Lianhe Credit Rating Sovereign Credit Rating Methodology

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联合资信评估有限公司
China Lianhe Credit Rating Co.,Ltd.

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(This report is the English version of Lianhe Credit Rating's '联合资信主权信用评级方法'. In case of any discrepancy between Chinese and English versions of the report, the original version in Chinese shall prevail.)

I. Fundamentals of Sovereign Credit Rating

China Lianhe Credit Rating Co., Ltd. (hereinafter referred to as 'Lianhe Credit Rating') believes that sovereign credit rating refers to the evaluation of sovereign government's (in a country or region) credit quality, rather than a direct ranking of comprehensive national strengths. On the perspective of credit rating, sovereign credit rating reflects Lianhe Credit Rating's evaluation opinion on a sovereign government's ability and willingness to service its financial obligations on full and on time, to nonofficial (commercial) creditors, which is also a prospective assessment of sovereign's probability of default.

For local or foreign bonds or notes issued by a sovereign government, if the issuer failed to repay its debt on maturity date, or undertake a debt restructuring, or any other action that damages the interests of creditors, such acts are identified as credit default. Failure to serve obligations to other public sectors or governments, official creditors, supranational organizations (such as the International Monetary Fund or the World Bank), or failure to serve guarantee obligations, are not identified as credit default. However, failure to serve these obligations would be considered as signals of political or fiscal crisis, as well as signals of lacking of ability and willingness to service its other obligations, all of which need to be taken into consideration during sovereign rating.

II. Sovereign Rating Categories and Rating Definition

Lianhe Credit Rating's long-term local or foreign sovereign rating is classified into 3 grades and 10 categories, which are AAA_i, AA_i, A_i, BBB_i, BB_i, B_i, CCC_i, CC_i, C_i and D_i. The ratings from 'AA_i' to 'CCC_i' may be modified by the addition of a plus (+) or minus (-) sign to show relative standing within the major rating categories.

Grades	Categories	Definitions
Investment Grade	AAA_i	The lowest expectation of credit risk. The obligor's capacity to meet its financial commitment on the obligation is extremely strong. This capacity is highly unlikely to be adversely affected by foreseeable events.
	AA_i	Expectations of very low credit risk. The obligor's capacity to meet its financial commitment on the obligation is very strong. This capacity is not significantly vulnerable to foreseeable events.
	A_i	Expectations of low credit risk. The obligor's capacity to meet its financial commitment on the obligation is considered strong. This capacity may, nevertheless, be more vulnerable to adverse business or economic conditions.
	BBB_i	Expectations of credit risk are currently low. The obligor's capacity to meet its financial commitment on the obligation is considered adequate but adverse business or economic conditions are more likely to impair this capacity.
Speculative Grade	BB_i	An elevated vulnerability to credit risk, particularly in the event of adverse changes in business or economic conditions over time; however, business or financial flexibility exists which supports the servicing of financial commitments.
	B_i	Material credit risk is present, but a limited margin of safety remains. Financial commitments are currently being met; however, capacity for continued payment is vulnerable to deterioration in the business and economic environment.
	CCC_i	Expectations of credit risk are high. The obligor's capacity to meet its financial commitment on the obligation is limited. Default is a real possibility, with increasing indication occurring credit risk.
	CC_i	Expectations of credit risk are very high. Default of some kind appears probable.
	C_i	Expectations of credit risk are extremely high. Default is imminent or inevitable, or the issuer is in standstill.
Default Grade	D_i	Has experienced an uncured payment default on a bond, loan or other material financial obligation, or entered into bankruptcy filings

III. Sovereign Rating Methodology

Lianhe Credit Rating’s sovereign rating methodology mainly evaluate five aspects of a sovereign, which are country governance, macroeconomic performance, structural features, public finances, and external finances, through qualitative and quantitative analysis. Considerations of each factor are listed below.

- Country governance: country profile, political system and governance capacity, etc.
- Macroeconomic policies and performance: economic strength, growth and stability, appropriateness and sustainability of economic policies, etc.
- Structural features: economic structure, industrial structure, demographic structure, economic

and financial openness, effectiveness of banking system, etc.

- Public finances: fiscal revenues and expenditures, general government debts and their structures, government's ability to serve debts, etc.
- External finances: international balance of payments, external debts and their structures, foreign reserves, degree of internationalization of currency and banking sector, etc.

