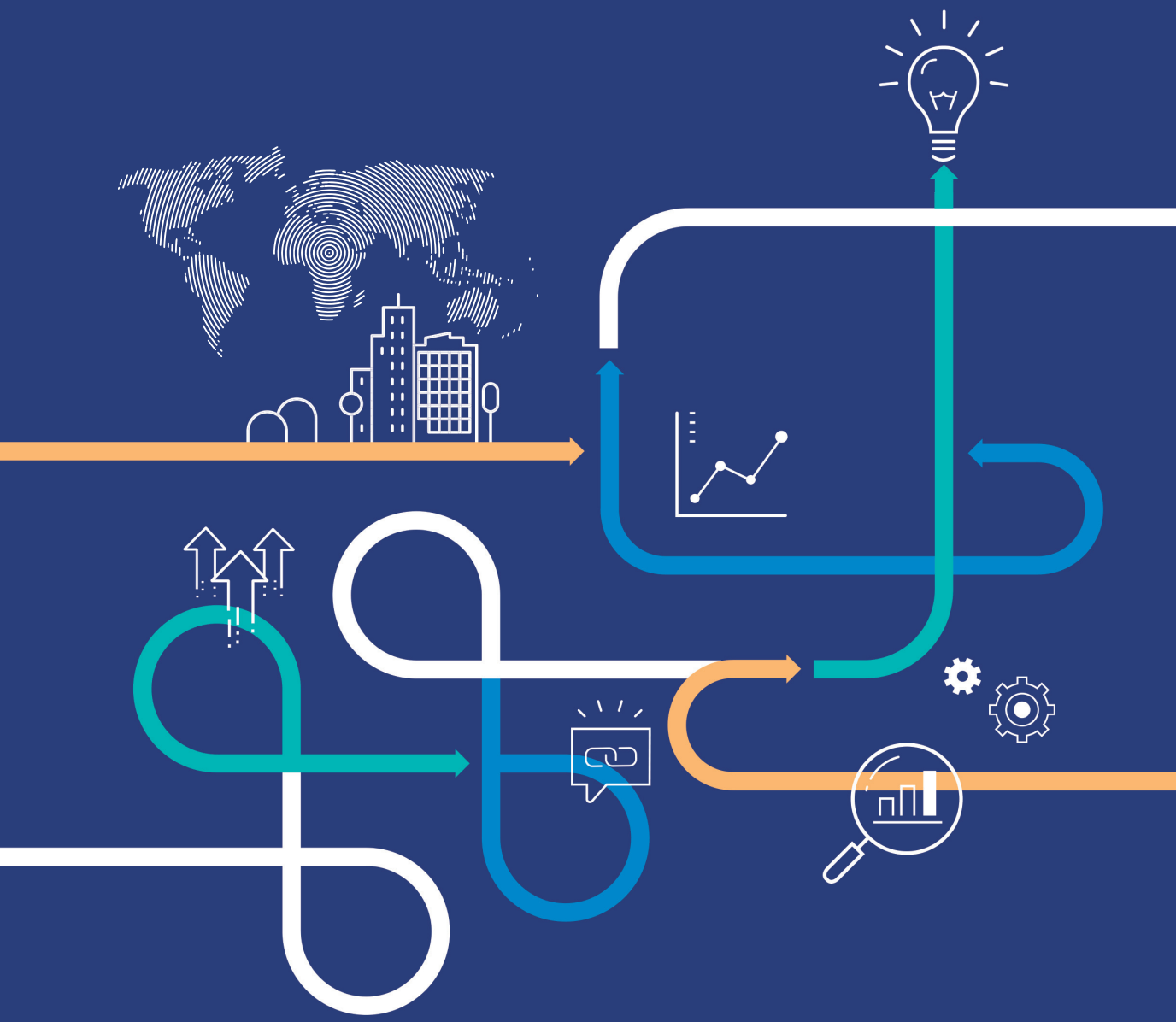
2021 PEMNA Treasury CoP Advisory Services Program

Introduction of Treasury Bills in Timor-Leste



PEMNA Public Expenditure Management Network in Asia

Prepared for the Ministry of Finance of Timor-Leste

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Background

Timor-Leste is a commodity-based developing economy, which is exposed to commodity price volatility, the risk of the depletion of natural resources, and an unstable macroeconomic environment. These factors could lead to high volatility in government revenues and deeper recessions. Because the current economic structure of Timor-Leste relies heavily on the petroleum fund, alternatives must be put in place to break through increasing fiscal deficits. One of the policies the government is currently planning to use to finance government expenditure and economic development is the issuance of Treasury bills (T-bills).

Taking into account the current economic circumstances of Timor-Leste, the proposal submitted by the Timor-Leste Ministry of Finance (MoF) on the "Development of Policy Document for Introduction of Treasury Bill" was selected as PEMNA's first project for the Treasury CoP (T-CoP) Advisory Services Program in 2021. For this project, PEMNA contracted one local consultant and two international experts to carry out the advisory responsibilities.

In general, T-bills are used to finance a government's fiscal deficit and to raise funds to implement government policies. Governments can also control liquidity in the money market through the issuance and purchase of T-bills. In addition, T-bills can be used to facilitate the flow of funds to be injected into the financial market.

The primary goal of this project is to assist Timor-Leste's MoF with the development of a policy document for the introduction of T-bills. The policy document, to be presented to the executive for approval, will serve as a milestone document to address the problems inherent in Timor-Leste's oil-dependent economy and serve as a foundation for diversifying non-oil revenues to finance its annual budget.

In this report, we describe the development of Korea's government bond market, introduce the current system and management of the Korean government bond market, analyze the economic conditions of Timor-Leste, and propose policy recommendations for the successful introduction of T-bills in Timor-Leste. This executive summary provides key points of each chapter of the report, which are (1) history of Korean government bond market, (2) Korea's current government

bond market system, (3) Timor-Leste's current condition for T-Bill issuance and (4) policy recommendations.

History of Korean government bond market

After the establishment of the government, Korea issued national bonds, based on the State Bond Act enacted in 1949, to compensate for insufficient tax revenue and to meet fiscal demand (Lee, 2013). The Nation-Founding government bonds were first issued in February 1950 and were the only bonds traded in the Korea bond market until the late 1960s, when other government bonds began to be listed (Jeong, 2004). In March 1956, the Korea Stock Exchange was established in order to ensure fair prices and the smooth circulation of securities. The Korea Stock Exchange originally organized the syndicate as a membership organization, jointly invested by the financial group, insurance group, and securities group. However, in 1962 the Securities Exchange Act was amended and the Korea Stock Exchange was reorganized into a government-funded institution.

Until the early 1970s, trading was allowed only on the Exchange. The amendment of the Securities Exchange Act in 1976 made it possible to trade bonds in the over-the-counter (OTC) market. Through the OTC market, unorganized transactions proceeded between securities companies and customers. Then, in the 1980s, as the number of issued bonds increased and the number of market participants also increased, the center of the secondary market shifted from the Exchange to the OTC market. By allowing OTC trading of all bonds in 1984, the government promoted the popularization of the Korea Treasury Bonds (KTB) market, and laid the foundation for the advancement of the OTC market by enacting the Regulations on OTC Transactions.

When corporate bonds were listed in 1972, the corporate bond market rapidly expanded, and the government bond market reached a plateau (Lee, 2013). Too many government bonds, individually managed, dispersed the demand. In an effort to resolve this problem, the Korean government completely revised the State Bond Act at the end of 1993 and merged myriad government bonds into one. Despite this change, at the end of 1996, while corporate bonds accounted for about 42% of the total issuance balance, the outstanding balance of government bonds was only 14.5% of the total bonds and 4.7% of the trading volume of the total bonds.

Although the market for KTBs, issued by the Ministry of Economy and Finance, had been formed, there was no active trading in practice before the Asian financial crisis in 1997. The government had a passive policy stance. Its focus was on the twin goals of preventing inflation and reducing economic fluctuations. However, because of the financial crisis, tax revenues decreased and the economy was in a large-scale recession. There was a clear need to revitalize the government bond market.

Accordingly, beginning in May 2000, the Korea government made a series of institutional improvements, which will be discussed in chapter two. The Asian financial crisis in 1997 caused corporate bankruptcies and left many financial institutions with bad debts. Corporate bonds could no longer be guaranteed. Therefore, the role of government bonds as the benchmark was emphasized. In addition, the government needed to raise a large amount of funding to deal with the crisis. The government extended the issuance of KTBs from KRW 2.1 trillion in 1997 to KRW 12.5 trillion in 1998. At the same time, the government promoted various modernization policies to efficiently manage the expanded government bond market and strengthen the secondary market for government bonds.

As part of the modernization, Public Debt Management Fund bonds were formulated to KTBs, and diverse government bonds were combined into KTBs by stages. In 1999, the issuance of government bonds was regularized, the KTS (KRX trading system for KTBs) was opened at the Korea Stock Exchange (now Korea Exchange), One of the most important improvements was the establishment of the PD (Primary Dealer) system for KTBs. The PD system gives Primary Dealers the exclusive right to participate in the primary KTB market and the role as market-makers in the secondary market. These changes were fundamentally different from the previous partial development policies. As a result of this effort to modernize the KTBs, efficiency was greatly improved (Lee, 2013).

After the Asian financial crisis, KTBs became the center of the bond market. Specifically, by 2008, the outstanding balance of KTBs increased about 5 times over what it had been prior to the Asian financial crisis, and the transaction volume increased more than 10 times. In terms of the benchmark role of the KTBs in the financial market, the government was able to finance necessary funds in a timely manner and at low cost. The improvements in government bond market lay the foundation for the development of the derivative financial market (Kwark and Rhee, 2004).

The Korean government had opened membership in the Exchange to foreigners in 1991 and foreign investment was allowed in 1992. However, foreign investment in the Korean bond market was insignificant until the first half of 2007, and it seemed to stagnate somewhat during the global financial crisis. However, it escalated sharply after May 2009. At the end of 2013, the balance of domestic bonds held by foreigners was KRW 94.7 trillion, up from only KRW 4.2 trillion (about 2.0% of foreign holdings of the listed balance of KTBs) in 2006 (Kim, Kim and Rowe, 2013). The number of countries for foreign investors grew from 19 in 2006 to 44 in 2020, due to the government's active promotion.

Korean government bond markets: structure and management

The primary function of government bonds is to finance the government's fiscal deficit and to raise funds to implement government policies. In other words, bonds can be regarded as instruments of borrowing for financing.

In Korea, four types of central government bonds are issued: Korea Treasury Bonds (KTBs), Treasury Bills (T-bills), National Housing Bonds (NHBs) Type 1, and Foreign Exchange Stabilization Fund Bonds (FX SFBs). Among them, KTBs serve as a key means of raising national finances and as a benchmark in the domestic bond market. A benchmark refers to bonds that serve as a basis for setting interest rates when various bonds are issued. In Korea, the distribution rate of 10-year KTBs has a role as a benchmark. KTBs are issued with seven different maturities: 2, 3, 5, 10, 20, 30 and 50 years.

The government uses the differing types of bonds, maturities and amounts of liquidity to achieve a variety of goals. For example, 50-year KTBs were introduced after the global financial crisis in 2008. They are used to support long-term policy management of the country, to stabilize financing, and to distribute the burden of the repayment. Foreign Exchange Stabilization Bonds have quite a different purpose. They are used to stabilize the exchange rate and to manage foreign exchange reserves.

Since the issuance scale of KTBs is closely related to the fiscal sustainability and the sovereign credit rating (Yim, 2019), there needs to be a strong legal foundation for the issuance and distribution of the government bonds. The legal basis for government bonds is based on the Constitution, the National Finance Act, and the State Bond Act. Government bonds are issued through parliamentary approval by the National Assembly. All of the KTBs must be approved by the National Assembly, as the total issuance is regulated in the State Bond Act. National Housing Bonds are issued under the Housing and Urban Fund Act in order to procure funds necessary for the national housing project.

Bonds are calculated monthly or periodically until maturity. They can be classified by their interest method: there are compound interest bonds, simple interest bonds, coupon bonds, and discount bonds. In general, coupon bonds are most used in the KTB market.

Two issuance methods of government bonds are used in Korea: competitive and non-competitive biddings. For the competitive bidding, nominal Treasury bonds are regularly bid for by primary dealers (PD) and preliminary primary dealers (PPD) through the electronic bidding method using the Bank of Korea Financial Network (BOK-Wire). The bidding limit for each participating institution is less than 30% of the total amount scheduled for issuance to the PDs and less than 15% of the total amount to the PPDs.

In the case of competitive bidding for Treasury bonds, 20% of the total amount scheduled to be issued is allocated to the general public, including individuals, financial institutions, and all other corporations, who cannot participate in the competitive bidding, but acquire the bonds by the non-competitive bidding.

The repayment of government bonds involves a series of processes through which government bonds are extinguished after the principal and interest of the bonds are paid to holders. The methods of repayment of government bonds include maturity repayment and early repayment (including buyback and conversion offer). Most government bonds are repaid at maturity. When repaying government bonds, the Bank of Korea charges the repayment fund from the government, obligated to repay in advance, receives the funds by the day before repayment, and deposits the payment into the national Treasury account.

To reduce the funding cost, Korea has various systems to provide bond market liquidation. The first is the Primary Dealer (PD) system, which is used in most OECD countries to advance the financial market structure and establish a stable financial foundation for the government. A PD is a financial institution with financial power and expertise in government bond investment and trading. The PD system provides good communication between policy authorities and market participants, through smoothly issuing treasury bonds and has revitalized the government bond secondary market.

The second method Korea uses to reduce funding costs is to promote the secondary market. For this, a competitive trading system based on an electronic transaction system was introduced to the government bond secondary market. The electronic trading system allows transactions to be concluded anonymously by price competition only through screen prices, without going through the search and negotiation of counterparties through brokers.

The third method is the use of the fungible issuance. The fungible issue is the issuance of additional government bonds with the same issuance conditions such as maturity and coupon rates for a certain period to revitalize the government bond market. This system expands the distribution volume of the same item.

Timor-Leste's current condition for T-Bill issuance and policy recommendations

This section summarizes the macroeconomic conditions of Timor-Leste for T-bill issuance. Then, given the conditions, the advisors recommend the types and procedure of the T-bills that are suitable for Timor-Leste. In addition, policy suggestions for minimizing the financing cost are provided.

The most important condition that should be considered is the current state of fiscal deficit. The country has a chronic fiscal deficit, most of which is financed from the oil fund. For example, in 2018, the deficit reached 27% of GDP, and the entire amount was financed by the petroleum fund. However, in 2022, the income of the petroleum fund is declining, and the development of new oil fields is unpredictable, so there is high uncertainty about the petroleum fund's financial condition. Further, in 2021, the inflation rate was 4.5%, and after 2022, the price of imports will rise along with the appreciation of the U.S. dollar, which will further increase the inflation rate. Due to the high inflation rate, the interest rate is also higher than 10%, so when issuing government bonds to domestic financial institutions, high interest rates must be paid.

Next, another important condition for issuance of T-bills is the development of the domestic financial market. When a government issues T-bills, if there are not sufficient demand sources to purchase them, the issuance itself is difficult or, even if the issuance is possible, a high cost must be paid. Unfortunately, this country's financial market is focused only on banks, and the level of development is very low, so there are very few domestic demands for T-bills. In short, the conditions of Timor-Leste can be summarized into low domestic demand for T-bills, weak macroeconomic fundamentals, and high inflation and interest rates.

Considering the conditions and the fact that fiscal revenues and expenditures are made in US dollars, the advisors recommend the issuance of short-term dollar-denominated special bonds. Due to (i) high expected return, (ii) substantial diversification effect, and (iii) no exchange rate risk, significant portfolio investment demand from foreign central banks, international organizations and major global investment banks is expected. In order to implement special bonds with low yield to maturity, it is important to ensure the transparency and liquidity of the bond market. Specific policy tools are proposed in the report.

After comprehensive analysis, the advisors suggest the following technical procedure of issuing T-bills in Timor-Leste: The first step is to establish laws and institutions. For this, it is important to have a firm guideline on how much government debt is allowed in issuing government bonds. The scale of issuance of government bonds should be strictly managed. In general, the government bonds are issued for financing the implementation of national policies and lead to an increase in government debt. Therefore, in order to maintain fiscal soundness, strict regulations are needed to prevent an excessive increase of the national debt. In addition, it is necessary to design how government bonds will be underwritten by investors. It is common to experience a shortage of underwriters of government bonds in the beginning stage of a government bond market. That is because there are not many investors who want to invest in unestablished government bonds. Hence, a country needs to have balanced methods of an underwriting system. In order to establish a government bond market, a forced underwriting system can be utilized because it enables high financing at relatively low level of national credit.

The second step is issuing special-purpose government bonds. In the report, we recommend introducing various types of the government bonds to relieve concerns from the market and

to meet policy purposes. One is inflation-linked bills, in which both the principal and interest payments are linked to inflation, whereas in general T-bills, the principal and interest payments are fixed. Inflation-linked bills are used as a means of hedging risks from future uncertainty, by preventing damage caused by inflation and guaranteeing investors' real purchasing power. Another recommended type of bond is the foreign exchange stabilization bond to secure the foreign currency reserve. In developing countries, many economic variables can frequently fluctuate with speculative foreign exchange inflows and outflows. This situation entails domestic economic risk and foreign exchange risk due to the instability of economic indicators. In order to prevent the hazard posed by volatility in foreign exchange, it is necessary to expand foreign exchange reserves through issuance of foreign exchange stabilization bonds and maintain a stable exchange rate. The last recommended bond that Timor-Leste might consider is a government bond for a special purpose. For example, in Korea, National Housing Bonds are issued for the purpose of financing the national housing project. When people in Korea purchase a newly-built house, it is mandatory to purchase the bonds. These bonds have advantage of not only raising the necessary funds for implementing the project, but also generating positive externalities by improving the aesthetics of the city and providing a high-quality residential environment to the people. This is an example of the type of bond that can finance a specific government project.

The third step is to ensure adequate liquidity in the bond markets for efficient management, which is critical for reducing the funding cost. Various methods, including the abovementioned examples, are addressed in the report.

1

Introduction

1 Introduction

Timor-Leste's current economic structure is deeply dependent on oil revenue, but that might not last long. The dependency is shown by the fact that transfers from the Petroleum Fund (PF) pay for more than 85 percent of the annual state budget. With its heavy dependency on the petroleum fund, alternative sources of funding must be explored to break through the current status quo. According to an independent think tank Lao Hamutuk (LH) in Dili, the capital saved and invested in the PF might last for about ten years or more. This suggests the need to improve efficiency of public finance management. Otherwise, the current practice of using the fund to pay for the majority of the state budget may speed up the depletion of petroleum fund.

As of February 2022, the PF has received USD 24.3 billion in petroleum revenues and USD 3.8 billion in interest and dividends on its investments, and the unrealized value of the investment has increased by USD 4.9 billion. The government has withdrawn USD 13.6 billion from the fund, which paid 87 percent of state spending (Scheiner 2022, p.9). From 2005 to February 2022, oil revenues that go into the PF were USD 24.3 billion and USD 8 billion from the return on investment. In aggregate, it is USD 32.3 billion. However, when the total withdrawals (USD 13.6 billion) are deducted, the net value is less than USD 20 billion. Because of these challenges, the Democratic Republic of Timor-Leste (herein refers to as Timor-Leste Government) needs to proactively diversify its portfolio in order to sustain the national development. One of the portfolio diversifications can be in the area of the securities market.

The Ministry of Finance (MoF) of Timor-Leste Government, through its Treasury office's (strategic plan 2021-2026), has set the sustainable management of government debt as its strategic objective. On the other hand, the Central Bank of Timor-Leste (CBTL, herein refers to as the Central Bank), as the PF manager, has already diversified some 40 percent from the PF in terms of equity. The Ministry of Finance (on behalf of the government) could also separately initiate expansion of the sources of financing from foreign governments.

Issuing Treasury Bills (T-bills) is one possible option. It is a short-term government debt with a maturity of one year or less. The purpose of using T-bills in Timor-Leste is to raise funds for the government to responsibly finance economic development with various stakeholders. Some key stakeholders in the domestic market are banks. Through a series of consultation with several banks (BNU, BRI, Mandiri Bank, BNCTL) in Dili, at least two banks have shown their very strong interest to participate in the purchase of the T-bill.

Given the current economic circumstances of Timor-Leste, the proposal submitted by the Timor-Leste Ministry of Finance (MoF) on "Development of Policy Document for Introduction of Treasury Bill" was selected as PEMNA's first project for the Treasury CoP (T-CoP) Advisory Services Program in 2021. For this project, PEMNA contracted one local consultant and two international experts to carry out the responsibilities of advisors.

In general, T-bills are used to finance a government's fiscal deficit and to raise funds to implement government policies. Further, a government can control liquidity in the money market through the issuance and purchase of T-bills. T-bills also can be used to facilitate the flow of funds to be injected into the financial market.

The primary goal of this project is to assist Timor-Leste's MoF with the development of a policy document for the introduction of T-bills. The policy document, to be presented to the executive for approval, will serve as a milestone document to address the problem inherent in Timor-Leste's oil-dependent economy and build foundations for diversifying non-oil revenues to finance its annual budget.

For this, the advisors submitted the work plan to the Secretariat and Timor-Leste MoF (advisee). The advisors communicated directly with both the local consultant and advisees to gain necessary background information and receive data and research materials for analysis. The advisors and the local consultant presented the draft of the report to the Secretariat and Timor-Leste's MoF three times: the Kick-off workshop, Interim workshop, and Final workshop. The Secretariat and the World Bank reviewed the draft and provided comments, which are reflected in the updated report. The advisors and local consultant then resubmitted the updated version of the report to the Secretariat for publication.

The document is structured as follows: Chapter two describes history of Korean government bond market, functions and types of Korean government bonds, and the legislature structure in Korea; Chapter three explains Korea's current government bond issuance system, repayment, liquidity, market structure, repurchase agreement, and globalization of the bond market; Chapter four evaluates Timor-Leste's current condition for T-bill: the market conditions, legislation structure, and obstacles to government bonds; and Chapter five presents recommendations considering circumstances in Timor-Leste.

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Introduction of Treasury Bills in Timor-Leste

2

Korean Government Bond Market: Development and Experience

2 Korean Government Bond Market: Development and Experience

2.1 History of Korean Government Bond Market Development

2.1.1 Background

Government bonds are used to meet the nation's fiscal needs, as debt instruments with maturities. More specifically, the government controls liquidity in the money market through the issuance and purchase of government bonds. They are used to facilitate the flow of funds to be injected into the financial market and to cover insufficient tax revenue. Also, since the rate of Korean Treasury Bonds (KTBs) usually determines the overall national rate in the market, government bonds affect the overall economy. In Korea, the government bond market has gone through many improvements and massive growth in the decades since the first Nation-Founding government bond was issued in February 1950. And efforts are ongoing to continue to expand the government bond market and stabilize the economy despite the COVID-19 pandemic.

Although the KTB market had been formed, there was no active trading in practice before the Asian financial crisis in 1997. The government's policy stance was passive, focusing on preventing inflation and reducing economic fluctuations, rather than activating the KTB market. The need for a vitalization policy using bonds stood out, owing to decreased tax revenues along with a large-scale economic recession. Accordingly, in May 2000, institutional improvements were carried out, focusing on advancing the government bond market. Since then, the government bond market is growing, both quantitatively and qualitatively, as foreign investment has increased and the Korea-style auction method has been introduced.

