

Rating Methodology of Creditreform Rating AG

Sovereign Ratings

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This document (v1.2) is an update which contains no essential, fundamental methodological changes. The content was clarified and slightly modified. The update was carried out in July 2016.

1 Introduction

Creditreform Rating AG (“CRA“) has been established in 2000 and registered as a European Rating Agency pursuant to Regulation (EC) No 1060/2009. In this document, CRA discloses its methodology of rating sovereign issuers in order to provide the parties involved, investors and the wider public with the opportunity of developing a deeper understanding of the mechanisms behind its ratings. The rating methodology will be regularly updated to reflect any changes in the underlying requirements. The CRA rating methodology and Code of Conduct can be freely accessed on our web page (www.creditreform-rating.de).

This document describes how CRA ratings for sovereign issuers (“sovereign ratings“) are carried out. CRA sovereign ratings take into account all available information that CRA deems relevant for an assessment of the risks that might affect a full and timely redemption of the principal and interest payments. Sovereign ratings are assessments of creditworthiness that can be applied to all sovereigns, independent from their level of economic development.

The key factors that affect sovereign credit risk are divided into four categories: Macroeconomic Performance, Institutional Structure, Fiscal Sustainability and Foreign Exposure. CRA assessments are based on a rating methodology that analyzes these risk factors using statistical methods, taking into account quantitative as well as qualitative indicators. We also establish adjustment criteria to reflect country-specific risks.

Sovereign ratings represent well-informed assessments of a given sovereigns’ creditworthiness. They represent no recommendation of whether or not to purchase, sell or hold certain financial instruments and are not meant to estimate the value or price of such assets. Neither must sovereign ratings be misconstrued as legal opinions.

2 Scope of Application

CRA sovereign ratings assess the ability and willingness of a sovereign to meet its financial obligations fully and on time. Sovereign ratings are an assessment of the creditworthiness of a sovereign in its capacity as a debtor, not overall country risks where a given country’s business environment and the risks of providing funds to a debtor within that country are quantified. CRA also issues ratings for individual bonds or financial liabilities that have been issued by sovereigns either in local or foreign currency. Government bonds commonly represent senior unsecured claims against a sovereign. Thus, issuer and issue level ratings will only rarely differ. This document explains the general methodological framework for the analyses and assessments that are conducted for the purposes of sovereign ratings.

3 Rating Result and Rating Process

3.1 Rating Result

CRA sovereign ratings assess the ability and willingness of any given sovereign to meet its financial obligations fully and on time. Sovereign ratings are forward-looking assessments of sovereign creditworthiness and not forecast of default probabilities.

Fig. 1: Rating Scale for Long-Term Sovereign Ratings

Rating Category	Rating	Assessment
AAA	AAA	Highest level of creditworthiness, lowest default risk
AA	AA+	Very high level of creditworthiness, very low default risk
	AA	
	AA-	
A	A+	High level of creditworthiness, low default risk
	A	
	A-	
BBB	BBB+	Highly satisfactory level of creditworthiness, low to medium default risk
	BBB	
	BBB-	
BB	BB+	Satisfactory level of creditworthiness, medium default risk
	BB	
	BB-	
B	B+	Moderate level of creditworthiness, increased default risk
	B	
	B-	
C	CCC	Low level of creditworthiness, high or very high default risk
	CC	
	C	
SD	SD	Insufficient level of creditworthiness, selective default of a considerable proportion of the country's payment obligations
D	D	Insufficient level of creditworthiness, default
NR	Not Rated	Rating suspended, expired, temporarily suspended due to insufficient information

For its sovereign ratings, CRA uses a rating scale with rating categories from AAA to D reflecting 19 levels of creditworthiness (see Fig. 1), two default stages and the stage NR ("Not Rated"). The ratings in categories AA to B feature sub-categories where a plus (+) or a minus (-) sign is added to qualify the rating grade and to indicate the relative standing of the sovereign within the rating category. Unsolicited sovereign ratings are identified as such.

The issuance of ratings requires a clear definition of a default event. CRA will downgrade sovereign ratings to SD (Selective Default) or D (Default) when the sovereign issuer has failed to meet his financial obligations to private creditors. (For the exact definition, please see the Appendix.)

A distinction can be made between long-term and short-term ratings. The above list refers to ratings that reflect an issuer's solvency over a longer period of time ("Long-term sovereign ratings"). CRA also issues long-term ratings for individual government bonds with a residual term of at least one year.

CRA qualifies each rating with an outlook that indicates the direction into which the rating is most likely to migrate over a period of one year after the date of the rating. This outlook reflects potential changes of the economic or financial conditions and is either "negative", "stable" or "positive". It must not be assumed that a positive or negative outlook will inevitably require an adjustment of the rating.

CRA may set a rating on "watch", replacing the outlook and indicating CRA's intention to review the rating before the end of its one-year term (usually within the first six months). This may be required if certain event risks threaten to affect the development of the sovereign under review or if actual developments differ from the forecast to an extent where the rating analysts must quickly acquire additional information to ensure that the rating still reflects the new risk situation. Extraordinary events that could lead to a rating watch include natural catastrophes and an escalation of interior or exterior political conflicts. Sovereign ratings can also be set on "watch" if CRA has deemed it necessary to review the methodology or basic assumptions of the analytic framework for its sovereign ratings. A rating watch does not make the adjustment of the sovereign rating inevitable. Also note that CRA remains free to raise or lower sovereign ratings that have not previously been set on "watch" as long as extraordinary events are believed to justify such a move.

3.2 Rating Process

3.2.1 Data Requirements and Data Processing

The CRA assessments of sovereign issuers and their levels of creditworthiness are based on the quantitative and qualitative analyses of data and information that have been acquired from publicly available international resources, including the databases of the International Monetary Fund (IMF), the World Bank, the Organisation for Economic Co-operation and Development (OECD), the United Nations (UN), the Bank for International Settlements (BIS), the Asian Development Bank (ADB), the Inter-American Development Bank (IADB) and the European Commission. CRA also uses data of national organizations and public agencies such as central banks, statistical offices and government ministries. If the sovereign or a related third party did participate in the rating process (solicited sovereign rating), CRA can also take into account

confidential information from the accounts, management and other relevant internal documents for the rated sovereign or a related third party.

All data are subjected to plausibility checks before they are archived in internal data storage facilities and subsequently used in the rating process. Most of these data are historical. Additionally, CRA determines forecast values that are largely based on projections by the IMF, the governments themselves and CRA analysts. The CRA analytical framework therefore takes into account the expected development of certain variables, especially financial and budgetary indicators of the sovereign under review.

3.2.2 Rating approach

The rating process is designed to generate an accurate and reliable assessment of a sovereigns' creditworthiness, based on an efficient and consistent methodology. This approach reflects the objectives of guaranteeing the quality and integrity of the rating process, of avoiding conflicts of interest and of ensuring transparent and comparable decision-making mechanisms. The final instance of the rating process is the Rating Committee. The results of the analyses are submitted to the Rating Committee, and it is this Committee that determines the eventual rating on the basis of the quantitative and qualitative analyses.

