

The Trap of Financial Capital:

The Impact of International Bonds on the Debt Sustainability of Developing Countries

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Acronyms

| | |
|----------------|--|
| Eurodad | The European Network on Debt and Development |
| IMF | International Monetary Fund |
| ISIN | International Securities Identification Number |
| HIPC | Debt Relief Under the Heavily Indebted Poor Countries |
| LMC | Lower Middle Income Countries |
| MDRI | Multilateral Debt Relief Initiative |
| RD | restricted default |
| SD | selected default |

The Trap of Financial Capital:
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Sustainability of Developing Countries

Executive Summary

- The stock of sovereign bonds of all low and middle-income countries (LMCs) rose nearly 400% within twelve years to reach \$1,737.2 billion in 2020. Because of the high interest rates, LMCs paid 63.2% of their total interest payments on the bonds, which have become the major debt burden of the countries that issue bonds.
- Argentina, Zambia, and Sri Lanka have defaulted their bond repayments since 2020 and experienced a series of socio-economic turbulences subsequently. Quantitative analysis finds that Ghana and four other countries meet similar challenges for debt service and require immediate actions to mitigate the stress.
- The global capital market has exacerbated economic fluctuations of developing countries through international bonds. When commodity prices were high, financial institutions encouraged developing countries to issue more bonds. Inexperienced developing countries have thus been lured into the trap of high debt risk. During the current economic downturn and interest rate hikes of the US dollar, these countries are affected by multiple superimposed challenges and face huge pressure of debt repayment.
- Problems related to international bonds include procyclicality, high interests, short due period, fluctuation of exchange rates, unfair credit rating, and inappropriate utilization of funding. The international community ought to coordinate to improve the global financial system to make it more conducive for long-term development.

Research Background

In the twenty-first century, international bonds have become an important financing tool for developing countries and have significantly changed the structure of their external debt. This trend has been particularly evident in the aftermath of the

2008 global financial crisis, with the stock of sovereign bonds of all low and middle-income countries rising from \$484.3 billion in 2009 to \$1,737.2 billion in 2020. The share of sovereign bonds in the government-guaranteed external debt of low and middle-income countries correspondingly climbed from 30.7% in 2009 to 50.4% in 2020. At the same time, traditional bilateral and multilateral loans have grown relatively slowly and their shares in developing countries' overall debt are actually decreasing. Sub-Saharan African countries' sovereign bonds have grown particularly fast, with their stocks quintupling from just \$22.6 billion in 2009 to \$136.6 billion in 2020. In contrast, the bilateral debt of African countries has only about doubled in the same period, amounting to \$114.9 billion in 2020, and similar phenomena have been observed in other regions. In addition, the coupon rates on 10-year Eurobonds issued by African countries in 2013-2019 are around 4% to 10%, while bilateral and multilateral debt rates are much lower. Considering the generally high interest rates on international bonds, the financial cost of international bond debt service accounts for a higher percentage of the cost of debt for these countries. Low and middle-income countries paid 63.2% of their total interest payments on international bonds in 2020 while only paying 9.8% for bilateral debt. It is important to note how the surging bond stock and high financial outlays affect low and middle-income countries that issue bonds.

Since 2016, developing countries have been facing steadily rising debt pressure due to a combination of multiple external factors, including severe fiscal deficits, falling commodity prices, declining international demand, the COVID-19 epidemic, etc. However, international attention has largely focused on non-Western emerging lenders, for instance China, and has put forward factually ungrounded arguments like "debt

trap", while seriously underestimating the impact of international bonds on sovereign debts. With the peak of international bond repayments in the coming years and the volatility of capital markets caused by the new cycle of US dollar interest rate hikes, developing countries will face a more severe external debt burden. Against this backdrop, our researchers have conducted an in-depth study of the internal and external factors behind the massive issuance of international bonds by developing countries in recent years, examined the process and causes of the new round of debt problems, and made a prediction and early warning on the debt sustainability of developing countries through extensive data collection and analysis.

Surging Eurobond Issue and Its Consequences

The main component of international bonds for developing countries is Eurobonds, which are bonds issued by a government, financial institution, business enterprise, or international organization in foreign bond markets in the denomination of a third country's denominated currency (usually U.S. dollars or euros).¹ Eurobonds provide a means for developing countries to quickly raise a significant amount of capital. They are flexible, easy to issue, inexpensive, not subject to official approval, and not subject to any national interest rate control or limit on the amount of issuance. As the bondholders can stay anonymous and can keep the bonds overseas, they may avoid the income tax on their interest income, which attracts many investors.

Generally speaking, countries with high credit mainly finance through Eurobonds, while countries with low credit mainly finance through bilateral and multilateral borrowing with sovereign guarantees. Low-income developing countries have difficulties accessing financing in international capital markets due to their mediocre economic

performance, investment environment, and credit ratings. Because of the remarkable economic surge of developing countries in the early twenty-first century, coupled with the tepid economic situation in developed countries in Europe and the United States, financial institutions hoped to find high returns in emerging economies, and Eurobonds have seen a quick surge in Asia, Africa, and Latin America in the last decade. Although most African countries have only been issuing sovereign bonds in international capital markets since 2007, this financial instrument has become a more common choice for African countries as of 2021. More than 20 African countries hold one or more outstanding Eurobonds, and in 2021 alone, African countries issued \$11.8 billion worth of Eurobonds. Eurobond issuance in Asia and Latin America have also shown an upward trend.

The top 10 underwriters of developing country sovereign bonds are investment banks from the U.S., U.K., Switzerland, and the EU, with the market power of large underwriters becoming stronger. The top 15 subscribers in terms of holdings are also all from developed countries, mainly including well-known investment institutions from the US, Germany, France, and Italy. Investment companies from the U.S. subscribed the most number and amount of securities covered by sovereign bonds, with BlackRock topping the list of subscribers. Other major investors included fund managers, insurance and pension funds, hedge funds, and commercial banks. These financial institutions, with capital strength and profit-seeking motivation, have actively helped African countries and others issue Eurobonds and purchased large amounts, which greatly contributed to the rapid growth of total debt of LMCs. Although the favor of capital allows developing countries to easily obtain financing in a short period, the accumulation of debt will become a long-term uncertainty in the international debt market.

1. Since this kind of bond issue originated in Europe, it is called "Eurobond". This report focuses on Eurobonds issued by sovereign governments.

Usually the rating of B- is considered the lowest acceptable rating for issuances in international capital market. However, investors driven by yields have been increasing their acceptance of credit risk and pricing in the risk of default in a low interest rate environment. A number of low-income countries have successfully issued sovereign bonds despite having sovereign ratings below B-, and the low sovereign ratings at the time of issuance do not appear to have been a significant impediment to these countries issuing Eurobonds. Moreover, many countries continue to issue Eurobonds even though their credit ratings have been downgraded since the initial Eurobond issuance. The demand for investment by international financial capital, in defiance of traditional risk management rules, has led to a surge in sovereign bond issues in developing country markets. In addition, many investors actively or passively track market indices or benchmark their investments against them. Some "automatic" purchase demand is generated if a bond qualifies for inclusion in an index.

Most Eurobond coupon rates in developed countries are below 2%; in contrast, 10-year Eurobond coupon rates for African countries issued in 2013-2019 were between 4% and 10%, with a slow upward trend, indicating that the sovereign bond coupon rates for African economies are higher than usual. Against the backdrop of the global capital market downturn, high interest rate Eurobonds offered by developing countries show unprecedented attractiveness. At the same time, compared to the secondary market prices of developed country sovereign bonds, the prices of developing country sovereign bonds in the secondary market are generally lower, showing an overall trend of significant deviation from the issue price. Although low secondary market prices and low trading frequency do not directly affect the current financing costs of issuing countries in terms of outstanding sovereign bond, the change in the market's

risk judgment of their sovereign bond may lead to the need for issuing countries to use higher coupon rates and lower issue prices to attract investors when issuing new bonds. From this perspective, the cost of financing for developing countries may face indirect pressures to rise in the future.

Surging bond stocks in developing countries have led to higher debt service costs, shrinking fiscal resources, and macroeconomic instability. Sub-Saharan Africa's debt grew from 35% of GDP in 2014 to 55% in 2019, with interest payments becoming the highest spending component of fiscal budgets and debt service consuming on average more than 20% of government revenues in African countries as the fastest growing expense. The maturity of Eurobonds issued by African countries is also significantly shorter than bilateral or multilateral borrowing, with the average maturity of bilateral and multilateral concessional loans received by African countries reaching 28.7 years. In contrast, the repayment terms of Eurobonds issued by African countries are significantly shorter than those of concessional loans and are not easily rolled over due to commercial contractual constraints. The maturity of Eurobonds issued in the early years ranged from 5 to 10 years, and even though the maturity of Eurobonds issued after 2014 has been extended, long-term bonds account for a relatively small share. Under the dual impact of concentrated debt issues and short bond maturities, African countries are expected to experience their first debt service peak in 2023-2025. According to statistics, African countries will need to repay a total amount of over \$106 billion Eurobonds by 2025, and the reduction in available financial liquidity could jeopardize macroeconomic stability. By the time debt service peaks, emerging market debtor countries that are unable to successfully refinance their debt will be forced to spend large amounts of foreign reserves on debt service, which is likely to lead to a sudden reduction in public spending with devastating consequences for national development.

The severe debt situation and the impending debt service peaks are likely to cause developing countries to experience credit rating downgrades and reduced access to international capital markets. With lowered credit ratings, these countries will have to obtain future financing at higher costs and may even be excluded from international capital markets altogether. At the same time, as the Federal Reserve in the US raises interest rates and shrinks its balance sheet, the U.S. dollar experiences a significant appreciation, and international investors' capital will flow back from emerging economies to developed economies such as the United States. A massive sell-off of bonds issued by emerging economies will lead to a decline in their bond prices and a rise in bond yields, increasing the size of foreign debt. The massive capital flight itself will in turn trigger currency depreciation in developing countries, making the size of bonds denominated in foreign currency bigger. Combined with the COVID-19 epidemic further reducing government revenues in developing countries, many countries may not have the necessary capital to repay their bonds as they are due. If payments are overdue, a large-scale emergence of defaults and restructuring agreements may occur. The disposition of defaults on international bonds may also be more complex than bilateral and multilateral debt, even with the emergence of "vulture hedge funds" that acquire distressed assets and seek high profits through malicious litigation, which can cause lasting and substantial economic damage to the issuing countries.

Sustainability and default risk prediction of Eurobond issuance

This study collects the daily trading price data of 158 sample bonds issued by 22 developing countries, the core elements such as value date, maturity date, duration, and coupon rate of these sovereign bonds, as well as several macroeconomic indicators. Employing the Mann-Whitney U statistical test method to examine the relationship

between the changes of credit risk premium and issuance financing cost in different countries and the debt ratio and scale of foreign debt, this paper analyzes the sustainability of sovereign bond issuance.

On the whole, the credit risk premium of the sample countries has increased significantly. The overall level of subject qualification has decreased significantly while the divergence of the average transaction spread data has increased; the polarization of the overall level of subject qualification has increased significantly, and the change trend is accelerated. Among them, the transaction spreads of Argentina, Ethiopia, Ghana, Mozambique, El Salvador, Sri Lanka, Suriname, Tunisia, and Zambia increased to a certain extent during the statistical period, and the overall debt pressure of the sample countries gradually increased the longer they were in the bond market, with the debt ratio of more than 90% of the sample countries increasing during the statistical period. In addition, countries with high debt ratios are found to be more prone to rising transaction spreads.

The difference in credit risk premiums between countries with high debt ratios and countries with low debt ratios tends to increase significantly with the amount of time spent in the bond market. Countries with high debt ratios have shown characteristics of significant increase in the average transaction spread and credit risk premium annually after entering the bond market, while for countries with low debt ratio, the transaction spread, and average credit risk premium have remained at a relatively stable level and have not much increased over time. However, the issuance spreads of all countries, high debt ratio countries and low debt ratio countries, have not shown a significant increase. In particular, the sovereign bond transaction spreads of high debt ratio countries increased with more time in the bond market, but their issuance spreads did not increase with passage of time. Therefore, the

price information of the secondary market in countries with high debt ratios has not been fully transmitted to the pricing factors of the primary market, and the financing cost of bond issuance has not changed significantly. This study also found that the external debt scale and the debt ratio of economies with low bond issuance spreads are generally higher than those with high bond issuance spreads, indicating that the debt situation of economies with relatively low financing costs is worse than that of economies with relatively high financing costs.

The research outcome on the price trends of the secondary market and the primary market shows that the initial ease of financing has caused developing countries to issue a large amount of bonds. The primary market is optimistic about their bond issuance, which provides a relatively loose financing environment and reduces the cost of initial bond issuance. Even though the secondary market sends warning signals, the primary market still does not adequately reflect the risk of bond-issuing countries, and this delayed risk awareness encourages the bond issuance behavior of emerging economies. The loose financing environment has brought about an increase in the scale of foreign debt, but it does not necessarily guarantee economic development. On the contrary, after the issuance of bonds in most sample countries, the economy stagnated and the fiscal revenue did not improve, causing a rise in the debt ratio of external debt and a significant deterioration in the macro fundamentals. Only when problems have accumulated over a long period of time and become apparent will they affect the primary market, resulting in downgraded ratings, higher issuance costs, and even difficulties in refinancing. Ultimately, the loose environment in the primary market and the delayed judgment of risks have led to excessive bond issuance.

By comparing a total of 19 macroeconomic indicators between the default group and the non-default group, the research team

screened seven indicators as predictors of the default risk of an economy, namely total savings rate, foreign debt as a percentage of GDP, exchange rate, exports of goods and services as a percentage of GDP, total capital formation as a percentage of GDP, tax revenue as a percentage of GDP, and the growth rate of private sector debt to M2. Based on this, the default risk for bond-issuing countries is divided into three groups: low, medium, and high. Combined with the transaction spread data of different countries, this verifies that the larger the transaction spread, the higher the default risk. Finally, from the two dimensions of macro fundamentals and transaction spreads, it is concluded that there are 8 countries with high bond default risk: Zambia, Sri Lanka, Angola, Argentina, Ethiopia, Suriname, El Salvador, and Ghana.

Zambia, Sri Lanka, and Argentina have defaulted on their bonds after 2020, causing serious economic and social unrest. From 2012 to 2015, the Zambian government issued a total of \$3 billion in Eurobonds, which would generate an annual interest expense of \$240 million. During this period, Zambia's debt increased at the fourth fastest rate in Africa, and the proportion of commercial bonds in Zambia's external debt rose from zero to 46.2% by 2015. However, after the copper price fluctuated, its credit rating fell rapidly, and it was unable to refinance, leading to default. In recent years, Sri Lanka's foreign exchange reserves have been composed almost entirely of commercial loans, and the investment income is lower than the loan interest. While failing to effectively promote industrial transformation or to find new sources of income, the country issued many commercial bonds, increasing the fiscal deficit and making the national economy fall into the dilemma of rising interest rates and borrowing new debts to repay old debts. In early 2022, Sri Lanka's foreign exchange reserves were unable to repay Eurobonds due within this year, and in April, it announced

its first debt default since its founding. Under the combined influence of the epidemic, war, and international financial fluctuations, the fragile Sri Lankan economy was unable to bear the pressure and collapsed quickly. At present, Ghana and four other countries are also experiencing deteriorating debts and difficulties in refinancing. It is therefore urgent for the international community to work together to avoid any further expansion of the debt crisis in developing countries.

Systematic Reflections on the Impacts of Eurobonds on Developing Countries

The issuance of Eurobonds by developing countries is a market behavior, but its main driving force comes from the need of international financial capital to pursue high returns. Admittedly, developing countries have demand for funding, as a result of expansionary fiscal policies. However, they reduced the proportion of bilateral and multilateral preferential loans, which have low interest rates and long repayment cycles, mainly because the international financial market has offered convenient and abundant funds for these countries to issue Eurobonds. Nevertheless, institutional investors from the advanced economies respond enthusiastically to bonds issued by developing countries completely out of their own commercial interests. Their operations mainly follow the practices of mature markets in the world, which meet the needs of investors to obtain high returns in the short-term but neglect the vulnerability of the economic structures and the particularity of the long-term development of developing countries.

First, pricing, subscription, and rating of Western financial institutions are procyclical. In the period of high global liquidity and commodity prices, developing countries that mainly rely on mineral and energy export are in a period of economic prosperity, so they are more likely to issue sovereign bonds and have high ratings while the cost of issuing bonds is relatively low. However, if the global economy is in recession and the prices of

natural resources decline, these countries may need to finance more to maintain economic stability, but at this time, rating agencies would downgrade these countries. Meanwhile, new bonds need higher coupon rates and lower issuance prices to attract investors, which exacerbates the situation. Although developed countries also face similar superimposed market fluctuation, developing countries usually have less revenue sources and smaller economic volume, so they are more likely to encounter crisis or default. In addition, as the issuance of Eurobonds is mainly denominated in the U.S. dollar, when the liquidity of the dollar is loose and the exchange rate is low, it is easy to issue Eurobonds, but when the U.S. dollar has higher interest rates and the exchange rates rise, a large amount of funds flows out of developing countries, which makes bond-issuing countries have to borrow money and repay debts at high interest rates and exchange rates during a period of tightest liquidity, forming another superimposed impact. When developing countries, which lack market experience and economic volume, enter this gigantic profit-oriented financial market, it is easy for them to fall into the development trap under the seemingly fair rules due to short-term interest. They are likely to prematurely overdraw their growth prospects and become shackled by international financial capital.

The timeliness of Eurobonds is not in tune with the economic development rhythm of developing countries and is not helpful to maintain stable economic performance. Eurobonds are not only short-term, but their maturity also concentrates. Infrastructure construction and production projects in developing countries usually take a long time to complete. Some of them take more than 10 years to yield benefits, and the prospect of revenue is hard to guarantee. This means that bond-issuing countries have to frequently look for other valuable foreign exchange or issue bonds with higher interest rates to repay their maturing debts, further squeezing the limited liquidity and disturbing the normal economic order. If the issuing country fails to find money to repay the matured debt, it will default, and

its future financing will become extremely difficult. The timing of international financial capital is mainly based on the mature economic activities of developed countries and is not flexible and tolerant enough to the liquidity challenge faced by developing countries.

Eurobonds do not limit the purpose of use, and funds can be used for non-productive expenditure. Actually almost all the Eurobonds issued by African countries between 2019-2021 have been spent for supporting budget deficits and repaying maturing bonds. For general commercial bonds, enterprises are required to clearly state the investment usage of the received funds and explain how to bring future output. Accordingly, investors will pay attention to the future profitability of the bond issuers. However, because sovereign bonds have lower default risk and higher credibility compared with corporate bonds, countries are not required to promise the use of bond proceeds when issuing Eurobonds, and the investors do not care about the use of funds. They only measure the investment risk by the overall macroeconomic situation of the country and seek to benefit from high price and high interest rates, without supervising and paying attention to the usage of funding. Yet, for developing countries with unstable political and economic conditions, such freedom allows for bonds to be used for filling fiscal gaps or to serve as a funding source for short-term political goals, resulting in the situation of “living beyond their means”, while neglecting investment in productive and profitable projects, thus causing unsustainable long-term development.

In conclusion, the surge of Eurobond issuance in developing countries in recent years, and the consequent impact on bond-issuing countries, is essentially a serious test for the long-term development process of developing countries by the profit-seeking market behaviors of international financial capital. In the context of the sluggish economies and abundant liquidity of developed countries, private financial institutions have vigorously promoted the

issuance of bonds by developing countries in order to profit from the rapid growth of emerging markets. However, because these investors are the dominant players in the international financial market, the bond issuance rules they formulated give priority to the interests of financial institutions and the needs of developed country markets. They fail to fully account for the characteristics of developing countries such as single revenue sources, strong cyclicity, weak capacity of managing risks, and need for long-term infrastructure construction. Consequently, many developing countries lacking experience in bond issuance have been lured into the trap of high debt risk. During the current economic downturn and interest rate hikes of US dollars, these countries are affected by multiple superimposed challenges and face huge pressure of debt repayment.

Market activities tend to add icing on the cake but rarely act as a lifeboat in a storm. Small and inexperienced developing countries lack the power to influence the complex and huge international financial markets. The conveniences and benefits enjoyed during the economic upward cycle imply risks and burdens in the downward cycle. If the issuer is not prepared to use the funds obtained when the financing costs are low to improve productivity and generate returns higher than interest, it is likely to fall into a vicious circle of borrowing new debts with higher interest rates to repay old debts under the market rules. The interests and priorities of investors in developed countries, the most powerful in the global economy, are not the same as those of peasants and laborers in developing countries. Developing countries must be vigilant when entering the financial markets dominated by these investors, otherwise they will not be able to properly protect the priority interests of their own economies, people, and societies once a debt crisis erupts. The international community needs to provide developing countries with more precise information, in-depth analysis, and timely guidance to help them avoid these financial traps.

Chapter 1

Research Background

In the twenty-first century, international bonds have become an important financing tool for developing countries and has significantly changed the structure of their external debt. This trend has been particularly evident in the aftermath of the 2008 global financial crisis, with the stock of sovereign bonds of all low and middle-income countries rising from \$484.3 billion in 2009 to \$1737.2 billion in 2020. The share of sovereign bonds in government-guaranteed external debt of low and middle-income countries correspondingly climbed from 30.7% in 2009 to 50.4% in 2020. At the same time, traditional bilateral and multilateral loans are growing relatively slowly and their shares in developing countries' overall debt are decreasing (see Figure 1-1). Sub-Saharan

African countries' sovereign bonds have grown particularly fast, with their stocks quintupling from just \$22.6 billion in 2009 to \$136.6 billion in 2020. In contrast, the bilateral debt of African countries has only about doubled in the same period, to \$114.9 billion in 2020. South Asia has seen even faster bond growth, with a total bond stock of \$91 billion in 2020, more than seven times that of 2009, while bilateral debt has grown less than double. A similar phenomenon is seen in other regions, with sovereign bonds of Middle East and North Africa at \$84.6 billion in 2020, while bilateral debt is only \$61.9 billion. Latin America's sovereign bonds more than doubled between 2009 and 2020 to \$555.7 billion, while bilateral debt rose only from \$34.2 billion to \$41.2 billion.¹

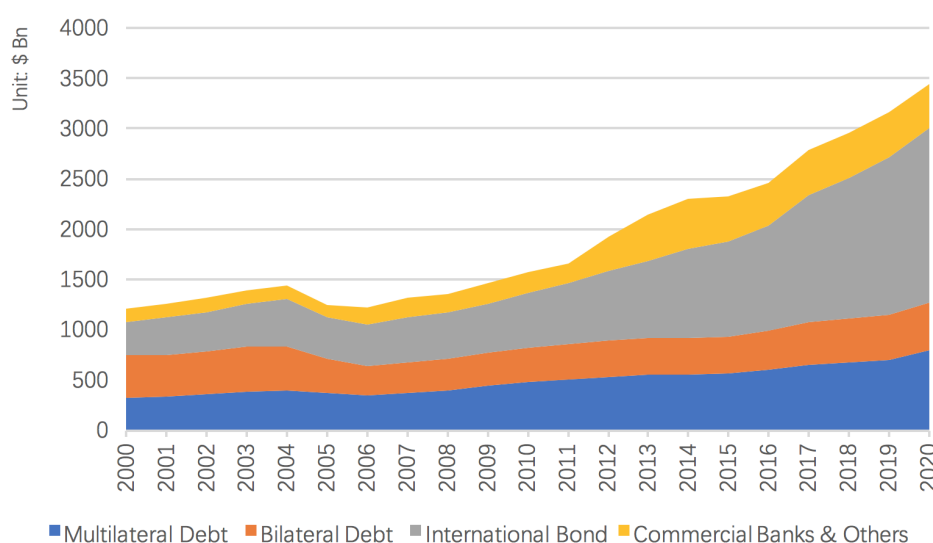


Figure 1-1
Trends in External Debt Stock of Low and Middle-Income Countries 2000–2020 (by Creditor Type)²
Data Source: International Debt Statistics

Considering the generally high interest rates on international bonds, for example, the coupon rates on 10-year Eurobonds issued by African countries in 2013–2019 are around

4% to 10%, while bilateral and multilateral debt rates are much lower, the financial cost of international bond debt service accounts for a higher percentage of the cost of debt for

1. World Bank. *International Debt Statistics 2021* [R/OL]. 2021 [2022-7-7]. <https://openknowledge.worldbank.org/handle/10986/34588>

2. World Bank. *2022 International Debt Statistics* [DB/OL]. 2022 [2022-7-7]. <https://datatopics.worldbank.org/debt/ids/regionanalytical/eap/counterpartarea/wld>.

these countries.¹ Figure 1-2 shows the total amount and proportion of interest paid by low and middle-income countries to different types of creditors each year. These countries paid 63.2% of their total interest payments on international bonds in 2020, compared to only 9.8% for bilateral debt, while the interest on international bonds was only 53% of total interest payments in 2009. It is important to note how the surging bond stock and high financial outlays will affect low and middle-income countries that issue debt.