1. Country governance

Country profile includes three aspects: basic information, natural condition and historical performance. Effects and benefits of natural resources to the country's economic development, frequency of natural disasters and their impacts on government finance are evaluated when assessing natural condition. More specifically, richness in natural resources would be beneficial to country's economic development. As the frequency of natural disasters is associate with geographic environment of the country, its economic development and government finance would be adversely affected if it suffers natural disasters like earthquake, typhoon, or tsunami more frequently. Historical performance is a summary of a country's past political and economic performances, as well as its international influence and sovereign default history (if any). Historical performances may reflect future trends, and we believe that a long-term prosperous and stable economy would be of better credit quality than economies where economic or political crisis frequently occurs. A sovereign with international influence may have more sources of finance, and may be more likely to be assisted by international financial organizations when suffering a crisis. Furthermore, sovereigns with default records are usually of lower credit quality.

Political system is an important factor to evaluate the legality and stability of regime. An appropriate and effective political system of a sovereign would be the determinant of better governance. Legality of regime refers to an elected and accredited government, while stability refers to governing party would always implement and achieve its administrative targets, and complete its administration on schedule without improper struggles inside the party or among parties.

Sovereign governance mainly assesses government's governance capacity, public appeal, abilities to deal with emerging events and safeguard national security. Governance can be evaluated via World Bank Governance Indicators, including political stability, government effectiveness, rule of law, control of corruption, voice and accountability, and regulatory quality. Public appeal reflects government's influence in the public, and a creditable government will receive more public supports so that it would be easier to implement policies. Government's ability to deal with emerging events like major natural disaster, accident, riot, or military conflict is also evaluated, as it has a significant weight in keeping a country in order.

War, terrorism and ethnic tension are more related to national security. Generally, a country at war or threatened by war may have increasing military expenses, as well as heightening government fiscal pressure, which have negative impact on the stability of economic development. Moreover, terrorism and ethnic tension may also negatively affect social stability and economic development.

Key Indicators	Descriptions
Governance indicators	Include political stability, government effectiveness, rule of law, control of corruption, voice and accountability, and regulatory quality

2. Macroeconomic policies and performance

To assess the stability of a sovereign's economic development and predict its growth, it should take the sovereign's medium and long period economic performances and appropriateness of macroeconomic policies into account. Appropriateness and sustainability of macroeconomic policy are the determinants of sustainable and stable economic development.

Macroeconomic policies include macro-controls such as fiscal policy, monetary policy, and exchange rate policy. It is believed that the coordination of fiscal and monetary policies, aiming to achieve production maximization and minimization of inflation, would be the most appropriate macroeconomic policy framework to ensure stable economic growth. Sovereigns with long period of sound macroeconomic policies are likely, other things being equal, to enjoy stable and higher non-inflationary growth, leading to higher income levels and greater resilience to shocks. Thus, sovereigns that have benefited from a track record of low inflation and stable economic growth will tend to be rated higher than those that have experienced chronic inflation and severe economic cycles.

Inappropriate exchange rate policy may result in the collapse of monetary system and cause financial crisis or sovereign debt crisis. Thus, a sound exchange rate policy is the key to ensure stable economic development. For sovereigns with managed exchange rate regime, foreign currency may be the major store of value, therefore exchange rate becomes key reference price, especially for those highly indexed or dollarized countries that experience high inflation. Contractual dollarization and indexation may limit the monetary authorities' ability to contain and manage shocks through monetary and exchange rate policies, and reduce the headroom for domestic-currency debt monetization when inflation is under control. In such cases, it should conduct a comprehensive analysis on the sovereign's consistency and sustainability of macroeconomic policy, robustness of financial system, trend of international balance of payments and level of foreign reserves.

Unemployment rate is a quantitative indicator to measure the degree of unemployment of a sovereign as well as its economic development status. Long-term unemployment rate and unemployment rate of younger generation are important indicators in analyzing labor market. For long-term credit rating, structural unemployment is also taken into account, as sovereigns with high unemployment rate over a long period may have structural problems that would increase government fiscal pressure. Higher unemployment rate of younger generation might be a sign of sluggish economic growth or economic recession.

Key Indicators	Descriptions
Economic Growth Rate	Real GDP growth rate
Economic Volatility	Standard deviation of real GDP growth rate
Price Index	CPI growth rate (annual)
Price Index Volatility	Standard deviation of CPI growth rate (annual)
Unemployment Rate	Total unemployment rate, long-term unemployment rate and youth unemployment rate
Monetary Supply	Supply of M1, M2 and M3 and their trends
Interest Rate	Current interest rate and its trends
Exchange Rate	Current exchange rate and its trends

3. Structural Features

Structural features of the economy, including economic structure, industrial structure, demographic structure, economic and financial openness, effectiveness of banking system, etc., are important factors to estimate the economic growth potential and identify certain risks in the economy. Our analysis will focus on economic growth pattern, external dependence, limitation of economic development, financial stability, matching of real and virtual economies, etc.

