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# Thailand

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## Executive Summary

The Asian crisis, which erupted in Thailand in July 1997, had a devastating effect on the country. Gross domestic product (GDP) growth fell by 10.2 percent in 1998 and more than 50 percent of bank assets were estimated to be nonperforming.

With a sequence of budget deficits reflecting the Government's attempt to mitigate the effects of the financial crisis, the fiscal position has become very weak. The accumulation of past fiscal surpluses, of some 400 billion baht (B) in 1996, has been run down to a mere B90 billion. Meanwhile, smaller than predicted revenues have forced the Government to rely more on deficit financing, raising the ratio of government debt to GDP from 16 percent of GDP in 1996 to 36.8 percent of GDP in 1999.

Of this amount, 55 percent was domestic and 45 percent was foreign debt, while 51 percent was from the Government's direct borrowings and 49 percent by state enterprises. Based on the current fiscal policy stance, total government debt is projected to rise further to B2.37 trillion in 2000, or approximately 44 percent of GDP, peaking at around B2.8 trillion, or 49 percent of GDP, in 2001, with deficits predicted to continue until 2003.

Thailand's domestic bond market, as a ratio of GDP, stands at 12 percent—small, compared with 97 percent in Singapore or 84 percent in the Republic of Korea. The Asian crisis thus provided the impetus for concerted bond market reform and development, in an area where there is still plenty of room for growth.

Part of the International Monetary Fund (IMF) recovery program, implemented in August 1997, includes specific reference to bond market reform. Initiatives include a master plan aimed at addressing infrastructure concerns, such as the establishment of a better benchmark yield curve, while improvements in bankruptcy legislation, which will enhance lenders' ability to recover debts, are expected to reduce the spread of Thai sovereign bonds issued in the United States (US).

Historically, bond issuance started early. The Thai Government issued

the first Thai bond in Europe as early as 1905, and the first domestic bonds in 1933.

However, the bond market did not really take off. Bonds issued to fund successive budgetary deficits during the period of the 1961 National Economic and Social Development Plan, for example, were absorbed by a captive market, preventing the development of a secondary market, as institutions preferred to hold on to bonds until maturity.

Despite recent developments, infrastructure such as the tax environment and clearing and settlement system remains insufficient. In the primary market, investors or financial institutions are often unable to efficiently plan their investment portfolio due to irregular auction schedules. Moreover, they may not be able to purchase required amounts of bonds due to insufficient supply in the market.

In the secondary market, illiquidity remains a problem in both the public and private bond market, due to the lack of a market-making system, electronic trading system, and efficient price discovery. Disclosure of both pricing and fundamental information is not fully transparent, and some investors still face investment constraints due to the inefficient regulatory framework. There is also a lack of common understanding of the pricing convention. These problems, in both markets, arise partly from the inefficiency of the supporting infrastructure.

It is clear, however, that the growing financial needs of Thailand's economy can no longer be met by the banking sector alone, and its overregulated environment will soon have to give way to a more market-oriented, private sector-driven one that is more conducive to the development of new instruments and institutions.

The bond market today is dominated by government securities. In 1991, their share of the market was 90 percent, compared with less than 2 percent for corporate bonds. This was because, before 1992, the issuance of corporate bonds was limited to public companies and companies listed on the Stock Exchange of Thailand (SET). As a result, private companies relied heavily on bank loans and equity as funding sources. This meant the proportion of outstanding value of corporate bonds was minimal compared to that of government and state enterprise bonds.

This all changed with the crisis, however, which brought massive problems of nonperforming loans and low confidence, resulting in a sharp decline in bank lending to the private sector—even to top-rated companies. The Government had to step in to support the distressed financial sector with B500 billion in government bonds issued through the Financial Institutions Development Fund (FIDF) to recapitalize the system, and state enterprises and corporations had to issue debt to restructure their debts and fund new projects.

This, along with previous deregulation of the corporate market, saw the corporate bond market share rise to 15.2 percent in 1999.

The market still suffers from a lack of diversity of instruments. These should be expanded for the benefit of both issuers and investors. Currently, many institutional investors are hindered by out-of-date restrictions, while Thailand's low per capita income and limited market understanding among individual investors have constrained retail participation.

Despite Thailand's recognition of the numerous benefits of developing its bond market in terms of noninflationary deficit financing, effective implementation of monetary policy and efficient domestic savings mobilization, the Government must commit itself to "investing" in this system to reap these benefits, by developing both long and short-term strategies.

Based on the responses of 41 active bond market participants and regulators, the following are urgent requirements in the key bottlenecks affecting current market development in Thailand.