The main component of international bonds for developing countries are Eurobonds, which are bonds issued by a government, financial institution, business enterprise or international organization in foreign bond markets in the denomination of a third country's denominated currency. Since this kind of

bond issue originated in Europe, they are called "Eurobonds." This report focuses on Eurobonds issued by sovereign governments. Eurobonds are issued jointly by issuing banks and securities firms and are offered internationally, i.e., not only in one country, but are traded by market participants in international financial centers. The Eurobond market is divided into several regions depending on the currency of denomination. For example, Eurobonds issued in U.S. dollars are often referred to as Eurodollar bonds, and similarly, bonds issued in British pounds are referred to as Europound bonds. Nowadays, a Eurobond is any bond issued outside the country of issue of that currency and is not limited to Europe. Due to historical reasons and the importance of the U.S. economy, the U.S. dollar has been the primary denomination of Eurobonds.

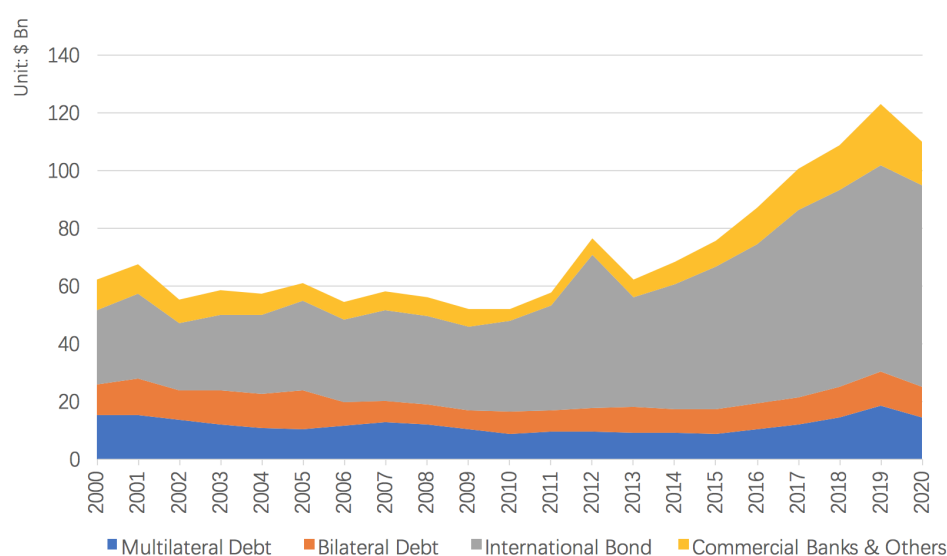


Figure 1-2
Interest Payments on External Debt of Low- and Middle-Income Countries 2000–2020 (by Debt Category)²
Data Source: International Debt Statistics

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1. African Development Bank, *African Economic Outlook 2021* [R/OL]. 2021 [2022-7-7]. <https://afdb-org.cn/wp-content/uploads/2021/05/AfDB21-01-AEO-main-English-highlights-1.pdf>

2. World Bank. 2022 *International Debt Statistics* [DB/OL]. 2022 [2022-7-7]. <https://datatopics.worldbank.org/debt/ids/regionanalytical/eap/counterpartarea/wld>.

internationally, i.e., not only in one country, but are traded by market participants in international financial centers. The Eurobond market is divided into several regions depending on the currency of denomination. For example, Eurobonds issued in U.S. dollars are often referred to as Eurodollar bonds, and similarly, bonds issued in British pounds are referred to as Europound bonds. Nowadays, a Eurobond is any bond issued outside the country of issue of that currency and is not limited to Europe. Due to historical reasons and the importance of the U.S. economy, the U.S. dollar has been the primary denomination of Eurobonds.

In the 1960s, the U.S. government was forced to take a series of restrictive measures due to the continuous outflow of U.S. capital. In 1965, the U.S. government issued regulations requiring financial institutions to limit the amount of loans they could make to foreign borrowers. These two measures made it difficult to issue U.S. dollar-denominated bonds or obtain U.S. dollar-denominated loans in the United States. At the same time, many countries had large dollar surpluses and needed to invest in the lending market to obtain interest, so some European countries began to issue dollar bonds outside the U.S. This was the origin of Eurobonds, which arose and developed due to the centrality of the dollar and European reconstruction after World War II.

In July 1963, the world's first Eurobond was listed on the Luxembourg Stock Exchange, successfully raising a sum of \$15 million for Autostrade (an Italian freeway company) with a six-year maturity. Eurobonds were a financial innovation in the face of U.S. government control, and gradually emerged with the formation of the European money market. In the 1970s, the dollar became increasingly strong, Eurobonds became a very popular investment product, and quickly developed into the largest share of the international bond market. After the 1980s, as the exchange rate fluctuation of the U.S. dollar increased, the proportion of Eurobonds denominated in

Deutsche Mark, Swiss franc, and Japanese yen gradually increased, and the issuance place also began to break through the geographical limitation of Europe and expanded to the Asia Pacific, North America and Latin America, which has become the largest share of the international bond market.

Generally speaking, countries with high credit are mainly financed through Eurobonds, while countries with low credit are mainly financed through bilateral and multilateral borrowing with sovereign guarantees. Low-income developing countries have long had difficulties in accessing financing in international capital markets due to their not-so-strong economic performance, investment environment and international ratings. Because of the remarkable economic surge of developing countries in the early twenty-first century, coupled with the general tepid economic growth in developed countries in Europe and the United States, financial institutions hoped to find high returns in external emerging markets, and Eurobonds have seen a surge in Asia, Africa and Latin America in the last decade. Although most African countries have only been issuing sovereign bonds in international capital markets since 2007, this financial instrument has become a more common choice for African countries as of 2021. More than 20 African countries hold one or more outstanding Eurobonds, and in 2021 alone, African countries issued \$11.8 billion worth of Eurobonds. Eurobond issuance in Asia and Latin America is also showing an upward trend.

Since 2016, developing countries have been facing steadily rising debt pressure due to a combination of multiple external factors, including severe fiscal deficits, falling commodity prices, declining international demand, the COVID-19 epidemic, etc. However, international attention has largely focused on non-Western emerging lenders like China, and has put forward factually incorrect arguments such as the "debt trap theory," while seriously underestimating the

impact of international bonds on national sovereign debt. With the peak of international bond repayments in the coming years and the volatility of capital markets caused by the new cycle of US dollar interest rate hikes, developing countries will face a more severe external debt burden. Against this backdrop, this report conducts an in-depth study and analysis of the internal and external factors behind the massive issuance of international bonds by developing

countries in recent years, examines the process and causes of the new round of debt problems, and makes a prediction and early warning on the debt sustainability of developing countries through extensive data collection and analysis. The report also reflects on the root causes of the huge impact of international bonds on the financial situation of developing countries, and proposes corresponding policy recommendations for improving regulations.

Chapter 2

Historical Evolution of Debt Crises in Developing Countries

1. Early Debt Crisis in Developing Countries

The recession of the world economy and the rise in interest rates in the international financial markets in the early 1980s directly led to the international debt crisis of developing countries. The surge in oil prices induced a recession in the world economy and caused a rapid deterioration in the balance of payments of non-oil producing countries, especially non-oil producing developing countries. Coupled with the protectionist trade measures adopted by Western countries, the prices of primary products, which are the main exports of low-income countries, fell sharply. As a result, export revenue growth in developing countries slowed down, and their debt servicing capacity decreased accordingly. In addition, Western countries implemented tight monetary policies to cope with inflation, resulting in higher interest rates in financial markets. In particular, the significant increase in interest rates in the United States attracted a large amount of international capital flows to the United States, and other major Western countries had to raise their money market interest rates accordingly in order to avoid a large outflow of domestic capital, resulting in a general increase of interest rates worldwide. Borrowing by developing countries was mainly medium-term loans provided by international commercial banks, the main body of which was dollar-denominated debt. The high interest rates, combined with the sharp rise in the exchange rate of the dollar, greatly increased the debt burden of developing countries.

The fundamental reasons for the debt crisis of developing countries at that time were the following: First, the obsessive pursuit of economic growth rates and the lack of necessary macro planning and appropriate management of external debt by the government, which led to the uncontrolled

scale of borrowing. Secondly, many developing countries misjudged the international economic trend and borrowed a large amount of commercial loans with floating interest rates in the 1970s when the international financial market was well-financed and interest rates were very low. However, the most serious post-war economic crisis broke out in the West in the early 80s, and developed countries had reduced imports and depressed the prices of primary products and significantly increased interest rates, resulting in a sharp decline in foreign exchange earnings of developing countries while the burden of interest costs on foreign debt had increased exponentially. Third, developing countries relied too much on external debt as a form of getting foreign capital and improperly used external debt with poor efficiency, creating a heavy debt burden, which was difficult to repay on time. In short, due to the excessive scale of debt and the heavy proportion of commercial loans with floating interest rates, developing countries finally could not withstand the sudden changes in the international economic and financial situation and fell into the debt crisis.

The Heavily Indebted Poor Countries (HIPC) initiative was launched by the International Monetary Fund (IMF) and the World Bank in September 1996, and the Multilateral Debt Relief Initiative (MDRI) was launched in 2005 to strengthen and complement the HIPC debt relief measures. By phasing in the relief arrangement, the HIPC aims to create a multi-stage, dynamic relief arrangement.¹ Before reaching the decision point, HIPCs are eligible for 67% debt relief; after that, HIPCs need to continue to implement the relevant Poverty Reduction Strategy Papers (PRSPs) and establish a good track record before receiving irrevocable debt relief and assistance once

1. 蒲大可. 非洲外债问题研究: 历史演进、深层逻辑及其影响 [D]. 上海师范大学, 2020

they' ve reached the completion point. As of 2019, of the 39 eligible HIPC, only three countries - Sudan, Somalia, and Eritrea - are at the pre-decision point, while the rest have reached their completion points.¹

In order to completely solve the debt problems of developing countries, the IMF, the Paris Club, and other international organizations have formulated a series of bailout plans and debt relief measures. For low- and middle-income heavily indebted countries and heavily indebted poor countries, the G8 and the Paris Club have proposed a series of debt relief regulations; the terms of which basically use a menu model to provide creditors with debt relief, debt and interest relief, extended repayment periods, and other options. The financial support from the IMF and the World Bank has played a crucial role in the disposal of debt crises in both Latin American countries and African countries. The concessional loans from international organizations have not only enabled the debtor countries to continue their projects, thus recovering their economic strength more quickly to avoid falling into a vicious circle, but also alleviated the debt servicing pressure of the debtor countries to a certain extent.

However, there are obvious shortcomings in the handling of debt crisis. First, there is a lack of effective ex-ante prevention mechanisms for debt crises. The sovereign debt crisis management mechanism is mostly based on the bailout measures taken when the crisis is about to happen or has already happened, but the construction of ex-ante prevention and control mechanism for sovereign debt crisis is relatively insufficient. For example, there are obvious deficiencies in the construction of an international financial market supervision mechanism, a sovereign debt early warning mechanism, a risk prevention and control mechanism, etc.² Secondly, the international

debt disposal is largely subordinate to the interests and standards of developed countries. The economic reform measures that the IMF requires debtor countries to take are based on the standards of Western developed countries, which are often not conducive to the sustainable development of debtor countries.³ Thirdly, the loans and guarantees of international organizations are subject to strict conditions and are mainly invested in countries and regions with close relations with relevant developed countries. For example, in the disposal of the Latin American debt crisis, Mexico, which has closer ties with the United States, received 40% of the total projected loans under the Baker Plan and received even more in the Brady Plan; in the disposal of the African debt crisis, the Commonwealth countries accounted for 23.5% of the African countries participating in the HIPC debt reduction plan, and the franc zone countries accounted for 38.2%. By 2002, of the six countries that adopted comprehensive poverty reduction strategy papers, five were Commonwealth or franc zone countries.⁴

2. Financing Needs of Developing Countries at the Beginning of the 21st Century

The 2008 financial crisis led to a global recession, and countries implemented accommodative monetary policies. In contrast, developing countries in Asia and Africa generally enjoyed faster growth at the beginning of the 21st century, driving the demand for financing in these countries. In particular, the larger and relatively wealthy emerging economies began to issue bonds in international markets. As shown in Figure 2-1, the cumulative Eurobond issuance size ranking of African countries over the period 2000-2022 is strongly correlated with the country's level of economic development, with a country more likely to issue bonds when it has a larger economy, higher GDP per capita, lower public

1. Heavily Indebted Poor Countries (HIPC) Initiative and Multilateral Debt Relief Initiative (MDRI)-Statistical Update, IMF, Policy Paper No. 2019/028, August 6, 2019.

2. 胥爱欢, 李红燕. “一带一路”建设中的主权信用风险防控——来自巴黎俱乐部的实践经验与教训 [J]. 西南金融, 2018, (11).

3. 凌激. 论巴黎俱乐部的债务重组对解决国际债务的影响 [D]. 对外经济贸易大学, 2002.

4. 李讯, 侯娉, 孙玉茗. 发展中国家债务危机处理机制的国际经验及现实研究 [B]. 金融观察, 2020.

debt, and more effective government.¹ South Africa became the first sub-Saharan African country to issue a Eurobond in 1995, when it ranked third in Africa in terms of GDP per capita. It was followed by Seychelles, which was the second to issue a Eurobond in 2006, when it ranked first in Africa in terms of GDP per capita. Most African countries had GDP growth rates above 5% prior to their initial issuance, as favorable domestic conditions helped attract investors.² For example,

Namibia's economy was sluggish in 2008 and 2009, with GDP growth rates of 2.6% and 0.3% respectively, but GDP growth rose to 6% in 2010, and when Namibia issued Eurobonds for the first time in 2011, its GDP growth rate was 5.1% that year. As previously stated, Seychelles became the second country in Africa to issue Eurobonds in 2006. Although its economy experienced negative growth in 2003 and 2004, it recovered in 2005 and 2006 with GDP growth rates of 9% and 9.4%.

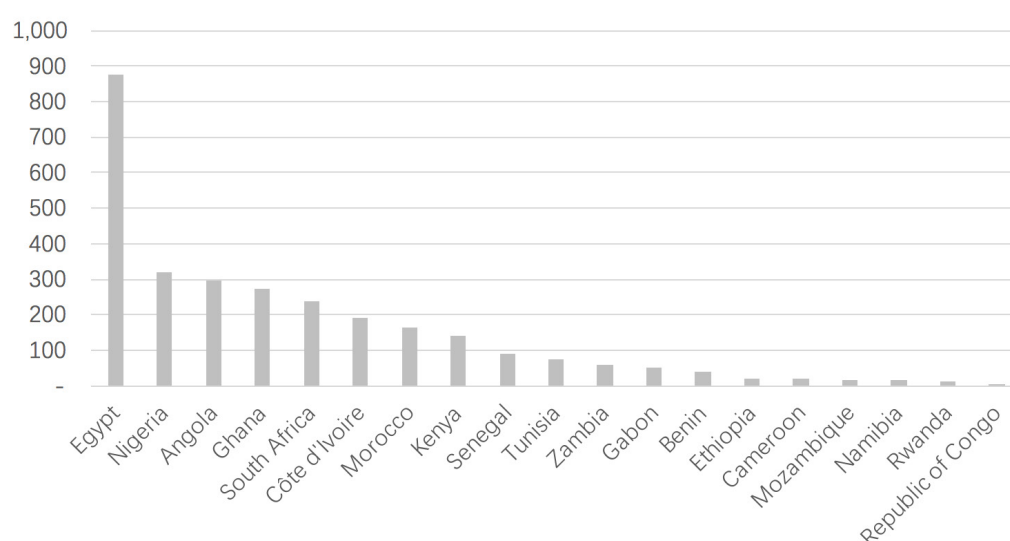


Figure 2-1
African Countries' Outstanding Bonds in 2022 (US\$ billion)
Data Source: Bloomberg

In addition, expansionary fiscal policies have led to a surge in sovereign bond issuance in emerging markets and developing countries during this period. Most African countries ran widening fiscal and current account deficits ahead of Eurobond issuance. Namibia and Kenya, for example, had fiscal deficits close to 5% of GDP when they entered international capital markets in 2011 and 2014.³ At the same time, concessional loans from multilateral and bilateral sources have been significantly reduced following the termination of the HIPC, so there has been an urgent need to open additional

sources of financing. The size of bonds is also highly correlated with tax revenues. In countries with high budget deficits, the smaller the tax-to-GDP ratio, the larger the financing needs and the size of bonds. A major reason for the continued increase in sovereign debt in African countries is the failure to generate sufficient tax revenues to service the debt raised for economic development and infrastructure.⁴ Countries that have made efforts to raise domestic tax revenues, such as Rwanda and Kenya, have more sustainable sources of revenue than countries that rely on commodity

1.Presbitero, Andrea F., Dhaneshwar Ghura, Olumuyiwa S. Adedeji, and Lamin Njie. "Sovereign bonds in developing countries: Drivers of issuance and spreads." *Review of Development Finance*, Vol.6, No.1, 2016, pp.1-15.

2.Chuku Chuku and Mustafa Yasin Yenice, "Eurobonds, debt sustainability and macroeconomic performance in Africa: Synthetic control experiments," *Working Paper Series*, 2021.

3.Chuku Chuku and Mustafa Yasin Yenice, "Eurobonds, debt sustainability and macroeconomic performance in Africa: Synthetic control experiments," *Working Paper Series*, 2021.

4.The African Legal Support Facility, "Understanding Sovereign Debt Options and Opportunities for Africa," 2021.

exports. Over the past 15 years, sub-Saharan Africa has seen a decline in both real and absolute tax revenues due to weakened fiscal capacity. Tax revenue to GDP ratios in some countries are below 15% and are not even sufficient to fund the basic government budget. As a result, these countries have had to go to international capital markets for financing.¹

Another reason for issuing Eurobonds stems from the urgent need for foreign currency. Most low-income developing countries, especially in Africa, still rely heavily on imported industrial manufactured goods. These imports are used not only for consumption but also for production and services, which are necessary to support industrial transformation and generate spillover effects. Studies show that most of the sub-Saharan African countries that issued Eurobonds after 2005 were countries with low foreign exchange reserves to imports ratios and countries with high trade deficits.²

3. Issuance and Subscription of Eurobonds

Eurobonds can be denominated in any currency unit. Usually, each Eurobond issue requires a guarantee from the government, large enterprises, or banks, so it is relatively safe and secure for investors. Eurobonds can be issued in a wide range of bond types, maturities, and currencies, and can meet the diverse funding requirements of governments, multinational corporations, and international organizations. Eurobonds can be traded globally, so they can attract a large number of investors. The amount of funds raised is large, and the requirement for financial disclosure is not high. They are issued in bearer form and can be kept abroad, which is suitable for some investors who want to keep secrecy or have high requirements for personal privacy. The secondary market for Eurobonds is active and efficient, thus allowing bondholders to transfer bonds for cash more easily.

When a sovereign bond is issued in the primary market, the sovereign issuer engages one or more investment banks to act as lead managers or arrangers for the issue. The investment bank plays a key role in coordinating the issuance, marketing, and request for quotations (meaning that the underwriters gather information about the demand for and appropriate pricing of the bonds), assisting the issuer in determining the financial terms and the timing of the proposed offering as well as in distributing the bonds to investors in selected markets. The fees charged by the banks for this service are estimated to be approximately 0.05% to 0.225% of the bonds' face value. A study of 62 low- and middle-income countries, launched by the European Network Committee on Debt and Development (Eurodad) in May 2021, shows that the top 10 underwriters of developing country sovereign bonds are U.S., U.K., Swiss, and EU investment banks: Citigroup (U.S.), Deutsche Bank, JPMorgan Chase (U.S.), Standard Chartered (U.K.), Bank of America, HSBC (U.K.), Goldman Sachs (U.S.), Barclays (U.K.), Societe Generale, and Credit Suisse. Underwriters were heavily concentrated in these ten investment banks, which participated in a total of 440 bond issues, equivalent to 80.1% of the total issuance. The largest underwriter of sovereign bonds was Citigroup, a U.S. investment bank involved in at least 255 bond issues with a combined face value of \$343 billion. They were followed by Deutsche Bank and JPMorgan Chase, which issued 160 bonds with a face value of \$233 billion and 152 bonds with a face value of \$234 billion, respectively. The dominance of these investment banks in underwriting sovereign bonds dates to the early 1990s. Due to high transaction costs, countries tend to rely on the same investment banks to issue bonds over time, which has led to the growing market power of large underwriters. Their ability to provide countries with a broader network of investors and better

1. Misheck Mutize, "African governments have developed a taste for Eurobonds: why it's dangerous," <https://theconversation.com/african-governments-have-developed-a-taste-for-eurobonds-why-its-dangerous-165469>

2. Olabisi, Michael, and Howard Stein. "Sovereign Bond Issues: Do African Countries Pay More to Borrow?" *Journal of African Trade*, Vol.2, No.1 – 2, 2015, pp.87.

3. Van Der Wansem, P. B. G., Jessen, L., and Rivetti, D, *Issuing International Bonds*, World Bank Group, 2019.

financial conditions has further driven their market share.¹

After a series of underwriting and packaging processes by investment banks, Eurobonds issued by developing countries will formally enter the international bond market and be subscribed by bond subscribers around the world. After the issuance is completed, these sovereign bonds remain liquid in the secondary market. Bondholders can choose to hold the bonds for a period and then sell them to other investors in the secondary market at real-time prices, receiving the coupon proceeds and the spread between real-time price and purchase price during the holding period, or they can choose to hold them to maturity, receiving all the coupon proceeds and eventually recovering the principal repaid by the issuer. Because developing countries have relatively lower sovereign debt ratings than developed countries, their sovereign Eurobonds have higher coupon rates and corresponding holding yields, which make them popular among many institutional investors in the international bond market.

Table 2-1 lists the major holders in the Eurobond market for sovereign bonds issued by 12 developing countries, including Egypt, South Africa, and Sri Lanka, etc.² This data shows that, without exception, the top 15 holdings are all from Western developed countries, including mainly the United States, Germany, France, and Italy. These subscribers include many of the world's leading investment institutions, such as BlackRock, Vanguard Group, FMR LLC and JPMorgan Chase & Co. of the U.S.; Royal Bank of Canada; Intesa Sanpaolo Spa of Italy; Credit Agricole Group of France; AllianzSE of Germany; and KBC Group NV of Belgium. The combined holdings of these developed country institutional investors in the sovereign bonds of these developing countries amounted to 50% of the total global holdings. Among them, investment firms from the United States subscribed the highest number and amount of securities covered by sovereign bonds, while BlackRock topped the list of subscribers with the highest total holdings.

| No. | Company | Holdings (Million USD) | Share % | Number of Securities |
|-----|----------------------------------|---------------------------|------------|-------------------------|
| 1 | BLACKROCK | 7,978.44 | 14.35 | 111 |
| 2 | ALLIANZ SE | 5,333.13 | 9.59 | 107 |
| 3 | VANGUARD GROUP | 2,005.12 | 3.61 | 96 |
| 4 | FMR LLC | 1,405.31 | 2.53 | 48 |
| 5 | JP MORGAN CHASE & CO | 1,372.76 | 2.47 | 97 |
| 6 | ALLIANCE BERNSTEIN | 1,353.51 | 2.43 | 72 |
| 7 | ROYAL BANK OF CANADA | 1,210.35 | 2.18 | 75 |
| 8 | NEUBERGER BERMAN GROUP LLC | 1,121.80 | 2.02 | 61 |
| 9 | INTESA SANPAOLO SPA | 1,116.47 | 2.01 | 97 |
| 10 | MASSACHUSETTS FINANCIAL SERVICES | 990.41 | 1.78 | 36 |
| 11 | KBC GROUP NV | 928.28 | 1.67 | 17 |
| 12 | CAPITAL GROUP COMPANIES IN | 913.80 | 1.64 | 53 |
| 13 | UBS | 871.88 | 1.57 | 102 |
| 14 | CREDIT AGRICOLE GROUPE | 871.70 | 1.57 | 88 |
| 15 | PRUDENTIAL FINANCIAL INC | 788.98 | 1.42 | 106 |
| | Total | 22,928.80 | 50.84 | - |

Table 2-1
Major Subscribers of Sovereign Eurobonds of 12 Developing Countries
Source: Bloomberg. Sovereign Eurobonds include all outstanding, prospectus-bearing Eurobonds.

