sub-Scoring' criteria and cut-offs	Data- Indicative & Threshold Scores	Reflected & Agreed Score
Credit Financials 50% "Country Balance Sheet"	S O L V E N C Y	Total Gross External FX Debt % Total Foreign Exchange Earnings - or GDP for hard currency regimes	10	Quantitative Scoring Threshold Cut-Offs QST (a)	?	?
		Total Gross Debt Service as % of Total Foreign Exchange Earnings	10	Quantitative Scoring Threshold Cut-Offs QST (b)	?	?
	L I Q U I D I T Y	External Liquidity Gap as % of Total Foreign Exchange Earnings	10	Quantitative Scoring Threshold Cut-Offs QST (c)	?	?
		Current Account Balance as % of GDP	10	Quantitative Scoring Threshold Cut-Offs QST (d)	?	?
		Import Cover – months	10	Quantitative Scoring Threshold Cut-Offs QST (e)	?	?
Economic 30%		FX earnings volatility **New !**	5	Quantitative Scoring Threshold Cut-Offs QST (f)	?	?
		Private Debt – Banking System Assets	10			
		'Economic': Structure, Economic Policy, Economic Management and Capacity	15-25	ECONOMIC Risk Scoring Sub-Criteria	?	?
Politics 20%		Politics & Strategic	20	POLITICS Risk Scoring Sub-Criteria	?	? Final Score & Rating: X / 100
		Total Score: (Scoring in **Steps of 5** only)	100/100 and 100 %	Insert Rating 'Outlook' =		

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IHS Markit **Assessing the Risk of Potential Default ("PD") MT-SRS** 7

Model's "Mother Criteria" : -

- **20% - Solvency Indicators**   **Quantitative**

- **30% - Liquidity Indicators**

_____ **50%**
                                                 50%

- **30% - Economic Structure & Policy Impacts**

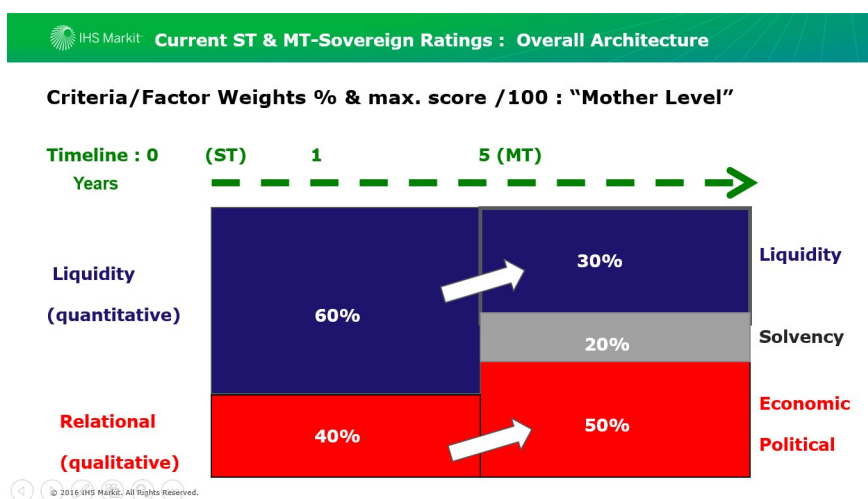- **20% - Political factors**   **Qualitative**

NOTE: Method

A county's financial indicators (credit risk ratios) and forecasts are systematically leveraged-off the country's economy (macroeconomics) in motion & related finances (key financial balances, assets and liabilities position)
i.e. the credit risk indicators (**blue** above) are extracted from a country's balance sheet to help start _position_ the rating level. Further risk exercises follow on non-financial economic risks (policy, structure) and political risk for additional rating leveling.