2.1.2 Development and Progress of the Korean Government Bond Market

2.1.2.1 Before the 1997 Asian financial Crisis (1949~1997)

The historical root of the KTB market dates back to the time when Nation-Founding government bond was introduced in Korea. After the establishment of the government, Korea issued national bonds, based on the State Bond Act enacted in 1949, to compensate for insufficient tax revenue and to meet fiscal demand (Lee, 2013). The Nation-Founding government bonds had the characteristics of revenue protection bonds, and were the only bonds traded in the Korea bond market until the late 1960s, when other government bonds began to be listed (Jeong, 2004).

Afterwards, the Korea Stock Exchange was established in March 1956 in order to achieve fair price formation and the smooth circulation of securities. The Korea Stock Exchange organized the syndicate as a membership organization jointly invested by the financial group, insurance group, and securities group. However, in 1962 the Securities Exchange Act was amended and it was reorganized into the Korea Stock Exchange, a government-funded institution. Stock Exchange membership was opened to foreigners in 1991 and foreign investment was allowed in 1992, thereby further expanding the Korean government bond market, paving the way for foreign investment.

Until the early 1970s, trading was allowed only on the exchange market, so more than 95% of the scale of distribution of KTBs was traded on the Exchange. The amendment of the Securities Exchange Act in 1976 made it possible to trade bonds in the over-the-counter (OTC) market. Through the OTC market, unorganized transactions proceeded between securities companies and customers. By the 1980s, as the number of issued bonds increased and the number of market participants increased, the center of the secondary market shifted from the exchange market to the OTC market. In 1984, the government promoted the popularization of the KTB market by allowing OTC trading of all bonds. The government also enacted the Regulations on OTC Transactions in an effort to lay the foundation for the advancement of the OTC market.

Before the Asian financial crisis, the Korean government bond market was in a stage where it neither grew quantitatively nor qualitatively (Kwark and Rhee, 2004). In 1996, because of the policy framework of prioritizing fiscal soundness, the annual issuance of government bonds for financing was KRW 4 trillion, which was only 1% of the gross domestic product (GDP). In addition, the underlying structure, including the issuance market, could not develop while the KTBs were forcibly allocated at an issuance rate below the distribution rate (Kwark and Rhee, 2004).

After corporate bonds were listed in 1972, the corporate bond market rapidly expanded, while the government bond market reached a plateau (Lee, 2013). One problem was dispersed demand because too many government bonds were individually managed. As a result, 3-year bank-guaranteed corporate bonds with abundant liquidity acted as the benchmark in the bond market. At the end of 1996, while corporate bonds accounted for about 42% of the total issuance balance, the outstanding balance of government bonds was only 14.5% of the total bonds and 4.7% of the trading volume of the total bonds, so the role of government bonds was not prominent. In other words, there was a problem that the government bond market did not function properly under an inelastic interest rate structure (Lee, 2013).

In efforts to resolve this problem, the Korean government completely revised the State Bond Act at the end of 1993 and merged myriad bonds into one. Specifically, for more efficient management, all provisions for the legal ground of issuance of government bonds in individual laws were deleted. In addition, the Public Debt Management Fund was newly established, and in 1994, Farm Land bond, Agricultural Development Fund bond, and Railway bond were integrated into the Public Debt Management Fund bond.

Not all the changes were successful. In 1994, in order to improve the practice of forced underwriting, a syndicate of around 100 financial institutions was formed and an auction was introduced for issuance. However, due to the range of predetermined rates and the forced distribution of unsuccessful bids, the market principle was still violated in the bond market (Yoon and Kim, 2010). Moreover, a registration issuance system that guarantees the legal rights of creditors through electronic registration began to be applied. However, the details of creditors' rights were registered at the electronic system without actual issuance of real securities. As such, the government tried to solidify the foundation of the government bond market through various institutional improvements, but they were not fundamental changes.

2.1.2.2 After the Asian Financial Crisis (1998~2008)

At the end of Asian financial crisis in 1997, the government actively pursued policies to improve the infrastructure of the government bond market. It was imperative to prepare a huge amount of financing to overcome the Asian financial crisis. In addition, the bad debts of financial institutions increased along with corporate bankruptcies, and corporate bonds could no longer be guaranteed. Therefore, the role of government bonds as the benchmark was emphasized. The government extended the issuance of KTBs from KRW 2.1 trillion in 1997 to KRW 12.5 trillion in 1998 to defuse the financial predicament and revitalize domestic demand for KTBs. At the same time, various modernization policies were promoted to efficiently manage the expanded government bond market and strengthen the secondary market for government bonds.

In 1998, Public Debt Management Fund bonds were formulated to KTBs, and diverse government bonds such as Consolidated Grain Management Fund bond and Foreign Exchange Stabilization bond were combined into KTBs by stages. Also, in 1999, the issuance of government bonds was regularized, KTS (KRX trading system for KTBs) was opened at the Korea Stock Exchange (now the Korea Exchange), and the PD (Primary Dealer) system for KTBs was introduced. The PD system gives Primary Dealers (PDs) the exclusive right to participate in the primary KTB market and the role as market-makers in the secondary market. These policies were fundamentally different from previous partial KTBs development policies, and efficiency was greatly improved by the modernization of the KTBs (Lee, 2013).

The government announced the "Plan for the Advancement of the Bond Market Structure" for the development of the KTBs. In 2000, the fungible issue system was introduced to improve liquidity of KTBs. This is a system in which bonds issued within a certain period are treated as a single one with the same issuance conditions, such as maturity and coupon rates. Through the fungible issue system, the government has been able to secure liquidity in the government bond market and ensure the continuity of interest rates.

Table 2-1 Fungible issue system in Korea

Maturity	Number of annual new issuance	Month	Fungible issue term
2-year	Four times a year	March, June, September, December	Three months (March to May, June to August, September to November, December to February of the next year)
3-year	Twice a year	June, December	Six months (June to November, December to May of the next year)
5-year		March, September	Six months (March to August, September to February of the next year)
10-year		June, December	Six months (June to November, December to May of the next year)
20-year	Once a year	September	One year (September to August of the next year)
30-year		March	One year (March to February of the next year)
50-year	Every other year	September	Two years (September to August of the following two years)
Inflaion-linked		June	Two years (June to May of the following two years)

Source: Ministry of Strategy and Finance (2020) partially modified

Moreover, in 2002, the Exchange, in which government bonds traded, was stimulated. By regulation, the benchmark must be determined in the Exchange, so that the significance of the Exchange was reinforced. Furthermore, the government could monitor and control trades by the laws in the Exchange. Interest rates in the KTB market were secured with transparency and competitiveness (Lee, 2013).

To prolong the maturity of KTBs, the issuance of 10-year KTBs was added in 2000, and 20-year KTBs were newly issued in 2006. Also, in 2006, the introduction of the principal and interest separation system (STRIPS) provided various maturities and yields, contributing to enhancing liquidity in the market. Meanwhile, the first issuance of inflation-linked KTBs in March 2007 provided a means to hedge the risk of price fluctuations by linking principal and interest to inflation.

As the need to expand foreign exchange reserves increased during the Asian financial crisis, practical measures were taken to open up investment to foreigners. For example, in May 1998, the limit on foreign investment in listed bonds was abolished and foreign investment in all bonds was allowed. In 2007, by increasing the limit of the KRW loans, the burden of reporting for foreign investors in KTBs was mitigated. In addition, the regulations were adjusted to enable them to purchase KRW at all times.

The government had suffered a foreign currency shortage due to the speculative inflow and outflow of foreign currency during the Asian financial crisis. As a countermeasure against this, the 'foreign exchange equalization fund' was established to reduce exchange rate fluctuations and to maintain the KRW value stably. Also, to finance these funds, the government issued bonds at the

foreign-exchange equilibrium rate (Kim, Kim and Rowe, 2013).

Since the Asian financial crisis, KTBs became the center of the bond market. Specifically, compared with prior to the Asian financial crisis, by 2008, the outstanding balance of KTBs had increased about 5 times, and the transaction volume also increased more than 10 times. In terms of the benchmark role of the KTBs in the financial market, the government was able to finance necessary funds in a timely manner and at low cost. This also lay the foundation for the development of the derivative financial market (Kwark and Rhee, 2004).

2.1.2.3 After the global financial crisis (2009~2019)

With the outset of the global financial crisis in 2008, a large amount of financing was required to overcome the crisis. As a result, the parliament approved an extra budget and raised funds to meet the expanding demand for KTBs. Meanwhile, the demand for investment in treasury bonds increased due to the preference for safe assets in the financial market (Ministry of Economy and Finance, 2009), and in 2009, compared to the previous year, the issuance of treasury bonds increased to KRW 85 trillion, up 63% from KRW 52.1 trillion.

In 2009, the government implemented the "Measures for efficient KTB issuance'. In order to keep the KTB market in stable condition, the exchange of treasury bonds was conducted to maintain a monthly equal issuance stance and expand the demand base. In addition, the right to acquire non-competitive bonds was expanded to provide incentives for acquisition and distribution for PDs. Likewise, in June 2009, a differential pricing bid was introduced to form an appropriate interest rate, reducing the burden of PDs' acquisition.

In June 2009, the government launched the 'Differential pricing auction', which mixed a conventional auction and a Dutch auction, which is a method that uses an existing interest rate determination. Differential pricing action is a method in which bid rates below the highest one are grouped at regular intervals, and the highest interest rate for each group is applied to the successful bidders as the winning bid rate.

Under Dutch auction, the winning bid rate is applied equally regardless of what the bid rate is , so the incentive for the PDs to present an appropriate bid rate is low. As a result, the winning bid rate is often the same as or lower than the distribution rate, which reduces the incentive to participate in the issuance market, resulting in a decrease in the bid rate. Therefore, the bid rate for KTBs in early 2009 was around 100%, which was quite low, even compared to other countries.

Table 2-2 Comparison of cut-off yield among different auction methods

PD	Bidding conditions	Cut-off yield		
		Dutch	Conventional	Differential-Price
A	2.955%	All 3.055%	2.955%	2.955% *(Grouping 2.955~2.910%)*
B	3.000%		3.000%	3.005% *(Grouping 3.005~2.960%)*
C	3.005%		3.005%	
D	3.020%		3.020%	3.055% *(Grouping 3.055~3.010%)*
E	3.055%		3.055%	

Source: Ministry of Strategy and Finance (2020) partially modified

To spread out the repayment burden of KTBs, the government successfully issued 20-year KTBs in 2006, 30-year KTBs in 2012, and 50-year KTBs in 2016. These long-term government bonds not only contribute to stable fiscal policy in preparation for long-term fiscal demand, but also are useful as a means of financing long-term national projects because they do not require frequent repayment and refinancing as opposed to short-term KTBs (Song, 2012a). Thus, due to increasing fiscal demand for social overhead capital (SOC) projects, welfare in preparation for an aging population and asset management, an increase in the maturity of government bonds is necessary (Song, 2012b). The fungible issue period of 20-year and 30-year KTBs was set for one year. From a mid-to long-term policy perspective, the scale of the 20-year and 30-year KTBs is expanding.

Foreign investment in the Korean bond market was insignificant until the first half of 2007, and it seemed to stagnate somewhat during the global financial crisis. However, it escalated sharply after May 2009. At the end of 2013, the balance of domestic bonds held by foreigners was up to KRW 94.7 trillion, even though it had been only KRW 4.2 trillion—about 2.0% of foreign holdings of the listed balance of KTBs—in 2006 (Kim, Kim and Rowe, 2013).

The proportion of foreign holdings, which exceeded 6% before the global financial crisis, temporarily dropped to less than 4% during the global financial crisis (Woo, 2017). The number of countries with investors who participated in the Korean bond market grew from 19 in 2006 to 44 in 2020 due to the government's active promotion. For example, the development of the bond market infrastructure and the enhancement of the marketability of KTBs were promoted. The quality of the foreign investment has also advanced as international organizations and global funds participated. The FIMS (foreign investment management system) was developed, which makes it efficient to identify the trend of foreign investment funds promptly, responding to market fluctuations caused by the inflow and outflow.

2.1.2.4 After the COVID-19 pandemic

The issuance of KTBs in 2020 was KRW 174.5 trillion up to the limit. Supplementary budgets were organized to overcome the COVID-19 crisis, and the issuance of government bonds increased by

a KRW 72.8 trillion from a KRW 101.7 trillion in 2019. A continuous growth of the issuance of KTBs is expected because of the delay of the economic recovery after the COVID-19 outbreak and a slowdown, due to low fertility and aging population.

In terms of moderating the refinancing risk, buybacks and exchanges are also directly promoted to deal with the concentration of KTBs maturities in a specific year. On the other hand, a monthly issuance policy is used to increase market predictability and stability by balancing supply and demand in time.

The government announced the "Measures to enhance the capacity of the KTB market" in October 2020 for the purpose of providing stable funding based on abundant liquidity. Specifically, the following plans were made to minimize the impact of KTB market overruns; reorganizing the lineup by promoting the issuance of 2-year KTBs, establishing a new non-competitive underwriting system, and reorganizing the bidding schedule to meet market demand.

The government temporarily established the non-competitive underwriting of primary dealers to strengthen their capacity. Additionally, by amending the Regulations on KTB issuance and PD operation, it supported PDs ability to focus more on the underwriting of KTBs. Accordingly, efforts are being devised to implement necessary policies for promoting the stabilization of the financial and government bond markets despite the COVID-19 crisis.

2.2 Functions and types of government bonds

2.2.1 Introduction

The primary function of government bonds is to finance the government's fiscal deficit and to raise funds to implement government policies. In other words, bonds can be regarded as instruments of borrowing for financing. In general, bonds are divided into government bonds and corporate bonds. The former is issued by the government, especially the central government or local governments. In the following, we will examine the types and roles of government bonds, excluding the latter, corporate bonds.

Bonds are calculated monthly or periodically until maturity. Classified by the interest method, there are compound interest bonds, simple interest bonds, coupon bonds, and discount bonds. In general, coupon bonds are most used in the KTBs market.

As another classification criterion, government bonds can be classified into government bonds, local bonds, and special bonds by issuer. Among them, government bonds are also classified based on their characteristics. Currently, four types of bonds are issued: Korea Treasury Bonds (KTBs), Treasury Bills (T-bills), National Housing Bonds (NHBs) Type 1, and Foreign Exchange

Stabilization Fund Bonds (FX SFBs).

2.2.2 Classification of bonds by interest payment method

2.2.2.1 Compound interest bonds

Compound interest bonds are calculated at maturity by both on the original sum of money and on interest which has formerly been added to the sum. In other words, compound interest bonds refer to bonds in which the principal and interest are paid together at maturity after reinvesting by adding interest to the principal, without paying interest in the middle.

There is no risk of reinvestment since the principal and interest at maturity are fixed when purchasing bonds. National Housing Bond is one type of compound interest bonds.

2.2.2.2 Simple interest bonds

Simple interest bonds refer to a method of applying coupon interest rate to the par amount. An interest rate is applied only to the principal, and interest and principal are paid on the maturity date.

Compound interest bonds are usually more advantageous than simple interest bonds to investors. This is because compound interest is added to the principal in each period, and interest is added to the sum of principal and all accumulated interest. Compound interest bonds can be efficient to investors compared to simple interest bonds when the same principal and interest rate are set.

2.2.2.3 Discount bonds (non-coupon bonds)

Discount bonds are also called non-coupon bonds because they pay no interest at all. On the other hand, the issuance price is lower than the par price (redemption price) by deducting the interest equivalent at the time of issuance.

2.2.2.4 Coupon bonds

Coupon bonds pay interest payments periodically, as much as the coupon rate. Contrasted with the above methods in which interest and principal are paid together at maturity, coupon bonds have the advantage of paying periodic interest. As the most common form of government bonds, the interest payment cycle is most popular in 3-month. And occasionally the 6-month unit is issued in KTBs with maturities of more than 5-years KTBs.

2.2.3 Classification of bonds by the purpose

2.2.3.1 About the benchmark

Since the foundation of the KTBs market in February 1950, government bonds with various purposes and characteristics have been issued. The current government bonds are classified according to their characteristics as four types as mentioned above. Among them, KTBs serve as a key means of raising national finances and as a benchmark in the domestic bond market.

A benchmark refers to bonds that serve as a basis for setting interest rates when various bonds are issued. In Korea, the distribution rate of 10-year KTBs has a role as a benchmark. In other words, when issuing corporate bonds or bank debentures, the interest rate is determined by adding a spread to the distribution rates of KTBs.

On the supply side, in order for government bonds to play a benchmark role, new government bonds must be steadily issued to secure liquidity (Kwark and Rhee, 2004). Therefore, it is necessary to make appropriate adjustments by the government not only in the issuance market, but also in the secondary market. Since the benchmark rate serves not only for being a standard in setting interest rates for other bonds, but also for proving the public confidence of the country, efforts to consistently lower the additional interest rate are required.

2.2.3.2 Korea Treasury Bonds (KTBs)

These bonds are issued by the Public Fund Management Fund. The bonds are used by the government to secure and supply funds necessary for public purposes. They are also called deficit government bonds because they are issued to finance budget deficits when internal revenue is not enough to cover the annual expenditure of the government. KTBs have their legal ground in the State Bond Act and the principal and interest will be paid back unless the country goes bankrupt. Therefore, compared to corporate bonds and government bonds issued by other institutions, the risk is lower, and so is the yield.

KTBs are issued with seven different maturities: 2, 3, 5, 10, 20, 30 and 50 years. In particular, in relation to long-term KTBs, 50-year KTBs were introduced after the global financial crisis in 2008. They support the long-term policy management of the country, stabilize financing, and distribute the burden of the repayment.

On the demand side, the role of long-term government bonds for nurturing the capital market is emerging as long-term institutional investors, such as insurance companies, increase the size of their own money management (Kwark and Rhee, 2004). In the case of such long-term KTBs (20-year, 30-year, and 50-year), the demand for long-term investment assets for retirement is increasing due to the aging of Korean society and the extension of life expectancy. (Hwang, 2016)

Inflation-linked Korea Treasury Bond (KTBi) refers to bonds whose principal is not fixed and

fluctuates according to the consumer price index (CPI). Inflation-linked bonds originated in 1997 in the United States, where they are denoted as Treasury Inflation Protected Securities (TIPS).

When inflation occurs, the real value of the bond's principal also rises, so it is advantageous to the buyer. However, in a situation where deflation is expected in the future, the investment value of inflation bonds may decrease, which may be disadvantageous to bond purchasers.

In Korea, KTBi was first introduced in 2008, and the real value of investment is guaranteed because interest is calculated after the principal is recalculated by reflecting the consumer price index (CPI). In Korea, the maturity of KTBi is a tenyears. Linking bonds to consumer prices eliminates the risk of inflation. In February 2021, the method of issuance of inflation bonds was changed from non-competitive acquisition to competitive bidding, so that participation in the market could be widened.

Treasury bills are issued by the State or local governments. A purpose of the Treasury bills is to secure financial income. T-bills are based on the Management of The National Funds Act and are stipulated to have a maturity of less than one year, but in practice, the redemption is made for a short period of less than three months.

2.2.3.3 National Housing Bonds (NHBs) type 1

NHBs are based on the Housing and Urban Fund Act, to raise funds for national housing construction. Compared to other government bonds that are issued through competitive bidding, the NHBs are compulsory issuance bonds. The purchase of these bonds is mandatory when buying a house. In the past, type 1, 2, or 3 had been issued, depending on the obligatory acquirers and the reasons for the acquisition, but now only type 1 is issued. The interest rate of the NHB type 1 must be determined in consultation by the Minister of Strategy and Finance and the Minister of Land, Infrastructure and Transport, considering the interest rates of KTBs and the account balance of the National Housing Fund. Redemption is made on the fifth year from the issuance date, and interest is calculated every year. From August 8, 2019, an annual interest rate of 1.00% is being paid.

The issue date is the last day of the month, in which the bond is newly created. Since August 16, 2019, when issuing bonds, the bonds are issued by electronic registration with the electronic registration authority (Korea Securities Depository) without issuing paper bonds. Accordingly, bond certificates and purchase certificates are not issued, but only receipts handed over. NHBs can be sold as soon as issued at the window of a bank branch or deposited into a securities company's account.

When purchasing National Housing Bonds, the bonds can be sold at the same time as the issuance at a bank window or held through a brokerage account. In the case of an immediate sale, only the gap between the purchase price and the sale price is borne. For investors wishing to hold bonds, NHBs can be deposited in the brokerage account or a trust account opened at a

bank window.

The purchase of National Housing Bonds is mandatory for the following: any person who obtains a license, permission, or authorization to construct houses from the State or a local government, any person who files an application for registry or registration with the State or a local government, a person who concludes a contract for a construction project with the State, a local government, or a public institution, prescribed by Presidential Decree, and any person who is supplied with housing constructed and supplied pursuant to the Housing Act.

However, there are some exceptions to mandatory purchase of housing bonds, such as State institutions, local governments, government-invested institutions, local public corporations under the Local Public Enterprise Act, and the Korea Asset Management Corporation.

2.2.3.4 Foreign Exchange Stabilization Bonds (FX SFBs)

FX SFBs are issued in foreign currency terms, such as dollars, by the central government. The main purpose of FX SFBs is to stabilize the exchange rate and to manage foreign exchange reserves (Kim, Kim and Rowe, 2013), rather than to secure finances. FX SFBs are issued as foreign-currency denominated bonds in the overseas bond market.

The Exchange Equalization Fund was created by the government to intervene in the foreign exchange market, and to be in charge of foreign exchange directly or indirectly. Particularly, it can protect against fluctuations caused by speculative foreign exchange inflows and outflows. In most countries, it is implemented in a similar form: the Exchange Stabilization Fund in the US, the Exchange Equalization Fund in the UK, and the Exchange Equalization Fund in South Korea.

If there is an overflow of foreign currency in the market, the domestic currency appreciates in response. To control the appreciation, the FX SFBs are issued to secure the KRW and supply it to the market, thereby stabilizing the value of the KRW. Conversely, if there is a lack of foreign currency in the market, foreign currency could be ensured by issuing FX SFBs, thereby maintaining a stable exchange rate. FX SFBs are used to finance the foreign exchange equalization fund. In addition, FX SFBs work as a reference for issuance of foreign currency bonds by domestic institutions and are issued periodically.

A premium or a spread in the market reflects sovereign economic indicators including simple market supply and demand conditions. A spread, mentioned as the representative index, shows the risks in a financial market, indicating the sovereign credit rating (Cho and Choi, 2011). In general, the protection buyer who wants to avoid credit risk pays the premium through paying the price of risk. As the same, the buyer takes a lower interest rate for buying US Treasury bonds as risk-free bonds instead of buying KTBs as risky bonds (Cho and Choi, 2011). Therefore, foreign exchange stabilization bonds are issued by adding FX SFBs spread to the interest rate of US Treasury bonds.

In 2020, FX SFBs were issued worth KRW 1.7 billion. The interest rate on foreign exchange stabilization bonds was at an all-time low. To be specific, the 700-million-euro bond with a 5-year maturity was issued at -0.059%, and the 625-million-dollar bond with the 10-year maturity was issued at 1.198%. In particular, the rate of Euro-denominated foreign exchange stabilization bonds was negative for the first time among non-European government bonds, and 10-year dollar-denominated foreign exchange stabilization bonds were also at record lows in both issuance and spread rates. Thus, in the Oct. 2021, Euro-denominated foreign exchange stabilization bonds were issued at an all-time low spread of 13bp (1bp = 0.01%).