1. Daniel Munevar, *Sleep now in the fire: Sovereign Bonds and the Covid-19 Debt Crisis*, Eurodad, 2021.

2. The following developing countries are listed in alphabetical order: Angola, Argentina, Brazil, Cote d'Ivoire, Chile, Egypt, Ghana, Kenya, Sri Lanka, Nigeria, Tunisia, and South Africa.

Against the backdrop of the global capital market downturn, high interest rate Eurobonds offered by developing countries have shown unprecedented attractiveness, with many countries' Eurobonds being oversubscribed.

¹Angola's 10-year fixed bond issue in early 2022 was more than twice as oversubscribed at a coupon rate of 8.75%, raising \$1.75 billion. South Africa followed with a \$3 billion Eurobond issue in April 2022, which was oversubscribed by a factor of 2.4 and ultimately raised more than \$7.1 billion.²The favorable capital has made it easy for developing countries to obtain large amounts of financing, with major investors including fund managers, insurance and pension funds, hedge funds, commercial banks, etc.

Based on the above analysis and data, it is obvious that institutional investors from developed countries in Europe and the United States have deep-pocket capital and a high degree of profit-seeking tendency when subscribing to developing countries' sovereign bonds. In the period when risk aversion is not strong enough in the financial market, developing country sovereign bonds easily become an important target for these institutional investors due to their higher coupon rates and the lower overall default risk and higher creditworthiness of sovereign bonds compared to corporate bonds. Before the outbreak of the COVID-19 epidemic in 2020, the economic situation was stable and positive, and there was a large amount of active capital in the global capital market. The financial institutions had sufficient strength and willingness to purchase developing countries' sovereign bonds with high coupon rates, so as to achieve higher investment returns. Developing countries were eager to finance by issuing sovereign bonds, and simultaneously, international capital was looking for high-

return financial products to invest in. Within this context, capital in developed countries subscribed to and holds large amounts of developing countries' sovereign bonds.

4.Credit Ratings and Eurobond Prices

A country's credit rating greatly determines the coupon rate at which a country conducts sovereign borrowing and also has a significant impact on the demand for lending by creditors (including the demand for bonds by international investors).³International capital market access depends on investors' perceived credit risk, which is measured through a country's credit rating. The international rating of B- is usually considered the lowest rating for international capital market issues. However, driven by pursuit of high yields, investors have been increasing their acceptance of credit risk and pricing in the risk of default in a low interest rate environment. A number of low-income countries have successfully issued sovereign bonds despite having sovereign ratings below B-, and the low sovereign ratings at the time of issuance do not appear to have been a significant impediment to these countries issuing Eurobonds. Moreover, many countries continue to issue Eurobonds even though their credit ratings have been downgraded since the initial Eurobond issuance.⁴The demand for investment by international financial capital, in defiance of traditional risk management rules, has led to a surge in sovereign bond issues in developing country markets. In addition, many investors actively or passively track market indices or benchmark their investments against them. Some "automatic" purchase demand is generated if a bond qualifies for inclusion in an index.⁵

The ratings of developing countries by the major Western credit rating agencies are relatively "short-sighted" and pro-cyclical,

1.Carlos Mureithi, "Why Investors Can't Get Enough of Africa's Debt," <https://qz.com/africa/1996978/why-investors-have-a-huge-appetite-for-african-eurobonds/> (last visited 2022-05-28)

2.Kanika Saigal, "Angola raises \$1.75bn in bond market, as Africa appetite returns," <https://www.theafricareport.com/192590/angola-raises-1-75-in-bond-market-as-africa-appetite-returns/> (last visited 2022-05-28)

3. 蒲大可, 非洲外债问题研究, 2020, 上海师范大学, PhD dissertation.

4.Chuku Chuku and Mustafa Yasin Yenice, "Eurobonds, debt sustainability and macroeconomic performance in Africa: Synthetic control experiments," Working Paper Series, 2021.

5.Daniel Munevar, *Sleep now in the fire: Sovereign Bonds and the Covid-19 Debt Crisis*, Eurodad, 2021.

and do not sufficiently account for the performance of these countries in terms of governance and economic development in the medium- to long-term. During periods of high global liquidity and commodity prices, developing countries, which rely heavily on mineral and energy exports, also experience economic booms, have higher ratings, and relatively lower bond issuance costs. But if the global economy is in recession and resource commodity prices fall, these countries may need more financing to keep their economies afloat, but then rating agencies will downgrade their ratings. An empirical study of 27 African countries between 2007 and 2014 shows that Fitch and Moody's, when assigning credit ratings to African sovereigns, tend to upgrade them during boom phases and downgrade them during recession phases.¹

Lower ratings imply higher yield spreads for new bond issues. In total, AAA issuers may pay spreads of only 10 to 20 basis points above the risk-free reference rate, while single-B rated countries may pay 600 basis points or more. Most Eurobond coupon rates in developed countries are below 2%, yet according to the African Development Bank, 10-year Eurobond coupon rates for African countries issued in 2013-2019 are between 4% and 10% with a slow upward trend.² The study shows that sovereign bond coupon rates for African economies are

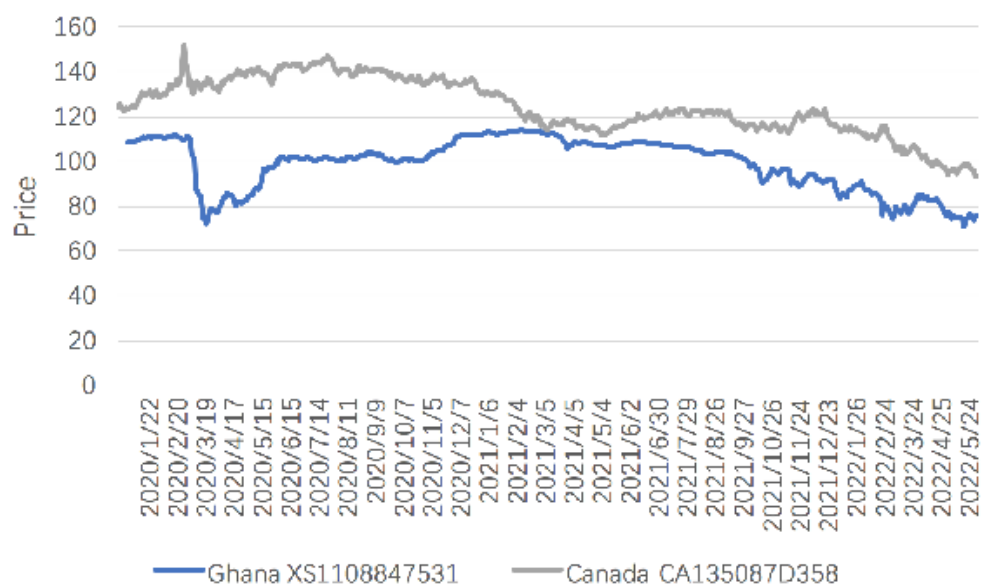
above normal, averaging about 2.9% higher than those corresponding to macroeconomic fundamentals or credit risk ratings.³

After a bond is issued, the secondary market price of the bond will change somewhat in response to market conditions. If the outstanding price of a bond in the secondary market rises to a desirable level, it may be better to sell the bond directly to obtain a desirable return than to hold it to maturity. However, due to factors such as the COVID-19 epidemic and the Russia-Ukraine conflict, global economic conditions have seen more pronounced fluctuations and downtrends in recent years, and developing country sovereign bond prices have weakened. Compared to the secondary market prices of developed country sovereign bond, developing country sovereign bond has shown a significant trend away from the issue price. In contrast, during the same period, prices of developed country sovereign bond, while also somewhat lower due to overall market conditions, largely did not show significant price deviations below the issue price. As an example, Figure 2-2 illustrates the price trend of developed country governments: sovereign bonds issued by the Canadian government (ISIN: CA135087XG49) versus developing country governments and sovereign bonds issued by the Ghanaian government (ISIN: XS1108847531) over the last three years.

1.Pretorius, Marinda, and Ilse Botha, "The Procyclicality of African Sovereign Credit Ratings," In *Advanced in Applied Economic Research*, Chap. 35, pp. 537 – 546.

2.African Development Bank, *African Economic Outlook 2021*, 2022.

3.Olabisi, Michael, and Howard Stein. "Sovereign Bond Issues: Do African Countries Pay More to Borrow?" *Journal of African Trade*, Vol.2, No.1 – 2, 2015, pp.87.



Canada: issue price: 99.21; coupon rate: 2.750%; issue date: 6/2/2014; maturity date: 12/1/2048; ISIN: CA135087D358
 Ghana: Issue price: 99.16; Coupon rate: 8.125%; issue date: 9/18/2014; maturity date: 1/18/2026; ISIN: XS1108847531

Figure 2-2
 Comparison of the Price Trend of Canadian and Ghanaian Government Bonds in the Last Three Years
 Data Source: Bloomberg

The secondary market price of a bond reflects market investors' real-time assessment of the risk of that bond. From the data presented in Figure 2-2, we can see that the market price of sovereign bonds issued by the Canadian government is consistently in a range that is significantly higher than the issue price. In contrast, the market price of sovereign bonds issued by the Ghanaian government has often been in a range significantly below the issue price in recent years. The secondary market price of Ghanaian sovereign bonds also showed an upward momentum above the issue price during the period when global economic conditions were favorable prior to the large-scale outbreak of the COVID-19 epidemic in early 2020. During the global outbreak in 2020 and the global economic downturn starting in late 2021, the market price of the sovereign bond was significantly lower than the issue price, indicating a higher risk premium and higher expected market risk in the eyes of secondary market investors.

In terms of secondary market liquidity for sovereign bonds, developing country sovereign bonds are generally less liquid than developed country sovereign bonds. Markets

Insider's trading volume data shows that developed country sovereign bonds are more actively traded in the secondary market while developing country sovereign bonds usually do not show bar chart statistics due to low trading volume. According to the London Stock Exchange, as of May 15, 2022, only two of the five most recent trades in an Egyptian sovereign bond (ISIN: XS2176897754) occurred in April 2022 with three more occurring in March. Only two of the five most recent transactions of an Angolan sovereign bond (XS2083302419) occurred in April with three more in March and one in February. The five most recent transactions of a Nigerian sovereign bond (XS1717013095) all occurred in February 2022. While issues such as low secondary market prices and low transaction frequency do not directly affect the current issuer's financing costs for outstanding sovereign debt, changes in the market's determination of the risk of its sovereign debt may result in future issuance of new bonds at higher coupon rates and lower issue prices in order to attract willing investors. From this perspective, the cost of financing for developing countries may indirectly rise in the future.

5. Fiscal Impact of Eurobond Issuance

IMF research shows that the main impact after sovereign bond issuance is on the composition of public debt rather than the level of public debt, with the vast majority of countries experiencing a slight deterioration in their primary fiscal balance after the issuance of sovereign bonds.¹ The surging bond stock in developing countries has led to higher debt service costs, reduced fiscal space, and in some cases, jeopardized macroeconomic stability. Sub-Saharan Africa's debt grew from 35% of GDP in 2014 to 55% in 2019, with interest repayments becoming the highest spending component of fiscal budgets and debt service consuming on average more than 20% of government revenues in African countries as the fastest growing expenditure.² African countries also issue Eurobonds with significantly shorter maturities than bilateral or multilateral borrowing, with the average maturity of bilateral and multilateral concessional loans received by African countries reaching more than 25 years. In contrast, the repayment terms of Eurobond issued by African countries are significantly shorter than those of concessional loans and are not easily rolled over due to commercial contractual constraints. The maturity of Eurobonds issued in the early years ranged from 5 to 10 years, and even though the maturity of Eurobonds issued after 2014 has been extended, long-term bonds account for a relatively small share. Under the dual influence of concentrated debt issuance and short maturity of bonds, African countries expect to face the problem of concentrated maturity of bonds in 2021-2025 and the first peak of debt repayment in 2023-2025. According to statistics, the amount of Eurobonds maturing in Africa by 2025 totals more than USD 106 billion

However, the pandemic of COVID-19 and the global economic slowdown that is expected to follow for at least three to four years means that African countries will continue to be challenged by widening fiscal deficits, which will undermine the countries' ability to refinance. In 2020, sub-Saharan Africa experienced its first recession in half a century, with GDP falling by as much as 2.1% and foreign direct investment flows falling 18% from about \$45 billion in 2019 to \$37 billion in 2020. African countries' fiscal deficits doubled, reaching a record high of 8.4% of GDP by 2020. According to the African Development Bank, the average debt-to-GDP ratio of African countries will increase to more than 70% in 2021-2022, up from about 60% in 2019, and commercial bonds account for 45% of all debt in the debt structure of African countries.³ The risk of refinancing will be further magnified by the accumulation of debt and widening fiscal deficits combined with economic slowdown. By the time debt service peaks, debtor countries may experience a sudden reduction in public spending with devastating consequences for national development. Infrastructural and public works projects may stall, overall social output may decrease, and unemployment may increase sharply.

The severe debt situation and impending debt service peaks are likely to cause developing countries to experience credit rating downgrades and reduced access in international capital markets. Of the 32 African countries rated by one or more of the three major credit rating agencies, 18 have experienced credit downgrades.⁴ After a credit rating downgrade, these countries must obtain future financing at a higher cost and may even be excluded from credit markets altogether.

1. Mauro Mecagni et al., "Issuing International Sovereign Bonds Opportunities and Challenges for Sub-Saharan Africa," International Monetary Fund, 2014.

2. Coulibaly, B., Gandhi, D., & Senbet, L. *Is Sub-Saharan Africa Facing Another Systemic Sovereign Debt Crisis?* Africa Growth Initiative Policy Brief, Washington DC: Brookings Institutions, 2019.

3. African Development Bank Group, *African Economic Outlook 2021: From Debt Resolution to Growth: The Road Ahead for Africa*, https://www.afdb.org/sites/default/files/documents/publications/afdb21-01_aeo_main_english_complete_0223.pdf, (last visited 2022-05-23).

4. Hippolyte Fofack, *Downgrading Africa's Development*, <https://www.project-syndicate.org/commentary/africa-credit-rating-downgrades-hurt-economic-development-by-hippolyte-fofack-2021-08?barrier=accesspaylog>, (last visited 2022-05-23).

It is already evident that spreads on African Eurobond issues are widening and that the number of new Eurobond issues has declined.

¹At the same time, as the Federal Reserve of the US raises interest rates and shrinks its balance sheet, the US dollar has seen a more substantial appreciation and capital from international investors will flow back from emerging economies to developed economies such as the US. A massive sell-off of bonds issued by emerging economies would lead to a decline in their bond prices and an increase in bond yields. The massive capital flight itself will in turn trigger a depreciation of developing countries' currencies, making the size of bonds denominated in foreign currencies rise. Combined with the COVID-19 epidemic further reducing government revenues in developing countries, many countries may not have the necessary liquidity to service their debt as it falls due. If payment dues are missed, there will be widespread defaults and restructuring agreements. The combination of factors mentioned above could very easily cause huge short-term economic liquidity difficulties in regions such as Africa.

6. Consequences of Bond Default and Debt Restructuring

When the agreed interest payment date of a sovereign bond arrives, the issuing country is required to pay the specified amount of coupons to the investors holding the bond; when the agreed maturity date arrives, the issuing country is required to repay the agreed principal amount of the bond and the last portion of the coupons still outstanding to the investors holding the bond. If the issuer fails to pay the coupons or principal in a timely manner, the debt will be in default. Overall, a sovereign government that defaults on its debt, or has a clear likelihood of defaulting on its debt, will face a number of serious consequences, a judgment supported by

several historical cases of sovereign debt crises. When a country declares that it cannot pay its external debt or demonstrates signs that it may not be able to pay, it usually causes public panic, which is reflected in a series of subsequent economic activities and triggers a further economic recession. If this process is accompanied by a downgrade of a country's sovereign rating by a rating agency, this vicious circle will occur even faster.

One of the more typical historical cases of problems caused by inadequate sovereign debt servicing is the Greek sovereign debt crisis. As a result of the pre-2013 Greece's beautification of economic indicators through a series of means to enter the eurozone, its continued pursuit of high social welfare, and its reliance on imports and tourism, the Greek government gradually struggled to cover its large fiscal deficit in the wake of the global financial crisis. The exposure of this problem led to the Greek government's sovereign bond credit rating being lowered by several mainstream rating agencies and to widespread negative sentiment in the Greek market, which gradually spread to other countries in the eurozone through the financial systems of eurozone banks and stock markets, eventually evolving into the famous European debt crisis and bringing heavy damage to the European economy and the global economy at large.²

Similarly, in November 2001, Argentina announced its inability to repay its foreign debts, and its defaulted debts reached a total of \$95 billion. This news soon had serious economic consequences, plunging Argentina into the worst recession since the Great Depression. Inflation in Argentina rose rapidly, the currency was severely devalued, many businesses failed, and unemployment skyrocketed as a result.

1. Africa Growth Initiative at Brookings, *Sub-Saharan Africa's debt problem: Mapping the pandemic's effect and the way forward*, <https://www.brookings.edu/wp-content/uploads/2021/10/COVID-and-debt.pdf>, (last visited 2022-05-23).

2. On December 8, 2004, Fitch, one of the world's three major rating agencies, announced that it had downgraded Greece's sovereign credit rating from "A-" to "BBB+" with a negative outlook. In the evening of December 16, 2009, international rating agency Standard & Poor's (S&P) announced that it had downgraded Greece's long-term sovereign credit rating by one notch, from "A-" to "BBB+". S&P also warned that if the Greek government is unable to improve its financial situation in the short term, it is likely to further reduce Greece's sovereign credit rating.

The problem of sovereign bond defaults is not just an isolated one in the bond market but will spread from single cases to a wide area and finally become a major problem in economic fundamentals, currency, and even politics. Since the serious consequences of sovereign bond defaults are obvious, bond issuers will do everything they can to prevent them. For financial institutions in developed countries, they choose to take higher risks during more stable economic periods in exchange for higher profits on developing country bonds, and they can earn relatively higher returns if the countries do not default. For developing countries, they have more adequate access to financing than before, but they are also more likely to fall into the trap of debt service pressure under the push of capital and even fall into debt crises.

The IMF and the World Bank play a crucial role in dealing with debt crises in both Latin American and African countries, and new loans from international organizations are mostly a prerequisite for debt restructuring in debtor countries, becoming the main source of funds for debtor countries to borrow new and repay old. Concessional loans from international organizations can also enable debtor countries to continue their projects and thus recover their economic strength more quickly. However, a special category of creditors that resist restructuring has emerged in the default disposition of international bonds - vulture funds.¹ Vulture funds refer to hedge funds that seek high profits by acquiring distressed assets and maliciously litigating them, earning their name through their practice of preying on distressed assets like vultures on carrion. Their investment strategy is to buy sovereign bonds that are in default or about to default first in the secondary market, then resist sovereign bond restructuring and reap huge profits by litigating to claim the full face value of the bonds from the debtor country.²

Since the 21st century, there has been a growth in sovereign bond default litigation and a shift in the identity of the lead plaintiffs from large commercial banks to vulture funds. According to statistics, 90% of the lawsuits after 2000 were filed by vulture funds. Compared to traditional creditors, vulture funds have a high degree of expertise and sufficient financial backing and possess a clearer purpose of profiting from specialization in distressed assets, making their litigation activities more professional and aggressive. After obtaining a successful court decision, vulture funds search the world for valuable national property in debtor countries and apply for enforcement in the courts where the property is located. Taking advantage of the widespread desire of debtor countries to resolve their debt crises as quickly as possible, vulture funds have continued to interfere with sovereign bond restructurings through litigation; combined with public pressure, many debtor countries have eventually had to give in to the vulture funds and meet their demands for full payment of principal and interest on their bonds. For example, Elliott Management, a New York-based hedge fund, bought \$11.4 million of Peruvian government bonds in 1996, then rejected the Peruvian government's debt restructuring agreement, and filed a lawsuit. In 2000, the fund won the lawsuit and received \$58 million in repayment, a return of over 400% on its investment.

Another example is the case of *NML Capital Ltd. v. Republic of Argentina*.³ NML Capital filed suit in New York after buying approximately \$172 million in face value of Argentine sovereign bonds at a discount of approximately 50%. In May 2006, the court ordered Argentina to repay NML Capital the principal, interest, and penalties on the bonds totaling \$284 million, after which NML Capital filed a worldwide judicial proceeding to seize Argentine state property. In 2011, NML Capital New York initiated a separate

1. Wheeler C, Attaran A. *Declawing the Vulture Funds: Rehabilitation of a Comity Defense in Sovereign Debt Litigation*[[J]]. *Social Science Electronic Publishing*. 254.

2. 李皓 主权债券违约诉讼研究 [J]. *Fa xue za zhi* (Beijing, China), 2016, 37(2): 126.

3. Brett, Neve. *NML Capital, Ltd. v. Republic of Argentina: An Alternative to the Inadequate Remedies under the Foreign Sovereign Immunities Act*[[J]]. *Carolina Law Scholarship Repository*, 2013, 39(2).

lawsuit against Argentina for violating the pari passu clause of the sovereign bonds, arguing that it should receive the same proportional payment as creditors who agreed to the restructuring. The U.S. Supreme Court ruled that Argentina could not pay principal and interest on the bonds to creditors who agreed to the restructuring if it did not pay NML Capital the same percentage.¹ This meant that

Argentina would have to repay the full \$1.33 billion worth of debt to the vulture funds if it chose to compromise. However, in 2014 the Argentine government chose not to repay the vulture funds even if it technically defaulted on the restructured sovereign bonds. It was only after President Macri took office in 2015 that the protracted lawsuit was finally negotiated and settled with the vulture funds.

1. Cornell Law School. *REPUBLIC OF ARGENTINA v. NML CAPITAL, LTD.* <https://www.law.cornell.edu/supremecourt/text/12-842>, (last visited 2022-05-28).

Chapter 3

Sustainability of European Bond Issuance and Forecast of Default Risk

To predict the sustainability and default risk of Eurobond issuance, this study collects daily transaction price data of sovereign bonds and several macroeconomic indicators, as well as the value date, maturity date, and duration of 158 bond samples in 22 countries. ¹Employing the Mann-Whitney U statistical test method to examine the relationship between the changes of credit risk premium and issuance financing cost in different countries and the debt ratio and scale of foreign debt, this section analyzes the sustainability of sovereign bond issuance. ²

1. Calculation model of issuance and transaction spread

According to the market efficiency hypothesis, in a market with sound laws, good functions, high transparency, and sufficient competition, all valuable information can be accurately, timely, and fully reflected in price trends. Price discovery is an important economic function of financial markets and plays an active role in the bond market. Taking the market price as the starting point of the research, the fundamental changes and market sentiment expectations of bonds and their credit entities can be obtained more efficiently in most cases. On the one hand, the initial issue price of bonds, in addition to being related to the bond issue period, also directly reflects the level of the entity's financing cost. The lower the initial price, the higher the coupon rate, the financing cost of the corresponding entity, and the subject's credit risk are. On the other hand, the daily trading price of the bond secondary market reflects the pricing of all the fundamental information of the bond by investors. Since the bond has a fixed cash flow in the future, the change in its price is mainly

due to the market as well as the term factor. Changes in bond credit risk premiums are caused by changes in liquidity and the credit qualifications of the issuers. The better the credit qualifications of the subject, the lower the corresponding credit risk premium and the corresponding yield-to-maturity. The initial issuance price and daily transaction price of the creditor's rights can be used in the following discount formula for bond cash flow to calculate the corresponding coupon rate and yield-to-maturity respectively and to derive the issuance spread and transaction spread.

$$PV = \frac{C}{(1+r)} + \frac{C}{(1+r)^2} + \frac{C}{(1+r)^3} + \dots + \frac{C+FV}{(1+r)^t}$$

Among them, PV refers to the theoretical value of the bond;

C means the coupon of the bond;

FV means the face value of the bond;

t means the expiry period;

r refers to the discount rate, which is the bond yield-to-maturity (YTM) or coupon rate.

The issuance spread is obtained by calculating the difference between the coupon rate and the benchmark yield when the bond is issued, which reflects the bondholder's additional interest income beyond the benchmark risk-free yield, also referred to as the issuer's financing cost. The larger the value, the higher the interest income of the bondholder and the financing cost of the corresponding issuer and the worse the credit qualification of the issuer. If the daily yield-to-maturity of the bond is calculated based on the valuation basis of the issuance spread, then:

1. Due to the technicality of this chapter, this is just a rough translation. Please consult the Chinese version for the most reliable and precise expression.