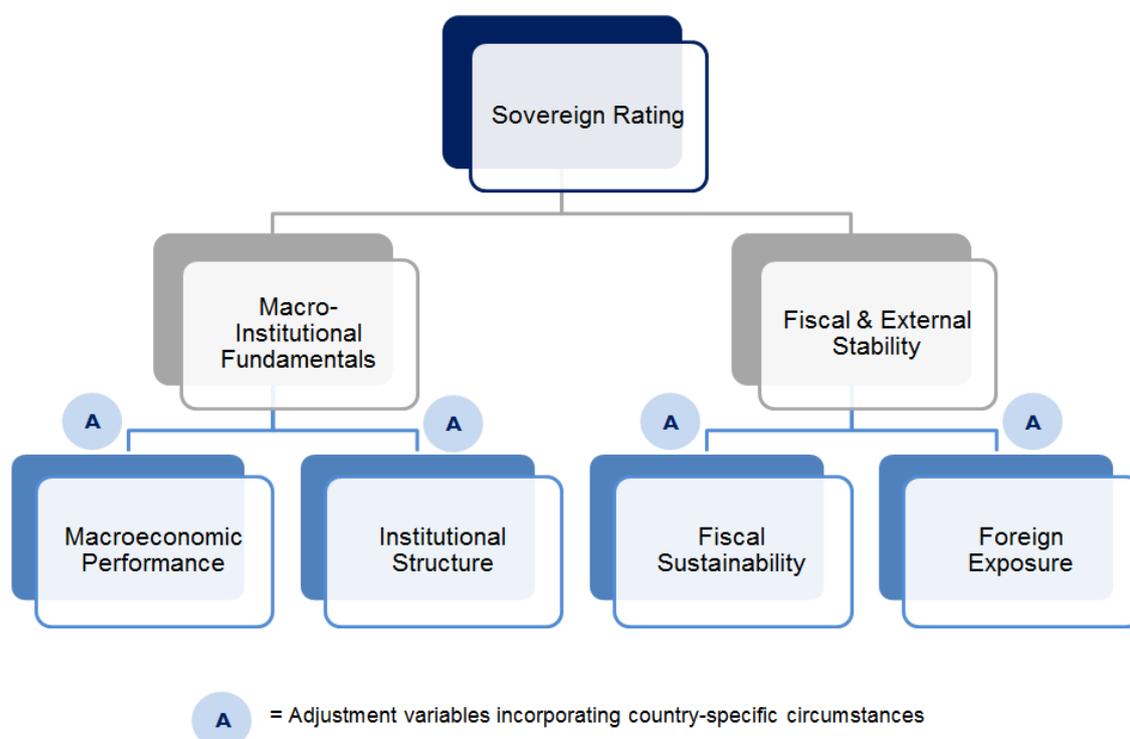
CRA sovereign ratings take into account the specific characteristics of the sovereign under review. CRA publishes a calendar for the following 12 month at the end of December, submitting the dates for the publication of sovereign ratings and rating outlooks. The publication dates of CRA sovereign ratings and related rating outlooks are set on a Friday. CRA publishes the sovereign ratings after the close of business hours of the last closed regulated market in the European Union and at least one hour before the opening of the first opened regulated market in the European Union.

4 Rating Method

4.1 Rating Model

The CRA sovereign rating model represents the analytical framework for the quantitative and qualitative assessments of a sovereigns' creditworthiness (see Fig. 2). The sovereign rating model is based on four risk factors: Macroeconomic Performance, Institutional Structure, Fiscal Sustainability, and Foreign Exposure. CRA uses a statistical approach under which a certain score is calculated for each of these risk factors, using a wide range of quantitative and qualitative indicators.

Fig. 2: CRA Sovereign Rating Model



The scores for the four risk factors are calculated in two steps. First, CRA determines the initial scores for each individual factor's underlying core indicators (for further details on this, see Chapter 4.4). The indicators are mapped on a 10-point-scale, according to their respective risk situation (see Fig. 3). Thus, all indicators are assessed on a scale that ranges from LR (low risk) to HR (high risk), with the categories S (stable risk situation), M (moderate risk), E (elevated risk) and I (impaired risk) in between. The categories S and I feature additional sub-categories where a plus (+) and minus (-) sign allow further differentiation. Standardized threshold values have been established for each risk factor indicator in the individual mapping categories.

Fig. 3: Scoring grid for the assessment of credit risk

Mapping categories	Risik situation
LR	low risk
S(+)	
S	stable
S(-)	
M	moderate
E	elevated
I(+)	
I	impaired
I(-)	
HR	high risk

In a subsequent step, each risk factor undergoes an adjustment process. The previously established initial scores of the individual risk factors provide a rough assessment of the risk profile and of the essential strengths and weaknesses of the sovereign under review. However, in order to make sure that country-specific parameters are properly taken into account, CRA introduces adjustment variables into the risk assessment in the four areas Macroeconomic Performance, Institutional Structure, Fiscal Sustainability and Foreign Exposure that are not equally relevant for all sovereigns. This guarantees that country-specific features and characteristics are taken into account and reflected by the eventual risk profile. This adjustment process can, ultimately, lead to a result where the individual risk factors have (even significantly) higher or lower values in the scoring grid than indicated by the initial scores. Adjustment variables and the underlying adjustment process are explained in detail in Chapter 4.2.

The risk factors, having been identified and subjected to the adjustment process, are finally combined into the so-called main factors. The risk factors Macroeconomic Performance and Institutional Structure are used to determine the main factor Macro-Institutional Fundamentals, while the risk factors Fiscal Sustainability and Foreign Exposure provide the input parameters for the main factor Fiscal & External Stability.

The risk factors Macroeconomic Performance (for more detail, see 4.2.1) and Institutional Structure (4.2.2) are combined with equal weightings, determining the main factor Macro-Institutional Fundamentals (see the combination matrix in Figure 4). For the purpose of determining the main factor scores, the same scoring grid is used that was already applied to determine the risk situation in the individual risk factors.

Fig. 4: Combination of the Risk Factors Macroeconomic Performance and Institutional Structure

		Macroeconomic Performance									
		LR	S(+)	S	S(-)	M	E	I(+)	I	I(-)	HR
Institutional Structure	LR	LR	LR	S(+)	S(+)	S	S	S(-)	S(-)	M	M
	S(+)	LR	S(+)	S(+)	S	S	S(-)	S(-)	M	M	E
	S	S(+)	S(+)	S	S	S(-)	S(-)	M	M	E	E
	S(-)	S(+)	S	S	S(-)	S(-)	M	M	E	E	I(+)
	M	S	S	S(-)	S(-)	M	M	E	E	I(+)	I(+)
	E	S	S(-)	S(-)	M	M	E	E	I(+)	I(+)	I
	I(+)	S(-)	S(-)	M	M	E	E	I(+)	I(+)	I	I
	I	S(-)	M	M	E	E	I(+)	I(+)	I	I	I(-)
	I(-)	M	M	E	E	I(+)	I(+)	I	I	I(-)	I(-)
	HR	M	E	E	I(+)	I(+)	I	I	I(-)	I(-)	HR

The main factor Fiscal & External Stability is determined by combining the risk factors Fiscal Sustainability (for more details, see 4.2.3) and Foreign Exposure (4.2.4). The risk factors are aggregated as illustrated in Figure 5, taking into account the sovereigns' currency status.

The currency status of the local currency is established on the basis of the IMF's currency basket for Special Drawing Rights (SDR) and the BIS's Central Bank Survey. CRA has implemented four currency status categories, ranging from CS 3 to CS 0. A high currency status indicates a sovereign with a reserve currency or a vehicle currency, i.e. a currency that is actively traded on the foreign exchange markets to a significant degree.