By replenishing the foreign exchange servers, the government has acquired a capacity to counteract the volatility of foreign markets. In addition, the issuance of euro-denominated foreign exchange stabilization bonds at negative interest rates is a great harvest because there is no interest cost.

2.2.4 Other government bonds

Local bonds include Seoul Metropolitan Rapid Transit bonds and regional development bonds, which are similar to government bonds, but differ in that the issuer is the local government.

Special bonds are divided into non-financial special bonds and financial special bonds. Non-financial special bonds include KEPCO (Korean electric power corporation) bonds and KOGAS (Korea Gas Corporation) bonds. In contrast, financial special bonds include Korea Development Bank bonds and currency stability bonds (monetary stability securities).

Monetary stabilization securities are securities issued by the Bank of Korea to control the money supply in the market. Monetary stability securities are issued in accordance with the Monetary Safety Securities Act of the Bank of Korea, and the issuance limit is determined by the Monetary Policy Committee within 50% of the total currency. All 10 types are issued with maturities ranging from 14 days to 2 years, and considering that 2-year coupon bonds are also issued, a total of 11 types are issued.

According to Park (2020), at the beginning of the government bond market, the policy that adjusted the money supply through treasury securities was insufficient. The amount of the issuance of KTBs was not enough to lower interest rates. Likewise, legal restrictions on making the balance issued at the end of each year to zero, made it useless to manipulate the open market. On the contrary, in order that interest costs are reduced, Monetary Stabilization Bonds (with rates are lower than that of 5-year KTBs) could be used, which r. It is a significant method in government financial management.

2.3 Legislation structure

2.3.1 Introduction: basis for issuance of government bonds

2.3.1.1 Legal basis

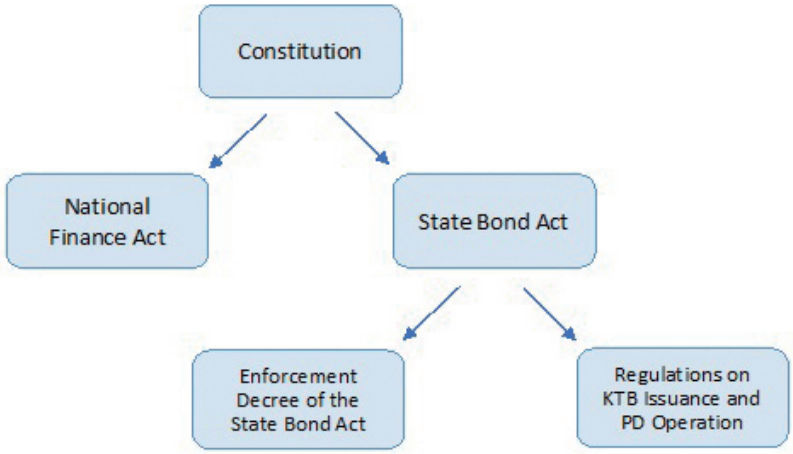
KTBs are based on the Constitution, the National Finance Act, and the State Bond Act. Government bonds are issued through parliamentary approval by the National Assembly. All of the KTBs must be approved by the National Assembly, as the total issuance regulated in articles 5 and 6 of the State Bond Act. According to the recent amendment, in the suggestion stage, a resolution will be made with a net issuance limit, not the total issuance amount by the National Finance Act.

Since the issuance scale of KTBs is closely related to the fiscal sustainability and the sovereign credit rating (Yim, 2019), the issuance and distribution of government bonds should be operated with a sound legal basis. Article 58 in the Constitution says that when the Executive plans to issue national bonds or to conclude contracts that may incur financial obligations on the State outside the budget, it shall have the prior concurrence of the National Assembly. Article 18 in the National Finance Act says that the financial resources for State expenditure shall be the revenues other than State bonds or loan funds borrowed. It also states that the funds raised through State bonds and loan funds borrowed may, if unavoidable, be appropriated for expenditure within the scope of the amount approved by a resolution of the National Assembly. Article 20 of the National Finance Act further says that when necessary to replace existing State bonds with new State bonds, the government may issue State bonds in excess of the ceilings and that in such cases, the government shall report the fact to the National Assembly in advance.

The State Bond Act is a general law on the issuance and redemption of government bonds and stipulates basic matters regarding government bonds. Article 3 of the State Bond Act strictly stipulates that government bonds are issued by the Minister of Strategy, if there are special provisions in other laws, the government bonds could be issued following the others.

As for details of the KTBs' regulations, the Regulations on KTB issuance and PD operation, by the Ministry of Economy and Finance, stipulates such as a bidding method, a PD system, buyback and exchange of the KTBs. Likewise, the Bank of Korea has Guidelines for Government Bond-related Tasks for the issuance and redemption of the KTBs.

Figure 2-1 Legal structure for issuance of government bonds



2.3.1.2 Housing and urban fund act for national housing bonds

National Housing Bonds are issued under the Housing and Urban Fund Act in order to procure funds necessary for the national housing project. Unlike other KTBs, NHBs are issued via a mandatory purchase method, the Housing and Urban Fund Act is applied as a special law, and the State Bond Act is applied as a general law according to Article 7 (3) of the Housing and Urban Fund Act.

According to Article 7 (1) of the Housing and Urban Fund Act, the government may issue National Housing Bonds at the expense of the fund in order to procure funds necessary for the national housing project. The fund raised through the issuance of NHBs is called the National Housing Fund. Also, pursuant to paragraph (2), national housing bonds are issued by the Minister of Strategy and Finance, upon a request of the Minister of Land, Infrastructure and Transport.

NHBs are issued by the compulsory issuance method, and each clause of Article 8 of the Act stipulates the subject of the obligation to purchase National Housing Bonds. However, exceptions are provided in the proviso to Article 8 (1) of the Enforcement Decree of the Housing and Urban Fund Act.

2.3.1.3 Management of the national funds act for treasury bills

Treasury bills are issued by the State or local governments for the purpose of financial income. T-bills had been based on the Treasury Bond Act, put into force in 1967. After the Treasury Bond Act was abolished on December 31, 2002, treasury bills have been regulated under the Management of The National Funds Act. More specifically, according to Article 33 Paragraph 1 of the

Management of The National Funds Act, it is stipulated that the issuance is issued by the Minister of Strategy and Finance. However, the maturity of the treasury bills is stipulated to be within one year, but it is actually made in a short period of three months or less.

2.3.2 Other laws and institutions

2.3.2.1 Listing

Article 3 of the State Bond Act stipulates that State bonds shall be governed by this Act, except as otherwise expressly provided for in any other Act. There are no special provisions in the State Bond Act for listings, so the State Bond Act follows the Financial Investment Services and Capital Markets Act". With regard to other statutes and rules, the listing of KTBs proceeds according to the regulations enacted by the Korea Exchange. The Korea Exchange arranges the "KOSPI listing regulations" for the listing of the bonds, including KTBs.

2.3.2.2 Issuance

All of the KTBs must be approved by the National Assembly, regulated in Article 5 and 6 of the State Bond Act. In particular, the Korea government operates the fungible issue system, which is stipulated in Article 7.

In terms of Article 5, necessary matters concerning the detailed terms, scope, etc. of issuing State bonds, other than those provided in paragraphs (1) through (5), shall be determined by the Minister of Strategy and Finance. According to this, the Regulations on KTB Issuance and PD Operation applies for the smooth issuance of KTBs, the creation of a transparent market, and the management of PDs. The system stipulates the issue of KTBs, the coupon rate and base rate, the date of bidding, bidding participants, and bidding by the general public. In addition, in relation to professional dealers, the designation and duties of PPD (Preliminary Primary Dealer) & PD are stipulated, and supervisory regulations are established.

However, an electronic registration system developed by Korea Securities Depository, which operates for bonds without issuing paper securities, is grounded on the Act on Electronic Registration of Stocks, Bonds, etc.

The securities standard code is a number designed to uniquely identify individual financial products, and is commonly referred to abroad as the International Securities Identification Number (ISIN). The securities standard code is issued and managed by one institution per country, and the Korea Exchange is registered with the ANNA (Association of National Numbering Agencies) as the only securities standard code issuance institution in Korea.

This system was introduced to facilitate the convenience of trading, depositing, and management in accordance with the rapid increase in international securities transactions and the computerization of the financial transaction process. Securities standard codes are issued by

exchanges, depository institutions, and central banks around the world. The system is in control of the Standard Code Management Standard for Securities and Related Financial Products. In the case of government bonds, the first digit of the attribute code is "1," representing the government bond.

2.3.2.3 Distribution

Regarding the distribution of KTBs, the distribution is stipulated in the State Bond Act and its enforcement regulations. Specifically, it includes the PD's obligation to create a market, etc. KTBs are also traded in the OTC market. The Regulations on Disclosure of OTC Transactions cover the fair trade in the OTC market. Accordingly, in the OTC market, the transaction details are reported to the Korea Financial Investment Association (KOFIA) within 15 minutes of the signing of the contract: 15-minute rule. In addition, the Regulations on KTB Issuance and PD Operation were prepared for the trades in the derivative market such as Repo market and STRIPS market.

2.3.2.4 Redemption

The principal is repaid at the time of maturity of the bond. Buybacks and conversion offers are alternate means for the redemption of KTBs. Through a buyback, the Ministry of Economy and Finance buys back immature KTBs to spread out maturities throughout the year and each quarter. Conversion offers means exchanging off-the-run bonds against on-the-run bonds. These procedures are stated clearly in Articles 11 and 13 of the "State Bond Act", and the specific contents are settled in the Regulations on KTB Issuance and PD Operation and the Enforcement Decree of The State Bond Act. The State Bond Act, Article 11 (Repayment of Principal and Payment of Interest on State Bonds) states that necessary matters concerning the detailed method, etc. for repaying principal and for paying interest on State bonds under paragraph (1) shall be prescribed by Presidential Decree. The State Bond Act, Article 13 (Purchase and Exchange of State Bonds before Maturity) says that when necessary for maturity diversification, liquidity adjustment of State bonds, the Minister of Strategy and Finance may purchase State bonds prior to maturity and that simultaneously with the purchase of State bonds, the Minister of Strategy and Finance may issue new State bonds and offer them in exchange for the purchased bonds after adjusting the prices.

Table 2-3 Development history of the KTB market

DEC.1949	Enact and enforce of the State Bond Act Introduced of Nation-Founding government bond as the first issuance
NOV.1961	Issued of monetary stabilization securities to control the money supply
1963	Issued of corporate bonds
1974	Issuance of national housing bonds
SEP.1998	Changed the name of Public debt management Fund bonds to KTB
JAN.1999	Regularized KTB issuance
MAR.1999	Established KRX trading system for government securities at the Korea Exchange (KRX KTB)
JUL.1999	Introduced primary dealers (PDs) system
MAY.2000	Introduced fungible issuance system
OCT.2000	Issued 10-year KTB
MAR.2003	Lengthened fungible issue period from three to six months
JUN.2004	Established the Regulations on KTB issuance and PD operation
JAN.2006	Issued 20-year KTB
MAR.2006	Introduced STRIPS
MAR.2007	Issued KTBi
JUN.2009	Changed bidding system (Dutch auction → Differential pricing auction)
APR.2011	Introduced preliminary PDs(PPDs) and implemented PD/PPD promotion & demotion system
SEP.2012	Issued 30-year KTB
JAN.2013	Announced measures to extend a maturity of the benchmark bond (5-year → 10-year)
OCT.2016	Issued 50-year KTB
OCT.2020	Announced the measures to enhance the capacity of the Treasury bond market

Source: Ministry of Strategy and Finance (2020) partially modified

3

Korean Government Bond Markets: Structure and Management

3 Korean Government Bond Markets: Structure and Management

3.1 Issuance of Government Bonds

3.1.1 Competitive Bidding for Treasury Bonds

There are three issuance methods of government bonds in Korea: bid issuance, compulsory issuance, and deliver issuance.

(a) Bid issuance: Competitive bidding is made and issued to institutions designated by the Minister of Economy and Finance and is applied when issuing Treasury bonds and financial securities.

(b) Compulsory issuance: A method that mandates the purchase of bonds in the event of real estate registration and various licenses. Class I National Housing Bonds are examples of this method.

(c) Deliver issuance: The government issues government bonds for paying in substitutes for the occurrence of legal debt without the purpose of financing. Instead of paying cash, the government issues government bonds with a unilateral intention. Compensation bonds are issued by deliver issuance.

The government bonds' issuance method can be also categorized into in-kind issuance and registration issuance, according to whether or not real securities are issued.

(a) In-kind issuance: Real securities are issued to the acquirer when issuing government bonds. Compensation bonds are an example of this.

(b) Registration issuance: Instead of issuing real securities, the bond is issued by registering them in the Government Bond Register. Both current Treasury bonds and financial securities are issued by the registration issuance method.

Nominal Treasury bonds are regularly bid[1] for primary dealers (PD) and preliminary primary dealers (PPD) through the electronic bidding method using the Bank of Korea Financial Network (BOK-Wire).

(a) If bidding through the Bank of Korea Financial Network (BOK-Wire) is unavailable, bidding participants are convened under the presence of the audit office prosecutor to conduct written bidding.

(b) To alleviate the decline of liquidity caused by the replacement of indicator bonds in the early stages of new items, a pre-sales system, which is the issuance of new indicator items and indicator items, was implemented in March 2015. Pre-sales take place two to three months before the new issue.

The bidding limit for each participating institution is less than 30% of the total amount scheduled for issuance to the Treasury bond dealers (PD) and less than 15% of the total amount to the preliminary primary dealers (PPD). Each institution can bid at multiple interest rates up to 7, with a minimum bid of KRW 1 billion. Any amount greater than that is increased by an integer multiple of KRW 1 billion.

Table 3-1 Bid date and issuance date for each maturity of Treasury bonds

	3 year	5 year	10 year	20 year	30 year
Bid date	First Monday	Second Monday	Third Monday	Fourth Monday	First Tuesday
Issue date of new item	June 10 December 10	March 10, September 10	June 10, December 10	September 10	March 10

The bidding time is from 10:40AM to 11:00AM (9:40AM-10:00AM for pre-sales)
After the pilot issuance in October 2016, additional issuance of 50-year bonds is determined irregularly.
Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

The winning bid shall be decided sequentially from the order in which the bidding rate is low to the scheduled issuance amount, but if the bid amount exceeds the allocation amount at the same interest rate, the total bid shall be made. However, if the amount of bidding exceeds the expected issuance amount due to large-scale bidding, etc., the total bid will not be carried out in consideration of the government bond issuance plan and will be partially successful.[2]

1 Treasury bonds were not issued by market principles before the currency crisis but were issued by allocating them to syndicate at government-set interest rates, but competitive bidding was made for primary dealers (PD) and preliminary primary dealers (PPD) from July 1999 and May 2011, respectively.

2 It is allocated in units of KRW 1 billion based on the partial bid rate (the ratio allocated in proportion to the amount bid at the same interest rate), but starting with the winning bidder with a large remaining allocation of less than KRW 1 billion, the amount is allocated in units of KRW 1 billion, and if the remaining allocation amount is the same, the amount is allocated in order of the bidding number.

The winning bid rate is divided into 3 basis points (bp) (3-year and 5-year) or 4bp (10-year, 20-year, and 30-year) intervals, and the Differential Pricing Auction Method applies the highest winning rate for each group, is used. If the highest bidding rate is 5.050% for 3-year bonds bidding, the bidding rate will be grouped into (5.050-5.025%), (5.020-4.995%), and (4.990-4.965%), and the winning rate will be applied to each group's highest rates of 5.050%, 5.020%, and 4.990%.

The winning bid price determination method was the conventional auction until July 2000 and the Dutch auction from August 2000, and from September 2009, the differential pricing auction that combines the advantages of the conventional auction and the Dutch auction is applied.

Table 3-2 Trends of changes in the differential bid rate interval

	3 year, 5 year	10 year	20 year, 30 year
Before September 2009	Single interest rate	Single interest rate	Single interest rate
2009. 09 ~ 2013. 05	0.03%p	0.03%p	0.03%p
2013. 06 ~ 2013. 06	0.02%p	0.02%p	0.02%p
2013. 07 ~ 2013. 12	0.02%p	0.03%p	0.03%p
2014. 01 ~ 2014. 12	0.02%p	0.02%p	0.03%p
2015. 01 ~ (Pre-sales 2015. 07 ~)	0.02%p (0.03%p)	0.03%p (0.04%p)	0.03%p (0.04%p)
2017. 04 ~ 2020.12	0.03%p	0.04%p	0.04%p
2021.01 ~	0.05%p	0.05%p	0.05%p

The Dutch auction system has been applied to 50-year Treasury bonds since 2016. 10.
Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

Reference **The background of introducing the differential pricing auction**

Conventional auction, applied since July 1999, seems advantageous to issuers because different prices can be applied to each successful bidder. However, if bidders offer interest rates lower than the weighted average bid rate only to win, there is a possibility that bidders will lose relatively (winner's curse), so they tend to reduce the size of the bid or offer a bid as high as possible, rather than the interest rate they think is appropriate. Therefore, as a result, the interest rate on issuing government bonds rises, raising the possibility of losses from the government's point of view. Accordingly, in August 2000, the Dutch Auction was had been introduced, which applies the highest winning bid rate to all successful bidders; however, the bidding rate was distorted due to excessive competition among Treasury bond dealers. As a result, the bid participation rate for Treasury bonds continued to decrease as the winning agency frequently incurred losses.
Starting in September 2009, differentiating groups based on the bidding rates offered by each Treasury bond dealer provides incentives to bid at appropriate interest rates, and differential pricing induction is introduced to ease the burden on dealers acquiring Treasury bonds by applying the highest winning rate in each group.

Reference **Formula for the issued unit price of Treasury bonds (Cut decimal point below 0.1 won)**

$$\left[\left(\sum_{t=1}^{n}\frac{10{,}000\times\frac{k}{m}}{\left(1+\frac{r}{m}\right)^{t-1}}\right)+\frac{10{,}000}{\left(1+\frac{r}{m}\right)^{n-1}}\right]\times\frac{1}{\left(1+\frac{r}{m}\times\frac{a}{b}\right)}$$

n: The number of remaining interest payments.
R: Coupon rate
a: Remaining days during the interest payment period*
m: Number of interest payments per year.
r: Winning bid rate.
b: The number of days during interest payments*

However, in the case where the sales date precedes the issuance date (at the time of pre-sales),

$$\left[\left(\sum_{t=1}^{n}\frac{10{,}000\times\frac{k}{m}}{\left(1+\frac{r}{m}\right)^{t}}\right)+\frac{10{,}000}{\left(1+\frac{r}{m}\right)^{n}}\right]\div\left(1+\frac{r}{m}\times\frac{a}{b}\right)$$

n: The number of remaining interest payments.
R: Coupon rate
a: The number of pre-sales days*
m: Number of interest payments per year.
r: Winning bid rate.
b: The number of days in 6 months right before the issuance date*
*: When calculating the number of date, only one of the first or last days of the period is included.

Table 3-3 Comparison of how to determine the winning bid price (issued KRW 70 billion)

Participation status		Dutch Auction	Differential pricing auction (3bp example)	Conventional auction
Agency	Bidding level			
A	5.100% KRW 10 billion	unsuccessful bid	unsuccessful bid	unsuccessful bid
B	5.050% KRW 20 billion	5.050% (Highest bid rate), KRW 70 billion	5.050% KRW 50 billion	5.050% KRW 20 billion
C	5.040% KRW 20 billion			5.040% KRW 20 billion
D	5.030% KRW 10 billion			5.030% KRW 10 billion
E	5.010% KRW 20 billion		5.020% KRW 20 billion	5.010% KRW 20 billion

Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

Issuance and payment shall be made on the next business day of the competitive bidding date (however, if the relevant date is the due date, it shall be the next business day). The received funds shall be paid to the Public Fund Management Fund. However, upon request from the Ministry of Economy and Finance, it shall be deposited in other accounts or funds.

The payment is calculated based on the issued unit price per KRW 10,000.

- Payment = winning face value × issued unit price/10,000

Table 3-4 Summary of Treasury bonds bid

Section	Contents
Bid time	Every Monday at 10:40–11 am, for 20 minutes,
Form of bids	Electronic bidding through the Bank of Korea Financial Network (BOK-Wire)
Bid participants	primary dealers (PD) and preliminary primary dealers (PPD)
Unit of bid participation	A multiplier of face value 1 billion won
Bid limitation	PD: 30% of the issuance amount, PPD: 15% of the issuance amount
The number of bid rates	Each PD and PPD can submit up to 7
The method of bidding	Differential pricing auction (Sold at the highest interest rate for each section by dividing sections at 3bp or 4bp intervals from the highest bidding rate)

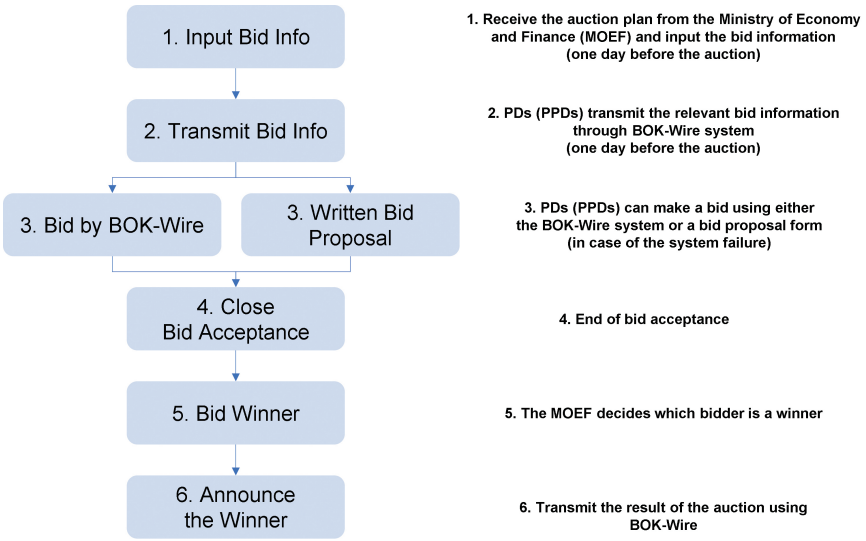
Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

Reference **Accounting when issuing Treasury bonds**

Accounting for the issuance of 3-year Treasury bonds (01750-2006-0307) on August 28, 2017.
Coupon rate: 1.750%, Issue date: 2017.6.10, Sales date: 2017.8.29, Winning bid rate: 1.750%,
Issuance price: 10,038.0, Out of 1,250 billion won issued, Bank A won KRW 60 billion.
(Execution of sales shall be handled by successful bidder, and transactions of funds transfer shall be handled separately after sales of all institutions are completed.)