2. The sample countries include Argentina, Egypt, Ethiopia, Angola, Benin, Ghana, Gabon, Cameroon, Côte d'Ivoire, Kenya, Rwanda, Morocco, Mozambique, Namibia, South Africa, Nigeria, El Salvador, Senegal, Sri Lanka, Suriname, Tunisia, and Zambia (mainly African issuers and issuers with credit ratings below B-). Due to the lack of data on bonds issued by Uganda and the macro data of Seychelles and Congo, it was not included in the sample.

Daily yield-to-maturity based on issue spread
 = The issue interest rate difference on the value date of the bond YTM on the same day corresponding to the remaining maturity of +the bond on the calculation day

$$= Rf_{t_i, T-t_i} + (YTM_{t_0} - Rf_{t_0, T-t_0})$$

$$= Rf_{t_i, T-t_i} + (\text{Coupon rate at issuance} + \text{Bond yield-to-maturity of treasury bonds on the value date corresponding to the total term of the bond})$$

The transaction spread is obtained by calculating the difference between the yield-to-maturity as corresponding to the daily trading price of the bond and the benchmark yield. The difference with the benchmark yield can eliminate the influence factors of the market liquidity level and the remaining maturity of the bond and thus more accurately reflect the credit risk premium level of the issued bond. The larger the value, the higher the credit risk premium level, which means that the subject qualification is relatively poor. If the daily yield-to-maturity of the bond is calculated based on the transaction spread as the valuation basis, then:

Daily yield-to-maturity based on trading spreads
 = Calculate the YTM of treasury bonds of the same day and with the same residual maturity corresponding to the remaining maturity of the bonds on the same day + the latest trading spread of the bonds

$$= Rf_{t_i, T-t_i} + (YTM_{t_j} - Rf_{t_j, T-t_j}) \quad \text{admits } j \leq i$$
 such that $VOL_j > 0$ and $VOL_{(j+1)}, \dots, VOL_i = 0$, in which VOL_j represents the turnover on jth day

In addition, if the bond is traded on the day of calculation, the latest transaction spread of the bond is the transaction spread on the day of calculation, that is, the situation in which the expression of the daily yield

$$= Rf_{t_i, T-t_i} + (YTM_{t_j} - \text{to-maturity } Rf_{t_j, T-t_j})$$
 based on the transaction spread degenerates. The $j=i$ daily yield-to-maturity formula for trading spreads is:

$$YTM_{t_i} = Rf_{t_j, T-t_j} + (YTM_{t_j} - Rf_{t_j, T-t_j}) = YTM_{t_j}$$

When calculating the issuance cost of the subject and the daily credit risk premium, it cannot be obtained from the disclosed national debt when the remaining maturity of the bond is a non-critical period since the yield-to-maturity of national government bonds only discloses the data of certain key terms on a daily basis. The risk-free interest rate data of the corresponding term is directly obtained from the yield-to-maturity data, so it is necessary to use an interpolation method to calculate the yield-to-maturity of treasury bonds with different remaining terms.

Interpolation refers to establishing a continuous function based on the known observation points, so the curve passes through all the known observation points, and at the same time, the estimated value of other points can be inferred through the continuous function. Mathematically, the definition of interpolation can be expressed as: the known function is $y=f(x)$ defined on the interval, $[a, b]$ the value $y_0, y_1, y_2, \dots, y_n$, at the known point $a \leq x_0 < x_1 < x_2 < \dots < x_n \leq b$, if there is a function $p(x)$ that satisfies the interpolation condition, that is $p(x_i) = y_i$ ($i=0, 1, 2, \dots, n$), is called $p(x)f(x)$ interpolation function, $x_0, x_1, x_2, \dots, x_n$ is called interpolation node, interval $[a, b]$ is called interpolation interval, any given point x is called interpolation point, and the method of constructing interpolation function $p(x)$ is called interpolation method.

Commonly used interpolation methods include linear interpolation, polynomial interpolation, spline interpolation, third-order Hermite interpolation, among other methods. Within these methods, the calculation process of linear interpolation is relatively simple, and the approximation between two points on the output function gradually deteriorates with the increase of the second derivative of the approximated function. In other words, the greater the curvature of the function, the greater

the error of the linear interpolation approximation. Polynomial interpolation overcomes most of the problems in linear interpolation, and the structure is neat and compact and does not even need to solve the equation system, but the computational cost of polynomial interpolation is huge, and it is very likely to oscillate, especially at the endpoints of the data. Spline interpolation has the same meaning as polynomial interpolation, though its error is much smaller than that of linear interpolation, and the overall smoothness is much higher. However, these three types of interpolation methods only interpolate through each node, and the connection between each piece-wise function cannot be smoothed. In contrast, the third-order Hermite interpolation resolves this kind of problem very well. It guarantees the smoothness and stability of the resulting curve by specifying the curve derivatives of the nodes and their positions.

After research and comparison, the third-order Hermite model is selected when constructing the yield curve of treasury bonds because it is more suitable for the actual situation of the bond market. This interpolation method also specifies the coordinate value of each node and the derivative of the curve at each node, meaning that the interpolation function is required not only to have the same value as the function at the node but also to have the same first-order, second-order, or even higher order as the function. Under this condition, the model is characterized by smoothness and flexibility.

In the actual calculation, the specific process when combined with the Hermite model fitting method is as follows:

Let $0 \leq x_i < \dots < x_n \leq T$, and knowing the corresponding rate of return of these terms $(x_i, y_i), (x_{i+1}, y_{i+1})$, $i \in [1, n]$, find any $x_i \leq x \leq x_{i+1}$ corresponding rate of return $y(x)$. Using the Hermite polynomial

interpolation method, $y(x) = y_i H_1 + y_{i+1} H_2 + d_i H_3 + d_{i+1} H_4$, where x_i is the term, y_i is the yield-to-maturity, and d_i is the derivative of the yield curve at x_i

$$\begin{aligned} H_1 &= 3 \left(\frac{x_{i+1} - x}{x_{i+1} - x_i} \right)^2 - 2 \left(\frac{x_{i+1} - x}{x_{i+1} - x_i} \right)^3 \\ H_2 &= 3 \left(\frac{x - x_i}{x_{i+1} - x_i} \right)^2 - 2 \left(\frac{x - x_i}{x_{i+1} - x_i} \right)^3 \\ H_3 &= \frac{(x_{i+1} - x)^2}{x_{i+1} - x_i} - \frac{(x_{i+1} - x)^3}{(x_{i+1} - x_i)^2} \\ H_4 &= \frac{(x - x_i)^3}{(x_{i+1} - x_i)^2} - \frac{(x - x_i)^2}{x_{i+1} - x_i} \end{aligned}$$

2. Statistical analysis of subject credit risk premium based on transaction spread

2.1 Based on the research on the transaction spread between different countries and its changing trend

On the whole, the credit risk premium of the sample countries has increased significantly, that is, the overall level of subject qualification has dropped significantly, and the average transaction spread data has increased; the polarization of the overall level of subject qualification has increased significantly, and the trend of change is accelerating. Among them, the transaction spread levels of nine countries, Argentina, Ethiopia, Ghana, Mozambique, El Salvador, Sri Lanka, Suriname, Tunisia, and Zambia, increased to a certain extent during the statistical period.

According to the analysis of the transaction spread and issuance spread, this section calculates statistics from the perspective of the transaction spread, analyzes its trend, and then obtains the changing characteristics of the main credit risk premium. The transaction spread of each bond at the end of each year is calculated for 158 sample bonds from 22 sample countries and averaged according to the issuing country to which the bonds belong. The statistical results are shown in Table 3-1.

| country \ year | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|----------------|--------|--------|---------|---------|---------|---------|
| Argentina | | | 8.0505 | 19.9446 | 29.4734 | 58.8858 |
| Egypt | 5.9968 | 4.1205 | 5.4853 | 3.7038 | 4.1168 | 5.0235 |
| Ethiopia | 5.5619 | 3.3808 | 4.9334 | 3.0516 | 5.6877 | 20.9774 |
| Angola | 7.5626 | 4.5123 | 6.4735 | 5.4362 | 8.1632 | 6.9741 |
| Benin | | | | 2.9930 | 3.7853 | 3.1470 |
| Ghana | 6.0953 | 3.7566 | 6.2560 | 4.7090 | 4.9246 | 9.5352 |
| Gabon | 5.4127 | 3.7891 | 6.4509 | 3.6780 | 4.7653 | 4.8244 |
| Cameroon | 5.6974 | 3.5007 | 6.4912 | 4.6584 | 5.7299 | 5.3582 |
| Côte d'Ivoire | 4.4881 | 3.0716 | 5.0093 | 3.6263 | 3.3181 | 3.4427 |
| Kenya | 5.4837 | 3.2810 | 6.3202 | 4.3770 | 4.4798 | 4.6822 |
| Rwanda | 4.5066 | 3.2844 | 4.2942 | 2.6251 | 3.4400 | 1.7472 |
| Morocco | 1.9239 | 1.1627 | 1.4970 | 0.5809 | 1.3611 | 1.2726 |
| Mozambique | | | | 6.2383 | 7.8639 | 9.2289 |
| Namibia | 3.1405 | 2.5527 | 4.5004 | 2.6433 | 3.0959 | 2.6222 |
| South Africa | 2.1757 | 1.8091 | 2.7103 | 2.2451 | 2.5551 | 2.1353 |
| Nigeria | 4.7407 | 3.5632 | 6.0013 | 4.8016 | 4.7363 | 5.5112 |
| El Salvador | 6.2434 | 4.6507 | 5.7826 | 4.2053 | 7.2841 | 16.3359 |
| Senegal | 3.9152 | 3.3584 | 4.7459 | 3.2199 | 3.4330 | 3.7590 |
| Sri Lanka | 4.4598 | 2.7850 | 5.4423 | 5.0781 | 21.2125 | 34.8169 |
| Suriname | | 5.6849 | 6.7637 | 12.3168 | 22.0214 | 21.2796 |
| Tunisia | 1.8740 | 1.5947 | 3.3176 | 3.2788 | 5.9226 | 10.3184 |
| Zambia | 5.8872 | 3.9109 | 12.0139 | 16.5679 | 34.6624 | 26.9714 |

Table 3-1
Transaction spreads in different countries at the end of each year of the statistical period (%)

Due to the differences in the listing and trading dates of the sample bonds, not all samples have transaction price data available since 2016, so the transaction spread data of some countries in Table 3-1 have gaps in the early stages of the sample. According to the data in Table

3-1, the average and standard deviation of the transaction spread data of all bond samples at the end of each year, regardless of country, is calculated to reflect the trend of the overall transaction spread and dispersion of the sample, as shown in Figure 3-1.

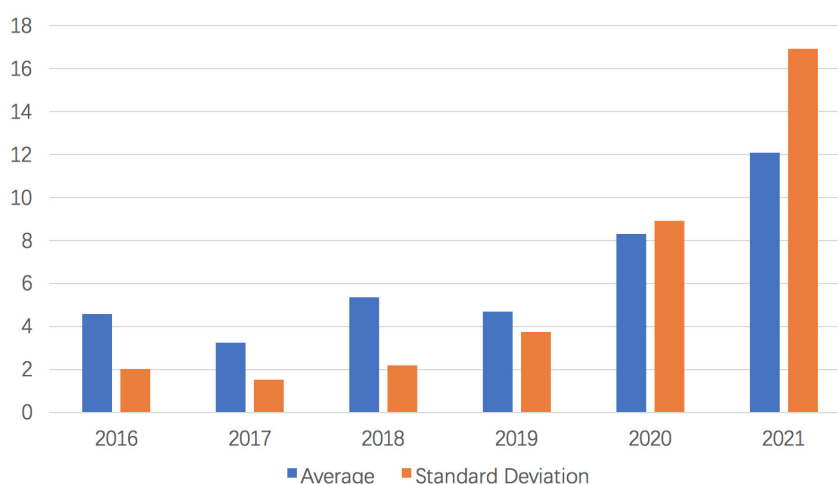


Figure 3-1
Average and standard deviation of transaction spreads in sample countries at the end of each year (%)

As can be seen from Figure 3-1, the average transaction spread data of the 22 sample countries rose from 4.57 % at the end of 2016, to 12.09% at the end of 2021., indicating that the credit risk premium of the sample countries has increased significantly while the overall level of subject qualification has dropped significantly. At the same time, the standard deviation data of transaction spreads in the 22 sample countries has fluctuated from 2.02 % at the end of 2016 to 16.95 % at the end of 2021, indicating that the average transaction spread data in the sample countries has increased. The polarization characteristics at the overall level increased significantly, and the change trend was characterized by an acceleration.

From the data results of different countries in Table 3-1, it can be seen that the transaction spread levels of nine countries (Argentina, Ethiopia, Ghana, Mozambique, El Salvador, Sri Lanka, Suriname, Tunisia, and Zambia) have increased to a certain extent, reflecting how the country's credit risk premium has increased, and the subject's qualification has declined. Among them, Argentina has the largest increase in absolute value, with a cumulative increase of more than 50% in the past three years;

followed by Sri Lanka, whose cumulative increase in the transaction spread in the past five years has also exceeded 30 %; the transaction spreads of Zambia, Suriname, Ethiopia, El Salvador have also increased by more than 10 % during the statistical period. This indicates that the credit risk premiums of the above-mentioned 6 countries have increased significantly and that the qualifications of the entities have seriously declined.

2.2 Research based on the debt ratio and its changing trend among different countries

The overall debt pressure of the sample countries increases gradually with the increase of the time since entering the bond market. In terms of countries, except for Ethiopia, most of the other countries have increased debt ratios during the statistical period. In addition, countries with high debt ratios are more likely to experience an increase in transaction spreads. Among the 9 countries with a notable increase in transaction spreads, only Ethiopia and Ghana are defined as low debt ratio countries while the remaining 7 countries are countries with high debt ratios.

According to the relevant theories on sovereign credit, there are many reasons for the decline of the subject's qualifications, among which the current debt ratio of the issuing country is a major factor. If a country's debt ratio is higher, the country's sovereign bonds will account for a larger proportion of the country's total economic output. This creates a greater debt repayment pressure and a more severe overall income and expenditure situation, and the corresponding bond default risk probability will increase. At this time, the pressure will be transmitted to the international secondary trading market, resulting in an increase in the country's main credit risk premium, or an increase in the corresponding bond yield-to-maturity, which in turn increases the transaction of the corresponding bond spreads.

In order to further study the reasons for the rise in transaction spreads in many of the sample countries, this study subsequently collected data on the scale of external debt and total GDP of the aforementioned 22 countries from 2016 to 2020 from the official website of the World Bank. At the end of each year, the ratio of the foreign debt scale of each country to the total GDP of the current year is calculated to obtain the country's debt ratio data for the current year, as shown in Table 3-2. Since the latest data disclosed by the World Bank is updated to 2020, and Namibia's external debt data has not been included for the time being, the country's debt ratio cannot be calculated for this statistical period.

| year country | 2016 | 2017 | 2018 | 2019 | 2020 | average debt ratio |
|-------------------------------|---|-------------|-------------|-------------|-------------|---------------------------|
| Argentina | 32.58 | 35.10 | 52.94 | 62.34 | 65.19 | 49.63 |
| Egypt | 20.80 | 35.94 | 40.12 | 37.97 | 36.02 | 34.17 |
| Ethiopia | 31.49 | 32.00 | 33.04 | 29.58 | 28.21 | 30.87 |
| Angola | 57.18 | 48.46 | 62.37 | 72.07 | 115.26 | 71.07 |
| Benin | 19.10 | 23.64 | 25.14 | 26.94 | 33.55 | 25.67 |
| Ghana | 37.49 | 36.77 | 34.43 | 39.13 | 45.71 | 38.71 |
| Gabon | 38.05 | 43.53 | 40.38 | 42.66 | 49.72 | 42.87 |
| Cameroon | 23.33 | 27.90 | 27.33 | 32.39 | 33.98 | 28.99 |
| Côte d'Ivoire | 23.89 | 26.07 | 27.90 | 33.85 | 40.87 | 30.52 |
| Kenya | 28.12 | 32.83 | 34.07 | 34.75 | 37.81 | 33.51 |
| Rwanda | 49.69 | 54.86 | 58.93 | 62.91 | 79.29 | 61.14 |
| Morocco | 46.09 | 46.52 | 42.70 | 45.93 | 57.25 | 47.70 |
| Mozambique | 119.00 | 119.69 | 125.82 | 130.72 | 149.31 | 128.91 |
| Namibia | The World Bank has no relevant data to disclose | | | | | |
| South Africa | 44.49 | 45.86 | 43.00 | 47.78 | 50.91 | 46.41 |
| Nigeria | 8.83 | 12.18 | 13.65 | 13.40 | 16.32 | 12.88 |
| El Salvador | 68.48 | 68.77 | 64.27 | 64.62 | 74.41 | 68.11 |
| Senegal | 39.57 | 46.77 | 54.86 | 64.96 | 69.95 | 55.22 |
| Sri Lanka | 56.63 | 58.07 | 60.16 | 66.81 | 69.84 | 62.30 |
| Suriname | 89.21 | 88.09 | 90.99 | 94.84 | 126.15 | 97.86 |
| Tunisia | 64.98 | 79.45 | 82.29 | 94.20 | 98.60 | 83.91 |
| Zambia | 72.62 | 88.72 | 89.41 | 118.95 | 165.90 | 107.12 |
| average value | 46.27 | 50.06 | 52.56 | 57.94 | 68.77 | 52.62 |

Table 3-2
Debt ratios (external debt/GDP) of different countries at the end of the statistical period (%)

According to end-year debt ratio data in Table 3-2, the average debt ratio level of the 21 sample countries increased from 46.27 % at the end of 2016 to 68.77 % at the end of 2020, illustrating how the overall debt pressure of the country increases gradually the longer it has been since it entered the bond market. In terms of countries, except for Ethiopia, the debt ratios of most of the other countries increased during the statistical period. Among them, the debt ratios of Argentina, Angola, and Zambia more than doubled, with an increase of 32.61 %, 58.08 %, and 93.28 % respectively. Suriname's debt ratio rose from 89.21 % in 2016 to 126.15 % in 2020, and Mozambique's debt ratio continued to exceed 100 % throughout the statistical period, even reaching 149.31 % by the end of 2016.

To better analyze and compare the relationship between debt ratios and transaction spreads, this study averages the debt ratios of each country at the end of each year during the statistical period, as shown in the last column of Table 3-2. The average debt ratio level of the 21 sample countries in the whole statistical period is about 52.62 %, and the median is 48.66 %. Comparing the average debt ratio level of different countries in the statistical period with the median, the countries with more than the median are defined as high-debt countries, and those below the median are defined as low-debt countries. Within the nine countries whose transaction spreads have notably risen, only two countries, Ethiopia and Ghana, are countries with low debt ratios as defined above, and the remaining seven countries are countries with high debt ratios. It can be preliminarily seen that countries with high debt ratios are more likely to experience rising transaction spreads, which confirms the previous hypothesis that “the higher the debt ratio of a country, the greater the debt repayment pressure as the time of entering the bond market increases, and the main credit risk premium rises, leading to an increase in trading spreads.”

2.3 Research based on the relationship between the debt ratio and the change trend of the transaction spread

With more time since entering the bond market, the difference in credit risk premium between countries with high debt ratios and countries with low debt ratios shows a clear trend of increasing. Countries with high debt ratios show a significant increase in the average transaction spread and credit risk premium year by year while for countries with low debt ratios, both the transaction spread and average credit risk premium remained at a relatively stable level and did not rise significantly.

The following uses the classic two independent sample Mann-Whitney U non-parametric statistical test method to carry out statistical analysis and test on the conclusion that the transaction spread of countries with high debt ratio increases significantly with the increase of the time since entering the bond market. The Mann-Whitney U test is currently the most widely used rank sum test for two independent samples, and its basic assumption is that there are differences in the center positions of the two samples. The null hypothesis of the Mann-Whitney U test assumes that the two independent samples are not significantly different. The Mann-Whitney U test method entails mixing the two groups of sample data and then sorting them. The sorted values are numbered 1 in order from small to large $1 \sim n$, and then the sum of the serial numbers of the two groups of samples is calculated and recorded as the T_1 sum T_2 , T_1 and T_2 the Mann-Whitney U test statistic:

$$U_1 = n_1 n_2 + \frac{n_1(n_1 - 1)}{2} - T_1, \quad U_2 = n_1 n_2 + \frac{n_2(n_2 - 1)}{2} - T_2$$

where n_1 and n_2 are the sample sizes of sample 1 and sample 2, respectively. The smaller of the sum is U_2 chosen U_1 as the final test statistic U.

For small samples, compare the test statistic U to the critical value in the Mann-Whitney U critical values U_0 , and accept H_0 if U is greater U_0 , otherwise reject H_0 . For the Mann-Whitney U statistic of large samples with both sample sizes greater than 10, the sampling distribution is close to the normal distribution, and the corresponding mean and standard deviation are

$$\mu_U = \frac{n_1 n_2}{2}, \sigma_u = \sqrt{\frac{n_1 n_2 (n_1 + n_2 + 1)}{12}}$$

The corresponding z-statistic is

$$z = \frac{U - \mu_U}{\sigma_u}$$

at a given level of significance, it can

be tested using the standard normal distribution.

First, for the three categories of all countries, countries with high debt ratios, and countries with low debt ratios, we will look at the characteristics of changes in transaction spreads during the statistical period. The specific method is to divide the transaction spread data of 158 sample bonds at the end of each year in the statistical period from 2016 to 2021 into two groups according to time, and select the overall total, high debt ratio, and low debt ratio in each group. Three different country labels are used to test the significance of the difference in transaction spreads. The test results are shown in Table 3-3.

| country label | All countries | | highly indebted country | | low-debt country | |
|-------------------------------------|----------------------------------|-------------|----------------------------------|-------------|----------------------------------|---------------|
| Statistical period year grouping | Trading spreads average value | p-value | Trading spreads average value | p-value | Trading spreads average value | p-value |
| 2016-2018 | 4.4957 | 0.002 | 4.9091 | 0.000 | 4.1203 | 0.555 |
| 2019-2021 | 8.4771 | significant | 14.7144 | significant | 4.1934 | insignificant |

Table 3-3
The test results of the significance of the difference in the transaction spread between the two different statistical period groups with different country labels

From the three sets of statistical test results in Table 3-3, for all countries and samples of countries with high debt ratios there is a significant increase in transaction spreads with the increase of time spent in the bond market. For countries with different rates, the difference in the transaction spread between the two different statistical period groups is not significant, that is, there is no significant increase in the transaction spread. Therefore, although the test results of the whole country sample are significant, it is due to the huge influence of the countries with high debt ratios. This is consistent with the statistical conclusion obtained in the previous section that “among the nine countries with a certain increase in transaction spreads, only two countries, Ethiopia and Ghana, are countries with low debt ratios as defined above, and the remaining seven countries are countries with

high debt ratios.”