CS 3 is assigned to sovereigns with a reserve currency. Whether or not a currency is regarded as a reserve currency is determined by the currency basket used by the IMF to evaluate special drawing rights. As per May 2016, sovereigns with a reserve currency include the United States (US-Dollar), the United Kingdom (Pound Sterling), the euro area members (Euro) and Japan (Yen). Recently, the Chinese Renminbi also received reserve currency status, following which CS 3 will also be assigned to China from 1 October 2016 onwards.

The "Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity" of the BIS is the most comprehensive source of information about the volume and the structure of foreign exchange markets. CS 2 will be assigned to a sovereign if its local currency makes up 2% or more of the average daily turnover on the global foreign exchange markets and CS 3 has not already been assigned to the sovereign. Category CS 1 contains all countries whose local currency makes up between 1 and 2% of the average daily turnover on the global foreign exchange markets. CS 0 is assigned to all other countries.

Fig. 5: Combination of the Risk Factors Fiscal Sustainability and Foreign Exposure

		Foreign Exposure									
		LR	S(+)	S	S(-)	M	E	I(+)	I	I(-)	HR
Fiscal Sustainability	LR	LR	LR	LR	LR	LR	S(+)	S(+)	S(+)	S(+)	S(+)
	S(+)	LR	S(+)	S(+)	S(+)	S(+)	S(+)	S	S	S	S
	S	S(+)	S(+)	S	S	S	S	S	S(-)	S(-)	S(-)
	S(-)	S	S	S	S(-)	S(-)	S(-)	S(-)	S(-)	M	M
	M	S(-)	S(-)	S(-)	S(-)	M	M	M	M	M	E
	E	M	M	M	M	M	E	E	E	E	E
	I(+)	M	E	E	E	E	E	I(+)	I(+)	I(+)	I(+)
	I	E	E	I(+)	I(+)	I(+)	I(+)	I(+)	I	I	I
	I(-)	I(+)	I(+)	I(+)	I	I	I	I	I	I(-)	I(-)
	HR	I	I	I	I	I(-)	I(-)	I(-)	I(-)	I(-)	HR

		Foreign Exposure									
		LR	S(+)	S	S(-)	M	E	I(+)	I	I(-)	HR
Fiscal Sustainability	LR	LR	LR	S(+)	S(+)	S(+)	S	S	S	S	S(-)
	S(+)	S(+)	S(+)	S(+)	S	S	S	S(-)	S(-)	S(-)	S(-)
	S	S(+)	S	S	S	S(-)	S(-)	S(-)	M	M	M
	S(-)	S	S	S(-)	S(-)	S(-)	M	M	M	E	E
	M	S(-)	S(-)	S(-)	M	M	M	E	E	E	I(+)
	E	M	M	M	M	E	E	E	I(+)	I(+)	I(+)
	I(+)	M	E	E	E	E	I(+)	I(+)	I(+)	I	I
	I	E	E	I(+)	I(+)	I(+)	I(+)	I	I	I	I(-)
	I(-)	I(+)	I(+)	I(+)	I	I	I	I	I(-)	I(-)	I(-)
	HR	I(+)	I	I	I	I(-)	I(-)	I(-)	I(-)	HR	HR

		Foreign Exposure									
		LR	S(+)	S	S(-)	M	E	I(+)	I	I(-)	HR
Fiscal Sustainability	LR	LR	S(+)	S(+)	S	S	S(-)	S(-)	M	M	E
	S(+)	S(+)	S(+)	S	S	S(-)	S(-)	M	M	E	E
	S	S(+)	S	S	S(-)	S(-)	M	M	E	E	I(+)
	S(-)	S	S	S(-)	S(-)	M	M	E	E	I(+)	I(+)
	M	S	S(-)	S(-)	M	M	E	E	I(+)	I(+)	I
	E	S(-)	S(-)	M	M	E	E	I(+)	I(+)	I	I
	I(+)	S(-)	M	M	E	E	I(+)	I(+)	I	I	I(-)
	I	M	M	E	E	I(+)	I(+)	I	I	I(-)	I(-)
	I(-)	M	E	E	I(+)	I(+)	I	I	I(-)	I(-)	HR
	HR	E	E	I(+)	I(+)	I	I	I(-)	I(-)	HR	HR

For countries with CS 0, the risk factors Fiscal Sustainability and Foreign Exposure are combined with equal weight into the main factor Fiscal & External Stability, while for countries with a lower currency status, the risk factor Foreign Exposure has a lower weight (20% for CS 3 or 2, 30% for CS 1). Sovereigns with a reserve or actively traded currency benefit from high international demand for their currencies. Reserve currencies are fully convertible, and central banks all over the world hold them as reserves to ensure liquidity. Currencies with CS 3/2/1 are also used as

vehicle currencies in cross-border finance transactions. As a rule, sovereigns with reserve currencies or actively traded currencies tend to have broader and deeper capital markets, and the demand for assets in their local currencies is significantly higher than for assets denominated in the currencies of CS 0 sovereigns. These factors ultimately provide CS 3/2/1 countries with substantially more room for maneuver for their monetary and fiscal policies, making it easier for them to refinance their national debt and increasing their resilience against external economic developments. CS 0 sovereigns are generally facing difficulties in raising capital in their local currencies. This makes them all the more vulnerable, since any devaluation of their local currency will make it harder for them to meet their financial obligations abroad, decreasing the willingness of foreign investors to finance these sovereigns.

In a final step, the two main factors Macro-Institutional Fundamentals and Fiscal & External Stability are combined into the sovereign rating. The main factor scores are aggregated in a non-linear pattern (see Fig. 6).

Fig. 6: Combination of the Main Factors Macro-Institutional Fundamentals and Fiscal & External Stability

		Macro-Institutional Fundamentals									
		LR	S(+)	S	S(-)	M	E	I(+)	I	I(-)	HR
Fiscal & External Stability	LR	AAA	AAA	AAA	AA	AA-	A	A-	BBB	BB	B+
	S(+)	AAA	AAA	AA+	AA-	A+	A-	BBB+	BBB-	BB-	B
	S	AAA	AAA	AA	A+	A	BBB+	BBB	BB+	B+	B
	S(-)	AAA	AA+	AA-	A	A-	BBB	BBB-	BB	B+	B-
	M	AAA	AA	A+	A-	BBB+	BBB-	BB+	BB-	B	B-
	E	AA+	AA	A	A-	BBB	BB+	BB	B+	B-	CCC
	I(+)	AA+	AA-	A-	BBB+	BBB-	BB	BB-	B	B-	CCC
	I	AA	A+	BBB+	BBB	BB+	BB-	B+	B	CCC	CCC
	I(-)	AA-	A	BBB+	BBB-	BB	B+	B	B-	CCC	CC/C
	HR	A+	A-	BBB-	BB+	BB-	B	B-	CCC	CCC	CC/C

Increasing fiscal sustainability and foreign exposure risks will affect a sovereigns' creditworthiness with very good macro-economic and institutional fundamentals less adversely than the creditworthiness of sovereigns with weaker fundamentals. Consequently, the main factor Macro-Institutional Fundamentals receives a higher weight in the mapping categories from LR to S(-) than in the categories characterized by higher risks. At the same time, sovereigns with a relatively weak macroeconomic performance and institutions are generally more vulnerable to unfavorable fiscal or external developments. This is why BB or B+ are the best ratings that sovereigns with an I(-) or HR assessment for the main factor Macro-Institutional Fundamentals can obtain.