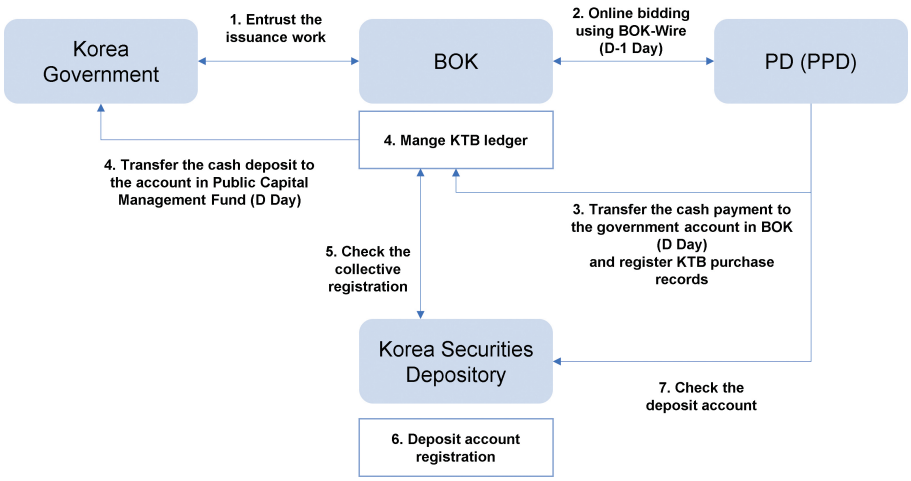
Section	Debit	Credit
Execution of sales (Fund accounting)	Won main branch 60,228,000,000 (Payment & Settlement Systems Department)	Government checking account 60,228,000,000
	checking account 60,228,000,000 (A bank)	Won main branch 60,228,000,000 (Office of Treasury & Debt Securities)
(Treasury account)		Treasury bonds issuance fund (777) (Revenue) 60,228,000,000
Issuance fund transfer (Treasury account)	Treasury bonds issuance fund (777) (provision) 1,254,750,000,000	Public capital management fund (676) (Revenue) 1,254,750,000,000

Figure 3-1 KTB auction process



This chart illustrates an overall process of KTB auction in the primary market. For further information, please refer to the source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764.

Figure 3-2 Bid and issuance flowchart



Only PDs and PPDs can participate in the primary market. The possible minimum bidding volume is 1 billion won.

Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

3.1.2 Non-competitive Bidding for Treasury Bonds

(A) Public bidding (Option I)

In the case of competitive bidding for Treasury bonds, 20% of the total amount scheduled to be issued is allocated to the general public, including individuals, financial institutions, and all other corporations who cannot participate in the competitive bidding, and who acquire the bonds by the non-competitive bidding.

- The general public who wishes to participate in the bidding shall submit a bid stating the desired purchase amount to the bidding agency (PD) from the date of the bidding announcement to the day before the bidding and pay the bid deposit (100% of the desired purchase amount.)

- The bidding agency submits the bidding details of the general public who participated in the bidding to the government bond handling agency by 10 AM on the day of the bidding.

- The minimum bid amount for the general public is KRW 100,000, the maximum bid amount is KRW 1 billion, and the amount exceeding KRW 100,000 will be increased in units of KRW 100,000.

If the total bid amount of the general public exceeds the amount allocated to the general public, it shall be prorated based on the total public bid of the bidding agency, and the applied interest rate shall be the highest bid rate for Treasury bonds determined by the competitive bidding method.

- The Treasury bonds that the general public has won are allocated in the name of the bidding agency, and the bidding agency allocates them to the general public's customer account.

(B) Professional dealer non-competitive acquisition (Option II)

A PD who acquired Treasury bonds in the competitive bidding can acquire government bonds at the highest bidding rate determined in the competitive bidding. Thus, the PD can generate additional profits by exercising the option according to the market interest rate on the option exercise date.

- Among bid days (12:00-15:30), bid days +1 and +2 (9:00-15:30), bid days +3 (9:00-12:00), it is possible to exercise the option once or several times within the limit (effective from January to November every year.) The minimum unit of acquisition is KRW 1 billion.

With their authority to acquire, excellent PDs (first to fifth place in semi-annual evaluation),

second-highest PD (sixth to 10th place in semi-annual evaluation), PDs who are 11th to 15th place in semi-annual evaluation, and other PDs will be given 20%, 15%, 10%, 5% of this year's acquisition performances of the competitive bidding, respectively. However, an additional 10%p is granted to excellent PDs in the previous month (first to fifth place in monthly evaluation). When allocated, the amount less than KRW 1 billion is discarded.

3.2 Repayment of Government Bonds

Repayment of government bonds is a series of processes in which government bonds are extinguished after the principal and interest of government bonds are paid to holders. Methods of repayment of government bonds include maturity repayment and early repayment (including buy-back and conversion offer). Most government bonds are repaid at maturity.

- Maturity repayment: To be repaid on the maturity date agreed upon at the time of issuance.
- Buyback: Repayment made before the expiration date
- Conversion offer: Exchanges of newly issued Treasury bonds with previously issued Treasury bonds

When repaying government bonds, the Bank of Korea charges the repayment fund from the government, obligated to repay in advance, receives it by the day before repayment, and deposits it into the bond principal and interest repayment fund account (national Treasury account.)

Table 3-5 The primary agent of the financial burden and the department in charge of each government bond

Item		Agent of Financial burden	Department in charge
Treasury bond		Public Capital Management Fund (General Account)	Bank of Korea Securities Team
Treasury-bill	Principal	Fungible account	Ministry of Economy and Finance's Treasury department
	Interests	National Treasury fund management profit account	Ministry of Economy and Finance's Treasury department

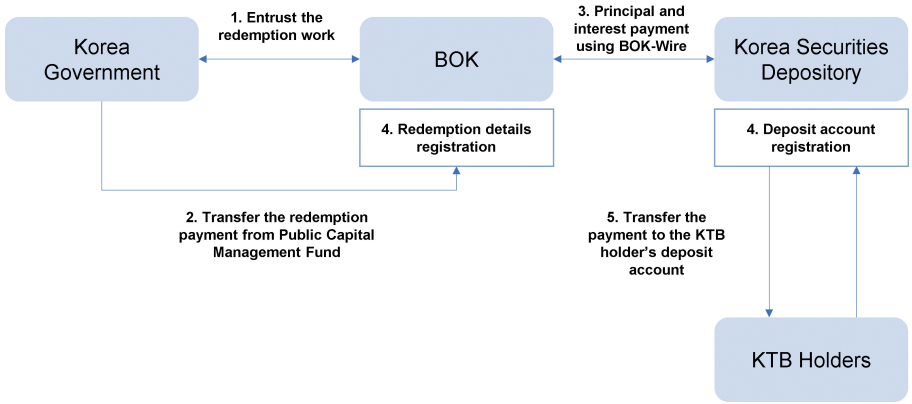
The extinctive prescription of Treasury bonds (principal and interest) is five years from the expiration date.
Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

3.2.1 Repayment at Maturity

When issuing government bonds, they are temporarily repaid on the agreed maturity date, and most government bonds are repaid by maturity repayment. However, the size and proportion of early repayment are gradually expanding to prevent the maturity of Treasury bonds from being concentrated at once and to control liquidity in the bond market.

Currently, all Treasury bonds are registered collectively in the name of the Korea Securities Depository in the government bond register managed by the Bank of Korea. Therefore, it is completed by the Korea Securities Depository, receiving principal and interest through the full text of the application for repayment of principal and interest, and then depositing the principal and interest into the Bank of Korea checking accounts of institutions and banks who have Treasury bonds.

Figure 3-3 KTB redemption process



Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

3.2.2 Buyback

3.2.2.1. Overview

A buyback[3] is a process, in which the issuer purchases Treasury bonds that have not yet expired to disperse maturity or enhance liquidity. They are used to revitalize the secondary market of Treasury bonds by purchasing short-term Treasury bonds and prolonging the maturity structure

3 The early repayment system can theoretically be used for the Treasury bill, but it is only used for long-term Treasury bonds.

in the secondary market.

If the maturity of Treasury bonds arrives intensively within a short time, the issuance of Treasury bonds should be expanded at once to repay them. However, market distortions may occur, such as a surge in market interest rates.

- Buybacks are intended to enhance the liquidity of off-the-runs through early repayment and prevent the risk of borrowing, which increases the financial burden at once, through the distribution of maturity.

3.2.2.2 Repayment Method

Buybacks of Treasury bonds can be bid for by PDs and PPDs through the Bank of Korea Financial Network (BOK-Wire) or purchased directly from Treasury bondholders.

There is no bidding limit for each dealer when bidding for the purchase of Treasury bonds. Instead, the minimum bid amount for each item is KRW 1 billion, and other amounts can be bid with a multiple of KRW 1 billion. Bidding rates per item can be up to seven (however, duplicate bidding is not possible at the same interest rate.)

- In case of early repayment, the successful bidder will be determined sequentially from the high interest rate among the bidding rates for each item. Among the sections that are sequentially divided into 0.03%p intervals from the minimum bidding rate of the winning Treasury bonds, the minimum interest rate in each section to which each successful bidder's bidding rate belongs is applied (differential pricing induction).

- However, if the bidding participation rate is significantly lower or if the bidding rate is judged to be excessively lower than the market interest rate level, the winning bid can be reduced. In the case of bidding under the same conditions, it is possible to allocate KRW 1 billion per bid amount and partially win the bid.

The repayment funds are financial surplus funds or funds for issuing new Treasury bonds. When repaying Treasury bonds, the Bank of Korea requests reimbursement money from the main agent of issuing Treasury bonds (the public fund management fund, general account). In addition, it is received by the day before repayment and deposited into the Treasury bonds principal and interest rates repayment fund account (national Treasury account).

- However, in the case of an exchange of Treasury bonds, the same reimbursement money shall be received on the day of repayment.

The purchase unit price (KRW 10,000 units), applied by the calculation formula of the purchase unit price of Treasury bonds below, is used as the purchase price. Based on the confirmation of the holding period submitted by each successful bidder to the Bank of Korea on the business day

following the bidding date, the withholding tax on the bond interest for the holding-period after January 1, 2010, is deducted by the Corporate Tax Act. And, by the Local Tax Act (enforced on January 1, 2015), the repurchase price is paid after deducting the special collection amount (local income tax).

Reference **Formula of the purchase unit price of Treasury bonds (Cut decimal point below 0.1 won)**

$$\left[\left(\sum_{t=1}^{n}\frac{10{,}000\times\frac{k}{m}}{\left(1+\frac{r}{m}\right)^{t-1}}\right)+\frac{10{,}000}{\left(1+\frac{r}{m}\right)^{n-1}}\right]\times\frac{1}{\left(1+\frac{r}{m}\times\frac{a}{b}\right)}$$

n: The number of remaining interest payments.
R: Coupon rate
a: Remaining days during the interest payment period*
m: Number of interest payments per year.
r: Winning bid rate.
b: The number of days during interest payments*

*: When calculating the number of date, only one of the first or last days of the period is included.

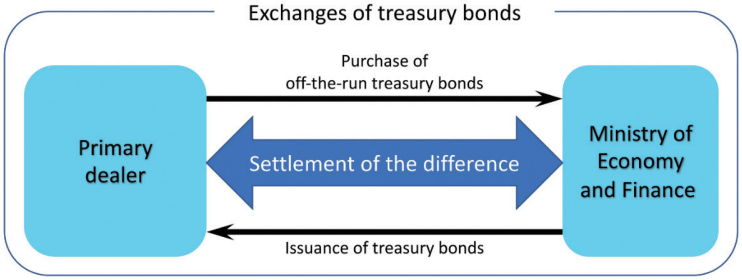
3.2.3 Conversion Offer

3.2.3.1 Overview

The conversion offer is a system that newly issues Treasury bonds for PDs and PPDs and exchanges them with previously issued Treasury bonds. It was introduced in Korea in May 2009.

- Payment shall be made only by the difference between the newly issued Treasury bonds and the off-the-runs. Off-the-run refers to Treasury bonds that have already been issued and have not expired.

Figure 3-4 Exchanges of treasury bonds



Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

If the Treasury bond exchange system is used well, it is possible to prevent the maturity of Treasury bonds from being concentrated at once. In addition, the supply of Treasury bonds (Both on-the-runs and off-the-runs are possible.) for a specific item can be expanded to enhance the liquidity of the corresponding items.

Exchanges of Treasury bonds are similar to buybacks in that previously issued off-the-runs are exchanged with newly issued Treasury bonds. Both use money funded by the issuance of Treasury bonds. However, the issuance process, counterparty, and fund flow are different.

Table 3-6 Comparison between the buy back and conversion offer

	Buyback	Conversion offer
Objective	• Improve liquidity by converting bonds with low liquidity into new bonds. • Distribute the maturity of government bonds through short-term purchases and long-term issuance.	• Increase liquidity by converting bonds with low liquidity into new bonds
Procedure	• Procedures for raising funds through the issuance of new Treasury bonds, and the two-step procedure of purchasing off-the-run using the funds	• The first step procedure of directly exchanging off-the-run and new Treasury bonds
Counterpart	• The buyer of the new Treasury bond and the buyer of the off-the-run are different	• Purchase the off-the-run against the same person and sell new bonds
Fund flow	• The government and the counterparty pay for the sale of bonds in cash, respectively	• New bonds and off-the-runs are exchanged in kind, and only the difference is settled in cash

Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

3.2.3.2 Effect of Conversion Offer

Low liquidity off-the-runs can be replaced with high liquidity on-the-runs to increase the trading liquidity of Treasury bonds, thereby promoting Treasury bond transactions.

- Even in the case of a credit crunch, there is a possibility that the off-the-run can be exchanged for on-the-run[4], so it has the effect of limiting the price drop of the off-the-run.

4 On-the-run is a Treasury bond issued through competitive bidding or an inflation-linked Treasury bond issued pursuant to Articles 9 and 13 of the Regulations on the Issuance of Treasury Bonds and the Operation of the Primary Dealers. It refers to the most recently issued Treasury bonds (except for pre-sales items and off-the-runs) by maturity. If there are inflation-linked government bonds of the same maturity, they are considered separately. Off-the-run refers to Treasury bonds that have already been issued and have not expired.

3.2.3.3 Procedure for the Conversion Offer

Conversion offers are made through competitive bidding through the Bank of Korea's financial network (BOK-Wire) for PDs and PPDs.

- Conversion offers are made in the order of issuance announcement, bidding and successful bid, and settlement of the difference in exchange.

A. Announcement

If the price of newly issued Treasury bonds is announced in advance, it is difficult to reflect the fluctuations in the market on the day to the bidding results. Therefore, the price is announced on the day of the bid based on the reference rate calculated by the average interest rate[5] submitted by each PD and PPD.

B. Bidding

Bidding shall be based on the announced interest rate of newly issued Treasury bonds, and the amount of successful bids shall be determined for each off-the-run by bidding the interest rate of the off-the-runs. (The volume is in the unit of KRW 1 billion each for on-the-run and off-the-run, and the face value is exchanged at 1:1.)

- There is no bidding limit for each PD and PPD, and up to 7 interest rates can be bid per off-the-run subject to purchase. Multiple bids are not possible at the same interest rate.

C. Successful bid

The winning bidder will be decided sequentially from the high interest rate among the bidding rates for each item.

- As in competitive bidding for issuance, the successful bid rate is based on the differential pricing auction method. The bidding rate is grouped from the minimum bid rate to a specific interval (3bp), and the minimum interest rate is applied for each group.

- However, if the bidding participation rate is significantly lower or if the bidding rate is judged to be excessively lower than the market interest rate level, it is possible to reduce the amount of successful bids. If bidding under the same conditions, it is possible to allocate 1 billion won per bid and bid partially.

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5 Of the returns reported by PD and PPD to the Korea Exchange as of 15:30 the day before the bidding, the arithmetic average is calculated, except for two highest and lowest, and that interest rate is announced by the Korea Exchange. It is calculated to the third decimal place.

D. Settlement

Settlement is to be exchanged in units of KRW 1 billion in face value of Treasury bonds and settled on two business days from the date of bidding. Repayment of exchanged off-the-run, issuing new Treasury bonds, and settlement of differences are carried out simultaneously.

- In the case of the conversion offer fund for Treasury bonds, if the government wins as a result of a conversion offer, the difference in settlement is received from PD and PPD on the day of conversion offer. Payment will be deposited into the account of the issuing entity (general account of the Public Capital Management Fund).

- If the government loses, the settlement amount is received from the Public Capital Management Fund (General Management) on the day of payment, and the difference in the conversion offer is paid.

- However, based on the confirmation of the holding period submitted by each successful bidder to the Bank of Korea on the business day following the bidding date, the withholding tax on bond interest shall be deducted for the holding period, after January 1, 2010, by the Corporate Tax Act. In addition, the repurchase price is paid by subtracting the special collection amount (local income tax) under the Local Tax Act (enforcement on January 1, 2015).

Non-competitive options are not granted for new Treasury bonds issued through the conversion offer of Treasury bonds.

Reference **Settlement amount in the conversion offer of Treasury**

Settlement amount = New item issuance amount – Off-the-run repayment amount

Settlement amount > 0 → Government wins (+), and PD pays the settlement amount.

Settlement amount < 0 → Government lost (-), and PD is paid the settlement amount.

☐ The issuance price of new products for each successful bidder is calculated by substituting the interest rate announced by the Korea Exchange into "<Reference> formula for the issued unit price of Treasury bonds." The off-the-run repayment price is calculated by substituting each successful bid rate (application of the pre-tax unit price) into "<Reference> Formula of the purchase unit price of Treasury bonds."

- However, if the Treasury bonds subject to issuance are inflation-linked Treasury bonds, it is calculated by substituting the issuance rate of inflation-linked Treasury bonds issued in the month of exchange into "r" of "<Reference> formula for the issued unit price of Treasury bonds."

☐ When issuing or purchasing inflation-linked government bonds as new products, the issuance price and payment price are calculated by applying the unit price calculation formula of nominal government bonds, and then by applying the price index linkage coefficient of the exchange date (payment date) of Treasury bonds.

3.3 Government Bond Liquidation and Market Structure

3.3.1 Primary Dealership

3.3.1.1 Overview

The Primary Dealership is used in most OECD countries to advance the financial market structure and establish a stable financial foundation for the government, and strengthen communication between policy authorities and market participants, through smoothly issuing treasury bonds and revitalizing the government bond secondary market.

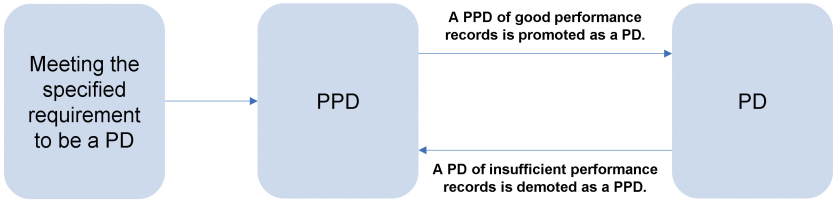
- A Primary Dealer (PD) is a financial institution with financial power and expertise in government bond investment and trading. They have the authority to participate in bidding exclusively in the primary market and receive support, such as acquisition and distribution financing. They have an obligation to be market makers, such as suggesting selling and buying asking prices, in the secondary market.

In 1999 when the existing system of issuance and acquisition, called the Syndicate, was reorganized into a PD system, which is oriented to market making. The Minister of Economy and Finance chose, from among the financial institutions authorized for investment and trading in government bonds, those institutions with a certain level of performance in treasury bond transactions and financial soundness and designated them as PDs. The PD system greatly contributed to the size and qualitative development of the domestic bond market.

In order to make the PD system more market oriented, in 2011, the Preliminary Primary Dealer (PPD) system, which was abolished in July 2007, was reintroduced. The PD system was greatly reorganized, with the PD-PPD promotion system in which PPDs with excellent performance are designated as PDs, and PDs with poor performance are demoted to PPDs.

- Financial institutions that want to be designated as PDs should be designated as PPDs first.

Figure 3-5 Elevation system between primary dealers (PD) and preliminary primary dealers (PPD)



As of May 2021, there are 17 PDs (seven banks and ten investment banks/securities firms), and four PPDs (one bank, three securities firms).
Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

Table 3-7 Status of PDs and PPDs (as of May 2021)

Section	Banks	Securities firms
PDs	KB Kookim Bank, IBK, NACF, KDB, KEB Hana Bank, Standard Chartered Bank Korea, Credit Agricole (Seoul Branch)	Kyobo Securities, Daishin Securities, DB Financial Investment, Meritz Securities, Mirae Asset Securities, Samsung Securities, Shinhan Investment Corp., Korea Investment & Securities, KB Securities, NH Investment & Securities
PPDs	BNP Paribas (Seoul Branch)	Yuanta Securities Korea, Eugene Investment & Securities, Kiwoom Securities

Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

3.3.1.2 Requirements for New Designation

In order to be designated as a PD or a PPD, an institution must meet somewhat strict requirements set by the government on financial soundness, manpower, and performance.

- The PPDs also serve as market makers equivalent to the primary dealers. Therefore, the designation requirement is equivalent to the designation requirement for the PD. However, in the case of banks, the total equity capital in the financial statements should be more than KRW 3 trillion (The equity capital of domestic branches of foreign banks pursuant to Article 2 of the Banking Act shall be at least KRW 300 billion), and in the case of securities firms, the total equity capital should be more than KRW 300 billion. In other words, the requirement for total equity capital was somewhat eased compared to that of PDs.

Table 3-8 Requirements for Designation as a PD

Section		Requirements
Financial soundness standards		• Banks and merchant banks: According to Article 34 of the Banking Act, the equity capital ratio (BIS) at the end of the previous quarter of the quarter to which the date of designation of primary dealers belongs is above the management improvement recommendation standard set by the Financial Services Commission. In the financial statements, the total equity capital is more than KRW 4 trillion. However, the equity capital of domestic branches of foreign banks under Article 2 of the Banking Act is more than 500 billion won. • Securities firms: In accordance with Article 31 of the Financial Investment Services and Capital Markets Act, the net capital ratio at the end of the previous quarter of the quarter to which the primary dealer designation date belongs is above the management improvement recommendation standard set by the Financial Services Commission. According to the financial statement, the total equity capital is more than KRW 400 billion.
Manpower and experience standards		• Dealing personnel: 5 or more dealers in charge of dealing treasury bonds, with more than three years of experience in dealing or brokerage bonds (including managers) • Research personnel: 3 or more experts in the economic and financial sectors with more than 3 years of experience in research, such as survey and analysis • Back-office personnel: 4 or more professional personnel related to treasury bonds and fund settlement, who have performed securities and fund settlement work for at least one year • Period of dealing with treasury bonds: The period from the date of approval as a government bond dealer to the date of application for designation of PPD is more than two years
Performance standard	Transaction performance of on-the-run in the government bond secondary market	• On-the-run trading performance, in the government bond secondary market compared to the total amount of on-the-run Treasury bond trading of the dealer in the previous two quarters from the quarter, including the date of primary dealer designation, is above 35%
	Transaction performance in the secondary market	• The dealer's Treasury bond transaction performance, compared to the average Treasury bond transaction volume of banks or securities firms, who are primary dealers, in the previous two quarters from the quarter, including the date of primary dealer designation, is above 35%
	Balances of government bonds	• Average balance of Treasury bonds for proprietary trading (dealing) in the last 6 months is more than KRW 300 billion.

For details and criteria for evaluating PD and PPD's implementation of obligations, refer to the Regulations on the Issuance of Government Bonds and the Operation of the Primary Dealer.
Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

PPD applications are received every May and November, and the designation is decided by the end of June and the end of December of the current year.

The government evaluates the performance of monthly and semi-annual primary dealers and provides differentiated benefits according to the evaluation results.