Second, from the end of 2016 to the end of 2021, six sections of time are used to see whether there is a significant difference in transaction spreads between countries with high debt ratios and countries with low debt ratios. The specific method is to divide the transaction spread data of 158 sample bonds into 6 categories according to the time section at the end of each year and then divide the samples in each section into two groups according to the countries with high debt ratio and low debt ratio, and finally calculate the two. The average value of the transaction spread of different debt ratio groups is shown in Figure 3-2, and the significance test of the difference in the transaction spread is carried out with the test results shown in Table 3-4.

| years | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|-------------------------------------|------------|------------|------------|-------------|-------------|-------------|
| p-value | 0.147 | 0.088 | 0.073 | 0.000 | 0.000 | 0.000 |
| significant results | insignific | insignific | insignific | significant | significant | significant |
| Average trade spread between groups | 0.8672 | 0.5891 | 0.9422 | 2.4474 | 10.972 | 17.9355 |

Table 3-4
Test results of significant differences in transaction spreads between two different debt ratio groups at different time sections

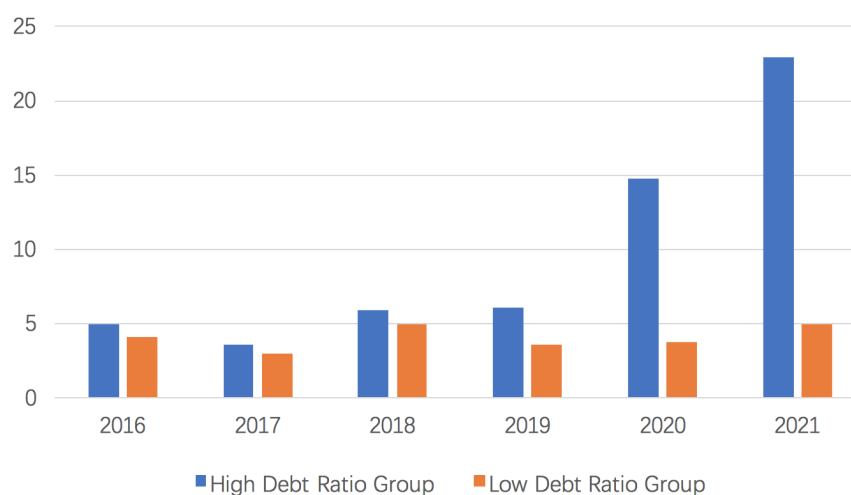


Figure 3-2
Average transaction spreads for countries with high and low debt ratios by year (%)

As seen in the significant changes of the 6 groups of statistical test results in Tables 3-4, during the period from 2016 to 2018, the average transaction interest spread of countries with high debt ratios at the end of each year was the same as the average transaction interest spread of countries with low debt ratios. There is no significant difference in the spread, but during the period from 2019 to 2021, the average transaction spread of countries with high debt ratios at the end of each year is significantly higher than that of countries with low debt ratios. This shows that with the increasing time since entering the bond market, the difference in credit risk premiums between countries with high debt ratios and countries with low debt ratios clearly widens. From Figure 3-2, the trend of the annual average transaction spread data for countries with high debt ratios and countries with low debt ratios can confirm

that as countries with high debt ratios have spent more time in the bond market from 2016 to 2021, the average transaction spread and credit risk premium also increase significantly year by year. For countries with low debt ratios, the transaction spread and average credit risk premium have remained at a relatively stable level during this period.

3. Statistical analysis of main financing cost based on issuance spread

3.1 Research based on the issuance spreads among different countries and their changing trends

With more time in the bond market, the average issuance spread of the sample countries did not increase with the increase in the average transaction spread. Essentially, with passage of time, the issuance cost of sovereign bond countries did not increase with the increase of the

average transaction spread. Its market credit analysis premium rises, but the price information in the secondary market is not fully transmitted to the pricing factors in the primary market.

The previous section demonstrated from the perspective of transaction spread that “the higher the country’s debt ratio, the greater its debt repayment pressure as the time it enters the bond market increases, and the transaction spread and the subject’s credit risk premium increase”, but will this impact be transmitted to the issuance interest rate difference, thereby increasing the financing cost of the country's bond issuance? This part will carry out statistical test of data from the perspective of issuance spread to answer this question.

Among 158 bond samples from 22 countries, the issuance year and issuance spread of each bond were calculated separately, and the average issuance spread of the current year was calculated for the bonds issued in each country each year. Due to the limited sample data and the uneven distribution of the corresponding issuance years, in order to avoid some sample countries with no issuance spread data and the lack of average issuance spread data in some countries in some years, the data analysis only counts the annual average issuance spread data of all sample countries compared with the average transaction spread data of all sample countries in each year, as shown in Figure 3-3.

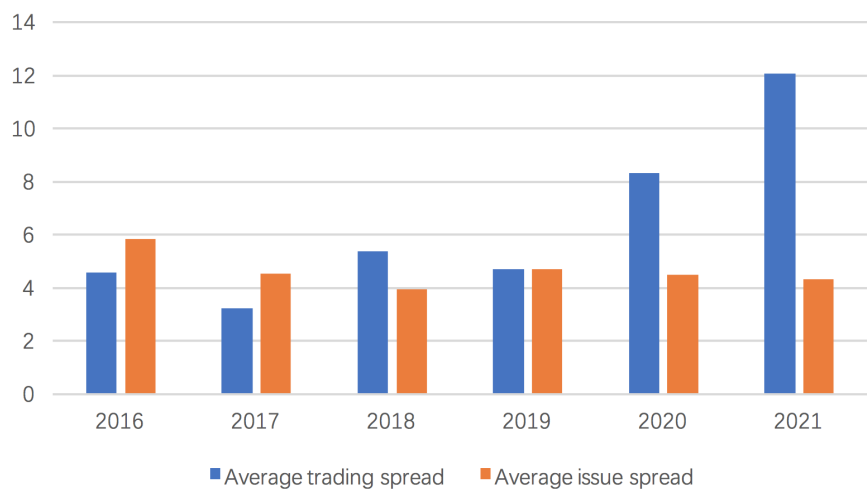


Figure 3-3
Average issuance spread and average transaction spread by country by year (unit: %)

It can be seen from Figure 3-3 that during the period from 2016 to 2021, the average issuance spread in the sample countries was relatively stable in general with little difference in changes, which is markedly difference from the trend of the average transaction spread. With the increase in the time of entering the bond market, the average issuance spread of the sample

countries did not increase with the increase in the average transaction spread. Basically, with passage of time in the bond market, the issuance cost of sovereign bond countries did not increase with the increase of the average transaction spread. Its market credit analysis premium rises, and the price information in the secondary market is not fully transmitted to the pricing factors in the primary market.

3.2 Research based on the relationship between the debt ratio and the change trend of the issuance spread

With passage of time in the bond market, the issuance spreads of all countries, countries with high debt ratios, and countries with low debt ratios did not show significant increases. The time of entering the bond market increased, but the issuance spreads did not increase. Therefore, the price information in the secondary market in countries with high debt ratios is not fully transmitted to the pricing factors in the primary market, and the financing cost does not change significantly.

In order to further test and demonstrate this phenomenon, the following section uses the classic two independent sample Mann-

Whitney U non-parametric statistical test method introduced in the previous section to test whether the issuance spreads of high debt ratio countries and low debt ratio countries vary with the time of entering the bond market. Using the categories of all countries, countries with high debt ratios, and countries with low debt ratios, we will look at the characteristics of changes in issuance spreads during the statistical period, analyzing these features as they increase. The specific method is to divide the issuance spread data of 158 sample bonds in the statistical period from 2016 to 2021 into two groups according to the issuance year and to select three different countries in each group: the overall total, the high debt ratio, and the low debt ratio. Finally, the study labels and carries out the significance test of the difference in issuance spread, and the test results are shown in Table 3-5.

| Country label | All countries | | Highly indebted country | | Low-debt country | |
|----------------------------------|-------------------------------|---------------|-------------------------------|---------------|-------------------------------|---------------|
| Statistical period year grouping | Issuance spread average value | p-value | Issuance spread average value | p-value | Issuance spread average value | p-value |
| 2016-2018 | 4.6655 | 0.564 | 4.8753 | 0.925 | 4.4557 | 0.446 |
| 2019-2021 | 4.7174 | Insignificant | 5.6061 | Insignificant | 4.4211 | Insignificant |

Table 3-5
The results of the significance test of the difference in issuance spreads between the two different statistical period groups with different country labels

From the three sets of statistical test results in Table 3-5, it can be seen that for the three types of sample labels of all countries, countries with high debt ratios, and countries with low debt ratios, the issuance spreads did not appear with more time spent in the bond market. Especially for countries with high debt ratios, although the sovereign bond transaction spreads of countries with high debt ratios increase with the passage of time in the bond market, their issuance spreads do not increase with the increase in the time. Therefore, as mentioned above, with passage of time in the bond market,

the issuance financing cost of sovereign bond countries does not increase with the increase of its market credit analysis premium, and the price information in the secondary market is not fully transmitted to the primary. The main reason for this phenomenon is that the price information of the secondary market in countries with high debt ratios has not been fully transmitted to the pricing factors of the primary market, resulting in the lack of significant increase in the primary market or significant change in the financing cost.

3.3 Research based on the relationship between the issuance spread and the scale and ratio of foreign debt

The external debt scale and debt ratio of economies with low bond issuance spreads are generally higher than those of economies with high issuance spreads, meaning economies with relatively low financing costs have a worse debt situation than those with relatively high financing costs.

This section uses the issuance spread as a proxy variable for the cost of issuing bonds, and the scale of external debt and debt ratio (external debt/GDP) as proxy variables for debt status. By splitting the issuance spread into different groups, the scale of external debt and external debt/GDP ratio are studied, essentially allowing the study of the debt situation of the economy under different debt issuance costs. 17 countries are selected, including Ghana, South Africa, Sri Lanka, Angola, Suriname, Nigeria, Côte d'Ivoire, Egypt, Argentina, Senegal, El Salvador, Tunisia, Konya, Morocco, Mozambique, Benin, and Gabon. All of them issued bonds in the international market between 2016 and 2020, as shown in Table 3-6.

The specific implementation steps are: calculate the weighted issuance spread of each country on an annual basis, divide the countries into a low-issuance-spread group and a high-issuance-spread group according to the issuance spread (bottom 50% vs. top 50%), and calculate the average external debt scale and external debt/GDP of the two groups respectively, observing the difference in the indicators between the two groups as shown in Figure 3-4.

Judging from the scale of external debt in the two groups with high and low interest spreads, the average scale of external debt in the low-issuance-spread group is higher than in the high-issuance-spread group. In 2016, 2017, 2018, and 2019, the scale of external debt in the low-issuance-spread group was higher than in the high-issuance-spread group. Only in 2020 did the low-issuance-spread group have a lower scale of external debt than the high-issuance-spread group. The average foreign debt scale from 2016 to 2020 is also higher in the low-issuance-spread group than in high-issuance-spread group. The scale of external debt measures indicates the scale of all debts that an economy should repay to foreign countries and is a measure of the scale of an economy's debt from the perspective of total volume.

Judging from the external debt/GDP ratio of the high and low issuance spreads, the external debt ratio of the low-issuance-spread group is higher than that of the high-issuance-spread group. In 2016, 2017, 2019 and 2020, the external debt/GDP of the low-issuance-spread group was higher than that of the high-issuance-spread group. The only exception was in 2018. Moreover, the average external debt/GDP from 2016 to 2020 is also higher in the low-issuance-spread group than in the high-issuance-spread group. External debt/GDP measures whether the scale of an economy's external debt matches its own level of economic development or not, representing the overall risk of external debt. The internationally recognized safety line of external debt ratio is 20%. From Figure 3-4, it can be seen that the external debt ratio of both groups exceeds the safety line, indicating that the external debt ratio of the sample countries is generally high for both high and low issuance spreads. However, the external debt ratio of the low-issuance-spread group remains higher than that of the high-issuance-spread group.

| Country | Weighted issue spread | External debt scale | Debt Ratio |
|---------------|-----------------------|---------------------|------------|
| 2016 | | | |
| Ghana | 9.41 | 21058.60 | 0.37 |
| South Africa | 2.78 | 143967.02 | 0.44 |
| Sri Lanka | 5.32 | 46661.46 | 0.57 |
| Angola | 7.76 | 57827.34 | 0.57 |
| Suriname | 7.46 | 2959.40 | 0.89 |
| 2017 | | | |
| Nigeria | 5.05 | 45780.01 | 0.12 |
| Côte d'Ivoire | 4.98 | 13449.13 | 0.26 |
| Egypt | 4.89 | 84722.48 | 0.36 |
| South Africa | 2.54 | 174920.79 | 0.46 |
| Senegal | 5.09 | 9820.21 | 0.47 |
| Sri Lanka | 3.85 | 50765.55 | 0.58 |
| El Salvador | 6.43 | 17179.36 | 0.69 |
| Tunisia | 3.41 | 33500.79 | 0.79 |
| 2018 | | | |
| Côte d'Ivoire | 2.93 | 16184.57 | 0.28 |
| Kenya | 4.76 | 31413.70 | 0.34 |
| Egypt | 3.36 | 100186.06 | 0.40 |
| Argentina | 3.44 | 277827.28 | 0.53 |
| Senegal | 2.78 | 12681.12 | 0.55 |
| Sri Lanka | 3.55 | 52919.69 | 0.60 |
| Angola | 5.81 | 63217.53 | 0.62 |
| Tunisia | 3.78 | 35032.57 | 0.82 |
| 2019 | | | |
| Côte d'Ivoire | 5.31 | 19816.40 | 0.34 |
| Kenya | 5.41 | 34941.39 | 0.35 |
| Morocco | -0.22 | 55058.24 | 0.46 |
| South Africa | 3.64 | 185357.00 | 0.48 |
| Sri Lanka | 5.07 | 56117.86 | 0.67 |
| Angola | 6.55 | 64446.16 | 0.72 |
| Tunisia | 4.42 | 39380.53 | 0.94 |
| Suriname | 11.18 | 3778.90 | 0.95 |
| Mozambique | 3.08 | 20110.34 | 1.31 |
| 2020 | | | |
| Benin | 5.12 | 5250.48 | 0.34 |
| Egypt | 6.53 | 131579.73 | 0.36 |
| Côte d'Ivoire | 3.88 | 25072.69 | 0.41 |
| Gabon | 5.88 | 7615.88 | 0.50 |
| Morocco | 1.92 | 65682.95 | 0.57 |

Table 3-6
Scale of national external debt, debt ratio (external debt/GDP) and issuance spread

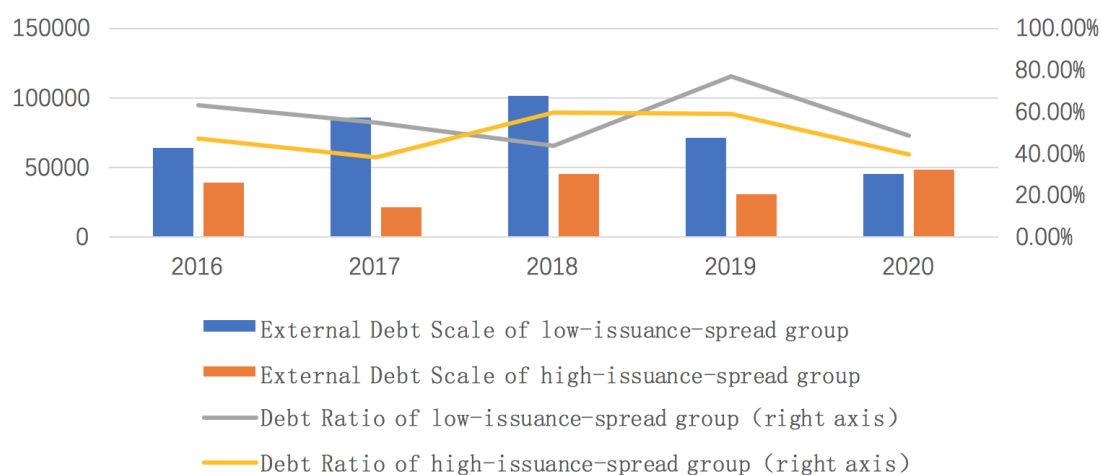


Figure 3-4
External Debt Scale and Debt Ratio (External Debt/GDP) of High and Low Issuance Spread Groups

The scale of external debt and of external debt/GDP are compared in terms of total volume and structure. The motivation for choosing two perspectives is that although the total amount of external debt represents the debt scale of an economy, it also represents the degree of its economic development and integration with the international community. Therefore, the scale of foreign debt cannot be the sole criterion for judgement but should be considered together with the ratio of external debt/GDP, which reveals the structural balance between its liabilities and economic development. According to the above research conclusions, the external debt scale and external debt/GDP of economies with low issuance spreads are higher than those of economies with high issuance spreads. In theory, low issuance spreads represent relatively good credit qualifications, but economies with lower issuance spreads have higher external debt scales and external debt ratios in practice because the economy's low issuance spread means that its financing cost is relatively low, which will prompt the country to be more willing to issue debt for financing. The purpose of issuing bonds is for economic development, so the good feedback loop is that the issuance spread is low \rightarrow the financing cost is low \rightarrow economic development \rightarrow the debt ratio is reduced \rightarrow the issuance spread is low, but

from the data of the sample economies, there is no such positive trend realized through bond issuance. On the contrary, low-issuance-spread economies have larger external debt and higher debt ratios, and their average external debt ratios are above the internationally recognized safety line. According to the statistics of the World Bank in 2020, Western private creditors are the largest creditors for sub-Saharan African countries and continued borrowing in international markets has put developing countries on the verge of a debt trap.

The risks of external debt generally include liquidity risk, solvency risk, and exchange rate risk. The balance of external debt with economic development, the total amount of external debt, and the structure of external debt itself affect the repayment risk of external debt. The growth of the external debt in a healthy economy depends on economic development, and development can alleviate the debt burden pressure. However, if the debt is issued just because the financial conditions are accommodative and the financing cost is low, it may cause the debt problem to further deteriorate. Affected by the new COVID epidemic, the debt problem of developing countries has become a risk point for the global economy, and the debt repayment burden has increased. The deterioration of the

debt problem of developing countries is closely related to their bond issuance in the international market. Despite the stagnating economy, developing countries have continued to borrow, leading to a debt trap. The correct way to solve the debt problem of developing countries is to use marketization and commercialization to help them develop rather than encourage them to issue bonds in the international market.

4. Prediction and analysis of sovereign bond default risk

4.1 Prediction and classification of sovereign bond default risk based on macroeconomic indicators

Default predictors of risk for the economy are defined as total savings rate, external debt to GDP, exchange rate, goods and service exports to GDP, total capital formation to GDP, tax revenue to GDP, and private sector debt to M2 growth rate ratio. Thus, according to the forecast results, Zambia, Sri Lanka, Angola, and Argentina are considered to have higher default risks from a macro-fundamental perspective.

In order to study whether macroeconomic indicators can predict the default risk of an economy's sovereign bonds, it is proposed to select several indicators that can measure the economic aggregate of an economy and reflect the internal economic structure and political factors of the economy, including GDP (gross domestic product), real GDP growth rate, total savings rate, total import growth rate, total export growth rate, current account balance as a percentage of GDP, external debt as a percentage of GDP, M2 growth rate, foreign exchange reserves, exchange rate, per capita GDP, CPI year-on-year, net foreign direct investment inflows, exports of goods and services as a share of GDP, imports of goods and services as a share of GDP, gross capital formation as a share of GDP, tax revenue as a share of GDP, growth rate of claims on the private sector to M2, and credit to the private sector as a share of GDP. By comparing the differences in these 19 macroeconomic indicators between economies that have had sovereign bonds defaults and ones that have not, we can extract indicators that reflect the default risk of sovereign bonds in the economy and predict the risk of default in an economy.

| | Significance test p – value | Significant results |
|---|--------------------------------|------------------------|
| gross savings rate | 0.0155 | Significant |
| Current account balance as a share of GDP | 0.0003 | Significant |
| External debt as a percentage of GDP | 0.0129 | Significant |
| M2 growth rate | 0.0000 | Significant |
| exchange rate | 0.0000 | Significant |
| GDP per capita | 0.0000 | Significant |
| CPI YoY | 0.0001 | Significant |
| Net inflow of foreign direct investment | 0.0012 | Significant |
| Exports of goods and services as a share of GDP | 0.0001 | Significant |
| Gross capital formation as a share of GDP | 0.0030 | Significant |
| Tax revenue as a share of GDP | 0.0000 | Significant |
| Growth rate of claims on private sector to M2 ratio | 0.0025 | Significant |

Table 3–7
Macroeconomic indicators that have passed the Mann–Whitney U significance test

Furthermore, the above macroeconomic indicators that passed the Mann-Whitney U rank sum test and where the default group performed worse than the non-default group were selected as variables for predicting the default risk of an economy. The results are shown in Figure 3-5. Specifically, the total savings rate of the default group is higher than that of the non-default group, indicating that the default group has insufficient consumption demand and residents' risk appetite is lower than that of the non-default group. The ratio of external debt to GDP in the default group is higher than that of the non-default group, and the ratio of external debt to GDP represents the debt ratio, indicating that the debt ratio of the default group is higher than that of the non-default group. The exchange rate of the default group depreciated significantly compared to the non-default group. The proportion of exports of goods and

services in the GDP of the default group is higher than that of the non-default group, indicating that the external dependence of the economy in the default group is higher than that in the non-default group. The ratio of total capital formation to GDP of the default group is lower than that of the non-default group, indicating that the investment efficiency of the default group is lower than that of the non-default group. The proportion of tax revenue to GDP in the default group is lower than that of the non-default group, and as tax is a "barometer" of the economy, this indicates that the economic environment of the default group is worse than that of the non-default group. Lastly, the growth rate of the ratio of claims on the private sector to M2 in the default group is higher than that in the non-default group, indicating that the default group has high private sector debt and higher risk than the non-default group.

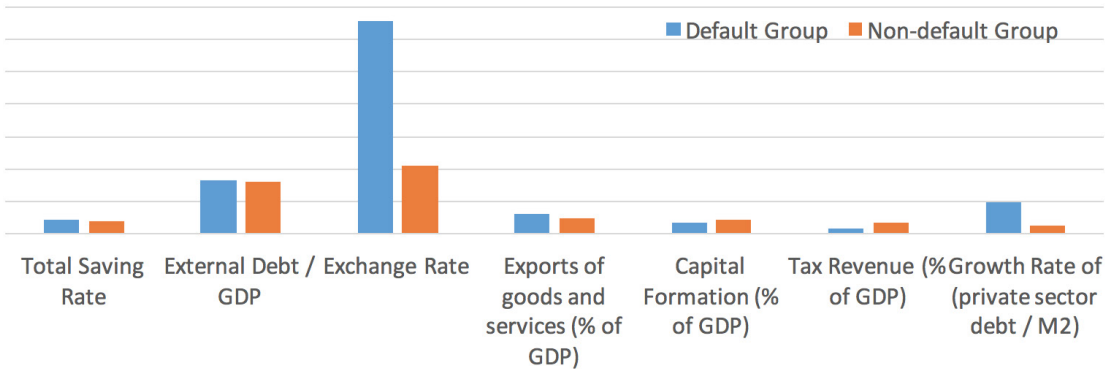


Figure 3-5
Default risk predictors

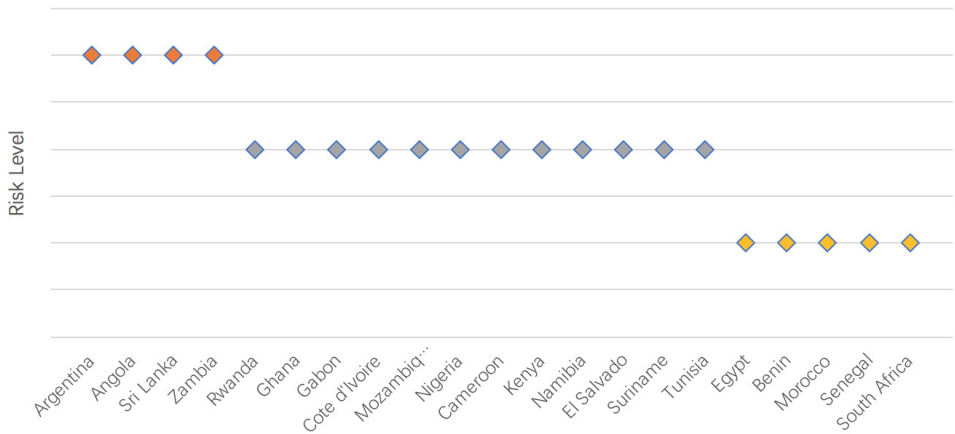


Figure 3-6
Default risk grouping results for different countries

Finally, the growth rate of the total savings rate, external debt to GDP, exchange rate, exports of goods and services to GDP, total capital formation to GDP, tax revenue to GDP, and private sector debt to M2 growth rate are used as seven indicators of the economic growth rate. For the predictor variables of individual default risk, the macroeconomic data after 2002 is sorted by cross-section between economies, and the time series mean value of the sorting is calculated. According to the proportion of the indicators ranked in the bottom 50 % accounting for no more than 40 %, 40%-70% and no less than 70%, the sample countries are divided into three groups of default risk, as shown in Figure 3-6: low, medium, and high. The high-risk group includes Zambia, Angola, Sri Lanka, and Argentina. The medium-risk group includes Rwanda, Nigeria, Gabon, Mozambique, Côte d'Ivoire, Ghana, Namibia, Cameroon, Kenya, Tunisia, Suriname, and El Salvador. The low-risk group includes Senegal, Benin, Morocco, Egypt, and South Africa. Zambia, Sri Lanka and Argentina, as out-of-sample defaulting economies, are included into the high-risk group, which can verify the validity of the default risk grouping to a certain extent. The analysis also shows Angola has high default risk.