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The other key steps in IHS Markit's credit-rating process are assessments of the relevant qualitative economic and political attributes of each country that make up the remaining 50% of factor weights to the sovereign model, in addition to the quantitative, credit-risk financial indicators, i.e., solvency and liquidity, described immediately above. These involve analysing recent trends and the current situation of each country to identify vulnerabilities and pressure points that could lead to financial difficulties and/or other problems that may undermine international payments and creditworthiness. In addition to traditional solvency and liquidity measures, and qualitative economic assessments on economic structure, economic policies, and crucially banking system soundness and private debts as potential contingent risks on the

sovereign, IHS Markit's Sovereign Risk Rating process also incorporates assessments of political stability, international relations, public sentiments, and policymakers' attitudes toward foreign creditors, i.e., political risks.

Objectives

- The sovereign credit risk models presented here can be seen as robust early-warning systems for credit default probabilities around the five-year time horizon, and for the emergence of financial stress and possible crisis in the shorter term of one year or less. The importance of external creditor relations, politics and repudiation risks in particular, as well as transfer payment delays are recognised in all risk rating assessments.

- A sovereign rating helps determine the sovereign risk point, or country ceiling, which is conventionally regarded as the level of highest creditworthiness in the country and incorporates the creditworthiness of all sovereign borrowing entities lying within the sovereign level. Unlike other rating agencies, we do not rate individually issued bonds or loans directly, but the borrowers themselves within the sovereign level. The sovereign rating is also the anchor point for the general pattern of higher credit risks below the sovereign level, i.e., in the banking and corporate realms. IHS's medium-term sovereign credit ratings are directly comparable to the "long-term foreign currency ratings" produced by established rating agencies to rate longer-term foreign currency bonds and loans from issuing entities within the sovereign level. The sovereign level includes central government, state departments, central banks, and state-owned companies and banks. All other borrowing entities outside the sovereign level will typically have a "risk distance", or lower rating, than the sovereign level itself.

- The transparent, country financial-balance-sheet basis for IHS Markit's credit-rating framework can also be used forensically to help evaluate conditions and pressure points for financial stress. The key external lending and investment patterns can be examined for each country.

- Finally, for the larger international banks, sovereign risk ratings, whether internally or externally generated, are the key inputs in the formulation of country dollar limits that are applied to the balance sheet in order to manage short- and longer-term exposures. Both the larger banks and IHS Markit benchmark these ratings against others for due diligence purposes. An applied risk-management system of dollar limits will usually also incorporate additional credit conditionality and country limit trigger features, as well as aspects of bank policy and strategy. In a second respect, country credit ratings can be used to apply capital-at-risk weighting measures to manage the international portfolio along prudential lines, including those required by the bank regulator and Basel II.

IHS Markit | Current ST & MT-Sovereign Ratings : Overall Architecture

Criteria/Factor Weights % & max. score /100 : "Mother Level"

Model designs

Medium-Term Sovereign Risk Model

The basic architectural design of the ST and MT sovereign risk models is presented in the diagram above. The structure of weighted-risk factors behind the IHS Markit Sovereign Risk Medium-Term Model for the Five-Year Horizon point (= "MT" or Medium Term) and beyond is as follows:

	Factor	Maximum score	Test
1	Debt load burden	10	Financial/solvency Test
	HC = Public debt % GDP		
	SC = External FX debt % FX earnings		
2	Debt service burden	10	Financial/solvency test
	HC = Interest payments % GDP		
	SC = External FX debt service % FX earnings		
3	External liquidity gap % FX earnings	10	Financial/liquidity test
4	Current-account balance % GDP	10	Financial/liquidity test
5	Import cover – months	10	Financial/liquidity test
6	Economic risks	30	Economic test
7	Political risks	20	Political test
	Maximum total score	100	

Notes:

Financial (or solvency and liquidity) factors 1 to 5 can contribute up to 50 points or 50% overall weight to the overall medium-term sovereign rating. All these financial factors are linked directly into the country's financial balance sheet and IHS Markit's macroeconomic forecasts from the outset. The remaining 50 potential points are divided between economic (30) and politics (20).