- The PD-PPD promotion system is implemented twice a year (March and September). However, from 2015, new PPD designated institutions can be promoted to PD early, based on the results of the four quarters after designation. In addition, institutions that have been demoted to PPD can be re-promoted to PD early based on their two-quarter performance after the demotion.

3.3.1.3 Benefits and Duties

For the smooth operation of the Treasury bond primary market and secondary market, the right to acquire treasury bonds is granted to the primary dealers (PD) and the preliminary primary dealers (PPD). In return, certain obligations are imposed for market making.

- However, in the case of preliminary primary dealers, limited market-maker obligations and authority are granted compared to primary dealers.

Table 3-9 Authorities and obligations of PD and PPD

Section		PD	PPD
Authorities	Participation in bidding	• Acquire up to 30% of the bidding volume	• Acquire up to 15% of the bidding volume
		• Acquire up to 100% of early repayment and conversion offer bid amount	• Same as the PDs
	Non-competitive acquisition	• In the event of a competitive bid, it is possible to acquire less than 30% of the winning bid (By semi-annual, five excellent PDs can acquire up to 20%. In the case of the next excellent five PDs, it is 15%, for the third most excellent group of PDs, it is 10%, and for others, it is 5%. Five PDs with excellent monthly performance can acquire an additional 10%)	• None
		• In the case of inflation-linked government bonds, it is 25% of the winning bid amount of nominal bonds	• Same as the PDs
	Financial support	• Loans are provided at low interest rates according to evaluation performance	• None

Section		PD	PPD
Duties*	Acquisition of treasury bonds	• Acquisition of 10% or more of the competitive bidding volume	• None
	Repurchase	• Winning the bid at least 5% of the purchase or conversion offer volume	• None
	Presentation of asking price	• More than 10 bidirectional asking prices for each sale and purchase in the government bond secondary distribution market (however, more than 5 for 30-year bonds and more than 3 for inflation-linked bonds) are submitted during the opening hours of the exchange market	• Same as the PDs
	Distributions	• Transactions of more than 200% of the average government bond transaction volume by bank and securities company • STRIP bond transaction performance is more than 200% of the average STRIP bond transaction volume of all primary dealers • The 10-year government bond futures trading performance is more than 200% of the average 10-year government bond futures trading volume of all primary dealers.	• Same as the PDs
	Holdings	• It maintains an average balance of 1 trillion won or more in treasury bonds for proprietary trading (dealing) every quarter.	• None
	Reports	• The current status of the balance held by each type of government bond and the performance of treasury bond transactions are reported to the Minister of Economy and Finance via the Korea Exchange every month	• Same as the PDs

* When the relevant mandatory criteria are met, it is reflected in the performance evaluation score.
Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

3.3.2 The Secondary Market

3.3.2.1 Overview

The introduction of a competitive trading system is based on the electronic transaction system into the government bond secondary market. Competitive trading market, using the electronic trading system, is a market in which transactions are concluded anonymously by price competition only through screen prices without going through the search and negotiation of counterparties through brokers. In the competitive trading market, all asking prices are

concentrated on the screen so that market participants can conduct real-time trading with only the asking prices presented on the screen without broker brokerage.

Competitive trading through the electronic transaction system can reduce transaction costs, announce real-time interest rates, represent a reference rate quickly and accurately, and increase market transparency by presenting screen calls with actual signing functions.

Under the government's policy support, the Korea Exchange successfully established a government bond secondary market based on Trading System for Government Securities (KTS) to revitalize the competitive trading market through Korea's electronic bond trading system.

(A) Overview of the sales system.

The government bond secondary market was opened in March 1999 by the Korea Exchange with the government's policy support in order to revitalize the Treasury bond market and enhance transaction transparency. The government bond secondary market is an electronic transaction market in which dealer companies directly participate using the Internet and use a system (KTS) in which the entire transaction process takes place through real-time screens.

Major market participants are banks and financial investment companies that have obtained membership of Korea Exchange's debt securities, and other financial institutions, such as pensions, insurance, and funds. General investors can also participate with consignments. The dealer company installs a sales program developed by the Korea Exchange on the PC of the person in charge of the transaction, without a separate computer investment, and the investor directly accesses the Trading System for Government Securities (KTS) through the Internet to conduct transactions.

Treasury bonds, monetary stabilization bonds, and Korea Deposit Insurance Corporation bonds account for most of the transactions, and the trading unit of Treasury bonds is an integer multiple of 1 billion won.

Table 3-10 Overview of the transaction system of the government bond secondary market

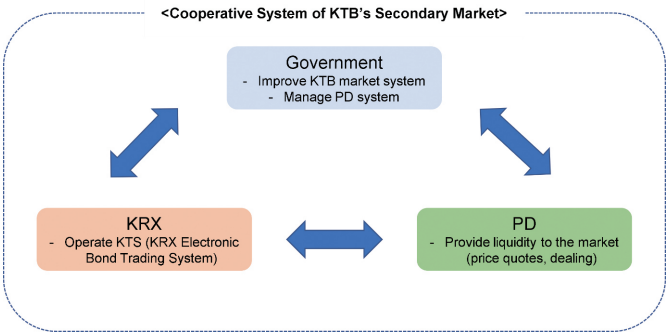
Section	Contents
Transaction time	9:00 ~ 15:00
Transaction item	Treasury bonds, monetary stabilization bond, and Korea Deposit Insurance Corporation bonds
Transaction volume unit.	an integer multiple of 1 billion won
Asking method	Asking price in the unit of 1 won
Signing method	Individual competitive trading based on multiple prices.
Participant	Government bond dealers (from banks, financial investment companies), consignment participants (general institutions, etc.)
Payment date	T+1 day.

Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

(B) The application of the market development system.

In the government bond secondary market, the government-designated primary dealer (PD) serves as a market maker that continuously presents bidirectional prices for sale and purchase by reference item. Therefore, market participants who are willing to trade can buy and sell the stocks they want at any time. Even if an investor uses the KTS for bond, it is difficult for transactions to occur on time due to low liquidity, when there are insufficient market prices. Therefore, the role of PD, the market maker, is crucial.

Figure 3-6 Cooperative system of KTB's secondary market



The trilateral relationship between the government, Korea Exchange, and PDs is essential for the KTB's secondary market.
Source: Korea Exchange. *Korean Bond Market* (in Korean). 2015

3.3.2.2 Background of Introduction

With the increase in the issuance of government bonds after the Asian financial crisis, it became urgently necessary to establish market infrastructure to reduce social costs and advance the bond market. Accordingly, the latest IT technology was applied to open a government-led electronic transaction market on the Exchange from the beginning, similar to what is used in advanced European countries.

The government bond secondary market began to be discussed in earnest in 1998 when the Ministry of Finance and Economy mentioned fostering reference bonds in its "plan to improve the government bond system and revitalize the bond market." Accordingly, in March 1999, a fully computerized system was opened for competitive trading between government bond dealers.

Since then, the computer system has played a pivotal role in the domestic bond market through continuous system improvement, leading to market efficiency improvement.

3.3.2.3 The Role of the Secondary Market

The government bond secondary market plays an essential role in advancing the entire bond market by revitalizing the distribution and issuance of government bonds and improving efficiency. First of all, the government bond secondary market fosters reference rates that accurately reflect market conditions through transparent market operations, providing valuable references of investment judgment and contributing to the formation of appropriate prices for other bonds.

The reference bond's contract return is provided to the bond market in real-time as a reference rate. As a result, s the utilization of government bond rates as a reference rate increased and contributed to the introduction of the government bond futures market.

Government bond dealers participating in the government's bond secondary market can increase their responsiveness to customer transactions by adjusting their government bond positions on time through the secondary market. In addition, they build a reasonable portfolio through dealing. The secondary market enables efficient risk management. This creates liquidity and a transparent distribution market, which increases the investment merit in Treasury bonds, creating a smooth basis for issuing Treasury bonds. In other words, the bid amount exceeds the expected issuance amount in the Treasury bond bidding, contributing to smooth market performance and the downward stabilization of the overall bond rate and the Treasury bond rate.

In addition, this allows the government to raise funds in a timely and low-cost manner and to accurately grasp the market situation through interest rates formed in the government bond secondary market, effectively implementing fiscal and financial policies.

3.3.2.4 Market System

(A) Types and methods of participating in the market.

Participants in the government bond distribution market are limited to financial investment companies and banks, which are government bond dealers. Financial investment companies can participate as securities members of the Exchange, and banks can participate as debt securities members. In principle, only those financial investment companies that are members can participate in the Exchange market. The debt securities membership system is designed to allow banks to participate. To become a debt security member, banks must obtain permission to trade government bonds, local bond securities, special bond securities, private bonds, and corporate bill securities.

Currently, financial institutions qualified as members of debt securities are limited to banks. Through the 2000 Ministry of Finance and Economy Notice No. 2000-8, banks' participation in the market was made possible by obtaining approval for the proprietary trading (investment trading) of government bonds among securities businesses under the former Securities and Exchange Act. Financial investment companies can participate in the market as entrusted financial investment companies for consignment orders from participating organizations in the government bond secondary market. However, banks have obtained approval only for proprietary trading of government bonds, so they cannot perform the trustee function like financial investment companies.

Meanwhile, other institutions such as pensions, insurance, funds, and asset management companies can participate in the government bond secondary market as consignment institutions. There are no restrictions on the consignment trading method. However, in general, consignment trading methods use phone orders and direct ask input methods on the Trading System for Government Securities (KTS). When a consignment-participating agency wants to use the same direct trading system as a dealer agency, unlike telephone orders, it must implement some institution registrations and transaction member registration process and designate a payment member. In both cases, the trustee's financial investment company will be responsible for guaranteeing implementation for the consigner's funds and securities.

Table 3-11 Types of participants in the government bond secondary market

Section		Participation type
Government bond dealer	Primary Dealer (PD)	Instead of having the right to participate in the issuing market directly, it fulfills its obligation to create a market.
	Preliminary Primary Dealer (PPD)	Compared to a PD, it is obligated to participate in the issuance market and create a market in a limited way.
	General dealer	While it is possible to participate as brokers and dealers in the government bond secondary market, it is impossible to participate in the issuance market.
General institutional investors (Pension, fund, insurance, asset management company, etc.)		Participate in the government bond secondary market by entrusting payment rights to government bond dealers.

Only limited numbers of PDs and PPDs are allowed to participate into the primary market. As a result of such exclusive access to the primary market, these PDs and PPDs are required to participate into the secondary market as a market maker.
Source: Korea Exchange. *Korean Bond Market* (in Korean). 2015

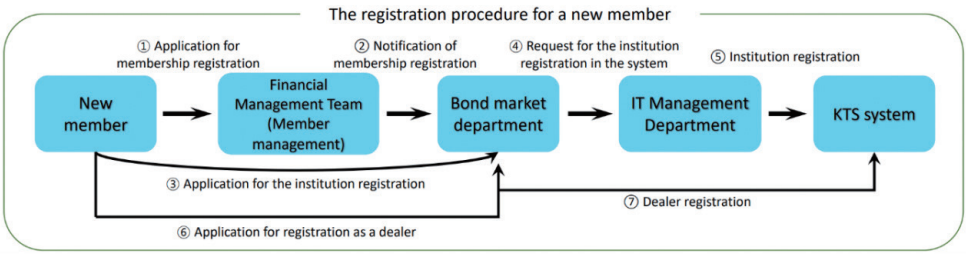
Government bond dealers that are licensed for proprietary trading for government bonds and qualify to participate in the government bond secondary market are divided into Primary Dealers (PD), market makers, Preliminary Primary Dealers (PPD), and general dealers. A PD is a government bond dealer (Article 2, No. 1. of the Regulations on the Issuance of Treasury Bonds and the Operation of PDs) that receives priority rights to acquire Treasury bonds in the Treasury bond primary market in return for fulfilling its obligations as a market maker in the Treasury bond secondary market.

For directly qualified dealers and consignment participants to trade in the government bond distribution market, they must go through a specific procedure of institutional registration and transaction member registration sequentially. Institutional registration refers to registering the names of institutions, such as specific financial investment companies and banks, in the government bond secondary market transaction system. The registration of a transaction member refers to the procedure of registering and certifying the specific person in charge of the agency in the transaction system. Institutional registration and transaction member registration take one day each, and institutional registration remains in effect after registration until withdrawn. The certification period for transaction member registration is usually every year, so there is a periodic renewal process.

In the case of consignment participation, not direct participation as a dealer, the basic procedure is the same as in the case of a dealer agency. However, it takes an additional one day before the consignment agency can submit an order through the KTS terminal, the Exchange market government bond transaction system, because the "designation of payment dealers" procedure is required. Therefore, the institutional registration process must be carried out by T-3 of the

expected market participation date, and the transaction member registration process must be completed by T-2. In addition, on T-1, certified traders must access the sales system and designate payment dealers in preparation for transactions on the expected date of market participation. All procedures will take effect the next day after application, so the designation of the payment dealer must be completed by T-1 to participate in the market as scheduled.

Figure 3-7 The registration procedure for a new member



This figure summarizes the application process to become a newly assigned PD/PPD.
Source: Korea Exchange. *Korean Bond Market* (in Korean). 2015

(B) Market development system for Treasury bond dealers.

As a market maker, a Primary Dealer (PD) is obligated to continuously present bidirectional composition asking prices for selling and buying in the government bond secondary market within the maximum allowable spread to secure liquidity in the secondary market. As the bidirectional composition asking price of Treasury bond dealers accumulates in the asking table in real-time, market participants who want to trade can submit the asking price at any time to carry out the transaction. As such, the government bond dealer (PD) serves as a market maker that supplies liquidity to facilitate transactions by offering bidirectional prices that reflect real-time market prices in the government bond secondary market.

When submitting bidirectional composition asking prices, at least ten selling and buying prices must be submitted for on-the-run items by maturity, respectively.* At this time, the asking price to be submitted must be at least 1 billion won in face value. On days when transactions are available in the government bond secondary market, they must be submitted continuously (more than 2 hours and 30 minutes of the time from 9:00 to 12:00 every trading day, and the entire time from 13:00 to 15:00.)**

*: At least five and three asking prices must be submitted for 30-year Treasury bonds and price-linked Treasury bonds, respectively.

**: The submission time of the 30-year Treasury bond must be at least 2 hours from 9:00 to 12:00

and at least 1 hour from 13:00 to 15:00.

(C) Sales system

The government bond secondary market is an inter-dealer market involving government bond dealers authorized for investment and trading in government bonds under the Financial Investment Services and Capital Markets Act. Details of sales and purchase orders submitted by each dealer are concentrated in the system and disclosed, and each dealer concludes the sale anonymously.

Bonds traded in the government bond secondary market are Treasury bonds (including Foreign Exchange Stabilization Bond), monetary stabilization bonds, and Korea Deposit Insurance Corporation bonds. Treasury bonds are divided into on-the-runs that are specially treated for market composition and non-on-the-run. On-the-runs are bonds that are considered most suitable for the formation of indicator interest rates through the secondary market due to their abundant liquidity, and are the latest among nominal Treasury bonds issued through competitive bidding and inflation-linked Treasury bonds.

The asking price unit of the government bond secondary market is 1 won, and the designated asking price method was adopted. Based on the face value of 10,000 won, the asking price is ordered by an integer multiple of 1 billion won in the face value of Treasury bonds, monetary stabilization bonds, and Korea Deposit Insurance Corporation bonds.

Meanwhile, the government bond secondary market has a unique system called composition asking price and trading asking price to support the market composition function of primary dealers. The composition asking price and the trading asking price are classified only for on-the-runs. Therefore, in the case of non-on-the-runs, monetary stabilization bonds, and Korea Deposit Insurance Corporation bonds, the separate classification of asking prices is not applied.

Table 3-12 Types of asking prices in the distribution market specializing in government bonds

Section		Contents
Composition asking price	Bidirectional composition asking price	It is the asking price that the PD submits at the same time as the selling and buying price to fulfill the obligation to create a market
	Unidirectional composition asking price	Selling or buying asking prices submitted by government bond dealers (including general dealers)
Trading asking price (Unidirectional)		It is sale or buying asking prices of the FOK, IOC, and FAS methods* submitted by government bond dealers (including general dealers). * FOK (Fill or Kill): It is a condition in which the entire asking price is automatically canceled if the total quantity is not concluded. * IOC (Immediate or cancel): Only available quantity is signed, and the remaining amount is automatically withdrawn. * FAS (Fill and Store): it is a condition that the effect of the remaining amount is maintained after the saleable portion is signed.

Source: Korea Exchange. *Korean Bond Market* (in Korean). 2015

The composition asking price is the price presented for market construction for on-the-runs and is again divided into a bidirectional composition price and a unidirectional composition price. The bidirectional composition price refers to the asking price at which a primary dealer must submit both the selling and buying prices for on-the-runs. The unidirectional composition asking price refers to general asking prices, such as selling or buying prices, made by government bond dealers.

The trading asking price refers to the unidirectional asking price suggested for trading with the composition asking price. What should be noted in this asking classification is that the possible asking prices may vary somewhat for each trading entity. The bidirectional composition price for on-the-runs is an authority and obligation granted only to primary dealers, and the unidirectional composition asking price and the trading asking price can be submitted by both government bond dealers and consignment participants. In other words, general dealers cannot submit bidirectional composition asking prices for on-the-runs, but unidirectional composition asking prices or the trading asking prices are possible. On the other hand, as mentioned above, professional dealers who have submitted bidirectional composition asking prices may temporarily suspend the validity of the asking price if necessary.

Table 3-13 Price asking method of the government bond secondary market

General information		The asking designated price system of the asking price method
		Asking price unit: 1 won. Asking quantity unit: 10,000 won.
		Unit of trading volume: An integer multiple of 1 billion won.
Classification of asking prices by item	On-the-run	Divided into the composition asking price and trading asking price
	Non-on-the-run	There's no separation of asking prices
Obligation to ask	Primary dealer	It is mandatory to create bidirectional composition asking prices for on-the-runs
	General dealer	No additional asking obligation
Restrictions on the asking price of a member's entrusted order		It's limited to unidirectional composition asking prices or the trading asking prices

Source: Korea Exchange. *Korean Bond Market* (in Korean). 2015

In terms of the asking price of either sale or purchase, the unidirectional composition asking price is similar to the trading asking price for the on-the-runs. However, there are some differences: The unidirectional composition asking price remains effective even if it is an unsuccessful asking price; The trading asking price is suggested for trading with the composition asking price. In addition, the trading asking price also differs in that you can choose various asking price options such as FOK, IOC, and FAS methods.

Unlike the stock market or the general bond market, the government bond secondary market does not have a single-price trading system or a reported trading system at the end of the market and a simultaneous asking price system. In addition, the composition and trading asking price can be maintained from 9 to 15 on the trading day, regardless of the morning or afternoon market. From the start of the market, whenever the composition and trading asking prices are counted, a sales contract is signed through individual competitive biddings, based on multiple prices according to the price and time priority principle. In the case of an order through the trading asking price, the contract is concluded using the preceding unidirectional or bidirectional composition asking prices as the counterparty asking price, so the concluded price becomes the price of the counterparty price.

(D) Payment system

The payment date of the government bond secondary market is the day after the trading day. The payment deadline is 16 o'clock on the payment date. When the market opened in March 1999, payments were made on the same day as trading, but in June 2003, the payment day was changed to the following day.

When a member sells securities, the Exchange receives payment liquidity from the Bank of Korea and pays the selling member without delay. When the buyer pays, the Exchange repays

the liquidity received from the Bank of Korea. In addition, the Bank of Korea reimburses the government bond securities provided as collateral to the Exchange, and the Exchange pays it to the buyer.

The trading of the government bonds in the secondary market is a trading transaction between Treasury bond dealers, with a small number of trading items and a large transaction unit, so it is efficient to deduct and pay securities and payments for each item. Considering this, on February 20, 2012, the Korea Exchange improved its liquidation and settlement system to allow securities and payments to be paid by item, in order to facilitate payments and enhance convenience. The main contents of its current liquidation and settlement system are as follows.

(a) The former payment method, which deducted for all items, was changed to the deduction method for each stock, using the same method as securities, so that both securities and payments can be received for each item. In addition, the requirements for receipt of securities and payments were eased, so that members could receive securities and payments related to the item if they paid the payment or securities. In other words, even if the payment was processed quickly from a payment that met the requirements, and not all securities or payments were paid, the speed and efficiency of payment were increased by delivering or paying securities early to the recipient who met the receipt requirements. In addition, through this, it is possible to secure consistency with the over-the-counter bond payment method.

(b) Selling members can use government bond securities paid to the Exchange as collateral. The Bank of Korea introduced a system that supplies payment liquidity to the Exchange in the form of "daily repo transactions". As a result, the Exchange was able to pay without delay the sale members who paid the government bond securities using liquidity supplied from the Bank of Korea, thereby solving the delay in the payment of government bonds.

(c) In the past, after the payment of all members' securities and payments was completed, the Exchange paid or delivered the payments and securities beginning at15:00. Currently, the Bank of Korea supplies payment liquidity beginning at 9 a.m., allowing the start of payment for payments and securities to be received to 9 a.m. As a result, the system operation risk and payment delay caused by the concentration of payment in the afternoon have been resolved. In addition, the early receipt of payments and securities increased the usability and convenience of securities and payments, improving the efficiency of members' asset management.

(d) On June 24, 2013, the Exchange introduced the payment liquidity supply system for government bond securities to resolve some delays in securities payments that were caused by deadlocked internal and external settlements. If the payment is delayed because the selling member fails to pay the securities by 16:30, the payment will be terminated by supplying liquidity using Treasury bonds held by the Exchange.

The payment method in the government bond secondary market is similar to Delivery Versus Payment (DVP) in the over-the-counter market in that both fund payments and securities payments are made at the same time; however, there are some differences in content. The over-the-counter DVP is based on negotiated transactions between individual institutions, so the payment method also adopts bilateral deductions. In addition, the risk of non-payment is also exposed to both sides.

On the other hand, in the Exchange market payments, the Exchange becomes the counterparty. In other words, the Korea Exchange, which opens and operates the market, plays a role as a Central Counterparty (CCP) that is responsible for payment implementation according to sales transactions. As a CCP, the Korea Exchange checks the details of the transactions concluded in the government bond secondary market and takes over the debts borne by the members for the transactions. A member goes through the process of indemnity debt acquisition of burdening the same debt, as the debt acquired by the Exchange, against the Exchange. This eliminates the payment risk that may arise from simultaneous settlement of securities delivery and payment.

3.3.2.5 Opening Effect

First, the introduction of the primary dealer (PD)[6] and the electronic transaction system(KTS) has greatly improved the overall efficiency of the bond market, including reducing transaction costs and making available the disclosure of real-time asking and signing information.

- The cost of searching for information is lower than that of non-electronic transactions (negotiated transactions).
- The market composition function of the PD reduces the asking spread.
- Market transparency is increased by presenting screen calls with an actual contract signing function.

Second, the center of the bond market was transferred from the corporate bond market to the government bond market. In particular, the indicator rate has been changed from the existing bank-guaranteed corporate bond rate to the liquidity and standardized Treasury bond rate. This contributes to the formation of the appropriate price of other bonds. For reference, the indicator rate on Treasury bonds is currently using 10-year Treasury bonds, in line with the advanced trend of reflecting long-term interest rates as indicators.