4.2 Prediction and verification of sovereign bond default risk based on transaction spread and its changes

There is a significant difference in the transaction spread between defaulting countries and non-defaulting countries, which can help to better distinguish defaulting countries from non-defaulting countries. Different countries in the same time section and different time series of the same country reflect the correlation of higher default risk with larger transaction spread. Therefore, the transaction spread can be used as a proxy indicator of national credit qualification and sovereign bonds default risk to predict and analyze the sovereign bond defaulting countries. Through the

analysis of transaction spread data, it is concluded that except for Argentina, Sri Lanka, and Zambia, which have defaulted in recent years, Ethiopia, Suriname, El Salvador, and Ghana have a higher risk of sovereign bonds default in the future.

According to the analysis of the national debt ratio above, the current debt ratio of the issuing country is a major factor that affects and leads to the occurrence of sovereign credit default, and the transaction spread can be used as a barometer and proxy indicator for the change of the country's main credit level. If the country has been at a high debt ratio for a long time and cannot repay its debt through economic development to reduce its debt level, then with the passage of time in the bond market, the debt repayment pressure will gradually appear, and it will accumulate and be transmitted to the international secondary trading market. As a result, the country's main credit risk premium will rise, which is reflected in the rise of the corresponding country's bond yield-to-maturity in the secondary market, thereby increasing the trading spread of the corresponding bond and the default risk probability of the corresponding bond. In this section, through the cross-sectional analysis and statistical test of the transaction spread data of 158 sample bonds in 22 sample countries, it is demonstrated that there is a significant difference in the transaction spread between default countries and non-default countries. Therefore, proving that the transaction spread can be used as a national credit qualification and proxy indicators of sovereign bonds default risk, and that by observing transaction spreads and their changing trends, it is possible to analyze and predict sovereign bonds default countries.

Among the 22 samples of sovereign bonds countries, a total of 5 sample countries have defaulted on their sovereign debt. Among them, Argentina, Cote d'Ivoire, and Gabon had their first defaults earlier while

the first default for Zambia and Sri Lanka occurred more recently between 2020-2022. These five countries, which have defaulted before, were defined as the default group, and the remaining 17 sample countries that had not defaulted were defined as the non-default group. The difference is averaged by country, and the statistical results are shown in Figure 3-7. As can be seen from Figure 3-7, in each year-end time section from 2016 to 2021, the trading spreads of the bonds of the default group countries are higher than those of the non-default group countries, and the bond spreads of the default group countries have increased year by year while the bond spreads of countries in the non-default group did not change significantly. As a result, the difference between the two increased every year from 0.42 % in 2016 to 18.14 % in 2021, indicating that the gap between credit qualifications of countries

in the default group and those in the non-default group expands over time. The default risk of countries in the default group grows year by year.

On the other hand, the sample data of bond spreads at the end of different years are mixed and divided into default group and non-default group only according to whether the country defaults or not, and the Mann-Whitney U two-sample mean significance test is used to compare the spread data between the default group and the non-default group, and the results are shown in Tables 3-8. As evidenced from the statistical results in Tables 3-8, under the condition of a significant level of 1%, the average transaction spread of countries in the default group at the end of each year is significantly higher than that of the non-default group.

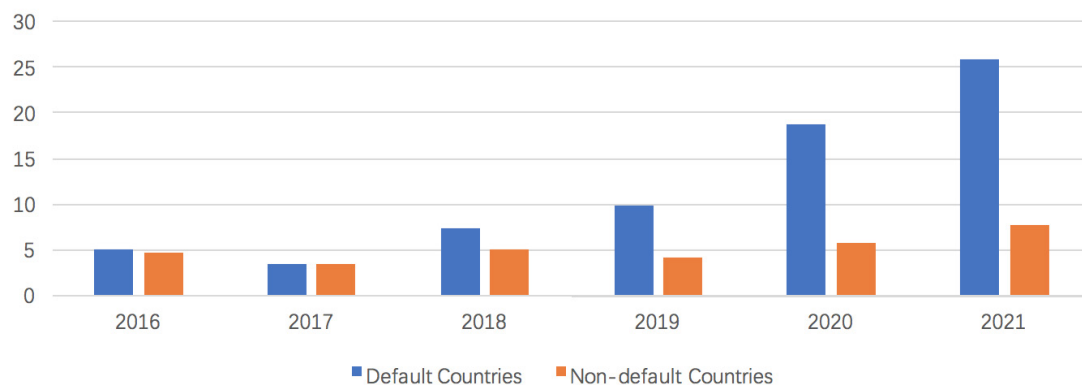


Figure 3-7
Average transaction spreads at the end of each year for bonds in default and non-default groups (%)

| | Average transaction spread by country at the end of each year (%) | p-value | Mann-Whitney U test results |
|---------------|---|---------|-----------------------------|
| default group | 12.2157 | 0.0075 | significant |
| non-default | 5.1610 | | |

Table 3-8
The average transaction spread and the significance test of the difference at the end of each year for the bonds of the default group and non-default group countries

The results of the average transaction spreads at the end of each year for bonds in the default group and non-default group countries, the average transaction spreads at the end of each year, and the test results of the significance of differences between the two groups show that the transaction spreads can better distinguish the default countries from the non-default countries. It reflects the trend that the credit risk premium level of defaulting countries increases year by year and that the credit status gradually deteriorates over time. It can be used as a proxy indicator of national credit qualification and sovereign bonds default risk to predict and analyze the sovereign bond defaulting countries.

Using the relative level of the cross-sectional value of the transaction spread as the basis for predicting the default risk of sovereign bonds, the average transaction spread level of each country at the end of the last year in the sample period (12.09 % at the end of 2021) is used as the comparison benchmark. Of the 22 countries, 6 countries (from high to low: Argentina, Sri Lanka, Zambia, Ethiopia, Suriname, and El Salvador) have sovereign bond trading spreads at the end of the year that were higher than the average trading spreads, as shown in Figure 3-8. Additionally, according to the increase in transaction spreads in each sample country during the five years from 2016 to 2021 with the average 7.52% increase in transaction spreads of each country as a comparison benchmark, 6 countries (from high to low: Argentina, Sri Lanka, Zambia, Suriname, Ethiopia, El Salvador, and Tunisia) exceeded the average increase in the transaction spread, as shown in Figure 3-9. Based on the above two aspects, the credit risk of sovereign bonds countries is analyzed from the transaction spread. There are 6 countries including Argentina, Sri Lanka, Zambia, Ethiopia, Suriname, and El Salvador, where the average transaction spread and increase rate are higher than that of all other sample countries. At the same time, the transaction spread in Ghana is expected to increase

significantly in 2021, from 4.92% at the end of 2020 to 9.54% at the end of 2021. According to the conclusion of “proxy indicators”, the sovereign bonds corresponding to the above seven countries have a relatively high risk of default. Comparing this result with the five countries that have defaulted within the sample countries, it is found that, except for Argentina, Sri Lanka and Zambia, which have defaulted in recent years, Ethiopia, Suriname, El Salvador and Ghana will have higher risk of defaulting sovereign bonds in the future.

In addition, comparing the forecast results of sovereign bonds defaulting countries based on transaction spreads in this section with the forecast results of sovereign bonds defaulting countries based on macroeconomic indicators in the previous section, we found 7 countries with high default risk forecast based on transaction spreads. Excluding Ethiopia due to a lack of macroeconomic indicators, Sri Lanka, Zambia, and Argentina are also in the list of high default risk predictions based on macroeconomic indicators. Suriname, El Salvador, and Ghana are also on the list of medium-risk defaults based on macroeconomic indicators. The above comparison results show that the forecasting results of sovereign bonds defaulting countries based on transaction spreads and macroeconomic indicators are relatively uniform. Furthermore, using the results based on macroeconomic indicators in the previous section, the average transaction spreads of countries with high, medium, and low sovereign bond default risks in the sample period from 2016 to 2021 were calculated respectively, which were 16.14%, 5.75% and 3.07%. The average transaction spreads of the three groups of countries with high, medium, and low default risk prediction show a monotonically decreasing distribution, which further verifies the relevant conclusion of the previous section that "the transaction spread can be used as a proxy indicator of national credit qualification and sovereign bonds default risk".

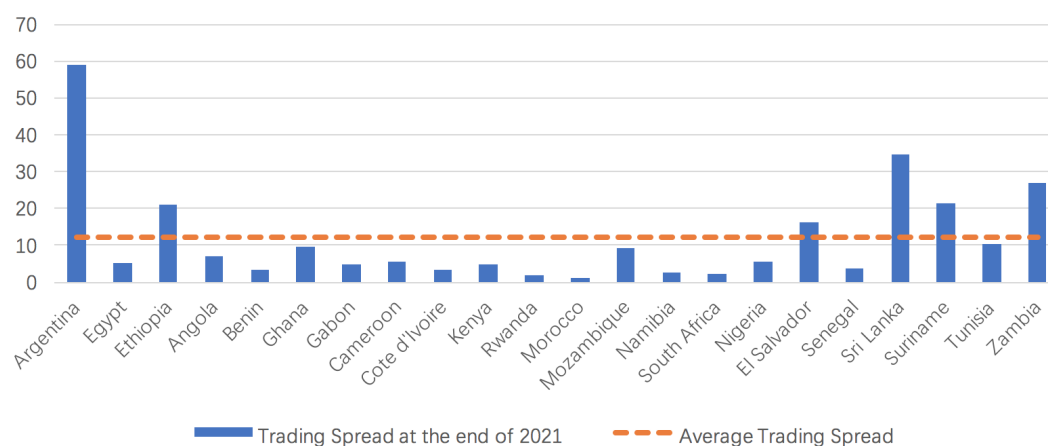


Figure 3-8
Average transaction spreads and default country forecasts by country at the end of 2021 (%)

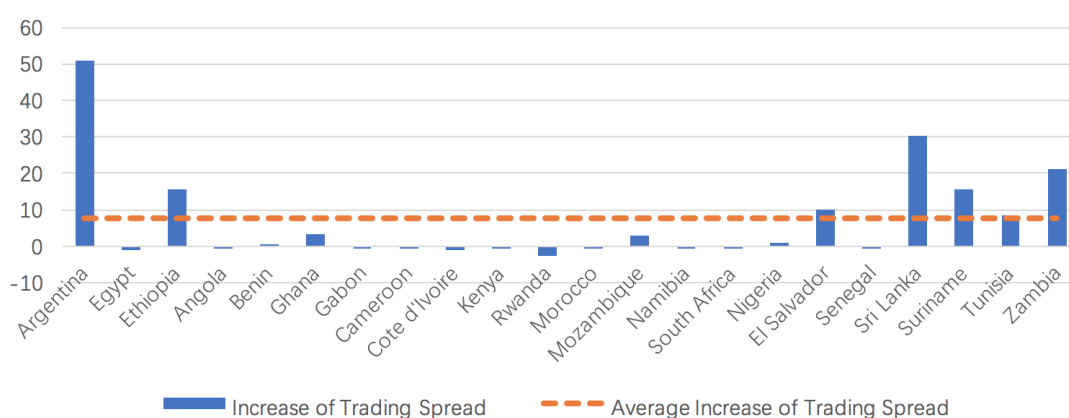


Figure 3-9
The rise in transaction spreads and default country forecasts for each sample country from 2016 to 2021 (%)

5. General summary

This chapter uses the daily trading price data of sovereign bonds and some macroeconomic indicators, according to the core elements such as the value date, maturity date, duration, and coupon rate of 22 countries and 158 corresponding bond samples, and adopts the Mann-Whitney U statistical test method from a quantitative point of view. The sustainability of sovereign bond issuance is analyzed through the research on the relationship between the changes of credit risk premium and issuance financing cost and the debt ratio and scale of foreign debt in different countries. In addition, through the comparison of a total of 19 macroeconomic indicators between the default group and the non-default group, seven effective variables are identified. Based on this, the default risk of sovereign

\bond issuing countries is divided into three groups: low, medium, and high. Combined with the transaction spread data of different countries, the hypothesis that a larger transaction spread leads to higher default risk is verified. The main conclusions of the study are as follows:

- (1) The initial financing easing caused a large number of bond issuance by developing countries;
- (2) With the increase of bond issuance, the interest burden is getting heavier and heavier, the country's own economic growth rate cannot match the scale of bond issuance, and the debt ratio increases significantly;
- (3) After the fundamental deterioration

caused by the rising debt ratio, the transaction spread in the secondary market increased significantly, and the refinancing capacity declined.

(4) Combining the default risk forecast results of macro fundamentals and transaction spreads, it is believed that Zambia, Sri Lanka, Angola, Argentina, Ethiopia, Suriname, El Salvador, and Ghana have high default risks.

From the perspective of the sustainability of sovereign bonds issuance, the high sensitivity of the bond market will magnify the extent of the debt crisis. Once a negative trend is formed, it will fall into a debt quagmire. Specifically, the transaction spread represents the credit risk premium. With more time in the bond market, economies with high debt ratios show a significant increase in transaction spreads while the transaction spreads in economies with low debt ratios do not obviously increase. The issuance spread represents the financing cost and the attitude of the primary market to its bond issuance, and the issuance spread of the high-debt-ratio economies does not increase with the increase of the transaction spread while the opposite is true in low-debt-ratio economies, especially the foreign debt of countries with low issuance spreads. The debt ratio is higher, and the average external debt ratio exceeds the internationally recognized safety line. The difference between the issuance spread and the transaction spread shows that economies with low issuance spreads have relatively high external debt scales and external debt ratios while economies with high external debt scales and external debt ratios have relatively higher transaction spreads in the secondary market. The higher trading spreads show that the primary and secondary markets have diverging views on the bonds

of these economies. The primary market is optimistic about their bond issuance, providing relatively accommodative financial conditions and encouraging them to issue bonds. The accommodative financial conditions have brought them a significant increase in the scale of external debt, but the economic development of many countries has stagnated because there has been no growth due to this type of bond financing. Investors in the secondary market have different judgment angles because they trade the value of bonds and pursue excess returns. The transaction spread includes credit risk premium, liquidity risk premium, etc. and the high transaction spreads for the economies with high foreign debt scale and high external debt ratios indicate that they have relatively high risk premiums, which is the judgement of secondary market investors reflected in their investment behaviors. As mentioned earlier, a good feedback loop should be low financing cost → growth in external debt → economic development → lower debt ratio → low transaction spread → low financing cost. As demonstrated, the debt issuance behavior of developing countries in the international market is motivated by the accommodative financial conditions in the primary market. Due to the lack of economic development, the debt problem has deteriorated, and the secondary market thus believes that such countries have high credit risk and liquidity.

Judging from the forecast results of sovereign bonds default risk and combined with the analysis results of macro fundamentals and transaction spread data, Zambia, Sri Lanka, Angola, Argentina, Ethiopia, Suriname, El Salvador, and Ghana have high sovereign bonds default risks. Continued attention is required.

Chapter 4

Case Study

This chapter will use Zambia, Argentina, and Sri Lanka, which have defaulted on international bonds since 2020, as case studies to supplement the quantitative analysis. It will conduct an in-depth investigation on the correlation between factors such as economic structures, fiscal policies, foreign trade, etc. and the bond defaults of these countries. It will also show the process of the outbreak of bond repayment crises in these countries, contextualized within the international market turmoil. In addition, the case of Mozambique is also included in this chapter to demonstrate how the flexibility in the issuance of international commercial bonds will bring hidden debt risks to developing countries.

1. Zambia

1.1 Overview of Zambia

Zambia is a landlocked country located in Southern Africa with a relatively stable and peaceful domestic political environment. From 2000 to 2010, Zambia maintained an average annual economic growth rate of 7.7%. In 2011, the World Bank listed Zambia as a lower-middle-income country. In the past decade, Zambia's economic growth has slowed down due to domestic and foreign factors such as the decline of copper prices in the international market, currency depreciation, energy crisis, fiscal deficit, and grain production reduction.

Mining industry is an important pillar of Zambia's economy. Although the policies of the Zambian government after 2000 have been committed to strengthening the development of the manufacturing and the agriculture sectors to diversify its economy, mining is still the dominant industry. The mining sector accounted for 4.2% of

GDP in 2000 and 14.6% in 2014.¹ Over-reliance on copper exports has made its economy greatly impacted by the external environment. Before 2015, Zambia had a good momentum in foreign trade as high copper prices helped Zambia to maintain a trade surplus. Meanwhile, flexible interest rate policies enabled Zambia to adapt to changes in the external environment in time. However, Zambia has been facing the problem of insufficient endogenous economic impetus. In 2014, Zambia's trade surplus amounted to \$16 billion, but in 2015, Zambia's trade deficit reached \$70 million as the international copper prices fell sharply to the lowest level since 2003, which dealt a serious blow to Zambia's economy. In order to recover the economy, the Zambian government adopted an expansionary fiscal policy to raise the salary of public service personnel, which further aggravated the government's deficit and failed to have a positive impact on economic recovery. The government's deficit accounted for 9.4% of GDP in 2015 from 2.4% in 2011.² In terms of external debt, the ratio of external debt to GDP increased from 10.2% in 2011 to 35% in 2016.³ Since 2017, the Zambian government has taken various measures to promote economic recovery, and the economy has been developing at a steady pace, but the government's deficit has continued to increase.

Zambia's domestic economy already faced multiple challenges before the pandemic, including high inflation, expanding fiscal deficit, high external debt, and low foreign exchange reserves. However, in 2020, due to the impact of the COVID-19 pandemic, Zambia's economy declined by 2.9%, which is Zambia's first economic recession since 1998. Zambia's total foreign debt (sovereign

1. African Development Fund. *Country Profile: Republic of Zambia*.

2. African Development Fund. *Country Profile: Republic of Zambia*.

3. 7 National Development Plan 2017-2021, Ministry of National Development Planning, Republic of Zambia. 2017. 18.

guaranteed debt) exceeded \$12 billion, and it became the first country in Africa to default on sovereign debt after the outbreak of the pandemic.

1.2 Background and Causes of Zambia's Bond Default

The ratio of Zambia's public debt to GDP fell from 129.91% in 2004 to 75.75% in 2005 as it received huge amounts of debt relief through the Heavily Indebted

Poor Countries (HIPC) Initiative. Zambia attained the HIPC Initiative completion point in 2005 and was supported by the Multilateral Debt Relief Initiative. At the same time, other creditor countries offered it debt relief, further alleviating its debt burden. From 2005 to 2015, the ratio of public debt to GDP remained at a low level in Zambia. During this period, Zambia registered relatively significant economic growth.

| Year | Zambia GDP per capita (USD) | Zambia GDP (billion USD) | Ratio of public debt to GDP (%) |
|------|-----------------------------|--------------------------|---------------------------------|
| 2019 | 1051 | 233.09 | 97.38 |
| 2018 | 1539 | 267.2 | 80.36 |
| 2017 | 1534 | 258.68 | 66.32 |
| 2016 | 1280 | 209.55 | 60.95 |
| 2015 | 1337 | 212.43 | 65.78 |
| 2014 | 1763 | 271.51 | 36.13 |
| 2013 | 1878 | 280.45 | 27.08 |
| 2012 | 1763 | 255.03 | 25.43 |
| 2011 | 1672 | 234.6 | 20.81 |
| 2010 | 1489 | 202.66 | 18.90 |
| 2009 | 1159 | 153.28 | 20.52 |
| 2008 | 1394 | 179.11 | 19.19 |
| 2007 | 1124 | 140.57 | 21.92 |
| 2006 | 1047 | 127.57 | 25.01 |
| 2005 | 702 | 83.32 | 75.75 |
| 2004 | 538 | 62.21 | 129.91 |
| 2003 | 435 | 49.02 | 159.46 |
| 2002 | 382 | 41.94 | 180.24 |
| 2001 | 382 | 40.94 | 210.24 |
| 2000 | 345 | 36.01 | 260.96 |

Table 4-1
Zambia's GDP, GDP per capita, and the ratio of public debt to GDP
Data source: IMF

| Issue time | Amount (100 million USD) | Maturity | Interest rate (%) | Annual interest payment (10 thousand USD) | Interest payment time |
|------------|--------------------------|----------|-------------------|---|-----------------------|
| 2015.07 | 12.5 | 2027.07 | 8.97 | 11200 | January and July |
| 2014.04 | 10 | 2024.04 | 8.5 | 8500 | April and October |
| 2012.09 | 7.5 | 2022.09 | 5.375 | 4000 | March and September |

Table 4-2
Zambia's issuance of Eurobonds
Data source: www.debtwi.com

From 2012 to 2015, the Zambian government issued three Eurobonds, with a total amount of \$3 billion and an annual interest payment of \$240 million. The proportion of commercial bonds in Zambia's external debt rose from zero to 46.2% in 2015. In 2012, the total external debt of Zambia was \$3.18 billion, which accounted for 17.2% of GDP, but it reached \$6.7 billion in 2016, which was 35% of GDP.¹ Zambia's debt growth rate was the fourth fastest in Africa from 2010 to 2016. Since 2014, commercial bonds have become the main financing mechanism of Zambia's foreign debt.²

From 2012 to 2015, the Zambian government issued three Eurobonds, with a total amount of \$3 billion and an annual interest payment of \$240 million. The proportion of commercial bonds in Zambia's external debt rose from zero to 46.2% in 2015. In 2012, the total external debt of Zambia was \$3.18 billion, which accounted for 17.2% of GDP, but it reached \$6.7 billion in 2016, which was 35% of GDP. Zambia's debt growth rate was the fourth fastest in Africa from 2010 to 2016. Since 2014, commercial bonds have become the main financing mechanism of Zambia's foreign debt.

Zambia has received debt sustainability framework analysis for low-income countries by the IMF and the World Bank between 2011 and 2015, which aimed to assess the influence of Zambia's debt and the expected borrowing on future debt repayment. It evaluated Zambia's debt, macroenvironment, and expected fiscal revenue and expenditure. It concluded that the public debt of Zambia was overall sustainable, and the external debt risk was low.³ However, in 2015, as global copper prices fell to the lowest level since 2003, Zambia's economy was severely hit. In September 2015, considering the sluggish economic development and weak commodity prices, Moody's lowered the sovereign credit rating of Zambia from B1 to B2. In April 2016, due to the decline of Zambia's economic growth rate and government revenue, Moody's further downgraded the sovereign credit rating of Zambia from B2 to B3 and rated its outlook as "negative". Since then, international rating agencies lowered the sovereign credit rating of Zambia year by year. With the mounting external debt, the Zambian government faces increasing challenge of debt repayment.

1.7 National Development Plan 2017-2021, Ministry of National Development Planning, Republic of Zambia. 2017. 18.

2. Florence Banda-Muleya, *The Allure of Commercial Debt: The Case of Zambia and Mozambique*, August 2021.

3.7 National Development Plan 2017-2021, Ministry of National Development Planning, Republic of Zambia. 2017. 19.

| Agency | Rating | Outlook | Time |
|---------|--------|----------|-------------|
| Fitch | B+ | Negative | Mar 01 2012 |
| Moody's | B1 | Stable | Nov 07 2012 |
| S&P | B+ | Stable | Oct 25 2013 |
| Fitch | B | Negative | Oct 28 2013 |
| Fitch | B | Positive | Sep 19 2014 |
| Fitch | B | Negative | Mar 13 2015 |
| Moody's | B1 | Stable | May 29 2015 |
| S&P | B | Negative | Jul 01 2015 |
| Moody's | B2 | Negative | Sep 25 2015 |
| Fitch | B | Stable | Feb 24 2016 |
| S&P | B | Stable | Mar 18 2016 |
| Moody's | B3 | Stable | Apr 19 2016 |
| S&P | B | Negative | Aug 25 2017 |
| Moody's | B3 | Negative | Jan 26 2018 |
| Moody's | Caa1 | Negative | Jul 27 2018 |
| S&P | B- | Negative | Aug 24 2018 |
| Fitch | B- | Stable | Oct 11 2018 |
| S&P | B- | Stable | Feb 22 2019 |
| Moody's | Caa2 | Stable | May 23 2019 |
| Fitch | CCC | Stable | Jun 27 2019 |
| S&P | CCC+ | Negative | Aug 23 2019 |
| S&P | CCC | Stable | Feb 21 2020 |
| Moody's | Ca | Negative | Apr 03 2020 |
| Fitch | CC | n/a | Apr 16 2020 |
| Fitch | C | n/a | Sep 24 2020 |
| S&P | CCC- | Stable | Sep 25 2020 |
| S&P | SD | n/a | Oct 21 2020 |
| Fitch | RD | n/a | Nov 18 2020 |

Table 4-3
2012–2020 Zambia's ratings assigned by the three rating agencies
Source: Tradingeconomics.com

By 2021, the sovereign credit ratings of Zambia assigned by the three international rating agencies, S&P, Fitch, and Moody's, were SD (selective default), RD (restricted default), and C. In November 2020, the Zambian government failed to pay \$42.5 million of Eurobond interest on time, thus becoming the first African country to default since the pandemic. According to the debt report released by the Ministry of Finance and National Planning of Zambia, as of June 2021, the total sovereign guaranteed debt of the Zambian government was \$12.91 billion, among which official debt was \$6.97 billion (53.99%) and commercial debt amounted to \$5.94 billion (46.01%). Eurobonds accounted for more than half of the commercial debt, reaching \$3 billion and

accounting for 23.24% of the total external debt.¹The Ministry of Finance and National Planning predicted that Zambia would face serious refinancing risks in 2022, 2024, 2025, and 2027, as Eurobonds will mature concentratedly in these years.