HC = Hard-currency country; SC = Soft-currency country; FX = Foreign exchange

Short-Term Sovereign Risk Model

The structure of weighted risk factors behind IHS Markit's Sovereign Risk Short-Term (ST) Model, covering the "one year or less" time horizon, is deemed more appropriate for shorter-term financial exposures, e.g., Trade Finance, Treasury and FX, and Money Market lines, and is essentially a re-engineered derivative of the medium-term model. In particular, a range of liquidity tests make up the bulk or 60% of the short-term sovereign model. They include the external liquidity-gap ratio, benchmark bond yield interest risk spreads (HC), current-account balance, import cover tests, the net financial position of the country's banking system with respect to foreign or outside banking systems, and liquidity test examining the net short position of the country, i.e., how far the country can cover short-term liabilities with short-term assets, especially foreign-exchange reserve liquidity. This set of liquidity tests is deliberately amplified for the short-term ratings to contribute up to 60 points out of a theoretical maximum of 100 for the short-term sovereign risk model.

In addition to the quantitative-based liquidity tests described above, the short-term model inserts two criteria pertinent to the shorter-term risk horizon that are creditor relational in nature: "Transfer Payments Delays and the Interest Arrears Position" and "Key External Creditor and Political Relations" (both 20 points maximum). In general risk-model design terms, the longer the time horizon for financial exposures, the greater the weight is given to economic structure, economic policy, and political factors, while liquidity and relational factors are deemed more important in the shorter term.

The structure of weighted-risk factors behind the IHS Markit Sovereign Risk Short-Term Model is as follows:

	Factor or criteria	Factor % weight and maximum score
1	Liquidity (made up of):	60
	External liquidity gap	10
	External current account	10

Factor or criteria	Factor % weight and maximum score
Import cover	10
Interest service ratio and risk spreads	10
Banking system – the (net) external financial position	10
Foreign-exchange reserve cover over short-term debt	10
2 Relational (made up of):	40
External creditor and political relations	20
Transfer payment delays	20
Maximum total score	----
	100

IHS Markit ST-SR Liquidity: How ? (Practice)

Six *Quantitative* Factors or Criteria	Factor % Weight & Maximum Score	Comment
Liquidity (**SIX** made up of):	**60 /100 or 60%**	
1. External Liquidity Gap	(10)	The 'Net Short' Position
2. External Current Account	(10)	Broad External Liquidity Balance
3. Import Cover in Months	(10)	Classic Liquidity Test
4. Interest Service Ratio & **Risk Spreads (HC)** New !	(10)	Interest Payments Burden New ! **& Risk Spreads Over AAA (HC only)**
5. Banking System – the (Net) External Financial Position	(10)	Net External Financial Position of Country's Banking System
6. Foreign-Exchange Cover over Short-Term debt (STD)	(10)	Classic IMF Liquidity Test for 'Capital Flight" Test

IHS Markit ST-SR Relational: How ? (Practice) 10

Two *Relational* Factors or Criteria	Factor % Weight & Maximum Score	Comment
Relational (**TWO** made up of):	**40%**	
1. External Creditor & Political Relations	(20)	IMF and Official Donor Relations, Goodwill" with Commercial Creditors Key Political Relations; Membership Bodies etc.
2. Transfer Payments Delays	(20)	Average Payments Delays in Days

Model operation

The key quarterly inputs into the models are the raw financial numbers and associated credit ratios, themselves linked into the country's financial balance sheet. These are available in the downloadable sovereign risk excel tables. Unlike most other rating agencies, the country's financial balance sheet is fully integrated with IHS Markit's macroeconomic forecasting and quarterly updating process. The other model inputs include analyst assessments of key country economic and political attributes, including crucially banking system soundness in all cases, which are monitored continuously as part of our Headline Analysis process. This analytical process is undertaken within the short- and medium-term model frameworks described and involves a comprehensive set of quality controls.

Country balance sheet and core financial ratios

Each sovereign rating is supported by a country financial balance sheet linked into the key macroeconomic variables and forecasts. The structure of this balance sheet not only exposes the important financial balances, asset, and liability position, but calculates the country's external financial requirement by weighing up its prospective external financial requirements on the one hand and the available financial sources and financing options on the other. In addition to furnishing subscribers with a comprehensive picture of each country's external finances and debt situation, the IHS Markit Sovereign Risk Service highlights five key external liquidity and solvency ratios that are the core financial measures of the credit rating system:

- Public debt burden over GDP (HC) and total external debt divided by annual foreign-exchange earnings on the current account (SC);
- Public debt service burden (HC) and total debt service divided by annual foreign-exchange earnings on the current account (SC);
- External liquidity gap divided by annual foreign-exchange earnings on the current account;
- The current-account position on the balance of payments; and
- The international usable currency reserves import cover position.