CRA issues long term ratings for sovereign issuers as well as for government bonds. The analytical framework for sovereign ratings, meanwhile, applies independently from the

denomination (national or foreign currency) of a given sovereign issuer's financial obligations. Sovereign ratings of government bonds that have been issued in local currency can, nevertheless, receive a deviating rating. This is explained in greater detail in Chapter 5, where a list of the assessment criteria can be found.

Overall, the analytical framework for the assessment of a given sovereigns' creditworthiness is flexible. The combination matrices shown above primarily serve the purpose of transparency. They are meant to illustrate and explain how CRA arrives at its sovereign ratings. When our analysts assess a sovereigns' ability of servicing its debt, the rating may differ from what would be implied by the methodology outlined above, provided they decide that such a deviation is necessary to consider and duly take into account all existing credit risks. Thus, it is in principle possible to apply rating criteria that have not been mentioned in this document or to assign different weights to the aforementioned risk or main factors.

4.2 Rating Criteria

Within the scope of its rating methodology, CRA analyzes the four risk factors Macroeconomic Performance, Institutional Structure, Fiscal Sustainability and Foreign Exposure. Each of these factors is composed of a wide range of quantitative and qualitative indicators. The core indicators are analyzed using statistical methods (see 4.1) and aggregated using the weighting method illustrated in Fig. 7. The final risk factor is then determined by applying a number of adjustment variables reflecting country-specific risks.

CRA uses historical data as well as forecasts of how the indicators in question are likely to develop. While the use of reliable time series data enables the detection of long-term trends, forecasts reflect the fact that ratings are always forward-looking assessments. A mere extrapolation of past developments may be misleading. Thus, CRA is using a through-the-cycle approach, guaranteeing that the adjustment of ratings is not exclusively determined by cyclical components and that the ratings accurately reflect the structural state of an economy and the underlying creditworthiness of the sovereign under review.

Fig. 7: Sovereign Rating indicators in the individual risk factor categories

Risk factors	Weight (in %)	Core indicators	Adjustment variables
Macroeconomic Performance	60	GDP per capita	Credit development Economic resilience and flexibility
	20	GDP trend growth	
	20	GDP volatility	
Institutional Structure	20	Monetary policy effectiveness	Payment record Program country Sustainability of monetary policy Political risk Quality of statistics
	80	Good governance	
	40	Government effectiveness	
	20	Voice & accountability	
	20	Control of corruption	
	20	Rule of law	
Fiscal Sustainability	40	Change in government debt/GDP	Fiscal policy framework Foreign currency debt Contingent liabilities/sovereign wealth funds Demographics
	20/40*	Government debt/GDP	
	40/20*	Interest payments/Revenue	
Foreign Exposure	30/20*	(Current account balance+net FDI)/GDP	Sudden reversals in balance of payments FX regime Refinancing conditions Sustainability of external debt service
	20/30*	International reserves/Imports	
	25	Sovereign external debt/Government debt	
	25	Sovereign external debt/Total external debt	

*) Risk weights for sovereigns with currency status=3/2 and sovereigns with currency status=1/0, respectively

While the risk factor analysis is primarily driven by quantitative indicators, qualitative indicators are also taken into account. In principle, the qualitative analysis of information is as important for the assessment of a sovereign issuer and his creditworthiness as quantitative analyses, at times even of superior relevance. This is mainly due to the fact that sovereign issuers have rights and powers at their disposal that other debtors lack. Governments can change their monetary and fiscal policies or make use of their regulatory and political powers. Quantitative factors alone will hardly be able to reflect this. It must also be borne in mind that any sovereign rating must not only consider whether a sovereign is able to honor its debt, but also whether it is willing to do so – in certain cases, the latter may be the more crucial question.

As a rule, other indicators may be used to assess the individual risk factors when CRA believes that any such additional indicators are required to better understand and reflect the ability and willingness of a sovereign to meet its financial obligations.

4.2.1 Macroeconomic Performance

The ability of a sovereign to generate sufficient levels of government revenue and to use this revenue to meet its financial obligations fully and on time is largely determined by the performance of its economy. The government in turn has an indirect impact on economic developments, since it determines the legal framework in which private actors operate. The government therefore has a key role in creating stable economic conditions. The long-term development of macroeconomic indicators provides sound evidence whether a sovereign is capable of stimulating economic activity through appropriate business, fiscal and monetary policies and whether it can thereby ensure its creditworthiness.

Core Indicators

The initial score for the risk factor Macroeconomic Performance (MP) is determined by the weighted average score of three core indicators: GDP per capita, GDP trend growth, and GDP volatility.

(i) GDP per capita: Per capita income is the most important indicator for an economy's state of development. Economies with high levels of per-capita income have a potentially broader tax base, being able to either increase existing taxes on domestic income and assets or introduce such taxes. High levels of GDP p.c. are commonly associated with high levels of prosperity in the form of human capital or tangible and financial assets), which gives such economies a better ability to absorb exogenous shocks. In general, economies with relatively high levels of GDP p.c. tend to have effective institutions and stable political systems. Frequently, they have also implemented mechanisms that are designed to prevent over-indebtedness.

In order to obtain the most objective and most accurate view on economic development, CRA considers GDP p.c. in purchasing power parity terms (PPP) to adjust for exchange rate effects

and ensure comparability across countries. GDP p.c. is calculated by dividing the GDP by the population size.

(ii) GDP growth trend: The debt to GDP ratio of a sovereign can decline even when the government fails to pay down any debt as long as the sovereign manages to generate economic growth. Thus, sustainable growth provides an opportunity to lower a sovereigns' debt burden, as a government would not have to implement unpopular austerity policies which could decrease the population's acceptance of the government's fiscal policy. Furthermore, positive economic development can also be expected to have positive effects on revenue, in general.

Since economic growth is not solely a reflection of a government's policies and may fluctuate from year to year due to exogenous events, CRA analyzes – according to the through-the-cycle approach – the medium- to long-term growth trends for the purposes of its assessments. In order to determine this underlying growth trend, CRA calculates a moving average reflecting forecasts for the current year and the two following years in addition to the real GDP growth figures for the last five years. It will be taken into account that there is generally an inverse relationship between GDP growth and per-capita income, i.e. developed economies tend to grow more slowly than emerging economies or developing countries.

(iii) GDP volatility: High levels of economic volatility can be caused by many factors. Economies that combine an excessive dependence on export markets with poorly developed domestic markets as well as economies with a large share of cyclical industries or commodity exports may suffer from increased output volatility. Particularly in emerging economies, increased levels of macro-economic volatility can be a consequence of country-specific financial or monetary policies. High volatility of economic growth rates can therefore indicate inappropriate fiscal or monetary strategies or an inefficient implementation of government policies. As a rule, low GDP volatility enhances a sovereigns' reputation on the credit markets since investors have a better idea of what they may be expecting.

Strong fluctuations of economic performance and, consequently, of government revenue make it more difficult to determine a sovereigns' debt affordability and may even jeopardize the full and timely repayment of the sovereigns' financial obligations. In order to measure volatility levels, CRA analyzes the standard deviation of real GDP growth over a period of eight years, taking into account the record of the past six years as well as the growth forecasts for the current year and the following year.

Adjustment Variables

CRA subjects the initial MP score to an adjustment process, determining whether and to what extent country-specific adjustment variables have to be taken into account to adequately assess sovereigns' creditworthiness. The rating analysts examine the risk pertaining to the credit development and the economic resilience and flexibility, evaluating several optional indicators.