Economies with more stable and flexible performances in responding to shocks are generally those with relatively optimal and rational economic and industrial structure, effective and sound financial system, openness to international investment flows and trade, attractive business environment, and flexible labor market. This kind of sovereign would be rated higher than those with relatively inflexible structural features and incapable in responding and resisting to shocks.

High level of income is a feature of better structure, because this implies that the labor force is engaged in high-value-added activities and hence the economy is less vulnerable and better able to absorb adverse shocks. Also, high income level reflects greater debt tolerance.

Stable and efficient financial or banking system could not only distribute social savings effectively to improve economic efficiency, but also provide funding support to government to resist risks to some extent. This also means governments and central banks are highly likely to intervene to prevent a systemic banking failure. This intervention can be through supervision and regulation, but can also take the form of financial support, including socialization of bank liabilities to ensure the solvency of the banking system. Thus, in most cases risks in banking sector may impute to sovereign to affect sovereign credit quality.

Although financial liberalization is an important feature of economic flexibility, we believe that economies with strong real economy and national savings are sounder than those relying on virtual economy and consumption. Besides, economies with better business environment are usually more competitive in the world, especially in attracting foreign investments and providing opportunities for local businesses.

For advanced economies, population aging would aggravate government fiscal pressure, therefore high level of government debt is a common feature of aging countries and those debts are unlikely to be cut. Moreover, as the percentage of laboring population reduces, these economies also face more growth pressure. For emerging economies, privatization of private sector, production efficiency of industrial sector, expenditure level of government R&D, effectiveness and attractiveness of business environment are important factors to evaluate the economy's growth potential.

Key indicators	Descriptions
Economic Structure	Contributions of final consumption expenditure, gross capital formation as well as exports and imports of goods and services to GDP
Industrial Structure	Proportions of primary, secondary and tertiary industries in GDP
Demographic Structure	Aged population as % of total
GDP per Capita	A measure of economic development
Human Development Index	A measure of economic and social development
Ease of Doing Business Index	A measure of business environment, comparable to rating peers
Gross National Saving Rate	Ratio of national savings to GDP, a measure of national or regional saving level
Capital Adequacy Ratio of Banks	A measure of banks' capital position
Non-performing Loan Ratio of Banks	A measure of banks' asset quality
Return on Equity of Banks	A measure of banks' profit performance
Domestic Private Credit/GDP	A measure of banking system and credit scale

4. Public Finances

Analysis of public finances is one of the most significant parts in sovereign local currency credit rating, which is mainly determined by level of public debt and debt coverage. Government's ability to pay current debts and feasibility of pay future debts, as well as its debt pressure, can be evaluated through analysis of debt composition, maturity structure, interest rate level, past and future trends of debt scale, etc. At the same time, level of fiscal balance, government revenues, or tax bases are also taken into consideration.

The core indicators to measure sovereign indebtedness are ratios of gross and net general government debts to GDP, and these two ratios are also comparable among sovereigns. Although high level and increasing trend of general government debt would negatively affect sovereign's solvency, the extent of negative impact would depend on sovereign's degree of economic development. Thus, credit rating and level of government debt is generally uncorrelated. However, when other things are equal, higher level of government debt indicates higher credit risk.

Percentage of short-term debt to total debt mainly reflects short-term payment risk, which has no significant impact on long-term credit rating. It should be noted that interest payment pressure, especially long-term interest payment pressure, would aggravate the government's fiscal pressure and reduce the elasticity fiscal expenditure. Thus, high level of government debt would negatively affect the sustainability of public finance.

Effective public debt management is also an important factor to assess debt risks. Generally, a weak debt structure can render public finances vulnerable to liquidity, interest rate or exchange rate risks. A reasonable structure of public debt refers to that the majority of debts are in local currency, fixed interest rate and long maturity. When other things are equal, credit rating of sovereigns with low financing costs and stable level of debt is higher than those with high financing costs and fluctuated debt trend. Stability of debt can be evaluated through sensitivity test of fluctuations in economic growth rate, exchange rate and interest rate. In these scenarios, lower debt fluctuation indicate higher debt stability. Further, when other things are equal, sovereigns are of lower debt risk when percentage of native debt holders' debts to total debts are higher.