Third, it helped to successfully settle the Primary Dealership. The government bond secondary market has provided an opportunity to develop the Korean bond market into a systematic

6 The Primary Dealer was introduced in 1999 with the opening of the Exchange's government bond secondary market, and is performing submissions of bidirectional composition asking price to perform acquisitions of bonds in the issuance market and create the government bond secondary market.

advanced electronic transaction market centered on primary dealers. Along with existing financial investment companies, banks with high government bond holdings have also participated as members of debt securities to strengthen the market creation function of primary dealers, which regulate government bond positions and manage risks efficiently through the secondary market.

Fourth, it contributes to the smooth performance of national financing. The liquidity and transparent distribution market have led to the revitalization of the issuance market and supports the smooth performance and distribution of government bond issuance, which has grown in absolute size.

3.3.2.6 The achievements of the past 10 years

The government bond secondary market has greatly improved the transparency of transactions in the Treasury bond market by adopting an electronic transaction method of through-the-screen asking. In addition, since the opening of the government bond secondary market, the yields of Treasury bonds have been established as an indicator rate, instead of corporate bonds, serving as the base rate of the yield on other bond rates.

With the introduction of a Primary Dealership in the government bond secondary market, transactions have been energized due to active market creation activities such as the bidirectional composition asking price of specialized dealers. It also contributed to increasing market efficiency by reducing the spread between the buy and sell asking prices.

A quantitative look at the performance of the government bond secondary market over the past decade is as follows.

(a) The trading volume of the government bond secondary market increased by about 2.9 times compared to the beginning of its opening, growing into a market worth 1,402 trillion won per year.

• Annual transaction volume: 358.4 trillion won in 2004 → 1,402.2 trillion won in 2014

(b) The listed balance in the government bond secondary market increased by about 2.6 times compared to the beginning of its opening.

• Listed balance of Treasury bonds: 123.1 trillion won in 2004 → 438.9 trillion won in 2014

(c) The proportion of transactions through the government bond secondary market among all Treasury bond transactions increased from 28.8% in 2006 to 48.8% in 2014.

(d) The government bond secondary market contributes to improving the efficiency of the entire Korean government bond market.

- The introduction of the Primary Dealership and the electronic transaction system significantly improves the efficiency of the entire bond market, including reducing transaction costs and disclosure of real-time asking and signing information.

- Reducing the asking price spread by creating a market of primary dealers.

3.3.2.7 What successful factor in establishing a market?

Since its opening, as described above, the government bond secondary market has achieved remarkable growth, which was possible thanks to the efficient performance and organic cooperation of the government, exchanges, and market participants.

First of all, the government has laid the institutional foundation to foster a dealer-oriented competitive trading market based on the electronic trading system, breaking away from broker-oriented negotiated transactions practices. In this way, the government launched the government bond secondary market through policy support, and introduced the government bond Primary Dealership to supply liquidity to the government bond secondary market.

In addition, the government has continuously improved the system on the obligation to create a market for primary dealers to encourage transactions in the government bond secondary market. They also introduced an early repayment system and exchange system for Treasury bonds to help primary dealers create markets, including reducing allowable bidirectional composition and asking price spreads and by evaluating government bond secondary market transactions.

As such, the government not only played a leading role in the launch of the government bond secondary market, but also its efforts led to remarkable growth in the government bond secondary market through continuous system improvement, such as the establishment of a government bond Primary Dealership.

Second, it is the role of the primary dealer. As a government-designated market maker, primary dealers continue to serve as a liquidity provider of the market by continuously submitting bidirectional asking prices for on-the-run Treasury bond by maturity in the government bond secondary market in real-time. Even in the government bond secondary market equipped with the latest electronic transaction system, it would have been difficult to revitalize transactions in the market without primary dealers, as market makers.

Primary dealers are making transactions in the government bond secondary market more active by conducting investment sales that operate on their own Treasury bond holdings as well as market composition asking price.

Primary dealers frequently submit market situation information necessary for the establishment and execution of Treasury bond policies, such as customer demand and market dynamics for Treasury bonds. They form their own consultative body, the primary dealer council to discuss system

improvement and perform policy suggestions on the issuance and distribution of Treasury bonds.

Lastly, the role of the Korea Exchange, the founder of the market, can be cited. The Exchange established a detailed system and developed a computer system in accordance with the government's market opening policy to open a government bond secondary market in the Exchange. Since the launch of the government bond secondary market, the Exchange has completely rebuilt the system three times, reflected the improvement of the system through timely program changes every time the government improves the market creation system. The Exchange developed a user-friendly system through regular market participants' opinions.

The Exchange also conducts regular communication with major market participants and primary dealers. It is responsible for the practical application and operation of the market creation system. As an executive secretary of the Primary Dealer Council, it also serves as a bridge between the government and the primary dealers. The Exchange makes suggestions to the government by synthesizing its opinions and requirements for system improvement of primary dealers, and prepares various market analyses and statistical data to provide basic data for the policy establishment of Treasury bonds.

3.3.3 Fungible Issue of Treasury Bonds

The fungible issue is the issuance of additional government bonds with the same issuance conditions, such as maturity and coupon rates for a certain period, to revitalize the government bond market. This is a system that is used to expand the distribution volume of the same item. Korea implemented this system in May 2000. The BOK has the authority to determine all necessary matters concerning the payment and settlement system that it operates in order to promote overall payment and settlement system safety and efficiency. The system has been developed by the BOK, and its name is BOK-Wire+. For the details about the BOK-Wire+, refer to the document at the following link: https://www.bis.org/cpmi/paysys/korea.pdf

3.3.3.1 Effect of the Fungible Issue

The fungible issue of government bonds enhances the liquidity of government bonds by expanding the issuance of government bonds per item.

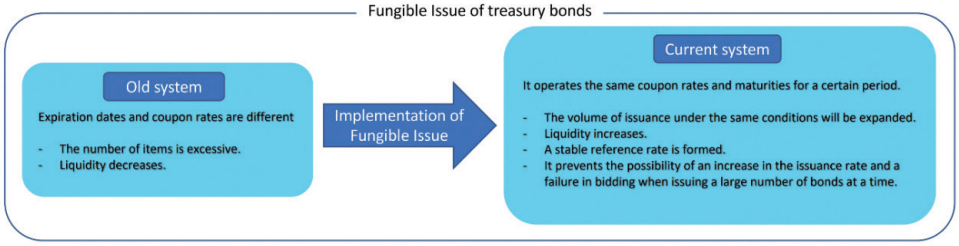
- High-liquidity government bonds can be issued at relatively low interest rates due to liquidity premiums, reducing the cost of issuing government bonds.

- Increasing the liquidity of government bonds stabilizes the government bond index interest rate by activating transactions.

- Fungible issues can be issued several times to secure the liquidity of government bonds, preventing the possibility of a rise in issuance interest rates and unsuccessful bidding due to one mass issuance.

- If market pressure occurs due to oligopoly of some institutions, government bond prices and market stability are secured through the fungible issue.

Figure 3-8 Fungible issue of treasury bonds



Source: Korea Exchange. *Korean Bond Market* (in Korean). 2015

3.3.3.2 Period of the Fungible Issue

The fungible issue period is within 6 months (3-year, 5-year, and 10-year bonds), 1 year (20- year, and 30-year bonds), and 2 years (inflation-linked government bonds), respectively, from the date of issuance of new stocks.

- For example, in the case of five-year Treasury bonds issued for six months, they will be issued as of September 10, 2016, through bidding on Monday, September 5, 2016. After that, it will be additionally issued under the same conditions (maturity, coupon rate, etc.) through bidding on Monday, October 10, 2016; Monday, November 7, 2016; Monday, December 5, 2016; Monday, January 9, 2017, and Monday, February 13, 2017.

Table 3-14 The government bond's period of the fungible issue

Item	The number of new issues	Period of the fungible Issue	New issue date
3 years	Twice a year	6 months	June 10 December 10
5 years	Twice a year	6 months	March 10 September 10
10 years	Twice a year	6 months	June 10 December 10
Inflation-linked	Every other year	2 years	June 10
20 years	Once a year	1 year	September 10
30 years	Once a year	1 year	March 10

The fungible issue plan was updated and has been active since 2015. As a result of the fungible issue system, the total issuing volume of KTBs has increased remarkably, thereby strengthening KTBs' status as benchmark bonds in the Korean financial market.
Source: Korea Exchange. *Korean Bond Market* (in Korean). 2015

3.3.3.3 Method of Determining the Coupon Rate and Marking the Item Management Code.

The coupon rate of Treasury bonds and bills must be a multiple of 0.125%, based on the weighted average winning bid rate (cutting the fourth decimal place or less) of newly issued Treasury bonds and bills. However, it should not exceed the weighted average winning rate.

- For instance, the coupon rate was 2.125% when the weighted average winning rate was 2.220%, and the new 10-year bond was issued on June 10, 2017.

The item management code for Treasury bonds is a total of 13 digits of coupon rates (5 digits) - maturing year and month (4 digits) – maturity and fungible issue round (2 digits + 2 digits).

- If a 10-year Treasury bond, which has a maturing date of December 2016, with a coupon rate of 1.500%, is issued for the 16th time in April 2017, the code is 01500-2612-1016.

In the case of new issuance, the coupon rate shall be indicated as "00000" before the bid. After the successful bid rate is decided, the code, including the interest rate, is given.

Table 3-15 Granting an item management code for newly issued Treasury bonds (Example)

When a new five-year bond was issued on December 5, 2016 (issued date: March 10, 2017)	
Before the bid	00000-2203-0500
The results of the bid	Winning bid rate 1.980%, coupon rate 1.875%
Item code	01875-2203-0500

Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

3.3.4 Issuance of Repurchase Agreement Government Bonds

3.3.4.1 Overview

In the case of a Repurchase Agreement (repo) government bond, the PD applies to the government to issue Treasury bonds of a particular item on a repurchase condition only if there is a concern about imbalances between supply and demand in the bond market due to an increased demand of the particular bond. Then, the government decides whether to issue it in consideration of the government bond market conditions.

- It is a bond issued on the condition that Treasury bonds will be returned to the government after a specific date.

The status and nature of the repo government bonds are the same as those of general Treasury bonds.

3.3.4.2 Bond Structure and Issuance

If there is a concern about unstable supply and demand in the government bond market due to increased demand for Treasury bonds of certain items, the PD requests issuance, and the government issues it in consideration of market conditions.

- Both on-the-runs and off-the-runs can be issued as repos.

- PDs can apply for at least 1 billion won to up to 50 billion won per item in units of 1 billion won.

- Calculation of the sale price and repurchase price.

  Sale price = (total face value of repurchase Treasury bonds × market value*/10,000).

  *: Market value is the price calculated by the Korea Exchange based on the valuation price of the repo Treasury bonds announced by the bond rating agency this year (market

valuation price).

However, in the case of the contract renewal for the sale of Treasury bonds, the sale price is the repurchase price on the day of renewal.

Repurchase price

= {Sales price × (1 + Repurchase interest rate × The number of days in the transaction period/365)}

* The repurchase interest rate is calculated as 90% of the unsecured call rate between banks (the next day item) announced by the Bank of Korea (cutting the third decimal place or less).

The repurchase transaction period is up to 90 days through a renewal of the repurchase transaction contract of Treasury bonds. However, it can be extended until the next issuance date of Treasury bonds in the same item.

- The repurchase transaction of Treasury bonds ends when the government pays the repurchase price on the repurchase day and the PD returns the repurchase Treasury bonds. The government incinerates the returned repurchase Treasury bonds.

- If a PD fails to return repo government bonds due to unavoidable reasons on the repurchase day, a cash* equivalent to repo government bonds can be paid instead.

*: If there is an issuance of Treasury bonds of the same item by the date of repurchase, the total face value of repo government bonds × market value / 10,000 × (1 + 0.5%)

*: If there is no issuance of Treasury bonds in the same item by the date of repurchase, the total face value of repo government bonds × market value / 10,000 × (1 + 0.2%)

#: The market value is the highest value among the market value of the date when the repurchase of the relevant government bonds was made and that of the repurchase date.

The repo Treasury bond system was introduced in June 2003, and on April 14, 2009, the three-year Treasury bonds were first issued, worth 20 billion won (face value). It was repurchased in May of the same year.

Table 3-16 Changes to the transaction system for repo Treasury bonds

	June 2003 ~ March 2011	After April 2011
Requirements for application.	Short selling of a PD occurred.	Concerns over unstable supply and demand in the government bond market.
Applicable bond	On-the-runs	On-the-runs and off-the-runs
Government approval when applying for issuance	When a PD requests issuance, the government must comply with the issuance	Determination of issuance in consideration of government bond market conditions.
Applicable quantity and application unit	Maximum 50 billion won per item	Per item, applicable for at least 1 billion won to up to 50 billion won in units of 1 billion won
Transaction period	It can be extended to the next issuance date of Treasury bonds in the same item within the range of 90 days	It can be extended up to 90 days or until the next issuance date of the same item

Source: Bank of Korea. Overview of Securities Business by the Bank of Korea (in Korean). Available at BOK: https://www.bok.or.kr/portal/bbs/B0000248/list.do?menuNo=200764

The Public Fund Management Fund, a primary agent of funding for Treasury bonds, pays a repurchase interest (90% of the call rate during the period) to the PDs on the maturity date of the repurchase transaction.

The issuance and repayment of repo Treasury bonds shall be made using the Bank of Korea's computer system (with a person in charge of securities affairs), and the Korea Exchange's computer system shall be used for repurchase price calculation and maturity management.

3.3.5 Globalization of the Bond Market

3.3.5.1 Overview

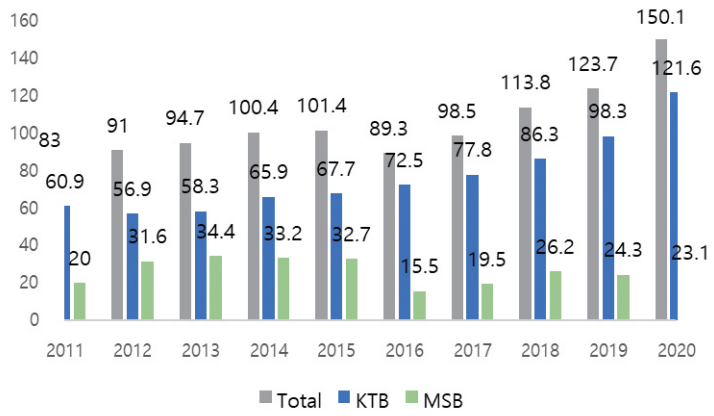
Foreigners recently showed a stable investment trend, increasing the balance of Korea's bonds despite lingering external uncertainties such as the United States-China trade dispute and the COVID-19 pandemic.

The balance of foreign bond holdings generally remained at around 100 trillion won since mid-2013, and declined slightly in 2016 due to portfolio adjustments of some global funds, but reached a new high every year and maintained a steady increase since it recovered to 100 trillion won in 2017.

Since March 2020, large-scale capital outflows have occurred in bond markets in emerging economies at a time when uncertainties in domestic and foreign financial markets increased significantly due to the spread of COVID-19. However, foreign investment in the Korean bond market increased substantially due to trust in Korea's stable fundamentals and increased demand

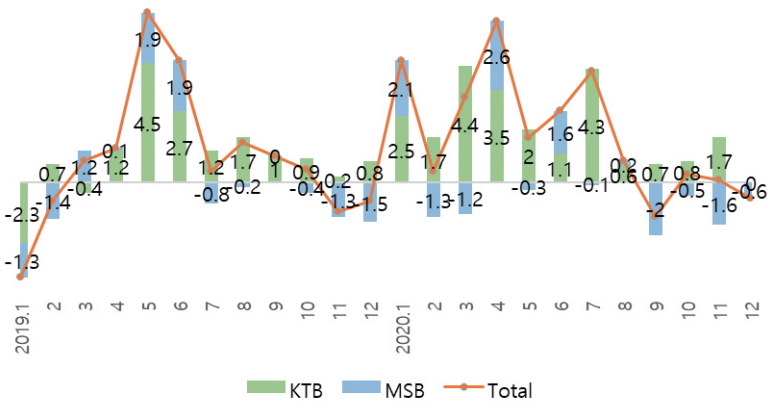
for fiscal transactions. The balance of foreign bond holdings reached an all-time high of 151 trillion won at the end of August. However, since October, some outflows occurred similar to previous years due to maturity repayments, such as Treasury bonds, and year-end book closures. However, the outflows showed a year-on-year reduction, and a stable foreign investors' investment trend continued through the end of the year.

Figure 3-9 Trends in the balance of bonds held by foreigners by year (tn won)



KTB and MSB refer to 'Korea Treasury Bonds' and 'Monetary Stabilization Bonds', respectively. All numbers are scaled in trillion won.
Ministry of Economy and Finance. *Korean Treasury Bonds*. 2020

Figure 3-10 Monthly trend of foreign net investment between 2019 and 2020 (tn won)

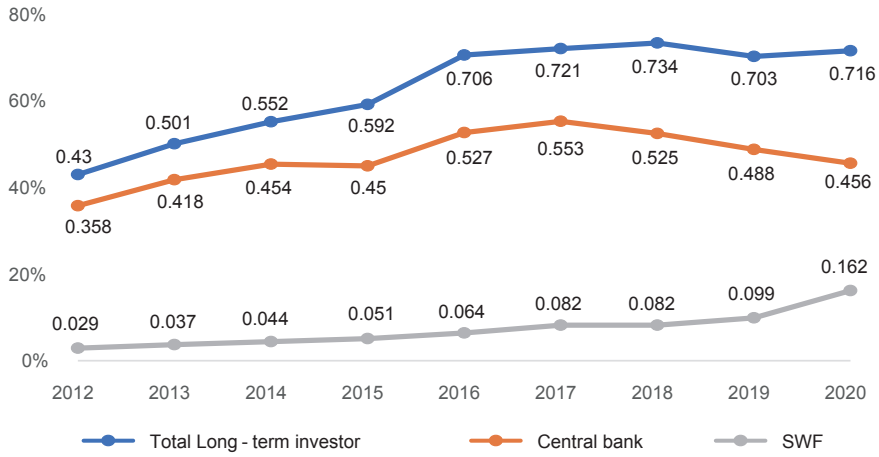


KTB and MSB refer to 'Korea Treasury Bonds' and 'Monetary Stabilization Bonds', respectively. All numbers are scaled in trillion won.
Ministry of Economy and Finance. *Korean Treasury Bonds.* 2020

By investor, the balance of holdings rose, especially in foreign central banks and sovereign wealth funds, both of which are mid to long-term investors. The ratio of mid to long-term investors continued to increase since 2007, reaching 71.6% as of the end of 2020. Accordingly, Korea's foreign bond investment showed improved results both quantitatively and qualitatively.

Among investors, sovereign wealth funds recently gradually increased their roles and proportions in the domestic bond market, and in 2020, they increased their large-scale investment holdings in the Korean bond market significantly. Meanwhile, foreign central banks are steadily decreasing their share of holdings every year due to the expansion of investment in sovereign wealth funds, but they are steadily increasing their investment every year. They still account for 45.6% of all foreign investors' bond holdings at the end of 2020, the highest proportion among major investment players.

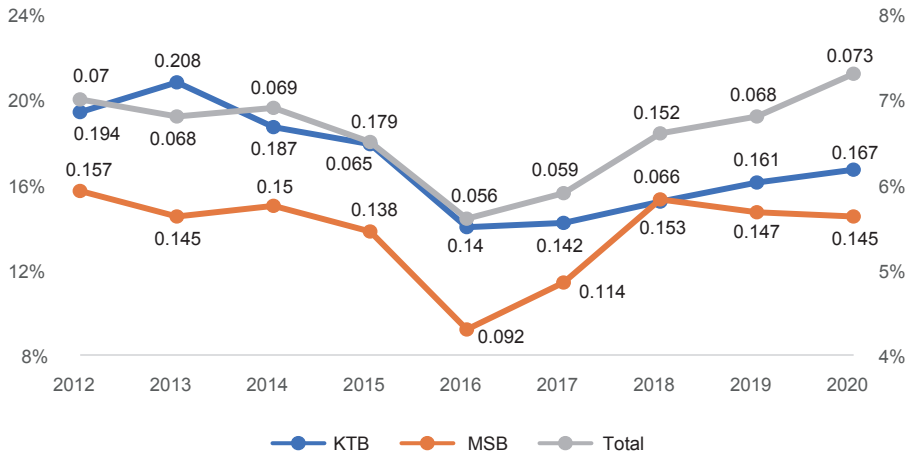
Figure 3-11 Monthly trend of foreign net investment between 2019 and 2020 (tn won)



SWF refers to 'Sovereign Wealth Funds'. Long-term investors share includes the outstanding holding volume of foreign central banks, sovereign wealth funds, insurance companies, and various pension funds.
Ministry of Economy and Finance. *Korean Treasury Bonds*. 2020

By item, the trend is showing a stable increase, mainly in Treasury bonds. The proportion of foreigner's bond holdings to total bonds gradually increased after a temporary decrease in 2016, reaching an all-time high of 7.3% as of the end of 2020. Among them, the share of Treasury bonds increased gradually from 13.8% at the end of 2015 to 16.7% at the end of 2020, while the share of monetary stabilization bonds holdings decreased slightly from 15.3% at the end of 2018 to 14.5% at the end of 2020.

Figure 3-12 Trend of foreigners' shares in Korean government bonds



KTB and MSB refer to 'Korea Treasury Bonds' and 'Monetary Stabilization Bonds', respectively. All numbers denote the percentage of foreigners' shares in total outstanding volume of each bond.
Ministry of Economy and Finance. *Korean Treasury Bonds*. 2020

The average remaining maturity of bonds held by foreigners is on the rise, along with an increase in the proportion of mid to long-term investors and an increase in long-term bonds issuance. In 2018, the average remaining maturity decreased slightly due to a rise in the inflow for monetary stabilization bonds with temporarily good returns. However, since 2019, the average remaining maturity of holding bonds rose again to the level of 4.53 in 2020 as the inflow for mid to long-term Treasury bonds increases. By bond, the average remaining maturity of bonds held by foreigners is around 5.45 years, and in the case of monetary stabilization bonds, it is about 0.55 years.