Credit development: As a rule, an efficient and sound financial sector capable of funding the growth of the domestic economy is credit positive. A high proportion of domestic credit (as a ratio of the GDP) indicates a well-developed financial market with a broad and diversified base of domestic investors. If, however, credit growth consistently outperforms GDP growth, MP core indicators may be distorted which would then inadequately reflect the actual performance and potentials of the economy under review. An excessive credit growth can also generate risks for the sovereigns' creditworthiness. If the total credit volume expands too fast, asset price bubbles can emerge. Boom-bust-cycles of loans and assets can adversely affect the overall economic stability. Most financial crises in the past have coincided with a sharp decrease of the economic growth figures.

In order to detect potential credit bubbles at an early stage, CRA is continuously monitoring credit growth. If, for a longer period, the expansion of the credit volume remains above the level that seems justified by the underlying fundamentals, CRA may opt to lower the MP score by up to two notches. CRA will act in the same way if credit growth appears to deviate significantly from its long-term trend.

Economic resilience and flexibility: CRA believes that the underlying business model of an economy is highly relevant for the assessment of the sovereigns' creditworthiness. The resilience of the economy under review and its capability of reacting flexibly to changing economic and financial circumstances are of specific importance. A lop-sided structure of an economy – disproportionate importance of certain industries, commodities or export markets – is, conversely, considered to represent a high risk. The sustainability of such a growth model and, together with it, the financial situation of the sovereign can be affected by technological progress, a shift in demand patterns and price changes on global markets. CRA therefore analyzes in its sovereign ratings whether the economy under review appears to rely on a small number of industries. CRA also examines to what extent commodity exports contribute to the overall economic performance.

CRA's assessments of a given economy's ability to adapt and to remain competitive in a changing business environment is also based on the "Ease of doing business index" of the World Bank and the "Global Competitiveness Index" of the World Economic Forum. We conduct a peer group analysis, assessing the business environment of the country under review in relation to the situation of other countries with a similar level of economic development. Further evidence for the (medium to long term) competitiveness of an economy is also provided by the development of the real effective exchange rate. Furthermore, the more flexible an employment market is, the better prepared the economy will be to absorb adverse economic and financial shocks. High levels of unemployment and low employment rates may indicate matching problems or rigid labor laws that can hold back an economy and prevent it from exploiting its full potential.

Economies with flexible labor markets and diversified economic structures that offer favorable operating conditions for companies tend to have a sustainable growth model. The revenue base

of their budgets is sufficiently broad and relatively easy to forecast, allowing the government to ensure its solvency. The adjustment variable Economic Resilience and Flexibility may raise or lower the MP score by up to four notches.

4.2.2 Institutional Structure

The risk that a sovereign may choose not to meet its financial obligations although it may have the resources required is reflected by the sovereigns' underlying institutions. Institutions are defined as the rules that govern or control the behavior of the economic actors throughout their various interactions. Of utmost importance are economic institutions such as property rights and the existence of regulated markets since these shape the society's incentive patterns and lower the level of uncertainty in any given economic system. Economic institutions are largely endogenous and shaped within a framework of collective decision-making whose results depend on the political institutions that determine the restrictions and incentive patterns of the political actors. Ultimately, differences in the design of economic and political institutions can help to explain why some economies are prosperous and generate high rates of economic growth while others do not. This is why CRA interprets the quality of an economy's institutions as a political signal for the active engagement and the fundamental willingness of a sovereign to meet its financial obligations.

Core Indicators

The initial score for the risk factor Institutional Structure (IS) is determined by the weighted average score of two core indicators: Good Governance and Monetary Policy Effectiveness

(i) Good Governance: The willingness of a sovereign to honor its financial obligations is of central importance for the assessment of a sovereign issuer's creditworthiness and points to an essential distinction between ratings of sovereign issuers and ratings of other issuers or financial instruments. The institutional framework significantly affects political decision processes and outcomes and thus, is a crucial element to consider when assessing the probability of a sovereign default. This framework is a constituent feature of governance, i.e. the execution of economic, political and administrative powers to exercise the functions of government on all levels. Good governance ensures the long-term growth perspectives of an economy and prevents a sovereigns' creditworthiness from significant deterioration. Typical features of good governance include a certain level of predictability and reliability of political decision-making processes, independently from any change in government. Sovereigns with a history of poor governance, conversely, are characterized by unreliable legal systems, low government effectiveness, an insufficiently rigorous determination to uphold the rule of law as the fundamental principle of government action and a lack of transparency in the application of public funds and corruption.

CRA bases its assessment of a sovereigns' institutional framework, inter alia, on the World Governance Indicators of the World Bank, the most important of which is the indicator for the

effectiveness and quality of economic policies (Government Effectiveness) that measures the competence of civil servants and the quality of public services. This sub-indicator consequently carries most weight in the composition of the core indicator Good Governance, followed by the two indicators that reflect the trust in government institutions: Rule of Law, representing the reliability of the legal system as well as the ability to enforce contractual agreements, and Control of Corruption, which indicates to what extent government powers are used for private gain. The final component is the indicator Voice & Accountability which captures the extent to which citizens are able to participate in electing their government as well as freedom of expression.

(ii) Monetary Policy Effectiveness: Very high and very low rates of inflation can equally increase the general level of uncertainty in an economy, potentially heighten the volatility of asset prices and fostering macroeconomic instability. Above all, however, CRA believes that stable prices are a good indication for the independence of the central bank and effective as well as efficient economic policies. The delegation of powers and authority over monetary policies to an independent central bank creates trust in a sovereigns' willingness to meet its long-term obligations. Relatively wide-ranging powers of intervention also provide the basis for more effective action in the course of economic or financial crises and serve to reinforce the foundations of sustainable economic growth.

CRA assesses the credibility of central banks on the basis of the medium to long term development of the inflation rate. Thus, an inflation trend is calculated as a moving average that reflects forecasts for the current year and the two following years in addition to the actual inflation rates for the last five years.

Adjustment Variables

CRA subjects the initial IS score to an adjustment process, determining whether and to what extent country-specific adjustment variables have to be taken into account to adequately assess sovereigns' creditworthiness. The rating analysts examine the risk pertaining to the payment record, IMF program participation, the sustainability of monetary policy, political risk, and the quality of statistics, evaluating several optional indicators.

Payment Record: The question at which point a certain level of sovereign debt ceases to be sustainable is inextricably linked to the governments past payment behavior. Empirical evidence shows that sovereigns that have defaulted at least once in the past are subject to higher default risks. Such a tendency can be seen as the symptom of a structural institutional weakness. Defaults can also weaken institutions in the medium and long term. Moreover, debt restructurings may ease short-term liquidity problems, but do little to address the underlying problems that reflect the defaulting sovereigns' structural weaknesses.

Sovereigns with a history of default(s) generally suffer from a poor reputation on the global capital market. In contrast to sovereigns that have met all principal and interest payments in the past,

they may be unable to convince investors to provide them with additional funds even if their debt ratios are relatively low. As a consequence, they have to pay higher interest rates and are more vulnerable to external shocks. CRA may decide to lower the IS score of sovereigns with a history of default(s) or arrears to official creditors by up to three notches.