There are multiple causes of Zambia's debt crisis. Since entering the bond market in 2012, with a growing proportion of commercial bonds, Zambia's debt has been increasing, and the repayment risk has increased. At the same time, Zambia's investment in infrastructure construction and poverty reduction has greatly increased the government expenditure. In 2011, the Sata government ignored fiscal deficit and continued to adopt an expansionary fiscal

1. Public Debt Summary – As of End-June 2021, Ministry of Finance and National Planning, Republic of Zambia.

policy, which increased the fiscal deficit and the demand for foreign debt, failing to manage the debt properly.¹ Meanwhile, Zambia's single export structure, weak foreign exchange earning capacity, and over-reliance on resource-based products have made its economy vulnerable to external market risk so as to be significantly affected by the fluctuations of copper prices. This also reflects the problems of Zambia's own economic development, including insufficient endogenous impetus and lack of sustainability. One external factor is the higher interest rates of commercial bonds compared to bilateral and multilateral loans. While Zambia's debt kept increasing, rating agencies continued to downgrade Zambia's ratings, which further added to the repayment stress of Zambia. Rating downgrade means higher risk for creditors, so the bond interest rates rose accordingly, and private investment in Zambia decreased, creating a vicious cycle.

2. Argentina

2.1 Overview of Argentina

Located in the southeast of South America and bordering the Atlantic Ocean in the East, Argentina is one of the regional powers in Latin America, with complete industrial categories and developed agriculture and animal husbandry. At the beginning of the 20th century, the economy of Argentina once ranked among the top ten in the world. In the 1980s, its economy fell sharply due to the debt crisis. Since 1991, it has pursued neoliberal economic policies with privatization at the core and implemented the 1:1 peso-dollar fixed exchange rate system. The economy returned to growth, with an average annual growth rate of 6% from 1991 to 1998. Under the impacts of the financial crisis in Southeast Asia and the

financial turbulence in Brazil, Argentina's economy began to decline in the second half of 1998, with soaring national risk index and intensifying external debt pressure. Its fiscal and financial system collapsed, and finally a serious economic crisis broke out at the end of 2001.

Since the economic crisis in 2001, the Argentine government has been focusing on the repayment of foreign debt. Due to the difficulty of international financing, it had to rely on the growth of domestic economy. It strengthened government intervention, implemented import substitution, ensured a foreign trade surplus by restricting imports and stimulating exports, and tightened foreign exchange control, forming the "Argentine model", which has achieved good results. Argentina's economy grew rapidly from 2003 to 2011.

Since 2012, affected by the international economic and financial situation, Argentina's economy has slowed down significantly, with high inflation, currency depreciation, and decline in foreign exchange reserves. Since the beginning of 2014, the Argentine government has taken measures such as easing foreign exchange controls, raising interest rates, and reducing fiscal subsidies, which have improved the macroeconomic situation. In July 2014, the debt negotiation between the Argentine government and the "vulture" fund failed, and Argentina fell into a technical debt default. After taking office, President Macri introduced measures, such as abolishing foreign exchange controls and relaxing imports and exports controls, and resolved the debt dispute with the "vulture" fund, which allowed Argentina to return to the international capital market.

1. Florence Banda-Muleya, *The Allure of Commercial Debt: The Case of Zambia and Mozambique*, August 2021.

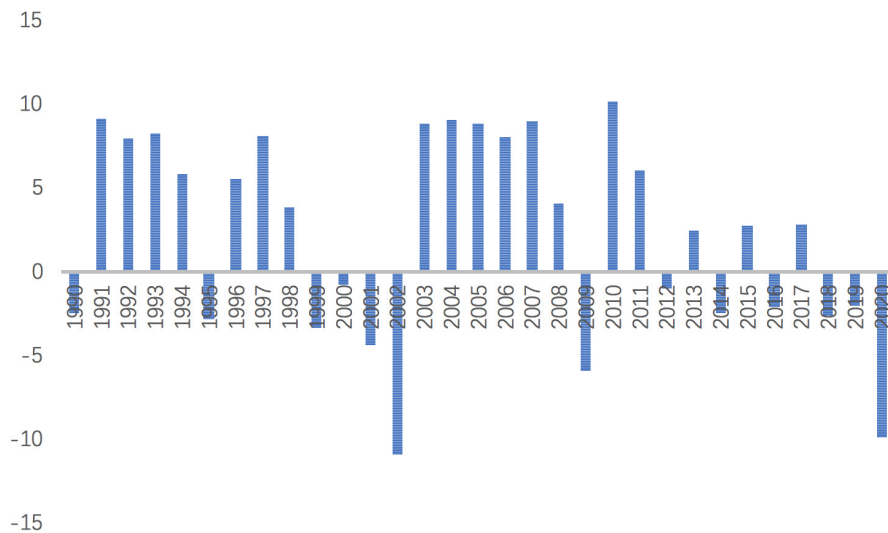


Figure 4-1
GDP growth rates of Argentina from 1990 to 2020 (%)
Source: World Bank

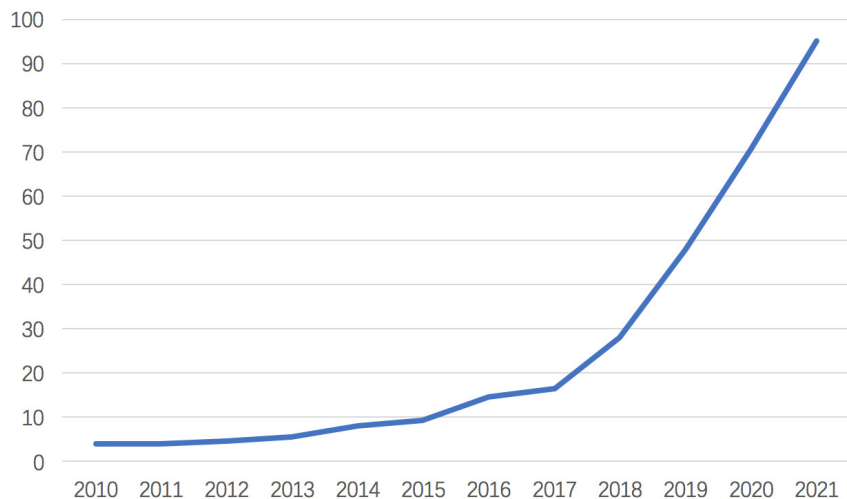


Figure 4-2
Exchange rate change of U.S. dollar to peso from 2010 to 2021
Source: World Bank

2.2 Background and Causes of Argentina's Bond Default

It took 15 years for Argentina to gradually resolve the 2001 debt crisis. Its current economic crisis not only stems from these long-standing problems, but also relates to its recent development. After the election of President Macri in 2015, the government introduced a series of economic reforms, including reducing export taxes, abolishing currency controls, and resolving the 15-year-long disputes with the creditors of

Argentina's defaulted bonds, which enabled Argentina to resume its access to the international capital market. In addition, the Central Bank of Argentina raised the interest rate to 25% to curb inflation. To finance budget and account deficit, Macri's government turned to the traditional international capital market and issued more than \$62 billion international bonds between 2015 and 2018.

Since the end of 2017, the following factors have brought many problems to Argentina's economy: 1) The US Federal Reserve began to raise interest rates of US dollar, which reduced the interest of investors in Argentina's bonds; 2) The Central Bank of Argentina reset its inflation target, which raised doubts about its independence and its commitment to reducing inflation; 3) Argentina experienced the worst drought within 50 years, which damaged local agricultural production and reduced agricultural export income. Accordingly, investors began to sell their assets in Argentina, putting downward pressure on the peso. Despite the fiscal reform plan of the IMF, the peso depreciated rapidly. To stabilize the currency, the Central Bank of Argentina even raised the interest rate to 60% at the end of August 2018.¹ Since most of Argentina's debt is denominated in the U.S. dollar, the depreciation of the peso has increased the real value of Argentina's debt. Argentina's external debt reached \$283.6 billion in 2018, with an increase of more than \$100 billion since 2015, more than half of which were bonds with high interest rates.

Even after obtaining the largest loan in the history of the IMF, Argentina's economic situation did not improve. The IMF initially envisaged that Argentina would resume growth in 2019, but the country's economy contracted by 2.2% in 2019. After the new president Fernández took office in December 2019, he implemented a series of measures to revitalize economy and made solving debt problems a priority. However, because of the pandemic, Argentina's economy faced increasing downward pressure, with a recession of 9.9% in 2020. On May 22, 2020, Argentina failed to pay the bond interest of \$503 million on time, resulting in a technical default, which was also its ninth default in history. Fitch and S&P later adjusted the rating of Argentina to RD (restricted default). Although Argentina held talks

with bondholders and other creditors and reached an agreement with major creditors on the restructuring of \$66.2 billion foreign debt in August 2020, it cannot refinance from the international bond market for a long time. In January 2022, Argentina and the IMF reached a restructuring agreement over \$44.5 billion debt, easing the short-term debt pressure. However, in early July, the resignation of Guzmán, Minister of Economy, the key figure in the debt refinancing plan, has brought uncertainty again. Over-radical fiscal policies, exchange rate fluctuations, and problems left over by history have caused Argentina's economy to, once again, miss its development opportunity in this past decade.

3. Sri Lanka

3.1 Overview of Sri Lanka

Sri Lanka is an island country in the southern Indian Ocean. Its economy is dominated by plantation economy, and its main crops include tea, rubber, coconut, and rice. Its industrial base is weak while agricultural production and the garment manufacturing industry play an important role. Sri Lanka has a low level of technological development and insufficient economic growth impetus. From 2013 to 2019, its GDP growth rates hovered between 2%-4%, which was lower than the average level of its neighbors in South Asia.²

Sri Lanka's foreign exchange income mainly comes from primary product export, immigrant remittance, and tourism, and its exports fluctuate greatly. Since 2010, Sri Lanka's export has stagnated for a long time and even registered negative growth sometimes, putting the country in a trade deficit for many years (See figure 4-3). Sri Lanka's foreign exchange reserves also showed a corresponding downward trend. The country's foreign reserves fell from \$7.5 billion in November 2019, when the new government took office, to less than

1. Argentina's Economic Crisis and Default (2020). Retrieved From: <https://sgp.fas.org/crs/row/IF10991.pdf>

2. World Bank WDI Databank, <https://databank.worldbank.org/reports.aspx?source=worlddevelopment-indicators#>.

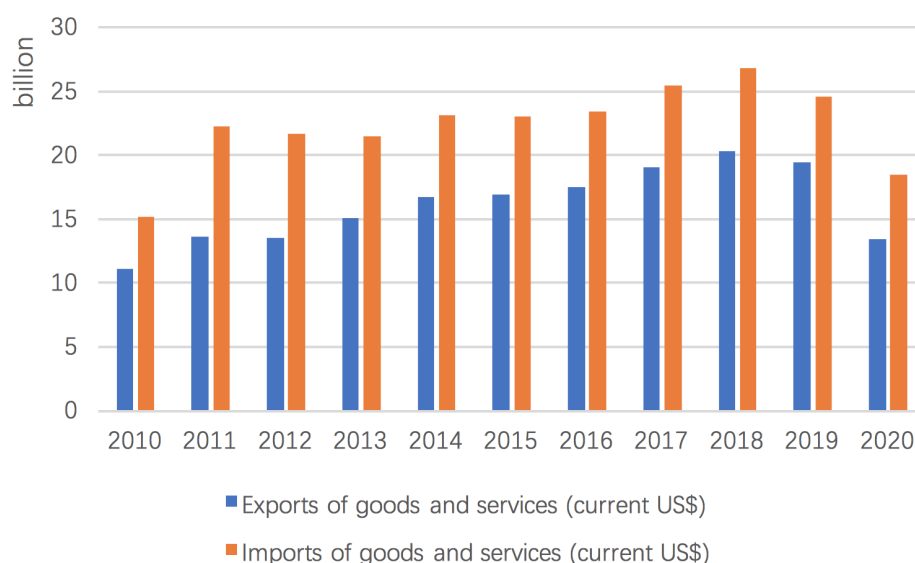


Figure 4-3
Sri Lanka's imports and exports from 2010 to 2020.
Source: World Bank

\$2 billion at the beginning of 2022, which could only sustain the import expenditure of the following months.¹Meanwhile, its public budget deficit has been widening. Sri Lanka has long been implementing a wide range of social welfare subsidy policies, causing great expenditure pressure, which can only be alleviated by long-term financial overdraft. According to the statistics of the World Bank, the overall budget deficit of Sri Lanka increased by 160% from 2007 to 2017, and the total debt owed by the government increased by 209%.

3.2 Background and Causes of Sri Lanka's Bond Default

In recent years, Sri Lanka fell into a debt crisis mainly because its foreign exchange reserves are almost entirely composed of commercial loans and the investment income is lower than the interest on loans. From 2007 to 2017, Sri Lanka's non-project loans increased by 605%, and the growth rate of project loans was only about 117%. Non-project loans increased too fast, and they could not generate income to repay the

principal and interest. In addition, since the issuance of international sovereign bonds in 2007, the proportion of multilateral and bilateral preferential loans in Sri Lanka's external debt has declined rapidly. In 2017, commercial loans accounted for 42.98% of its total debt, with an average interest rate reaching 6.29% and a maturity of about 7 years.²The government was forced to borrow new debt to repay the existing debt in a short amount of time. Sri Lanka issued 14 international bonds between 2017 and 2019, with a total amount of \$16.55 billion, and the coupon rate rose to 7.85% in 2019. With the strong dollar and the recovery of capital markets in developed countries, heavily indebted Sri Lanka became particularly vulnerable to a refinancing crisis. Sri Lanka's external debt accounted for about 42% of its GDP in 2019 but has risen to 119% of GDP in 2021. From the perspective of liquidity, the proportion of foreign exchange reserves to foreign debt in Sri Lanka has fell from 24.2% in 2011 to 5.48% in 2021, which indicates that its foreign exchange reserves will face serious challenges in response

1. Sri Lanka reverses course, seeks financial support from IMF, aljazeera, <https://www.aljazeera.com/economy/2022/3/15/sri-lanka-reverses-course-seeks-imf-help-report#:~:text=Sri%20Lanka%20has%20about%20242%20billion%20of%20foreign-currency,a%20241%20billion%20dollar%20bond%20maturing%20in%20July>.

2. 李艳芳, “斯里兰卡外债问题的生成逻辑与争议辨析”, 国际展望 2020 年第 1 期

to emergencies in the future, exacerbated by the fact that 2019-2022 and 2025-2027 are the two peak periods of foreign debt repayment in Sri Lanka.

The COVID-19 pandemic and the Russia-Ukraine conflict hit Sri Lanka's economy severely. First, tourism used to account for more than one tenth of Sri Lanka's GDP. In 2018, tourism earned \$4.4 billion for Sri Lanka and contributed 5.6% to GDP, but due to the pandemic, the figure fell to 0.8%. According to the data provided by the Sri Lankan Tourism Development Authority in the Monthly Tourism Arrivals Report of February 2022, Russia and Ukraine are Sri Lanka's two largest source countries of tourists. In the first two months of 2022, there were nearly 28,000 tourists from Russia and 13,062 tourists from Ukraine arriving in Sri Lanka. With the outbreak of war in Ukraine, the tourists from the two countries have declined sharply. The conflict also takes tolls on the tea export of Sri Lanka, which is another source of foreign exchange reserves because Russia is the largest importer of Sri Lanka's tea. Under the Western sanctions, the ruble collapsed, making it difficult for Russians to continue to import Sri Lanka's tea. At the same time, global commodity prices soared due to the influence of the pandemic and the war, leading to a surge in the prices of crude oil and food which are in short supply in Sri Lanka. By March 2022, Sri Lanka's national inflation rate climbed to 17.5% and foreign exchange reserves fell to \$1.9 billion. It was nearly impossible to repay the dollar debt due in 2022, of which the maturing Eurobonds amounted to \$2 billion. In this situation, on April 12, 2022, Sri Lanka announced that it would default on its external debt, which was its first debt default since its founding.¹

In the past decade, Sri Lanka has failed to effectively promote industrial transformation and find new sources of

income generation at home and abroad. Instead, it has issued large amounts of commercial bonds, which increased the fiscal deficit and made the country fall into the dilemma of borrowing new debt to repay the old debt with rising interest rates. Under the superimposed impacts of the pandemic, the war and international financial fluctuations, the vulnerable Sri Lankan economy could no longer bear pressure and collapsed rapidly. Other developing countries should seek to learn from Sri Lanka's painful lessons.

4. Mozambique

Mozambique was granted debt relief after meeting the criteria of the HIPC Initiative in 1999. Mozambique's economy is dominated by fishery and agriculture while its economic development faces many difficulties due to the impacts of the domestic political environment and natural disasters. Mozambique overly relies on the exports of primary products in the global market, which are greatly affected by the fluctuations of international commodity prices. Moreover, its dependence on non-renewable resources also leads to the unsustainability and vulnerability of Mozambique's economic development. Since 2016, as global commodity prices went down and the domestic natural gas development slowed down, Mozambique's debt problem has become prominent.

In 2016, Mozambique admitted concealing over \$2 billion international bonds issued between 2013 and 2014, which made the ratio of external debt to GDP suddenly rise from 76.6% to 104.3%. After the disclosure of the hidden debt, Mozambique's debt default risk naturally increased as well. The World Bank and the IMF suspended the direct economic assistance and loan programs to Mozambique, which made its declining economy even worse.

Moody's lowered the sovereign credit rating

1. Bala, Sumathi (4 March 2022). "Sri Lanka's economic crisis deepens as the country is snowed under its crushing debt". CNBC. Retrieved 4 April 2022.

of Mozambique from Caa1 to Caa3 with a negative credit outlook. S&P downgraded Mozambique's credit rating from B- to CCC. Fitch lowered the long-term debt rating of Mozambique in domestic and foreign currencies from CCC to CC. Consequently, Mozambique's debt has been classified as highly speculative.

The crisis originated in 2013 when the three state-owned companies in Mozambique (Pro Indicus, Ematum, and MAM) secretly issued \$2 billion bonds to Swiss and Russian banks. The bonds were originally planned to invest in tuna boats and fishery, but the majority was ultimately used for maritime and national defense which could not generate revenue, resulting in the failure to repay the debt on time. In April 2016, Ematum's \$850 million in the "tuna bonds" was restructured into Eurobonds due in 2023. The 2016 debt crisis of Mozambique exposed the problems in the debt management and debt transparency of its state-owned companies.¹

According to the Joint World Bank IMF Debt Sustainability Analysis of Mozambique in 2018, Mozambique's debt was mainly composed of multilateral and bilateral loans at that time. The increase of commercial loans changed the structure of external debt and the debt sustainability of Mozambique, indirectly affecting the overall social and economic development.² Meanwhile, accumulating arrears, increasing fiscal deficit, decreasing private investment, declining market confidence, and depreciating currency all have negative impacts on its economic development.³ Today, Mozambique is still trapped by debt. The impact of the pandemic, frequent natural disasters, currency depreciation, and lack of proper debt management and transparency have affected the debt sustainability of Mozambique.⁴

1.Florence Banda-Muleya, *The Allure of Commercial Debt: The Case of Zambia and Mozambique*. August 2021.

2.Mozambique Joint World Bank IMF Debt Sustainability Analysis, 2018.

3.IMF, Republic of Mozambique, *Staff Report for the 2017 Article IV Consultation – Debt Sustainability Analysis*. February 22, 2018.

4.Florence Banda-Muleya, *The Allure of Commercial Debt: The Case of Zambia and Mozambique*. August 2021.

Chapter 5

Systematic Reflections on the Impacts of Eurobonds on Developing Countries

The issuance of Eurobonds by developing countries is a market behavior, but its main driving force comes from the need of international financial capital to pursue high returns. Admittedly, developing countries have demand of funding, as a result of expansionary fiscal policies. However, they reduced the proportion of bilateral and multilateral preferential loans, which have low interest rates and long repayment cycles, mainly because the international financial market has offered convenient and abundant funds for these countries to issue Eurobonds. Nevertheless, institutional investors from the advanced economies respond enthusiastically to bonds issued by developing countries completely out of their own commercial interests. Their operations mainly follow the practices of mature markets in the world, which meet the needs of investors to obtain high returns in the short term but neglect the vulnerability of the economic structures and the particularity of the long-term development of developing countries. Specifically, commercial international bonds have the following three systematic risks to the debt sustainability of developing countries, which call for special attention and improvement measures to be taken as soon as possible in order to avoid further expansion of debt default crises and more serious consequences for global development.

1.Procyclical commercial behavior is not conducive to small and medium-sized economies

As discussed above, pricing, subscription, and rating of Western financial institutions are procyclical. In the period of high global liquidity and commercial prices, developing countries that mainly rely on mineral and energy export are in a period of economic prosperity, so they are more likely to issue

sovereign bonds and have high ratings while the cost of issuing bonds is relatively low. However, if the global economy is in recession and the prices of resources decline, these countries may need to finance more to maintain economic stability, but at this time, rating agencies would downgrade their credit ratings. Meanwhile, new bonds need higher coupon rates and lower issuance prices to attract investors, which exacerbates the situation. Although developed countries also face similar superimposed market fluctuation, developing countries usually have less revenue sources and smaller economic volume, so they are more likely to face crisis or default. In addition, as the issuance of Eurobonds is mainly denominated in the U.S. dollar, when the liquidity of the dollar is loose and the exchange rate is low, it is easy to issue Eurobonds, but when the U.S. dollar has higher interest rates and the exchange rates rise, a large amount of funds flows out of developing countries, which makes bond-issuing countries have to borrow money and repay debts at high interest rates and exchange rates during a period of tightest liquidity, forming another superimposed impact.

1.1 International credit rating amplifies economic fluctuation

At present, 95 % of the market share of the international rating service is monopolized by S&P, Moody's, and Fitch Ratings, which are very influential on the global lending market. The three institutions assign the sovereign credit rating of a country mainly through the analysis of indicators such as macroeconomic environment, fiscal policy, and external risks. (See Table 5-1 rating indicators of S&P)

| Institutional & Economic Profile | Flexibility & Performance Profile |
|--|--|
| Institutional Assessment <ul style="list-style-type: none"> •stability (pressure bearing capacity) and legitimacy of political system •government fiscal sustainability •transparency and accountability of data, processes, and institutions •a sovereign's debt repayment culture •potential external and domestic security risks | External Assessment <ul style="list-style-type: none"> •status of a sovereign's currency in international transactions •country's external liquidity •residents' assets and liabilities (in both foreign and local currency) relative to the rest of the world |
| Economic Assessment <ul style="list-style-type: none"> •country's income levels as measured by its GDP per capita, indicating broader potential tax and funding bases •economic prospects, including savings and investment scale, government revenue, revenue and expenditure ratio, economic growth and structure, etc. •Economic diversity and volatility | Fiscal Assessment <ul style="list-style-type: none"> •fiscal flexibility •long-term fiscal trends and vulnerabilities •debt structure and funding access •potential risks arising from contingent liabilities |
| | Monetary Assessment <ul style="list-style-type: none"> •exchange rate regime and stability of monetary policy •monetary stability, including impacts of price stability, monetary expansion, and monetary policy on the real economy |
| Assessment level: 1–6 (subdivided into 11 grades, and 1 is the best) | Assessment level: 1–6 (subdivided into 9 grades, and 1 is the best) |
| The final sovereign credit rating is based on the combination of the two profiles above: AAA–SD/D (21 grades in total, and AAA is the best) | |
| Table 5–1 S&P sovereign credit rating framework ¹ | |

Based on the current rating framework of the three institutions, the sovereign ratings of developing countries are usually low because their economic indicators are at a disadvantage. The administrative mechanisms of developing countries are not as mature and sound as those of developed countries, and they have low financial risk bearing capacity. A study conducted an empirical analysis on the macroeconomic data of 60 countries and the average sovereign credit ratings assigned by the three major rating agencies from 2000 to 2009. It found that factors that have significant impacts on the sovereign credit ratings of developed countries are GDP per capita, inflation, savings/ investment, and gross government liabilities, while

the main factors influencing the sovereign credit ratings of developing countries also include deficits, current account balances, foreign exchange reserves/ foreign debt.² This shows that the sovereign credit ratings of developing countries are more likely to be affected by various short-term factors than those of developed countries, and accordingly, the ratings also change more frequently.