On the supply side, the following are needed: (i) improved regularity and predictability of bond supplies; (ii) increased varieties of tenor of bonds; (iii) accelerated centralization of public debt and Treasury management, and (iv) rationalized tax structure on financial services towards neutrality where possible.

On the demand side, efforts are needed to (i) expand the investor base, especially through individual participation; (ii) establish an information network, particularly on investment opportunities through issuers, securities companies, the Thai Bond Dealers' Club (Thai BDC), and mutual funds; (iii) update guidelines and remove investment constraints for institutional investors, particularly insurance companies, pension funds, and provident funds; and (iv) enhance market liquidity through equal tax treatments of repo outside the Bank of Thailand (BOT).

Finally, the development of market infrastructure could be accelerated through (i) augmenting the capabilities of primary dealers (PDs) and market makers with predetermined performance criteria; (ii) separating trading rights in BDC from membership rights (to prevent members from stalling the introduction of new members); (iii) effectively enforcing fair market practices via the coordination of Thai BDC, the Securities and Exchange Commission (SEC) and BOT; and (iv) strengthening the capability of credit rating agencies.

Longer-term strategies involve making improvements in nine key categories: (i) distribution methods, in particular the auction system; (ii) interest rate determination; (iii) coordination between Ministry of Finance, Central Bank, and other agencies; (iv) currency and maturity of scheduling structures; (v) promotion of PDs and market makers; (vi) derivative markets

and risk management; (vii) accounting practice and transparency issues; (viii) general infrastructure, including regulatory framework, settlement system, benchmark yield curve, and credit rating agencies; and (ix) removing artificial impediments, such as explicit and implicit taxes.

### I. Fiscal Policy and Management

Thailand was severely affected by the Asian crisis, with GDP growth falling by 10.2 percent in 1998 and more than 50 percent of bank assets estimated to be nonperforming.

Since the beginning of the IMF recovery program in August 1997, the macroeconomic policy framework has concentrated on stabilizing the value of the baht, fostering economic recovery, and reforming the financial sector.<sup>1</sup> The two last objectives have given rise to an increasing budget deficit as a percentage of GDP, from 0.7 percent in fiscal year (FY) 1997 to 2.5 percent in FY<sup>2</sup> 1998 and 5 percent in FY 1999.

With a sequence of budget deficits reflecting the Government's attempt to mitigate the effects of the financial crisis, the fiscal position has become weaker. The accumulation of past fiscal surpluses, of some B400 billion in 1996, for example, has been run down to a mere B90 billion. Meanwhile, smaller than predicted revenues have forced the Government to rely more on deficit financing, raising the ratio of government debt to GDP from 16 percent of GDP in 1996 to 36.8 percent of GDP in 1999.

Of this amount, 55 percent was domestic and 45 percent foreign debt, while 51 percent was from the Government's direct borrowings and 49 percent by state enterprises. Based on the current fiscal policy stance, total government debt is projected to rise further to B2.37 trillion in 2000, or approximately 44 percent of GDP, peaking at around B2.8 trillion, or 49 percent of GDP, in 2001.

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1. This section is based on reports from the Ministry of Finance, Thailand's Letters of Intent to IMF, and a research study by the Thai Farmers' Bank Research Center, published in *Bangkok Business News* on 11 December 1999; p. 17.

2. Fiscal year in Thailand starts in October and ends in September. FY1997/98 or FY98 in short, for example, covers the period from October 1997 to September 1998.

**TABLE 1**  
**Government Debt Projection, 2000–2003**  
 (B billion)

End of Fiscal Year	1999	2000	2001	2002	2003
Public Debt Outstanding	1.87	2.37	2.80	2.91	2.99
Government	0.95	1.40	1.79	1.84	1.87
Expenditure Projection		0.86	0.91	0.97	1.02
Revenue Projection		0.75	0.83	0.91	1.00
<i>Fiscal Balance</i>		0.11	0.09	0.06	0.03
Financing on FIDF's Behalf <sup>a</sup>		0.30	0.30		
Development Loan <sup>b</sup>		0.04			
Government Guarantees	0.90	0.95	1.00	1.05	1.10
FIDF Debt <sup>a</sup>	0.96	0.83	0.86	0.56	0.26
Public Debt and FIDF	2.83	3.19	3.66	3.47	3.25
Percent of GDP	55.7	59.3	64.1	57.3	51.1
GDP	4.80	5.09	5.39	5.72	6.00

<sup>a</sup> Financed by domestic bond issues.

<sup>b</sup> Financed externally.