Clients receive updates of these ratios, along with a wealth of other debt and related financial information used by IHS Markit economists to evaluate each sovereign's creditworthiness.

Benchmarking, due diligence, and 'consensus rating'

IHS Markit's sovereign ratings are fully benchmarked and comparable with other ratings services. Uniquely, all sovereign ratings are aligned on a common numerical credit rating scale of 0–100 for comparison and to derive a "consensus rating" for each country using an arithmetic mean. This cross-alignment of credit risk scales is dictated by three common credit anchor points: the "Top Notch" level where AAA is equal to IHS's 0/100; the investment grade and speculative grade dividing line where the lowest investment grade notch BBB- is equal to IHS's 40/100 level; and the highest speculative grade BB+ is equal to IHS's 45/100 mark. The "Actual or Possible Default Scenario" level starts at CCC+ and is equal to IHS's 65/100 mark: this is a key pivot point for country credits in financial stress. Higher-risk IHS Markit scores from 70 to 100 represent varying degrees of material default. The consensus rating is arrived at by converting the agencies' ratings into the numerical scale, combining with IHS Markit's, and then taking the mean.

Ratings scales alignment, benchmarking, and consensus rating

IHS Markit numerical ratings	Generic credit rating scale	Moody's rating scale	Definition
Investment Grade			
0	AAA	Aaa	Highest Quality
2.5	AA+	Aa1	Very High Quality
5	AA	Aa2	Very High Quality
10	AA-	Aa3	High Quality
15	A+	A1	Good Quality
20	A	A2	Good Quality
25	A-	A3	Good Quality
30	BBB+	Baa1	Supportive Credit Fundamentals
35	BBB	Baa2	Supportive Credit Fundamentals
40	BBB-	Baa3	Supportive Credit Fundamentals
Speculative Grade			
45	BB+	Ba1	Likely To Fulfill Obligations
47.5	BB	Ba2	Likely To Fulfill Obligations
50	BB-	Ba3	Ongoing Uncertainty

IHS Markit numerical ratings	Generic credit rating scale	Moody's rating scale	Definition
55	B+	B1	High Payments Risk
57.5	B	B2	High Payments Risk
60	B-	B3	Very High Payments Risk
Possible Default			
65	CCC+	Caa1	Extremely High Payments Risk
65	CCC	Caa2	Extremely High Payments Risk
65	CCC-	Caa3	Extremely High Payments Risk
Actual Default			
70	CC	Ca	Default – Interest Arrears
75	CC	C	Default – accumulating interest arrears
80	CC	C	Default- accumulating interest arrears
85	C	C	Poorest Quality
90	C	C	Poorest Quality
95-100	D	D	Poorest Quality

Notes:

The "generic credit rating scale" is the common letter-based rating scale used by Standard & Poor's, Fitch, Duff and Phelps, and many other rating agencies around the world.

IHS Markit's rating scale has minimum five-point increments roughly equal to an alphabetic rating notch and the higher the score, the worse the credit rating. The italicised ratings are provided for purposes of comparison. An agency "one-notch upgrade" is more or less equivalent to a five-point decrease in IHS Markit's sovereign credit rating score. Conversely, a "double-notch downgrade" is more or less equivalent to a 10-point increase in IHS Markit's sovereign credit rating score.

Disclaimer: Standard & Poor's, Moody's, and Fitch IBCA are not associated with this service and IHS Markit makes no warranty or representation about the accuracy of their ratings.