Program Country: CRA will take into consideration whether or not the sovereign issuer under review has been the beneficiary of IMF assistance or – if the sovereign in question belongs to the euro area – of support from the European Financial Stability Facility (EFSF) or the European Stability Mechanism (ESM). Both institutions have a range of instruments at their disposal to provide governments with assistance in their attempts to stabilize their economies as long as they meet a number of strict conditions. Involving the IMF or the EFSF/ESM can, however, have starkly different and even conflicting consequences. The funds of these programmes may prevent potential defaults. Support measures of international organizations can also serve to build trust among private and institutional investors. Beyond that, sovereigns may – under the obligation to comply with macro-economic reform programmes – improve their economic and financial situation. On the other hand, it is possible that investors will perceive the implementation of a programme as a signal to withdraw their capital, triggering capital outflows or even capital flight, also known as a “rush to the exit”. The success of any programme is also determined by the extent to which the government identifies with its measures and complies with the conditions and goals of the arrangement. CRA performs case-by-case assessments, taking into account the nature of conditionality and the scale of financial assistance as well as the terms and conditions of the emergency facilities. Depending on this assessment, the IS score can rise or fall by up to two notches.

Sustainability of Monetary Policy: The overall inflationary trend is seen as an indicator for the central banks’ effectiveness in fulfilling its mandate as well as for the general quality of a sovereign’s institutions. Another important figure is the volatility of the inflation rate. As a rule, a volatile inflation rates can slow down the pace of economic growth even if the price level increases slightly. Strong fluctuations of the inflation rate cause great uncertainty as regards the future development of the economy and the future price level and thus, indicate a (partial) failure of the central bank to fulfil its mandate.

CRA measures price volatility by determining the standard deviation of the inflation rate over a period of eight years, taking into account the inflation rates of the past six years as well as the forecasts for the current year and the following year. Depending on the level of inflation volatility, the IS score can in- or decrease by one notch.

Political Risk: Defaults can be triggered by a change of the political parameters that determine a sovereigns’ willingness to meet its financial obligations. As a rule, political instability increases default risk. This is why defaults are closely linked to reflect dramatic political changes and severe political or social tensions. Social unrest, political conflicts and wars have all caused defaults in

the past. Empirical evidence appears to indicate that the perspective of an impending political change immediately before a general election increases the sovereign default risk. Not all political changes, however, are preceded by an election, and the dismissal or resignation of a high-ranking minister can equally signal a shift in the respective sovereigns' attitude towards its financial obligations.

Among the sources used by CRA is the World Governance Indicator of the World Bank, Political Stability and Absence of Violence, which assesses a country's probability of being destabilized by unlawful or violent means. It must be emphasized that political risks are difficult to assess in quantitative terms and that the aforementioned indicator can be no more than the starting point for a deeper analysis. If CRA concludes that political factors represent a risk with regard to the willingness of a sovereign issuer to meet his financial obligations in the short to medium term, the IS score can be lowered by up to three notches.

Quality of Statistics: An insufficient quality of available data can make it very difficult to assess and quantify sovereign credit risk. Data quality criteria include the accuracy of official estimates, the frequency in which data are made available (how soon requests are complied with and how up-to-date the data are), availability and transparency of information, comparability of statistical figures, and data coherence. If the CRA rating analysts detect any problems with the public data that are provided by the national authorities from the country under review, they can lower the IS score by one notch.

4.2.3 Fiscal Sustainability

While certain general conditions – such as the development of the global economy – cannot be directly controlled by any sovereign, governments alone are responsible for their fiscal policies. This is why these policies are key indicators for the quality and efficiency of public action. The conditions under which sovereign issuers can raise capital on the global markets are directly influenced by the objectives of their fiscal policies and by the adequacy of the means which they apply to that purpose. As a general rule, sovereigns with sustainable fiscal policies will have easier access to the capital market and can raise capital under more favorable conditions. A sustainable fiscal policy is characterized by several features. Above all, it must demonstrate that government debt will be kept at a moderate level in the long term, assuring that the sovereign will remain capable of meeting its financial obligations even under unforeseen and adverse circumstances. The sovereign should also assure that, rather than using its proceeds merely for the purposes of consumption, an adequate level of public investments is maintained to improve the long-term growth perspectives of the national economy.

Core indicators

The initial score for the risk factor Fiscal Sustainability (FS) is determined by the weighted average score of three core indicators: Government Debt/GDP, Change in Government

Debt/GDP, and Interest Payments/Revenue. The way in which the variables Government Debt/GDP and Interest Payments/Revenue are weighted in the aggregation of the main factor Fiscal Sustainability will depend on the currency status of the sovereign under review (see Fig. 7).

(i) Government Debt/GDP: In principle, default risks rise in proportion to a sovereigns' debt ratio, because the expenses required to service government debt tend to rise alongside the debt ratio. Since the level of debt is a direct consequence of a government's budget policies, a high debt ratio can also indicate structural inefficiencies of government spending and/or a government's incapability to generate revenue. High debt ratios also narrow down a government's room for maneuver, e.g. its ability of reacting to exogenous shocks. Debt ratios in excess of 90% are deemed to slow down the pace of economic growth. Channels of transmission are (i) private saving patterns (ii) public investment, and (iii) total factor productivity (TFP).

(ii) Change in Government Debt/GDP: The rate at which the debt ratio of the sovereign is changing has a decisive impact on the development of the risk premiums for long-term government bonds. If the level of sovereign debt increases more quickly than the GDP, investors will generally demand higher risk premia. As a consequence, higher interest payments will put the national budget under additional strain, and additional funds may be required to meet the sovereigns' financial obligations, raising the debt ratio even further. Eventually, the sovereign might enter a vicious circle of rising interest payments and growing debt. Moreover, increasing interest rates also create the risk of crowding out.

In order to identify the underlying trends of sovereign debt development, CRA determines the annual change of the debt ratio and calculates a moving five-year average that reflects forecasts for the current year and the two following years in addition to the figures for the last two years.

(ii) Interest Payments/Revenue: In addition to debt levels and debt dynamics, CRA also examines to what extent government revenue can cover existing financial commitments. The ratio of interest expenses to government revenue indicates whether and to what extent taxes and duties can fund interest expenditure. It must be taken into account how stable the level of government revenue is, but also how sensitive the total expenditure may be to possible changes of the interest rate and currency risks. If a large share of the national budget has to be spent on debt service, this will restrict the government's fiscal space. In addition, it may also have negative repercussions on a government's willingness to meet its financial obligations. Empirical analyses show that sovereigns tend to cease debt service when interest payments account for more than 25% of their total revenue. When the amounts that are required to service national debt continue to rise, there will be less financial resources left for social services and public projects. The population will tend to question the agenda of a government that prioritizes its financial obligations, and political pressures will grow to either stop all repayments or to renegotiate existing credit arrangements.

Adjustment Variables

CRA subjects the initial FS score to an adjustment process, determining whether and to what extent country-specific adjustment variables have to be taken into account to adequately assess sovereigns' creditworthiness. The rating analysts examine the risk pertaining to the fiscal policy framework, foreign currency debt, contingent liabilities/sovereign wealth funds and demographics, evaluating several optional indicators.

Fiscal Policy Framework: The rating analysts determine whether the debt ratio is sustainable in the long term and whether the sovereign debt can be serviced through the government's fiscal revenue. The dynamics of the fiscal deficit are a crucial variable in this context, indicated by the medium-term trend of the cyclically-adjusted and primary budget balance. Furthermore, the analysts will also evaluate whether institutional rules are implemented that could effectively prevent a government from raising excessive debt levels. The maturity structure of the outstanding debt instruments – with a specific focus on short-term refinancing requirements – will also be examined. CRA furthermore analyzes how stable and reliable government revenues are, assessing the historic volatility levels of government revenue in times of falling or stagnating GDP as well as the sources of revenue.