Government's ability to serve public debts mainly rely on the growth of government revenue and refinancing ability. Effective fiscal policy could benefit government revenue growth in creating a sustainable growth environment of economic development. Also, fiscal balance, elasticity of government revenue and expenditure, effectiveness of expenditure items, and appropriateness of fiscal policy are also important factors when assessing government's debt serving ability. As tax income serves as a main composition of government revenue, wider tax base and lower tax rate could improve the elasticity of government revenue. On the other hand, narrow tax base usually results in more volatile government revenue. Effectiveness of government expenditure items refers to expenditures in public services, infrastructure, and education, which all have positive effects to support economic development. When the government's revenue growth potential is limited, we should evaluate the government's refinancing ability. Generally, government's sources of refinancing are mainly from domestic savings and external financing. Therefore, higher household and private-sector leverages are negative rating factors, which limits the feasibility of domestic refinancing, while strong external financing ability would be rating positive. Furthermore, countries with high rate of domestic savings are, other things are equal, able to sustain higher fiscal imbalances and debt load than low-saving economies, where government borrowing can quickly absorb domestic savings, forcing the sovereign and the private sector to borrow externally.

Key Indicators	Descriptions
General Government Revenue	A measure of fiscal revenue scale
General Government Revenue/GDP	A measure of fiscal revenue level
General Government Balance/GDP	A measure of sovereign government's fiscal balance.
General Government Gross Debt /GDP	A measure of public debt scale
General Government Net Debt/GDP	A measure of net public debt scale
General Government Revenue/ General Government Gross Debt	A measure of coverage for public debt by fiscal revenue
General Government Revenue/ General Government Net Debt	A measure of coverage for net public debt by fiscal revenue

5. External Finances

Analysis of external finances is one of the most significant part in sovereign foreign currency credit rating. It includes analysis of level and structure of external debt, foreign trade volume, current account revenue, net foreign assets position, foreign reserves, internationalization level of banking sector and currency, etc. Sovereigns that perform well in these factors usually have higher credit ratings.

The core indicators to measure sovereign external debt level are ratios of gross and net external debt to GDP. External debts are the total amount of external debts from general government, the central bank, and private sectors, all of which are taken into account when analyzing sovereigns with non-internationalized currency or weak external financing capacity in private sectors. For sovereigns with internationalized currency or global financial centers (country or region), their banks may have a large amount of foreign deposits, and their enterprises also have strong external financing capacity, therefore external debts of non-private sectors such as general government and central bank are more important when assessing the external debt level of such sovereigns.

Analysis of external debt structure includes debt holder structure, currency structure, maturity structure, interest rate structure, etc. Generally, well-distributed debt holders indicate lower payment risk of external debts; the higher level of foreign currency debts, the more exchange and exchange rate risks sovereigns may face.

As sovereigns must generate foreign exchange to pay external debts, from international borrowing, exporting of goods or services, or selling assets externally, so that sovereign's ability to generate foreign exchange is an important guarantee for paying foreign debts.

As international trade serves as an important way to generate foreign exchange, foreign trade volume of a sovereign can reflect its external financing capability.

Level of current account revenue can reflect a sovereign's external financing ability. Current account deficit would result in increasing external debts or reducing external assets, therefore high level of current account deficit during a long-period indicates the sovereign's poor ability to generate basic foreign exchange.

Foreign assets and foreign net assets position are indicators to measure sovereign's foreign investment situation. High level of foreign assets and positive foreign net assets would have positive impact on sovereign's external debt serving ability.

Adequate foreign reserves can improve a sovereign's international solvency, which could also improve its ability in dealing with emerging events and avoiding financial risks, especially for sovereigns with non-internationalized currency. For those sovereigns with open foreign exchange market and free floating exchange rate regimes, especially for sovereigns with internationalized currency, less foreign reserves are required than those with non-internationalized currency. Thus, these factors should be considered in evaluating a sovereign' coverage for external debts by foreign reserves.

Highly internationalized banks generally have strong external financing ability and high level of foreign assets, which can serve sovereign government to finance abroad and exchange currency. Liquidity is an important consideration for sovereigns relying on international capital market to raise fiscal funds, or those with managed exchange rate regime or partly dollarized economy.

Key Indicators	Descriptions
Gross External Debt/GDP	A measure of gross external debt scale
Net External Debt/GDP	A measure of net external debt scale
International Trade Volume/ GDP	A measure of international trade volume
Current Account Balance/ GDP	A measure of balance of payment position of current account
Net Foreign Assets/GDP	A measure of balance of payment position of capital account
Foreign Assets/Gross External Debt	A measure of coverage for external debt by foreign assets
Current Account Revenue/ Gross External Debt	A measure of coverage for external debt by current account revenue
International Reserves/Gross External Debt	A measure of coverage for external debt by international reserves