Table 3-17 Average remaining maturity trend of bonds held by foreigners

(Unit: year)

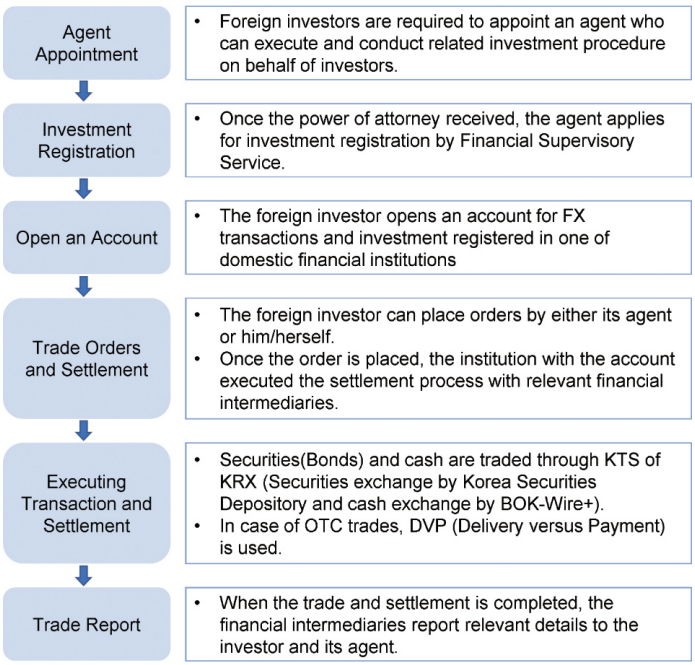
Year	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total bonds	2.59	2.88	2.90	3.21	4.21	4.07	3.70	4.46	4.53
Treasury bonds	3.59	4.02	4.04	4.45	4.99	4.96	4.65	5.37	5.45
Monetary stabilization bonds	0.82	0.85	0.68	0.67	0.72	0.57	0.61	0.73	0.55

Ministry of Economy and Finance. *Korean Treasury Bonds*. 2020

3.3.5.2 Foreigner's Investment Procedure

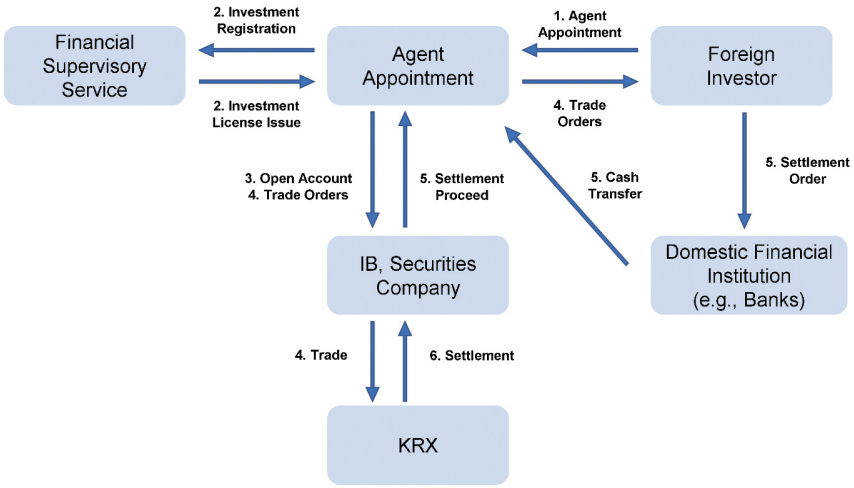
Figures 3-13 and 3-14 illustrate the procedure of foreigner's KTB investment.

Figure 3-13 Flowchart of foreigner's investment procedure



Since foreigners were first allowed to participate in the CB (Convertible Bond) market in 1994, the authorities worked on establishing relevant systems so that foreign investors could freely access the Korean bond market. As of July 1998, foreigners were finally allowed to trade unlisted bonds, and many experts claim that this is when foreign investors acquired full access to the Korean financial market.
Source: Korea Exchange. *Korean Bond Market* (in Korean). 2015

Figure 3-14 Schematic illustration of foreign investment procedure



This figure illustrates how the foreign investor can participate in the Korean bond market. For further information, refer to "Korea Exchange. *Korean Bond Market* (in Korean). 2015".

4

Timor-Leste Condition for Government Treasury Bills

4 Timor-Leste Condition for Government Treasury Bills

For the issuance and stable and efficient management of government bonds, various aspects, such as fiscal soundness, the level of development of the financial market, macro- fundamentals, and political stability, must be reviewed first. In order to review the necessity of issuing government bonds, it is vital to understand the current fiscal balance. Next, in order to secure liquidity and gauge the liquidity risk premium, it is crucial to review the entire domestic financial markets and institutions, which are potential sources of demand for government bonds. Finally, to estimate the default risk premium, we need to examine macro-fundamentals. Based on the above detailed analysis of the macroeconomic conditions, the types, maturities, and currencies of government bonds that can be operated stably and long-term at low issuance costs can be determined. This chapter details the current state of the macro conditions in Timor-Leste.

4.1 Fiscal Condition and Taxation

4.1.1 Fiscal Condition

The introduction of the T-bills is in line with the MoF Timor-Leste (General Directorate of Treasury Strategic Plan, 2021-2026 (p.15-16)). It is necessary for Timor-Leste to diversify its portfolio to ensure fiscal sustainability. Since 2011, the government has advocated for economic diversification. Recognizing the fact that the government's excessive dependence on oil is not sustainable, the government may be forced to make painful adjustments (e.g.: raising tax, cutting spending) in the near future. Since 2006, successive governments have embraced an extreme expansionary fiscal policy stance based on large spending and low taxation. This stance is unsustainable and requires a major overhaul. Very high public expenditure levels (averaging 86 percent of non-oil GDP in 2008-2019) and low domestic revenue collection (below 12 percent of GDP) are placing strong pressures on the country's petroleum wealth. The petroleum fund is predicted to be exhausted in about 10 years, owing to the imminent end of petroleum revenues and large withdrawals to finance the state budget (Timor-Leste Public Expenditure Review, 2021 p.xv).

In other words, revenue from petroleum has been the primary source of income for Timor-Leste's government, which sustains the state budget. Following is the aggregate fiscal data (the percentage of GDP, USD million)[7] of Timor-Leste.

Table 4-1 Total Expenditure Revenue (Year 2015-2017)

	2015		2016		2017	
	Budget	Actual	Budget	Actual	Budget	Actual
Total Expenditure (Incl. loans)	1,570.0	1,342.4	1,562.2	1,632.2	1,386.8	1,190.2
Total Revenue	808.9	821.7	716.2	743.7	687.8	669.0
Domestic Revenue	170.4	183.2	171.4	198.9	206.2	187.4
Estimated Sustainable Income (ESI)	638.5	638.5	544.8	544.8	481.6	481.6
Fiscal Balance	761.1	520.8	846.0	888.5	699.0	521.2
Financing	761.1	528.2	846.0	885.7	698.9	523.5
Excess withdrawals from the PF	689.0	640.0	639.0	700	597.1	597.1
Use of cash balance	2.1	-136	0.0	155.1	0.0	-103.7
Borrowings/Loans (Disbursement)	70.0	24.2	107.0	30.6	101.8	30.1

Source: World Bank

Recently, the MoF conducted a series of consultation with banks in Dili such as Bank Mandiri, BRI Bank, BNCTL Bank, and BNU. All of these banks advised the government to apply for credit worthiness by major credit rating agencies.[8] Good ratings may attract more stakeholders (individuals, government institutions, corporations) in purchasing the T-bills.[9] In this case, the government and a few commercial banks have expressed interests to participate in the purchase of T-bills. So, it is important to note that the government has demand to buy the T-bills in raising capital. When the Timor-Leste government goes to the financial market to raise money/capital, the government may act as a secondary buyer along with commercial banks. The BNU and the BNCTL have expressed their confidence to participate as secondary buyers.

Timor-Leste is a commodity-based developing economy. Its economy is exposed to commodity price volatility, the risk of the depletion of natural resources, and an unstable macroeconomic environment, which could lead to high volatility in government revenues and to deeper recessions. Fiscal rules for commodity-based economy are primarily designed to cope with the

7 PEFA Timor-Leste (2018). PEFA Checked June 2020. https://www.laohamutuk.org/DVD/2020/PEFA-TL-2020en.pdf
8 Major credit rating agencies: S&P, Fitch, Moody's.
9 BNU Bank and BNCTL Bank frankly expressed that they are willing to participate in the purchase of the Treasury Bills.

price volatility, achieve macroeconomic stability, fiscal sustainability, and ensure an equitable intergenerational allocation of resources. The establishment of the Petroleum Fund (PF), with Estimated Sustainable Income (ESI) and Excess Withdrawals (EW) attributes, is meant to help achieve these objectives. The government of Timor-Leste currently has two ways to inject cash for development: (i) ESI, which is an element of Revenue Rules (RRs) and (ii) loans. In addition, the MoF applies growth limit to budget categories in the fiscal sustainability model, but it has no legal compliance requirement. Under the existing fiscal and Public Financial Management (PFM) reform, the government should consider designing and using fiscal rules that may fit well to the country's context.[10]

Table 4-2 Proposed Fiscal Rules for Timor-Leste.

PROPOSED FISCAL RULES FOR TIMOR-LESTE			
Expenditure Rules (ER)			
80% Expenditure to GDP	◇	○	●
10% Recurrent Growth	◇	○	●
30% Capital to GDP	◇	○	●
Revenue Rules (RRs)			
3% ESI	●	●	●
60% Excess withdrawals to ESI	◇	●	●
15% of Domestic Revenue to GDP	◇	◇	◇
Budget Balance Rules (BBRs)			
30% Budget Deficit to GDP	◇	○	●
50 Recurrent to GDP	◇	○	●
Debt Rules (DRs)			
60% Debt to GDP	◇	●	●
3% Borrowings Cost	●	●	●

● Law and decree law ○ Government decree ◇ Political commitment
Short-term Medium-term Long-term

Fiscal Rules refer to institutional mechanisms that impose numerical limits on budgetary aggregates to ensure fiscal discipline and credibility. The table above shows that there are four types of fiscal rules: expenditure rules, revenue rules, budget balance rules, debt rules. Timor-Leste uses revenue rules. Timor-Leste uses revenue rules because its developing economy is based on commodities. As mentioned above, this exposes the country to an unstable macroeconomic

10 Policy Paper for Fiscal Rules (2020) by Senior Economist, Helder da Costa.

environment. Because commodity prices fluctuate and the country's ongoing supply of gas and oil is uncertain, the government faces high volatility in its revenue and the potential of a worsening economy.[11] Fiscal rules for a commodity-based economy are primarily designed to cope with these challenges, as well as create the conditions that will help a country achieve a stable and sustainable economy and create the conditions that will ensure a fair intergenerational allocation of resources. Establishment of PF with ESI and EW attributes are meant for these objectives. The fact that the ESI, as a fiscal rule, has been consistently breached over the past 10 years is a matter of concern.[12]

4.1.2 Taxation

Taxes in Timor-Leste are categorized as the following types: Sales Tax (*Imposto sobre as vendas*), Import Duty (*Imposto Sobre importação*), Wages Tax (*Imposto Sobre Saláry*), Withholding Tax (*Imposto Retenção na Fonte*), Income Tax (*Imposto Sobre Rendimento*)[13], Service Tax (*Imposto Sobre Serviço*), and Excise Tax (*Imposto Sobre Consumo*). The loss of sales tax revenue between the years 2014 and 2018 was worth USD 6,107,701. On average, it is a USD 1.2 million annual loss, which might contribute to an economic downturn, although it may not cause significant economic effect.[14]

Among these taxes, the excise tax (on food, beverage, and the like) is a major source of revenue, compared to income tax and the rest. Nevetheless, income tax is particularly a concern because there is a discrepancy between the total number of public servants registered by the Civil Servant Commission and the MoF. This is not a good sign because it does not depict efficiency and the efficacy of service delivery, both input and output. In a democratically elected government, efficiency and effectiveness boost participation and responsiveness; hence, it stimulates trust and cooperation.[15]

11 https://www.laohamutuk.org/econ/OGE21/jornada/PolicyPaperFiscalRulesJun2020en.pdf (p.6)
12 2021 Timor-Leste Public Expenditure Review: Changing Course Towards Better and More Sustainable Spending (p.xvii)
13 National average income at 1.54 per day, National Average at 1.90 per day PPP.
14 In a sharp economic downturn, the government may apply fiscal stimulus package and countercyclical fiscal policy. The latter aims to compensate for effect of economic cycle. Measures like decreasing the spending and increasing taxation should be a rationale and important event. Yet, it could be hard choice for political parties in trading off political votes.
15 Gi Heon Kwon, National Innovation Strategy and Solution (2014), p23.

Figure 4-1 Pyramid of Efficiency, Participation, Trust

The pyramid is particularly relevant to the point, because citizen[16] participation in paying taxes is not high in Timor-Leste. To increase participation, citizens should be well informed and convinced that the tax paid by the citizens are efficiently and effectively allocated in impoving public goods. This lays foundation to increase participation. In other words, if resource allocation and redistribution is effective and efficient, it attracts participation and responsiveness, and it further attracts trust and cooperation. But, it is also possible that change could begin from trust and cooperation to responsiveness.

4.2 Financial Market Condition

4.2.1 M2

To understand M2, one should understand the M1 first. The M1 refers to the cash/coins that are currently circulating in the public, checkable deposits, travelers' checks. The M2 is comprised of M1 and saving deposits in the form of certificates of deposit. An understanding of M1 and M2 allows us to measure the aggregate of money supply in the public.

Table 4-3 M2

Measure	Amount in 2017 ($ million)	Included
M1	273 (year 2021)	• Coins[17] • Cash
M2	822.9 (year 2017)	• M1 • Saving deposits • Money market mutual fund

Source: The Central Bank of Timor Leste (CBTL) Annual Report 2021 (p. 123)

16 Most of these people are very poor, and do not have money to pay taxes even if the system was changed to collect from them. About 40% of Timor-Leste households live in poverty. As the saying goes, "you can't get blood from a stone."

17 The coin is called "centavos" which is similar to a fiat money in Timor-Leste.

The amount of the M2 above is derived from the following table:

Table 4-4 Total Amount of M2 from year 2011 - 2017

	2011	2012	2013	2014	2015	2016	2017
GDP ($ million)	1,058.2	1,193.7	1,415.4	1,454.4	1,608.7	1,701.5	1,676.9
M2 ($ million)	322.4	406.9	500.2	599.8	642.4	733.9	822.9
M2/GDP (%)	30.5	34.1	35.3	41.2	39.9	43.1	49.1
Private Sector Credit ($ Million)	132.8	160.1	181.8	191.8	211.9	208.0	259.6
Private Sector credit/GDP (%)	12.5	13.4	12.8	13.2	13.2	12.2	15.5

GDP = gross domestic product, M2 = broad money
Source: Asia Development Bank and International Monetary Fund.

4.2.2 Major insurance companies

Insurance companies are relevant stakeholders in terms of providing information regarding the profile of potential secondary buyers, particularly if the buyers are from individual firms. At least, two insurance companies are now registered at the Central Bank; Sinarmas Insurance (SMI), and Federal Insurance Timor (FIT), originally from Samoa. Sinarmas has been licensed in Timor-Leste since 2011, while Federal Insurance Timor was licensed in 2016. The Sinarmas with its origin in Indonesia may have an advantage in absorbing the demands from Indonesian businesses. Both the insurers may play important roles as insurers to the potential economic players regarding some minimum guarantees.

4.2.3 Country credit rating

Timor-Leste is not yet registered in the global country credit ratings by major credit rating agencies like Standard and Poor's (S&P), Fitch, and Moody's. For S&P and Fitch, a bond is considered investment grade if its credit rating is BBB– or higher. Bonds rated BB+ and below are considered to be speculative grade. For Moody's, a bond is considered investment grade if its credit rating is Baa3 or higher. Bonds rated Ba1 and below are considered to be speculative grade.[18]

18 A speculative credit rating indicates that the company is less likely to be able to pay back its creditors than a company with an investment-grade rating.

Table 4-5 Credit Investment Grade

Investment Grade		Speculative Grade	
Highest quality	Medium Grade	Significant and high credit risk	Very high credit risk
Aaa, Aa1, Aa2, Aa3 AAA, AA+	A1, A2, A3, Baa1, Baa2, Baa3	Ba1, Ba2, Ba3, B1, B2, B3	Caa1, Caa2, Caa3, CCC

Since there is a lack of available data of country credit rating for Timor-Leste, two countries that share similar characteristics in terms of the Human Development Index (HDI) may be used as reference. According to the HDI 2019, Timor-Leste (0.626) was in between Namibia (0.645) and Lao PDR (0.604). But in the HDI 2020, Timor-Leste was dropped to 0.606, between Vanuatu and Nepal, while Lao PDR increased to 0.613.[19] Credit rating agencies like Fitch described the credit rating for Lao PDR as CCC while Namibia's credit rating is BB. Although Timor-Leste is not yet registered in the global credit ratings, the CBTL's *Annual Report 2021* provides the sovereign credit rating. While this sovereign credit rating can give investors insights into the level of risk associated with investing in the debt of a country, Timor-Leste may consider inviting a credit rating agency to help prepare the initial steps towards a credit rating assessment.

4.2.4 Commercial Banks

In preparation for introducing the T-bills in Timor-Leste, the CBTL is currently working on developing automated supervision involving all commercial banks in Timor-Leste to enhance the data quality in a prudent manner.[20] It is important to manage resources based on real data. It allows the Central Bank to consider convertible instruments, such as a Central Bank Certificate (CBC), which could be considered as a useful practice towards a more upgraded e-banking service in the domestic market. Potential buyers of the CBC in Timor-Leste are as follows:

19 Timor-Leste's HDI ranking fell 12 positions from 2014 to 2019, more than every country except Venezuela and Yemen. (https://hdr.undp.org/sites/default/files/hdr2020.pdf)

20 Interest rate of loans among financial institutions in Timor-Leste: BNU: 11-14 percent, Bank Mandiri: 9 ~ 17 percent, Credit Union: 36 percent, Kaebauk Investment: 29 percent, BRI Bank: 11 percent, BNCTL: 12 percent.

Table 4-6 Commercial Banks and Credit Institutions

No.	List of Banks	Potentially participating as secondary buyers	Origin of country
1.	BNU (Caixa Geral de Deposito)	High	Portugal
2.	BNCTL	High	Timor-Leste
3.	Bank Mandiri	Medium to high	Indonesia
4.	Bank BRI	Medium	Indonesia
5.	ANZ Group	-	Australia/New Zealand
No.	**List Credit institutions**	**Potentially participating as secondary buyers**	**Origin of country**
1.	Credit Union	High	Timor-Leste
2.	Kaibauk	-	Timor-Leste
3.	Moris Rasik	-	Timor-Leste

In terms of the priority, some banks suggest that it is better for Timor-Leste to start with T-bills, while other banks emphasize the importance of ratings of credit worthiness. Other than the lists above, there are also nine money transfer operators and four foreign exchange bureaus.[21] Three other players (Credit Union, Kaibauk, Moris Rasik)[22] are particularly noted because they could reach out to the very rural area. However, there are high number of their beneficiaries and business partners in rural areas that do not have a bank account. As a matter of fact, only 30 percent of the Timorese population uses a banking service.[23]

4.3 Macroeconomic Factors Related to Default Risk

4.3.1 Fiscal Account

The fiscal balance is the difference between general government revenues and expenditures, showing how much in a given year government spending is financed by the revenues collected. Following is aggregate fiscal data (percentage of Non-oil GDP):

21 https://www.bancocentral.tl/en/go/financial-institution
22 Some analysts from La'o Hamutuk are concerned about the credit unions that were established to make loans to small local businesses. It may override their purpose if they were to loan money to the TL government by purchasing T-bills. Also, their total assets are small compared with the government.
23 Economic Recovery Plan (p.81)

Table 4-7 Fiscal Aggregate Data (Percentage of Non-Oil GDP)

	2014	2015	2016	2017	2018
Total Revenue	55	51	44	42	46
Domestic Revenue	12	11	12	12	11
ESI	44	40	32	30	35
Total expenditure	93	84	97	75	73
Recurrent expenditure	63	64	61	58	52
Capital expenditure	29	19	36	17	21
Fiscal Balance	-37	-33	-53	-33	-27
Financing	37	33	53	33	27
Cash balances	29	-9	9	-7	-2
Excess withdrawals from the PF	7	40	42	37	27
Loans	1	2	2	2	2
Memorandum items					
Oil production (million BOE)	45	48	49	41	38
Petroleum Fund, closing balance (USD billion)	16,539	16,218	15,844	16,799	15,804

Source: World Bank

4.3.2 Petroleum Fund Prospect

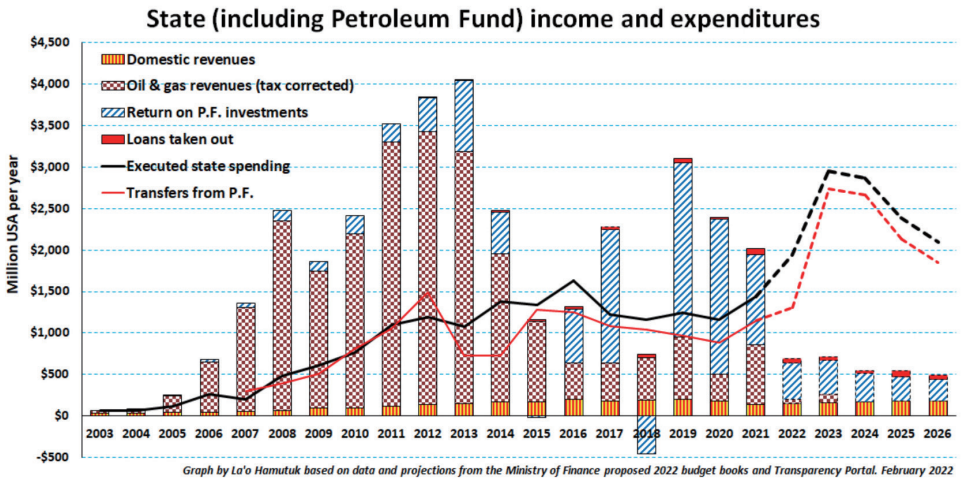
Timor-Leste petroleum fund is currently worth USD 19 billion (2021). But Dili-based think tank La'o Hamutuk analyzed the possibility that the Timor-Leste Petroleum Fund may run out in a decade. Production from current fields peaked in 2012 and is forecasted to end around 2033, while the prospects for new developments are uncertain.

From a global perspective, there is a possibility that oil price may reach USD 100 per barrel, with a prediction that oil peak will occur by 2030 (The prospect seems like decreasing trend). Moving towards the end of the oil era makes economic diversification imperative.[24] An oil-dependent country like Timor-Leste must diversify its economy to become resilient to changes in the energy market. As of February 2022, the total net capital of the Petroleum Fund is USD 19,460,415,000. Previously (Dec. 2021), the total net capital was USD 19,650,677,000. In August 2021, the fund was USD 19,713,591,000.

24 It is imperative for TL because there may be no more commercially viable reserves in TL's territory which could be extracted. This has nothing to do with the global situation (although responses to the threat and reality of climate change will end start to reduce oil production well before 2030), as observed by the La'o Hamutuk think tank.

Furthermore, the stance of the elected President of Republic, Jose Ramos Horta (2022-2027) is that he would speed up the Greater Sunrise fields' natural oil and gas reserves project, which has become more significant since the war in Ukraine triggered a global fuel crisis.[25] The project is expected to generate USD 40 billion over its projected lifetime of 30 years.[26] Future petroleum development, such as the Greater Sunrise project, could provide additional revenues, but they could also require large upfront costs, along with agonizing fiscal adjustment.

Figure 4-2 State income and expenditures



The graph above shows that the peak revenue of the PF was in year 2012. And since 2013, the revenue fluctuated in a decreasing trend. The year 2018 was particularly a bad year for the stock market, and the rising US dollar lowered the dollar valuation of the PF's investment in instruments in other currencies. The value of PF investments fell by USD 643 million during 2018, and foreign exchange losses were another USD 157 million. Therefore, although the PF received USD 365 million in interest and dividends, the overall investment return was negative.