Fiscal credibility and the ability and willingness to honor financial obligations will generally benefit from the moderate levels of new debt and a history of compliance with budgetary rules. The assessment of the fiscal policy framework can raise or lower the FS score by up to three notches.

Foreign Currency Debt: Emerging and developing economies in particular raise most of their capital in foreign currencies. If a significant proportion of the sovereign debt is denominated in foreign currencies, a sudden devaluation of the local currency can substantially increase the expenses required for payments of interest and principal. The sovereign issuer will in such a case only have a restricted range of possible countermeasures at his disposal, in contrast to his situation when dealing with bonds that are denominated in local currency. If a large proportion of sovereign debt is denominated in foreign currencies, the FS score can be lowered by up to two notches.

Contingent Liabilities/Sovereign Wealth Funds: Contingent liabilities are liabilities outside the national budget that may be triggered by certain events. This is why contingent liabilities represent a latent risk for the future development of the debt ratio. Contingent liabilities may include guarantees for state-owned companies and for liabilities of domestic banks. If actual claims under such guarantees were made, e.g. in the wake of a banking crisis, the government would be obliged to provide the financial funds required to recapitalize the banks in order to ensure the smooth functioning of the domestic financial system. In order to identify potential sources of risk in the domestic banking system at an early stage, CRA is using a broad set of financial stability indicators such as the share of non-performing loans, the dynamics of property prices and the loan-deposit ratio. Assets that are not directly owned by the government are also

taken into account. Sovereigns with large current account surpluses often operate sovereign wealth funds that invest government revenue in debt instruments and equity. Such funds represent state-owned assets that can be liquidated, if necessary, which is why they improve the creditworthiness of sovereign debtors even though they may be outside the budget. The assessment of contingent liabilities and the assets of sovereign wealth funds can raise the FS score by one notch or lower it by up to two notches.

Demographics: In countries with high employment rates, a high proportion of people of working age (between 15 and 64 years) in the general population has a positive effect on the national budget. Whether citizens are net contributors to or net beneficiaries from government services is largely determined by their age. CRA also analyzes the development of health care and social benefits expenses. If additional expenses must be anticipated in the light of demographic trends or developments of the government's spending policies that may require more debt, the FS score can be lowered by one notch.

4.2.4 Foreign Exposure

Reflecting the globalization of the trade in goods and services, financial market integration has increased significantly. Sovereigns as well as companies are taking advantage of the opportunities to raise capital on the international capital market and benefit from different financing conditions. However, close-knit networks of various stakeholders in the global economy also generate risks. Adverse developments in individual economies become harder to contain. High levels of dependence from foreign funds make sovereigns vulnerable and create sustained trade imbalances. This is why the creditworthiness of sovereigns can only be assessed by accounting for the risks that are associated with the international flows of goods and capital between residents and non-residents. The primary focus must be placed on the question whether and to what extent a sovereign issuer can generate sufficient amounts of foreign-denominated revenue in order to meet his financial obligations to non-residents.

Core Indicators

The initial score for the risk factor Foreign Exposure (FE) is determined by the weighted average score of four core indicators: $(\text{Current Account Balance} + \text{Net FDI})/\text{GDP}$, $\text{International Reserves}/\text{Imports}$, $\text{Sovereign External Debt}/\text{Government Debt}$, and $\text{Sovereign External Debt}/\text{Total External Debt}$. The way in which the variables $(\text{Current Account Balance} + \text{Net FDI})/\text{GDP}$ and $\text{International Reserves}/\text{Imports}$ are weighted in the aggregation of the main factor Foreign Exposure will depend on the currency status of the sovereign (see Fig. 7).

(i) *(Current Account Balance + Net FDI)/GDP:* If an economy's capital inflow permanently exceeds its outflow, this will have a positive effect on the ability of a sovereign issuer to meet his financial obligations. Economic transactions between residents and non-residents are recorded in the current account balance which indicates a sovereigns' ability to mobilize financial resources in

foreign exchange. A current account surplus means that the flow of income from non-residents exceeds the payments that are made to them, enabling the sovereign to acquire foreign-based assets that can be used to service foreign-currency debt or to build up international reserves. Direct investments are investments abroad with the objective to build up foreign-based subsidiaries or to acquire interests in non-resident companies. The provision of loans between affiliated companies and the purchase of bonds are also covered by the definition of direct investment. An economy with positive net direct investments attracts more investments from non-residents to its domestic economy than residents are prepared to make abroad. In order to measure a sovereigns' level of dependency from external capital flows, CRA analyses the ratio of the sum of the current account balance and net foreign direct investments to GDP.

(ii) International Reserves/Imports: Emerging economies that cannot cover their financing needs by raising funds (either entirely or partially) in local currency are specifically prone to liquidity crises. Many of these sovereigns finance their current account deficit through non-resident creditors. If, however, these non-residents withdraw their capital unexpectedly, the local currency will depreciate accordingly, increasing the prices of imported goods. In order to maintain the ability of local companies to import commodities and primary products, the central bank then has to tap the sovereigns' currency reserves. If these reserves prove to be insufficiently large, this can adversely affect growth and increase the number of corporate insolvencies.

In order to assess whether a sovereigns' foreign currency reserves are adequate to the economy's size and degree of openness, CRA calculates the ratio of the sum of gold and currency reserves and the total volume of imports. The higher the share of gold and currency reserves, the more likely the sovereign is to maintain its ability of meeting its foreign-currency-denominated financial obligations and, consequently, the higher the economy's apparent resilience against liquidity shocks.

(iii) Sovereign External Debt/Government Debt and Sovereign External Debt/Total External Debt: Sovereigns can cover their financing needs by raising debt on external markets. Especially economies with a poorly developed domestic capital markets often resort to this opportunity. Relatively beneficial borrowing conditions – in times of high levels of liquidity on the international financial markets – can provide these sovereigns with an additional incentive of raising external debt.

As a rule, however, it is a negative sign for a sovereigns' creditworthiness if a significant share of its debt is held by non-residents. Even sovereigns with only moderate levels of debt are subjecting themselves to high risks by making their budgets dependent on a constant capital inflow. The capital inflow from non-residents must be characterized as pro-cyclical and volatile. If unexpected events on the international capital markets increase the risk aversion of investors, these sovereigns then risk being cut off from their external financing sources. Such a sudden stop can cause a severe liquidity crisis and seriously curtail the sovereigns' ability to meet its financial

obligations. Additionally, external debt of emerging and developing economies is often denominated in foreign currencies and issued under the law of foreign countries. Further risks stem from currency mismatches, as revenues are often generated in local currency while liabilities are denominated in foreign currencies. If the local currency depreciates significantly, the debt burden – denominated in foreign currency – will increase. Finally, sovereigns with large amounts of external debt are less capable of devaluating their liabilities through inflationary policies.

In order to determine the degree to which a country is dependent on external funds, CRA uses two indicators: firstly, the ratio of sovereign external debt to total government debt, and secondly, the ratio of sovereign external debt to total external debt.

Adjustment Variables

CRA subjects the initial FE score to an adjustment process, determining whether and to what extent country-specific adjustment variables have to be taken into account to adequately assess sovereigns' creditworthiness. The rating analysts examine the risk pertaining to sudden reversals in balance of payments, the FX regime, the refinancing conditions and the sustainability of external debt service, evaluating several optional indicators.