Ratings Scales Alignment; Benchmarking and Consensus Rating

Key Ranges on the IHS Markit Numerical Scale 0 - 100	IHS Rating Scale*	Moody's Rating Scale	Generic Rating Scale**	Literal Credit Risk Definition
0 - 10 (Multiple As)	0	Aaa	AAA	Highest Quality "Top Draw"
	(2.5)	Aa1	AA+	Very High Quality
	5	Aa2	AA	Very High Quality
	10	Aa3	AA-	High Quality
15-25 (Single As)	15	A1	A+	Good Quality
	20	A2	A	Good Quality
	25	A3	A-	Good Quality
30-40 (Triple Bs)	30	Baa1	BBB+	Supportive Credit fundamentals
	35	Baa2	BBB	Supportive Credit fundamentals
	40	Baa3	BBB-	Supportive Credit fundamentals
INVESTMENT GRADE / SPECULATIVE GRADE – DIVIDE ***				
45-50 (Double B)	45	Ba1	BB+	Likely to Fulfill obligations
	(47.5)	Ba2	BB	Likely to Fulfill obligations
	50	Ba3	BB-	Ongoing Uncertainty
55-60 (Single B)	55	B1	B+	High Payments Risk
	(57.5)	B2	B	High Payments Risk
	60	B3	B-	Very High Payments Risk
POSSIBLE DEFAULT SCENARIOS				
65 (Possible Default)	65	Caa1	CCC+	Extremely High Payments Risk
	65	Caa2	CCC	Extremely High Payments Risk
	65	Caa3	CCC-	Extremely High Payments Risk
ACTUAL DEFAULT SCENARIOS				
70-80 (Outright Default)	70	Ca	CC+	Default - Interest Arrears
	75	CC	C	Default - Accumulating Interest Arrears
	80	C	C	Default - Accumulating Interest Arrears & Principal
90-100 (Prohibitive Credit Risk)	85	C	C	Poorest Quality, unable or unwilling to go to IMF
	90	C	C	Poorest Quality, unable or unwilling to go to IMF
	95-100	D	D	Poorest Quality, unable or unwilling to go to IMF

IHS Numeric Scale	Generic Scale
0 - 10	AAA, AA
15 - 25	A
30 - 40	BBB
45 - 50	BB
55 - 60	B
65 - 100	CCC-D

Three key ANCHOR points for benchmarking:

AAA = 0 = top notch

BBB - & BB + = 40 = lowest investment grade / speculative divide

CCC = 65 = potential default Scenarios

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IHS Markit Probability of Default ("PD") & Mapping To Expected % Loss (Stylised)

"PD" (Probability of Default) & Expected % Loss ^^

Credit Scale - Generic	Global Insight 0-100 Scale	Expected % Loss - Over One Year (%)	Expected % Loss - Over Five Years (%)
AAA	0 - 5	0	0.1
AA	10-15	0.01	0.3
A	20 - 30	0.04	0.62
BBB	35 - 40	0.3	3
BB	45 - 50	1.2	11.25
B	55 - 60	5.7	25.4
CCC	65 - 100	29	51
Investment Grades	0 - 40	0.12	1.2
Speculative Grades	45 - 100	5	20.22
All Grades	0 - 100	1.65	7.1

Expected Loss = Default Probability + Expected Loss Severity

^^ NOTE: The relationship between credit rating and expected % loss is *indicative* and *illustrative* only - based on Moody's empirical US corporate ratings histories and their related default histories

Data sources

- Primary: The primary data sources are authoritative, multi-lateral official and commercial institutions, particularly the IMF, World Bank, and the Regional Development Bank groups. The Bank for International Settlements (BIS) and the OECD are also primary data sources.
- Secondary: In terms of secondary data sources at sovereign level or below, sources include central banks and government statistical agencies. The financial markets and key market players are used to collate financial market data.
- Each sovereign rating is fully supported by a comprehensive economic and financial data set in downloadable Excel spreadsheets, where each data series is clearly sourced and named. To read more about IHS Markit's macroeconomic forecasting process, please consult the appropriate section of the Help system.

For further information about IHS Markit's Sovereign Risk Service, please contact **Jan Randolph**, Director of Sovereign Risk; Paul Hunt, Product Manager, IHS Markit Country Risk; or your account manager.