Therefore, even though developing countries have high sovereign credit ratings at the initial stage of bond issuance because of fiscal optimism, good exchange rate performance, economic growth, and other factors, if there are sudden external risks during debt repayment, they are likely to

1. "Sovereign Rating Methodology," <https://disclosure.spglobal.com/ratings/en/regulatory/article/-/view/sourceId/10221157>. Retrieved May 14, 2022.

2. 高辉, 发达国家与发展中国家主权信用评级要素的比较研究, 2012, 天津财经大学, MA thesis.

be downgraded and may face debt crisis if things get worse. ¹Under the impact of the COVID-19, some low-income countries applied for debt suspension or relief from creditor countries to bear the new public health expenditure, resulting in a great blow to their sovereign credit ratings. Take Ethiopia for example, shortly after it applied for debt restructuring with the G20 to combat the COVID-19 pandemic, S&P, Moody's, and Fitch lowered its ratings several times. S&P lowered the sovereign credit ratings of Ethiopia's long-term foreign currency and local currency from "B" to "CCC"; Moody's rating from "B2" to "Caa2"; Fitch's rating from "B" to "CCC". The overall debt risk increased sharply, and debt sustainability faced severe challenges. ²

1.2 The exchange rate risk of Eurobonds has a superimposition effect

Compared with advanced economies, emerging economies in Africa, Asia, and Latin America that issue large amounts of international bonds are prone to fall into the vicious cycle of debts and exchange rates through exchange rates transmission. Since the 1970s, emerging economies have experienced sovereign debt crises many times. From 1970 to 2017, Argentina and Ecuador had six sovereign debt crises, Turkey had five, Jamaica and Uruguay had four.³ Developing countries with late industrialization often have current account deficits and insufficient domestic savings, so their development requires more outside investment and purchase of foreign products and services. Therefore, these countries obtain foreign exchange by issuing Eurobonds. However, at the same time, issuing large amounts of international bonds will lead to a significant increase in the risks of foreign exchange and default of the country, which is likely to induce a sovereign debt crisis.

The capital of any international investor is always profit-oriented and will flow to regions with higher real interest rates. When countries adopt loose monetary policies to stabilize the economy, international investors purchase large amounts of international bonds issued by emerging market economies and increase investment in these countries to receive higher returns. However, once the expectation decreases, foreign creditors will be more flexible and faster than other creditors to sell the bonds of emerging market economies, leading to lower exchange rates and currency depreciation, which increases the default risk of emerging economies. From the perspective of oversight, supervision over the issuance of international bonds is generally weaker than that of transnational bank credit, so the liquidity of bonds is stronger than that of bank credit, and the exchange rate risk caused by the withdrawal of foreign currency bonds is greater in the short-term. For instance, in the first half of 2020, under the impact of COVID-19, when the international financial market was volatile, cross-border capital flowed back to the United States, and the demand for the U.S. dollar increased significantly while the U.S. dollar index strengthened. The currencies of emerging market economies depreciated relative to the dollar to varying degrees. In Brazil, South Africa, Argentina, Turkey, Chile, Mexico, and other economies, the respective currencies depreciated by more than 20%. The default of the Argentine government took place during this round of exchange rate fluctuation.

The foreign exchange reserves of developing countries are weak. Once their exchange rates are impacted, the governments have to spend a large amount of foreign reserves to stabilize exchange rates and even issue new

1. Stephany Griffith-Jones and Moritz Kraemer, "Credit rating agencies and developing economies", United Nations DESA Working Paper No. 175, December 2021

2. Ramya Vijaya, "Credit Ratings Are Punishing Poorer Countries for Investing More in Health Care during the Pandemic," <https://theconversation.com/credit-ratings-are-punishing-poorer-countries-for-investing-more-in-health-care-during-the-pandemic-165298>. Retrieved May 14, 2022.

3. Laeven, M. L. and Valencia, M. F, Systemic banking crises revisited, International Monetary Fund, 2018.

bonds to raise foreign exchange reserves. If the government has huge amounts of medium and short-term debts, once the outflow of foreign capital exceeds the inflow and the domestic foreign reserve is insufficient to make up its deficiency, its currency depreciation will accelerate, and the burden of foreign debts will increase. The country will fall into the vicious cycle of currency depreciation and debt increase, which increases the risk of debt crisis. According to the World Bank, by the end of 2019, the total external debts of emerging market economies had reached \$8.1 trillion with foreign debts denominated in the U.S. dollars accounting for the largest portion of external debts in emerging market economies.¹ For example, more than 80% of the current outstanding Eurobonds of African countries are denominated in the U.S. dollar with concentrated maturity times and huge bond scale. Yet, the current economic situation in African countries under the impact of COVID-19 is not optimistic, and the obstruction of imports and exports has led to a downward trend in GDP in the past two years, further increasing the risk of sovereign bond repayment.

Since the U.S. dollar is the most liquid and the largest valuation currency in the world, the monetary policy and the political and economic situation of the United States has a strong correlation effect on the exchange rates of debtor countries. For instance, the recent announcement of the Federal Reserve to raise the interest rate has caused the U.S. dollar to strengthen rapidly while the currencies of other countries have depreciated accordingly under the sharp fluctuation of exchange rates, and a large amount of money will flow back to the

United States as a result. The predictable large-scale withdrawal of capital has made the economic development of the emerging economies in Africa, Asia, and Latin America even more difficult. The increase in the actual repayment amount of large-scale outstanding bonds due to currency depreciation has also increased the risk of emerging economies in Africa and Latin America falling into the cyclical crisis of exchange rates and debts. Some scholars applied econometric methods to analyze the trend of Eurobonds yields in eight African countries from January 2010 to May 2020. The research results showed that the bond yields of most countries were in an upward trend.² This means that if African countries do not take actions to address the increasing burden of interest, coupled with exchange rate risk such as currency depreciation brought by the return of the U.S. dollar, they are likely to fall into a sovereign bond crisis.

1.3 High interest rates as a heavy burden and a source of risk

The Eurobonds of more than 20 developing countries studied in this report have high interest rates. The current average maturity of Eurobonds in Africa is 10 years, with interest rates ranging from 5% to 16%. This means that the governments of issuing countries must repay high interest in a short period of time, putting great pressure on the governments' financial systems. Interest repayment is the fastest-growing expenditure in the fiscal budget of sub-Saharan African countries. For example, Kenya, Angola, Egypt, and Ghana respectively used 20%, 25%, 33%, and 37% of their tax revenue to repay interest.³

The main reasons of high bond interest rates of developing countries are as follows:

1.Laeven, M. L. and Valencia, M. F, *Systemic banking crises revisited*, International Monetary Fund, 2018.

2.Mutize and Misheck, "A trend analysis of Eurobond yields in Africa," *International Journal of Monetary Economics and Finance*, Vol.15, No.1,2022, pp.19-34.

3.Misheck Mutize, "African Governments Have Developed a Taste for Eurobonds: Why it's dangerous," <https://theconversation.com/african-governments-have-developed-a-taste-for-eurobonds-why-its-dangerous-165469> (last visited 2022-05-28)

4.Misheck Mutize, "African Governments Have Developed a Taste for Eurobonds: Why it's dangerous," <https://theconversation.com/african-governments-have-developed-a-taste-for-eurobonds-why-its-dangerous-165469> (last visited 2022-05-28)

1. African countries that issue Eurobonds and sample countries in Asia and Latin America selected in this report are rated as “BB” or below, which correspondingly need to bear higher financing costs in the bond market and higher interest rates.

2. Eurobonds do not limit the purpose of use. Funds could be misappropriated or used for non-productive expenditure. Eurobonds charge higher interest for this flexibility.

3. Most bond issuing countries failed to effectively use funds raised through bonds to improve the long-term development capacity and fiscal revenue of the country. Consequently, they continued to issue bonds under the pressure of refinancing and had no choice but to accept high interest rates when the market and the sovereign ratings were not favorable.

These are established rules in the international financial market, which are understandable. However, when developing countries, which lack market experience and economic volume, enter this gigantic profit-oriented platform, it is easy for them to fall into the development trap under the seemingly fair rules due to short-term interest. They are likely to prematurely overdraw their growth prospects and become shackled by international financial capital.

2. The timeliness of Eurobonds is not in tune with the economic development rhythm of developing countries

Eurobonds are not only short-term, but their maturity also concentrates. Infrastructure construction and production projects in developing countries usually take a long time to complete. Some of them take more than 10 years to yield benefits, and the prospect of revenue is hard to guarantee. This means that bond-issuing countries have to frequently look for other valuable foreign exchange or issue bonds with higher interest rates to repay their maturing debts,

further squeezing the limited liquidity and disturbing the normal economic order. If the issuing country fails to find money to repay the matured debt, it will default, and its future financing will become extremely difficult. The timing of international financial capital is mainly based on the mature economic activities of developed countries and is not flexible and tolerant enough to the liquidity challenge faced by developing countries.

Due to market factors such as low ratings and high risks, the maturity of Eurobonds issued by developing countries is mostly shorter than the bilateral or multilateral loans provided by governments, multilateral banks, and international organizations. Before African countries issued sovereignty guaranteed Eurobonds, their debts were mainly composed of bilateral and multilateral preferential loans with an average interest rate of 1.6% and maturity of 28.7 years.¹ If the debtor country's economic situation is poor, it still has chances to discuss debt extension with creditors to reduce the risk of default. In contrast, the repayment periods of Eurobonds issued by African countries are significantly shorter than those of preferential loans. The interest rate is much higher than that of preferential loans, and commercial contracts are restricted from extending the repayment period. According to the IMF, from 2004 to 2013, the maturity of Eurobonds issued by African countries ranged from 5 to 10 years, of which 5 to 7-year bonds account for 50% and 10-year bonds account for 50%.²

After the issuance boom of Eurobonds in 2013-2014 in African countries, as investors became more confident of the sovereignty and development of African countries, the maturity of Eurobonds issued by African countries extended to a longer period and some countries began to issue bonds with

1. Trevor Hambayi, *Africa's ticking time bomb: \$35 billion worth of Eurobond debt*, <https://theconversation.com/africas-ticking-time-bomb-35-billion-worth-of-eurobond-debt-59404>, [2022-5-23].

2. IMF, *First-Time International Bond Issuance—New Opportunities and Emerging Risks* [2022-5-23], <https://www.imf.org/en/Publications/WP/Issues/2016/12/31/First-Time-International-Bond-Issuance-New-Opportunities-and-Emerging-Risks-417622>.

even longer maturity. According to 2016 data, the average floating coupon price of Eurobonds was 6.2% and the maturity was 11.2 years. In 2017, Nigeria successfully issued 30-year Eurobonds. Since then, Cote d'Ivoire, Ghana, Kenya, Angola, Egypt, and Senegal all have issued 30-year bonds. In 2020, Ghana issued its first 40-year bonds, which was also the longest maturity bond issued in sub-Saharan Africa.¹ However, these long-term bonds only account for a small proportion.

Under the dual influence of concentrated bond issuance and short bond maturity, African countries are expected to usher in the first debt repayment peak from 2023 to 2025. From 2010 to 2015, over ten countries in sub-Saharan Africa, including Angola and Nigeria, raised more than \$19.5 billion in 10-year commercial bonds. In 2015, the proportion of commercial bonds in total debts reached a record high of 68%. These bonds will mature between 2021 and 2025.² Especially after 2013, with the substantial increase in the issuance of 10-year bonds, the number of bonds maturing in 2024 and 2025 will surge. Including Morocco, Tunis and Egypt in North Africa, the sum of Eurobonds due by 2025 totals over \$ 106 billion for all African countries.

The large stock of commercial bonds in developing countries has led to higher debt servicing costs and reduced financial sustainability. Especially the reduction of available liquidity threatens macroeconomic stability. At the peak of debt repayment, if emerging market debtor countries cannot manage to refinance, they will be forced to spend a large amount of foreign exchange reserves to repay the debt, which may lead to a sudden reduction in the public expenditure and cause devastating consequences to national development. The

impacts of sudden reductions in government expenditure include: the infrastructure constructions and the public projects stagnate and will be unable to recover existing investment; the government's means of stimulating economic growth are further limited, the overall social output decreases, and the unemployment rate increases; the normal economic order is seriously disturbed, and bankruptcy and default spread. For emerging countries that urgently need to develop infrastructure and lack a sound industrial system, the sudden reduction of public expenditure caused by the debt repayment peak and the difficulties in refinancing might bring an abrupt end to the economic structural transformation efforts of the past few years or even more. It will take a long time to recover the pre-crisis results after the liquidity crisis. Such a huge impact of cyclical repayment has already caused several developing countries, including Argentina and Ecuador, to fall into the vicious cycle of unsustainable economic growth in modern history.

3. Eurobonds lack supervision over usage and neglect to cultivate long-term capacity of generating revenue

Eurobonds do not limit the purpose of use, and funds can be used for non-productive expenditure. The investors do not care about the use of funds. They only measure the investment risk by the overall macroeconomic situation of the country and seek to benefit from high price and high interest rates, without supervising and paying attention to the usage of funding. However, for developing countries with unstable political and economic conditions, such freedom allows for bonds to be used for filling fiscal gaps or to serve as a funding source for short-term political goals, resulting in the situation of "living beyond their means", while neglecting investment

1. Pamela Icyeza, *Bond, Eurobond: Tracking African Eurobonds Issued Between 2006-2021* [2022-5-23]. <https://www.bu.edu/gdp/2021/10/22/bond-eurobond-tracking-african-eurobonds-issued-between-2006-2021/>.

2. Trevor Hambayi, *Africa's ticking time bomb: \$35 billion worth of Eurobond debt*, [2022-5-23]. <https://theconversation.com/africas-ticking-time-bomb-35-billion-worth-of-eurobond-debt-59404>.

in productive and profitable projects, thus causing unsustainable long-term development.

The proceeds of Eurobonds guaranteed by sovereignty usually do not have specific purposes, which is different from bilateral or multilateral preferential loans and general commercial bonds. For general commercial bonds, enterprises are required to clearly state the investment usage of the financing funds and explain how to bring future output. Accordingly, investors will pay attention to the future profitability of the bond issuers. However, because sovereign bonds have lower default risk and higher credibility compared with corporate bonds, countries are not required to promise the use of bond proceeds when issuing Eurobonds. In the bond issuance documents of Eurobonds by many developing countries, the use of bond proceeds is simply written as “... the net proceeds of this issuance will be used for general budget purposes”, without including any substantial usage. For buyers in the bond market, they are prone to measure investment risk based on indicators, such as outstanding debts, resource reserves, and overall macroeconomic prospects; they seek high returns, without paying attention to and supervising the use of funds raised through bonds, and seldom considering the specific contribution or risk of bond issuance to the development of bond-issuing countries.

Bond-issuing countries can freely invest and use the funds raised from Eurobonds, and they have more freedom in debt management.¹ But under the surface of freedom, the use and management of such a large amount of fund that arrives suddenly is a great challenge for developing countries without stable and sound political and economic systems. Sometimes, funds are used for filling fiscal gaps or serving short-term

political goals, while neglecting investment in projects which improve productivity and generate revenue, thus causing unsustainable long-term development. In 2019, Edward Ouko, the auditor general of Kenya, submitted a special audit report to the National Assembly of Kenya, stating that although his office could confirm that \$2.15 billion Eurobond proceeds had entered into Kenya's National Exchequer Account, as the National Treasury failed to disclose the specific purpose of the money, the audit office could not determine which development projects the money was specifically used for, or whether it is really used for development projects as stated in the bond issuance. The National Treasury responded that the proceeds had been deposited into the National Exchequer Accounts in the Central Bank of Kenya (CBK), so it was impossible to confirm whether it was used for any specific infrastructure projects. The auditor general dismissed the explanation of the National Treasury and believed that funds raised through international sovereign bonds should be earmarked and traced to specific development projects.²

Before the COVID-19 pandemic, some developing countries chose to use the funds raised through issuing Eurobonds for large-scale infrastructure construction projects. However, infrastructure construction takes a long time, and the return time is also very long. Sometimes infrastructure projects need long-term, large, and stable investment to meet the need of public welfare and may even suffer from long-term losses, rendering Eurobonds, with short maturity and high interest rates, unsuitable for infrastructure projects. For example, in 2014, Ethiopia issued Eurobonds to finance the construction of 10 state-owned sugar manufacturing projects, but the development of the sugar industry was not smooth. The planting areas

1. Gregogy Smith, *Africa's hard-won market access*, [2022-5-23]. <https://www.imf.org/en/Publications/fandd/issues/2021/12/Africa-Hard-won-market-access>.

2. Moses Njagih, *Auditor: Eurobond proceeds came CBK but we cannot trace it to projects*, [2022-5-23]. <https://www.standardmedia.co.ke/business/news/article/2001322533/eurobond-money-earned-but-no-project>.

of sugarcane, including Kuraz, decreased. The decline of sugar output made the Ethiopian government unable to repay the debt and interest, putting a heavy debt burden on the government.

In the past three years, African countries have been plagued by debt crises. Especially after the COVID-19 pandemic, almost all newly issued Eurobonds have been used for supporting non-productive short-term expenditure and repaying maturing bonds. Bonds issued by Benin, Côte d'Ivoire, Kenya, Morocco, Gabon, Ghana, and Egypt

are all used for raising funds to support budget deficits and bond refinancing. This practice of African debtor countries has made Eurobonds into an expensive source of disposable income, which is often used to fill fiscal deficits and finance short-term political goals. Priorities of longer terms, such as crucial infrastructure and economic diversity, have been shelved. Therefore, the income from Eurobonds is only filling the fiscal gap and cannot bring more fiscal revenue, leading African countries to fall into a vicious cycle.

Chapter 6

Conclusion and Policy Recommendations

In conclusion, the surge of Eurobond issuance in developing countries in recent years, and the consequent impact on bond-issuing countries, is a serious test for the long-term development process of developing countries by the profit-seeking market behaviors of international financial capital. In the context of sluggish economies and abundant liquidity within developed countries, private financial institutions have vigorously promoted the issuance of bonds by developing countries and even lowered the threshold of bond issuance so that they can profit from the rapid growth of emerging markets. Western investors have also showed great enthusiasm for bond subscription. Low interest rates and rising resource commodity prices further promote developing countries to adopt expansionary fiscal policies, hoping to stimulate the economy through large amounts of investments. However, many new bond-issuing countries lacking market experience do not have a profound understanding of the fluctuations and hidden risks of the financial market, especially regarding the long-term impact of bond issuance.

This report conducts a detailed study on the debt burden and default brought by the large-scale issuance of international bonds in developing countries across Africa, Asia, and Latin America in the 21st century. It analyzes the motives, behaviors, and roles of all parties involved in the market, including bond-issuing countries, issuing agencies, subscribers, secondary market investors, rating agencies, and even “vulture” funds, to provide an accurate and in-depth understanding of the operating mechanism and principles of the Eurobond market and its impacts on developing countries. We have found that financial institutions in developed countries have abundant funds, rich experience, and interconnected

industrial partners that cooperate with each other. They are the leading force and rule makers in the international financial market. Such financial institutions are also supported by strong legal, monetary, political, and economic systems of developed countries. Accordingly, the rules of bond issuance and circulation made by these institutions also prioritize the interests of financial institutions and the need of mainstream markets in developed countries but fail to take the characteristics of developing countries into consideration, which include single economic source, strong cyclicality, weak ability of risk management, and the large number of long-term infrastructure projects. Therefore, many countries that lack experience in issuing bonds have been lured into the trap of high debt risk during the economic boom. During the current economic downturn and U.S. dollar interest rate hike, debt issuing countries are affected by multiple superimposed factors and face huge pressure of debt repayment.

This report employs the Mann-Whitney U statistical test method to analyze the sustainability of sovereign bond issuance, examining the relationship between the changes in credit risk premiums and issuance financing cost in different countries and the debt ratio and scale of foreign debt. After the calculation of the model, we verify that the strong volatility of the bond market will exacerbate the debt crisis. Once a negative trend is formed, it will fall into a debt trap, and the fundamentals of the economies that have defaulted on sovereign debt also confirm the deterioration of the debt problem. The study also found that primary and secondary markets hold different views toward the bonds of emerging economies. The primary market is more optimistic about their bond issuance, which provides a relatively loose financing

environment and encourages their bond issuance. The loose financing environment has brought about an increase in foreign debt, but does not necessarily guarantee economic development. On the contrary, after the issuance of bonds in most sample countries, the economy stagnated and the fiscal revenue did not improve, causing a rise in the debt ratio of external debt. The investors in the secondary market evaluate bonds based on the scale of foreign debt and the risk premium of economies with high debt ratio. Because the growth of the scale of foreign debt in the sample countries did not lead to economic development and the reduction of the debt ratio, the transaction spreads of these countries continued to rise, and the refinancing cost increased accordingly. We can see that the bond issuance behavior of developing countries is stimulated by the loose financing environment in the primary market, but stagnating economic performance has led to the deterioration of debt problems. The secondary market has identified the problems in the development of these countries, reflecting and even amplifying the worries of their credit risk and liquidity risk through market behavior. Based on the prediction of sovereign bond default risk, from the two dimensions of macro fundamentals and transaction spreads, we conclude that Zambia, Sri Lanka, Angola, Argentina, Ethiopia, Suriname, El Salvador, and Ghana have high sovereign bond default risk and need continuous attention.

The problem of sovereign bond default is not just an isolated one in the bond market but will spread from single cases to a wide area and finally become a major problem in the wider economic system, currency, and even politics. As the serious consequences of sovereign bond default are clear, bond-issuing countries will do their best to prevent sovereign bond default. However, the long-term hidden risk of commercial international bond issuance to the debt sustainability of developing countries should not be ignored

or even denied just because the number of developing countries that have defaulted is not large at present. As the review of the debt crises in Zambia, Argentina, and Sri Lanka shows, bond default may have been triggered by unexpected international and domestic incidents, but the seed of the crisis might have been sowed years ago, gradually developing until the crisis broke out, causing a heavy blow to the overall development of developing countries and the lives of thousands of people.

Market activities tend to add icing on the cake but rarely act as a lifeboat in a storm. Small and inexperienced developing countries lack the power to influence complex and huge international financial markets. The conveniences and benefits enjoyed during the economic upward cycle imply risks and burdens in the downward cycle. Although these countries have more financing channels than before, they are also more likely to fall into the trap of debt repayment pressure driven by capital. If the issuer is not prepared to use the funds obtained when the financing costs are low to improve productivity and generate returns higher than interest, it is likely to fall into a vicious circle of borrowing new debts with higher interest rates to repay old debts under the market rules. The interests and priorities of investors in developed countries, the most powerful in the global economy, are not the same as those of peasants and laborers in developing countries. Developing countries must be vigilant when entering the financial markets dominated by these investors, otherwise they will not be able to properly protect the priority interests of their own economies, people, and societies once a debt crisis erupts. The international community needs to provide developing countries with more precise information, in-depth analysis, and timely guidance to help them avoid these financial traps.

Finally, we put forward the following policy recommendations, hoping to improve the

management mechanism of international bond issuance, better control the debt risk of developing countries, and create an international financial system that conforms to the characteristics of developing countries.

1. International financial institutions such as the IMF should recognize the hidden risk of international bonds and help bond-issuing countries fully understand the advantages and disadvantages of different financing methods, especially their long-term impact on development. They should also provide more transitional preferential loans for former HIPC countries with vulnerable economic structures.

2. The utilization of funding obtained through bond issuance need to be better guided. The funds should be invested in the productive projects that can help the issuing countries generate sustainable income so that a virtuous circle of enhancing economic growth, improving fiscal revenue, raising credit ratings, and facilitating further

financing can form. The countries should avoid a vicious circle of relying on bond issuance to repay debt, rising interest rates and declining credit rating.

3. International bonds need to be issued in more diversified currencies. Over-reliance on the U.S. dollar bonds will make bond-issuing countries greatly affected by the monetary policy of the U.S. Federal Reserve. Issuing bonds in multiple foreign currencies can effectively decentralize the exchange rate risk.

4. Institutions should improve the long-term rating mechanism and market warning model to be better suited for developing countries. It should be noted that developing countries are more vulnerable to cyclical economic fluctuations. Therefore, they need to be prepared for the potential risk, and make comprehensive plans to tackle recession in the period of economic prosperity. International financing ought to focus on the long-term stable economic development of developing countries rather than serve short-term commercial interests.

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