Sudden Reversals in Balance of Payments: Empirical evidence suggests that emerging economies in particular can experience balance of payment crises when capital flows are suddenly reversed. In view of this, CRA examines the economies' entire balance of payments for potential weaknesses, concentrating specifically on the development of the current and the capital account as well as the net international investment position (NIIP). As the NIIP shows the value of an economy's claims and liabilities towards the rest of the world at a specific point in time, it complements the balance of payments that shows the changes of all economic transactions between residents and non-residents over a period of time. A positive NIIP is often closely associated with a current account surplus. If an export surplus is invested in foreign securities, the NIIP should improve.

As a rule, economies become more resilient against external shocks when domestic consumption can be funded without a net inflow of foreign capital (i.e. without a current account deficit). A positive NIIP, signalling higher independence from foreign funds, has a similarly mitigating effect on vulnerabilities from external shocks. Depending on the extent of a sovereigns' need for external capital, the FE score can be raised or lowered by up to two notches.

FX Regime: A country's foreign exchange regime is important, because the external value of a currency exerts an influence on an economy's vulnerability to external factors. Exchange rate movements can raise or lower the real value of foreign currency debt and moreover, impact the development of direct investments and the current account. A fixed exchange rate leaves the government with less room for action. Due to a lack of independent monetary or exchange rate

policies, the government has little influence on the economic and financial environment in which companies interact. Past experience has shown that a fixed exchange rate regime generates particularly large economic costs when it cannot be upheld permanently. Any government that tries to shield its currency from the markets also risks the emergence of external imbalances that may lead to a balance of payments crisis.

CRA's assessment of a government's current exchange regime is based on the classification of exchange rate regimes in the IMF Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). This report distinguishes between four currency regimes: floating, hard peg, soft peg, and other managed arrangements. Fixed currency regimes can increase the vulnerability of an economy to external shocks, specifically when combined with sustained imbalances in the balance of payments and consequently, lower the FE score by up to two notches.

Refinancing Conditions: As a rule, the sovereign's refinancing conditions should at any time reflect its macroeconomic fundamentals. However, financial turbulences could entail growing risk aversion that may temporarily detach refinancing conditions from these fundamentals and trigger a portfolio reallocation. Thus, bonds issued by emerging economies are sold and the proceeds from these sales are invested in bonds of developed countries or (presumably) safe financial instruments. In the wake of such a "flight to safety", the risk premia of certain sovereigns may rise, increasing their refinancing costs. A significant and sudden increase of medium- to long-term financing costs – measured by ten-year government bond yields and 5-year CDS spreads – can lower the FE score by up to two notches.

Sustainability of External Debt Service: A sufficient level of international reserves may be regarded as a prerequisite for a sustainable external debt service – in particular for emerging and developing economies whose foreign liabilities are usually denominated in Euro or US-Dollar. CRA uses two indicators, assessing the sustainability of a sovereigns' external debt service. The ratio of a sovereign's debt payments to its international reserves shows how long the sovereign could service its external debt, once capital inflows from non-residents declined. The ratio between short-term liabilities to non-residents creditors and the currency reserves indicates the liquidity risk. The FE score will be lowered by up to two notches if the sustainability of a sovereigns' external debt service does not appear to be given.

5 Foreign Currency and Local Currency Sovereign Rating

The CRA rating methodology applies to all of a sovereign's financial obligations, irrespective of the currency denomination. Thus, debt instruments denominated in local currency are generally subject to the same risk factors as debt instruments denominated in foreign currencies.

Sovereigns can generate revenues in local currency by imposing new or by increasing existing taxes. Sovereigns can also influence their refinancing costs through expansive monetary policies (in addition to the – theoretically existing – possibility of printing unlimited amounts of money). Finally, sovereigns with a liquid domestic capital market have more options at their disposal when having to refinance liabilities denominated in local rather than foreign currency, since they are less dependent on the international capital markets.

At the same time, however, recent historical experience with sovereign defaults appears to provide little evidence for the assumption that governments make significant distinctions between domestic and external creditors and prioritize honoring financial liabilities in their local currency. In light of growing liberalization of international financial markets, the idea of a preferential treatment for creditors holding debt instruments denominated in local currency and of a differentiation between local and foreign currency sovereign ratings seems to be of decreasing importance. In emerging economies as well as industrialized nations, capital markets are gaining in depth and breadth which is reflected by a growing contagion risk between problems of servicing domestic and problems of servicing foreign debt. The incentives for a preferential treatment of domestic debt are furthermore negligible, since capital controls are being increasingly lifted – not only in industrialized countries – and the capital of international investors can flow more or less freely. When sovereigns do not have a currency of their own (currency unions, dollarization), no distinction is made between debt in local and foreign currency.

As a consequence, sovereign ratings for debt instruments in local currency will rarely differ from the foreign currency sovereign rating. Notwithstanding, it may be appropriate to issue a local currency sovereign rating that is deviating from the foreign currency sovereign rating. CRA applies a “notch-up approach“, i.e. the local currency sovereign rating is one or two notches above the foreign currency sovereign rating when the creditworthiness of the sovereign appears to be different in local and foreign currency. CRA’s decision is essentially based on three criteria:

- (i) Development of the domestic capital markets: As a rule, countries with deep as well as diversified domestic capital markets have a low-cost and reliable funding source at their disposal that can provide them with sufficient funds to meet their financial obligations in local currency. This may apply when the domestic stock and bond markets are highly capitalized or capital is free to move and circulate.
- (ii) Imbalances between fiscal policy performance and vulnerability to external influences: In cases where governments pursue a sustainable fiscal policy which is based on sound budgets while their financing needs are highly susceptible to external shocks, sovereign ratings may be higher for local currency debt than for debt in foreign exchange. In these cases, it is usually the risk factor Foreign Exposure that adversely affects the main factor Fiscal & External Stability.

- (iii) Debt service reliability: If past payment behaviour patterns help to identify cases where preferential treatment was given to local currency debt, a local currency sovereign rating may be “notched-up”.

6 Continuous Monitoring

Following the release of a sovereign rating, the team of analysts proceeds to monitor the economic and financial developments in order to ensure that the rating continuously reflects the latest conditions and events. If events or developments occur that have a significant – positive or negative – impact on the sovereigns’ ability and willingness to meet its financial obligations fully and on time, the sovereign rating will be adjusted accordingly.

Appendix

Definition of a default

CRA will downgrade the sovereign rating to D (Default) if the sovereign issuer of a debt or financial obligation, debt security or another financial instrument fails to meet his payment obligations to private creditors.

CRA will downgrade the sovereign rating to SD (Selective Default), when the issuer is in arrears with a certain payment obligation while continuing to meet his commitments of other liabilities or debt instruments.

CRA considers that a sovereign as defaulted when one of the following events has occurred:

- i. The issuer has failed to pay either principal or interest on his financial obligations on the due date (taking into account any extensions or grace periods that may have been agreed), in violation of the terms in the credit agreement.
- ii. The issuer unilaterally changes the contractually agreed payment modalities (concerning principal or interest), e.g. by extending the term or by converting the outstanding debt into another currency.
- iii. The issuer offers the creditors a debt restructuring or the issue of new debt instruments under (for them) less favorable conditions which lead to diminished payment obligations.
- iv. The sovereign declares bankruptcy, with the consequence that it may be considered unlikely that the sovereign will meet its payment obligations in full or, at the very best, without a considerable delay.