Below is a balance sheet[27] shared by the CBTL as of February 2022:

25 https://www.laprensalatina.com/ramos-horta-claims-victory-in-east-timors-presidential-race/?fbclid=IwAR0CHZju6otWGaZv9Uga_Jn8A3nCjvZvelc381HH_AmRM3lYWNvNZX6vX7Q

26 https://www.hydrocarbons-technology.com/projects/sunrise-gas-field/

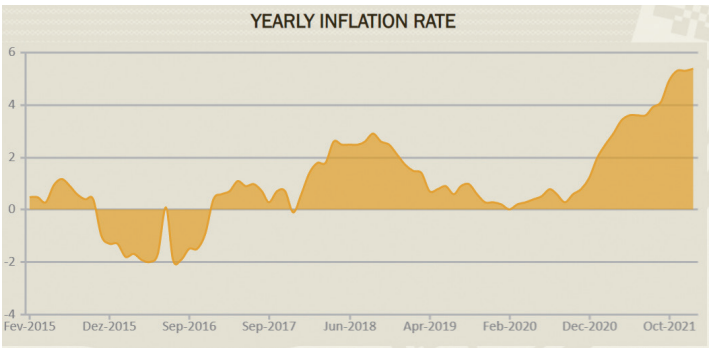
27 The government also has other financial assets, plus physical (infrastructure) and human assets (workers, systems, businesses, etc.). According to https://www.bancocentral.tl/uploads/documentos/documento_1647819835_7501.pdf, BCTL held $372 million in government deposits at the end of February 2022; and there are also accounts in other banks.

Table 4-8 Petroleum Fund Balance Sheet

BALANCE SHEET	USD '000
ASSETS	
Cash and cash Equivalents	2,294,855
Other receivables	19,952
Finance assets held at fair value through profits or loss	17,171,790
TOTAL Assets	19,486,597
LESS: LIABILITIES	
Payables for securities purchased	-24,714
Accounts payable	-1,468
TOTAL LIABILITIES	-26,182
TOTAL NET ASSETS	19,460,415
CAPITAL	
Opening Balance as of previous month	19,298,543
Capital Movement of this month	369,934
Net Result income for this month	-208,062
TOTAL NET CAPITAL	19.460.415

4.3.3 Inflation and interest rates[28]

Figure 4-3 Yearly Inflation Rate, 2015-2021 (Timor-Leste)



28 https://www.bancocentral.tl/en

The graph above shows that Timor-Leste's inflation rate in the middle of 2021 was 3.6 percent and 4.5 percent towards the end of 2021. According to the Timor-Leste General Directorate of Statistics (GDS) Consumer Price Index monthly report, the year-on-year inflation was 6.7 percent as of February 2022. However, because many commodities are imported from other countries, Timor-Leste has a very limited capacity to control inflation with fiscal policy. International prices and the value of the United States dollar are not under the control of the government, but recurrent expenditure is. The pressure for stabilizing inflation will lie with fiscal policy.

4.3.4 GDP

The April 2022 ADB *Asian Development Outlook* stated that the GDP is expected to grow 1.8 percent in 2021 and 2.5 percent in 2022. Yet, Timor-Leste GDS recently estimated 2021 GDP growth as 1.5 percent.[29] Considering the policies in response to the pandemic in Timor-Leste, growth in the GDP may go along with the government's fiscal stimulus package, which is reflected in the employment program, public investment and corporate tax cut.[30] Overall, Timor-Leste's GDP is largely dependent on the government's annual spending. In 2020, the GDP per capita was only USD 1,381.18. The Public Expenditure Review (by the World Bank Review) in 2021 made a policy recommendation to shift from development that is based on a natural resource (oil dependency) to human-oriented development. Investing in human resources is indeed a strategic investment for this population of 1.3 million.

4.3.5 Flows and Assets of the Petroleum Fund

Since the Petroleum Fund is the major source of funding, it is important to follow the flows and assets of the Fund.[31] Below is the flows and assets as described in the Petroleum Fund of Timor-Leste Quarterly Report (Vol.17 No. LXI).[32]

29 https://www.mof.gov.tl/eventdetails/timor-lestes-gdp-growth-rate-rises-1-5-in-2021after-negative-8-6-in-2020
30 This is reflected in the instruments like automatic stabilizers (tax cut) and one off spending program (employment fund).
31 This data may be entitled under the division of National Statistics that is not yet well-integrated in one unit.
32 https://www.bancocentral.tl/uploads/documentos/documento_1643940442_5656.pdf

Table 4-9 Flows and assets of the Petroleum Fund

Capital Account	USD '000
Opening book value (01 Oct.2021)	19,175,883
Receipts during the period	467,095
Transfer to General State Budget	-350,000
Investment Return	357,698
Closing book value (31 Dec.2021)	**19,650,677**

Assets	USD '000
Cash and Cash Equivalents	1,379,487
Other Receivables	4,730
Financial assets held at fair value through profit or loss	18,280,950
LESS	
Payable for Securities Purchased	-12,662
Accounts payable	-1,828
Total Current Account	**19,650,677**

Source: Central Bank Timor-Leste (partly changed)

4.4 Legislation Structure

Timor-Leste's fiscal year is from January to December. Every year in October, the National Parliament receives the state budget proposal submitted by the government.[33] Once the National Parliament receives the budget document from the government, it has approximately three months for review. Due to the unique source of funding from the oil revenue, the Petroleum Fund Law abides that:

- Transfer from the Petroleum Fund to the state budget must be appropriated by Parliament and the transfers in any one year may not exceed the ESI (unless the government provides the National Parliament justification that it is in the long-term interests of Timor-Leste).

- The ultimate authority is Parliament. Yet, the government side, by law, will need to present the state budget.

33 TL State Budget Process 2022 (http://timor-leste.gov.tl/?p=28338&print=1&lang=en)

- The state budget of each year is enacted into law and it is called the State Budget Law.

- This State Budget Law will then be promulgated by the President of the Republic. The promulgation will be followed by the publication of the State Budget Law in the *Jornal da Republica*. The Law is in effect after being published at the *Jornal*.

- The Petroleum Fund Consultative Council advises Parliament on appropriations from the Fund and the Investment Advisory Board may also provide independent and impartial advice on the Petroleum Fund's investment strategy upon the Minister's request.[34] If necessary, the government and the National Parliament invite the Investment Advisory Board for direct explanations about investment management's trend, challenges and prospects. Otherwise, the President of the Republic may use his constitutional right, article 88, to veto.[35]

- Budget process: 1) In May, the consolidation and analysis of ministerial line programs take place. 2) In September, Council of Ministers approve the budget. 3) In October, the state budget is handed over to the National Parliament, 4) In December, the National Parliament debates/finalizes the composition of the state budget and ready for the submission to the President of Republic to promulgate it. 5) Beginning in January, funds from the budget are available for spending.

The government, represented by the MoF, is responsible for the overall management and investment strategy of the PF. The CBTL is the operational manager[36] responsible for operational management of the PF by implementing policy determined by the MoF. In doing so, the CBTL ensures that the management of the PF is in line with the legal framework.[37]

As the government is responsible for formulating investment policy, future investment may be considered that will raise capital by borrowing which is separate from the PF.[38]

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34 Composition of the Investment Advisory Board: The Ministry of Finance, via the Director of Treasury or his/her delegate, and the BCTL, as the Operational Manager, and non-voting representatives on the Board actively contribute to the discussions preceding the IAB's advice.

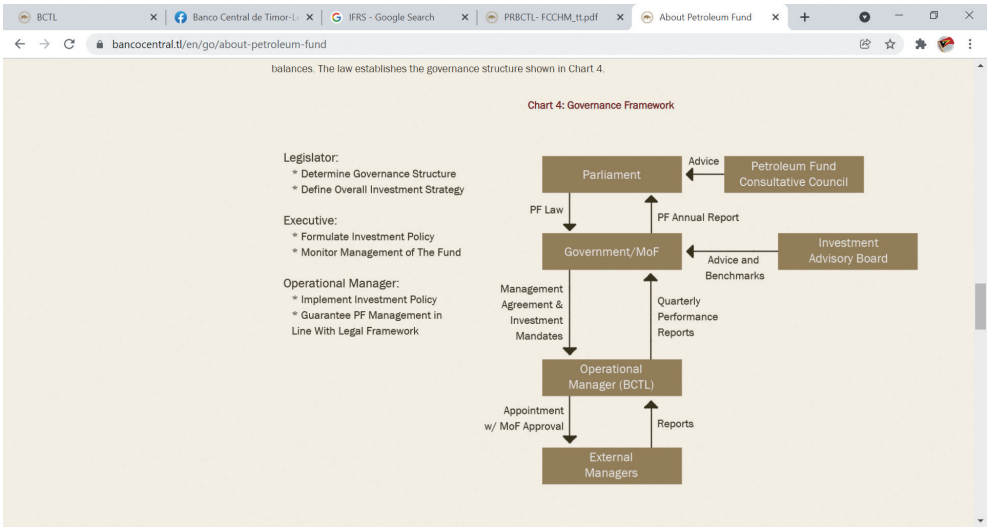
35

36 There is Board of Advisors to the CBTL to guarantee PF management is in line with legal framework. On November 25, 2021 the Board discussed a range of issues about harmonizing the banking supervision (Bank Supervision Application), credit risk management, credits classification, provisions and reserves regulatory. All these aforementioned points are to be updated in line with the International Financial Reporting Standards (IFRS)

37 https://www.bancocentral.tl/en/go/about-petroleum-fund

38 Gusmão "guaranteed" that the $13 billion is necessary to build the in-field infrastructure, pipeline and LNG plant would not come from the Petroleum Fund, but may be borrowed. (https://www.laohamutuk.org/Oil/Sunrise/18SunriseBuyout.htm#budget)

Figure 4-4 Coordination line of Timor-Leste Petroleum Fund Management



Source: Central Bank Timor-Leste (https://www.bancocentral.tl/en/go/about-petroleum-fund)

4.5 Obstacles to Introduction of T-Bills

T-bills and bonds are other names for government securities, created to raise capital for further investment. The Timor-Leste government has started borrowing money from outside (The World Bank, ADB, JICA, etc).[39] With the current balance of the PF, The Timor-Leste government may not have a problem in granting the principal or fulfilling its obligation/maturity, at least when the PF is still secured. While the internal mechanism between the CBTL and the government (MoF) is to be explored, there could be obstacles in regard to the introduction of T-bills and/or the government bonds:

- High inflation rate.
- Continued high spending by the government despite low tax revenue.
- Government may override the CBTL to buy more bills/bonds because there is sufficient reserved fund from the petroleum revenue.

39 The government has been borrowing since 2012, and have signed loan agreements for more than $550 million with the WB, ADB and Japan, of which about $230 million have already been disbursed. The IMF and World Bank have published several "Debt Sustainability Analyses" – see page 57-79 of https://www.laohamutuk.org/DVD/2021/2107IMFArtIVreport.pdf for a recent one.

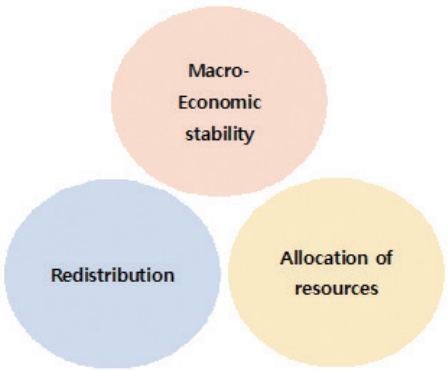
- If T-bills/bonds are introduced after the PF runs out, there might be high risk of default to repay the T-bill holders/bond-holders.

- Human capacity to manage high speed of internet is an urgent issue of soft infrastructure investment.

- Limited policy research in the area of capital market.

Regardless of the obstacles, it is important for the government to remember that a government has the responsibility to carry three important functions; macro-economic stability, redistribution, and allocation of resources.[40]

Figure 4-5 Function of Government



Macroeconomic stability should be responsive and flexible, through fiscal stimulus (i.e., automatic stabilizers and one-off spending programs). When an economy deteriorates significantly, automatic stabilizers (such as tax reduction, increases in unemployment allowance and family allowance) may not be enough. Therefore, more substantial one-off spending programs (for example, a temporary tax cut or a public employment fund) may be required. This is important to reduce economic volatility.

Resource allocation may include wages for civil servants, and infrastructure investment (for example, building schools, electricity, water, and transport). Redistribution may include progressive tax, social transfers for unemployment and family allowance. At the end, the government's function is to make sure that there is expenditure efficiency and inclusive growth.

This is pertinent to taxation in Timor-Leste because many in the economy stay in informal

40 Public Financial Management (PFM) course offered by the International Monetary Fund (IMF) 2021.

employment, resulting in fewer tax contributions. What is especially concerning is the fact that citizens may not find strong incentives to pay tax. Because of such a structural challenge, citizens may also not find any strong reason to push the government to radically change the composition of resource (budget) allocation. Dili-based think tank, La'o Hamutuk has been advocating for increases in resource allocations in critical areas (such as health and education) for the country's future. Unprecedented change of budget composition is necessary.

In addition, there are some practical challenges as the following:

- Change in leadership may affect decision to pursue T-bills.
- When there are limited secondary buyers, it may give room for the government to function as major secondary buyer. If the government involvement in the market dominates the use of the treasury bills, it may override the key role of the private sector.
- There may be a lack of human resources to manage risks, including the management of the secondary buyers.

5

Recommendations

5 Recommendations

5.1 Introducing Dollar Denominated Treasury Bills

In this report, we recommend the issuance of **short-term, dollar-denominated special bonds.** Due to (i) high expected return, (ii) substantial diversification effect, and (iii) no exchange rate risk, significant portfolio investment demand from foreign central banks, international organizations and major global investment banks is expected

5.1.1 Reasons for Dollar Denominated Special Bonds

The macroeconomic circumstances in support of dollar-denominated treasury bills are as follows.

5.1.1.1 Financial and Monetary Sectors

(a) Although the national currency is issued and circulated, independent monetary policy is not viable because the US dollar is used as the main currency.

(b) High domestic nominal interest rates are above 10%.

(c) The possibility of attracting foreign direct investment is weak due to political instability, the lack of legal and institutional systems, low predictability, and low level of human, technical, and social infrastructure.

(d) The development of the financial sector has been slow to the extent that only 30% of the population uses banking services. Due to insufficient domestic demand for government bonds, it is difficult to issue government bonds with low interest rates.

(e) The petroleum fund, which is formed from royalties, taxes, and interest income from oil development in the Timor Sea, serves as a foreign exchange reserve.

5.1.1.2 Real Sector

(a) A small proportion of the economy is in the manufacturing industry, while most of the country's economy is centered on agriculture that has low productivity.

(b) Oil production is mostly dependent on foreign capital and labor.

(c) The GDP is highly dependent on government spending, while the private sector accounts for a small portion of the GDP.

(d) Most of the government finances come from the petroleum fund.

(e) The fund balance is expected to decrease in the long term due to the depletion of oil fields and falling oil prices.

(f) Timor-Leste has a chronic and structural trade deficit.

In short, considering (i) the small amount of domestic demands for government bonds, (ii) the fact that fiscal revenues and expenditures are made in US dollars, and (iii) political instability, we propose the issuance of dollar-denominated special bonds to foreign investors.

5.1.2 How to Reduce the Funding Cost

In order to implement special bonds with low yield to maturity, it is important to ensure the transparency and liquidity of the bond market. Specific policy measures are as follows.

(a) The government needs to specify the target for issuance of government bonds in order to secure transparency. The issuance of special bonds with a specified funding target will earn investors' trust and will not cause much political controversy.

(b) To enhance transparency, it is necessary to establish a legal infrastructure for issuance and repayment of government bonds. Otherwise, if the repayment of government bonds is highly dependent on the discretion of the government, investment in government bonds is exposed to political risks, making it difficult to attract foreign investors.

(c) For liquidation, the government can introduce the professional bond Primary Dealer system of the Korean government bond market. We recommend the establishment of an electronic transaction system and electronic payment and settlement system. If the liquidity of government bonds is expanded, the liquidity risk premium can be reduced, thereby reducing the issuance cost of government bonds.

(d) If fiscal spending increases due to the issuance of government bonds, pressure on inflation and interest rates increase. To offset this, it is necessary to focus fiscal expenditure on social infrastructure, education, and research and development (R&D) investment to improve national productivity.

(e) In the long term, it is required to expand the domestic demand for government bonds by fostering a financial industry centered on commercial banks and insurance companies. This has the effect of reducing the default risk premium by lowering the national default risk as well as reducing the cost of procurement of government bonds due to increased demand.

(f) In consideration of liquidity and default risk, bonds should be issued with maturities of 1 to 2 years rather than long-term.

(g) In order to reduce the default risk premium, the government can promote small-scale currency swaps with multiple countries.

(h) In the absence of monetary policy, fiscal policy is the only means of business cycle stabilization. If the fiscal deficit is severe, concerns about the repayment of government bonds increase the default risk premium. As a result, the cost of issuing government bonds increases significantly. Therefore, the government should establish fiscal rules and a legal infrastructure, so that the rules can be maintained regardless of the political situation.

5.2. Building Fundamentals of the Government Bond Market

5.2.1 Establishing Laws and Institutions

It is critical to build a foundation to launch government bonds. In this report, we recommend these guidelines to establish legal frameworks.

5.2.1.1 Enactment of a Law for Limiting to the Amounts of Government Bonds Issued

(a) It is important to have a firm guideline on how much government debt is allowed in issuing government bonds. The scale of issuance of government bonds should be strictly managed.

(b) In general, the government bonds are issued for financing the implementation of national policies and lead to an increase in national debt.

(c) Therefore, in order to maintain fiscal soundness, strict regulations are necessary to prevent excessive increase of the national debt.

(d) In Korea, fiscal soundness is monitored by the National Assembly, which examines the total amount of government bonds, based on article 58 of the Constitution of Korea,

which provides: when the Executive plans to issue national bonds or to conclude contracts that may incur financial obligations on the State outside the budget, it shall have the prior concurrence of the National Assembly.

(e) In other countries such as the UK and Italy, the net amount of the government bonds is monitored.

(f) Hence, it is necessary to set up fiscal rules to limit the increase of government debt. Public debt can be limited by the laws or any other types of regulations.

5.2.1.2 Designing a Government Bond Acquisition System

It is necessary to carefully design how government bonds will be underwritten by investors.

(a) It is common to have a lack of underwriters of government bonds in the beginning stage of the development of the government bond market. This is because there are few investors who want to invest in an unestablished government bond market.

(b) At the beginning of the government bond market, a forced underwriting system might be necessary because the government requires a significant amount of financing despite the low level of national credit rating.

(c) Hence, in order to cover the necessary amount for government projects, it is crucial to forcibly allocate the amount to financial institutions.

(d) After securing an appropriate level of supply and demand for government bonds, it should be possible to issue through competitive bidding.

(e) Although compulsory institutions are helpful to form the initial government bond market for a country with a weak base of investors, in the long run, they may cause an imbalance between supply and demand, resulting in rigid interest rate formation and sluggish government bond trading.

(f) Therefore, a balance between the forced underwriting system and competitive underwriting system will secure a successful launch of government bonds.

(g) In Korea, only primary dealers, who have participated in the competitive bidding, are granted the right to participate in non-competitive underwriting.

This approach takes advantage of two systems by differentially granting the right to underwrite government bonds to primary dealers based on their performance of underwriting government bonds. This type of mixed system can be considered for implementation after the stabilization of

the market.

5.2.2. Issuing Special-Purpose Government Bonds

We also recommend various types of the government bonds to meet policy purposes. There are several forms of government bonds that are used in Korea.

5.2.2.1 Inflation-Linked Bonds

(a) In Korea, the inflation-linked KTBs have both the principal and interest payments linked to inflation, whereas in the general KTBs, the principal and interest payments are fixed.

(b) In the United States, inflation-linked bonds are named Treasury Inflation-Protected Securities (TIPS), which are issued in the same conformation as the KTBs.

(c) These are used as a means of hedging risks due to uncertainty in the future by preventing risks caused by inflation and guaranteeing investors' real purchasing power. This can encourage investors to purchase the government bonds.

5.2.2.2 Foreign Exchange Stabilization Bonds

It is necessary to issue foreign exchange stabilization bonds to secure the foreign exchange amount.

(a) In the developing countries, many economic variables can frequently fluctuate with speculative foreign exchange inflows and outflows.

(b) This situation entails domestic economic risk and foreign exchange risk due to the instability of economic indicators.

(c) In order to prevent the hazard posed by volatility in foreign exchange, it is necessary to obtain foreign exchange reserves through the issuance of foreign exchange stabilization bonds in order to maintain a stable exchange rate.

5.2.2.3 National Housing Bonds

(a) In Korea, National Housing Bonds are issued for the purpose of financing the national housing project. This is one example of using government bonds to finance a specific government project.

(b) This bond has the advantage of not only raising the crucial funding for the implementation of the project, but also improve the aesthetics of the city, while

providing a high-quality residential environment to the people.

(c) This type of the special bonds should be considered for implementation.

5.3 Stimulating the Government Bond Markets

5.3.1 Fostering Primary Dealers (PDs)

(a) National projects require large-scale financing compared to the private sector, so that major financial institutions need to participate in the government bond market.

(b) For this purpose, the KTB Primary Dealer (PD) performs the following two roles. First, it plays the role of underwriting government bonds in the issuance market. Second, it functions as a market maker who has to buy or sell a certain amount of government bonds in the secondary market.

(c) The evaluation criteria of PDs should be reasonably defined and managed so that they can perform their roles as professional dealers.

5.3.2 Introducing Electronic Securities System

(a) An electronic securities system is a system which handles all securities-related affairs, including the exercise, issuance and distribution of securities, without issuing paper securities.

(b) Electronic securities systems improve market transparency and openness by enabling quick identification of transaction details, and reduce transaction costs among market participants.

(c) An electronic securities system has to be strictly enforced by law in order to promote the reliability and transparency in the government bond markets.

5.4 Establishing Systems to Secure Liquidity

We recommend two plans for liquidity in the government bond markets, (i) a fungible system to sort and merge the government bonds and (ii) the means to facilitate an accessible market.

5.4.1 Utilizing a Fungible System

(a) Liquidity is imperative to the success of introduction of government bond. The fungible system is a system to secure liquidity and to form a reliable interest rate in the government bond market.

(b) This system treats different bonds, issued within a certain period, as identical by setting the same conditions, such as maturity and coupon rates.

(c) If bonds issued in different periods are treated as different bonds, liquidity in the market cannot be secured due to insufficient distributions.

(d) Furthermore, as the newly issued government bonds replace the existing ones, the interest rates are discontinued.

(e) The wide gap among the interest rates of government bonds issued in adjacent periods could lead to low reliability of the index interest rates.

Hence, we recommend considering the fungible system to enhance liquidity of the government bond markets.

5.4.2 Minimizing Limitation to Access to the Market

We recommend gradually removing obstacles for foreign investors to minimize market turbulence and to make accessible government bond markets.

(a) A country can have some restrictions to limit market turbulence by foreign investors in the beginning stage of the government bond market, but it is desirable to remove them gradually.

(b) In the early years in the government market, the demand of the government bond markets might come from domestic institutions, but in order to diversify investors, there is a need to promote investments by foreigners and foreign financial institutions and manage the diversification of investors.

(c) In this way, not only risks are dispersed, but also market volatility can be reduced by diverse investors with different risk preferences and trading purposes.

(d) However, an abrupt inflow and outflow of foreign investors can disturb the financial market. Hence, we recommend gradual removal of foreigner's access limitation to domestic financial markets.

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