Source: Ministry of Finance for 1999; projections by Trust Fund Bureau Research Center.

If the 1999 direct borrowings of some B960 billion of the FIDF (designed to recapitalize the distressed banking sector) were incorporated into public sector debt, the total debt outstanding would then amount to B2.83 trillion, or 55.7 percent of GDP. As financial reform and fiscal stimulus efforts, including incentives to set up asset management companies (AMCs), continue, public sector debt including the FIDF is projected to rise further to a peak of 64 percent of GDP in 2001.

As AMCs' efforts begin to pay off in 2002–2003 (assuming 40 percent recovery from the non-performing loans [NPLs] and the proceeds of sales of some intervened banks), the FIDF's loan is projected to fall to B260 billion by the end of 2003. Public sector debt outstanding will, accordingly, start to decline to 57 percent of GDP in FY2002 and 51 percent in FY2003. Of course, the rate of decline may be faster if the economy recovers faster than projected or if AMCs manage to recover more than 40 percent of the NPLs.

From 2000 to 2003, the fiscal position is projected to continue to be in deficit, however, to stimulate the domestic economy. In terms of fiscal outlays, gross expenditure is projected to continue to rise from B860 billion to above B1 trillion during the same period. Here, expenditure includes interest costs of financial restructuring of around B300

billion over five years. As the economy recovers, however, revenue will also pick up, leading to a lower level of budget deficit, declining from B110 billion in 2000 to just B26 billion in 2003.

### A. Fiscal Burden Arising from the FIDF

Playing the roles of both lender of last resort and deposit insurance, the FIDF has incurred a total gross outlay of some B1.9 trillion. From these transactions, however, it expects to receive a certain amount of money in return from recovery of NPLs by the AMCs, proceeds from sales of intervened banks and Financial Sector Restructuring Authority's (FRA) assets, as well as fiscal compensation, totaling some B1.3 trillion. The FIDF will thus incur a net loss of some B560 billion, with the Government taking up around a B1.1 trillion fiscal burden (around 20 percent of GDP) from the whole process.

**TABLE 2**  
**Net Fiscal Burden of the FIDF's Financial Restructuring Efforts**  
(B billion)

Item	Amount
<i>Losses of the FIDF (Items)</i>	554.4
Expenditures	1,905.4
Loans to 56 FCs Closed Down	410.5
Deposit Insurance for 56 FCs	291.2
Losses from BBC's Capital Reduction	26.0
Losses from FIDF's Refinancing of BBC's Loans	56.0
Capital Increases to Intervened Banks	451.6
FIDF's Share of Bad Debt Provisioning Burden	370.0
Interest Costs (1999–2004)	300.0
Revenue and Compensation	1,350.0
Proceeds from Sales of Intervened Banks	130.0
40 percent of NPL Recovered by AMCs	550.0
First Fiscal Compensation for FIDF's Losses (1998)	500.0
FRA's Auctioning Proceeds	170.0
<b>Total Government Compensation</b>	<b>1,055.4</b>

FCs = Finance Companies.

Source: Trust Fund Bureau Research Center's estimates.

## **B. Implications for Bond Market Development**

Development of a stronger debt market in the wake of the Asian crisis is absolutely crucial, and components of the IMF financial sector reform package include specific reference to bond market reform. Initiatives include a master plan aimed at addressing infrastructure concerns, such as the establishment of a better benchmark yield curve, while improvements in bankruptcy legislation, which will enhance lenders' ability to recover debts, are expected to reduce the spread of Thai sovereign bonds issued in the US.

Efforts to deepen and broaden the bond market become even more urgent to prevent the possibility of "debt indigestion" over the medium term. Barring this problem, the bond market in Thailand will reach its deepest point in 2001 (at around 64 percent of GDP), after which this depth is projected to decline gradually. From this perspective, the bond market's medium- to long-term development strategy will probably need to take into consideration private and government bonds. This point is likely to become even more relevant when deposit insurance is introduced. Since deposit insurance only promises to reimburse up to a certain limit in case of a financial institution's failure, it is likely to induce a "disintermediation process" where larger depositors withdraw money to invest in other financial instruments perceived to be more liquid or more secured. These instruments will most likely include debt as well as equity instruments, particularly private bonds.

On the government side, to prevent problems of debt indigestion, supportive measures could be considered in addition to development of the bond market to strengthen the fiscal position and lower the public debt burden. These include (i) measures to improve tax collection efficiency; (ii) privatization as a means of raising revenue; (iii) enhancement of AMC's management efficiency; and (iv) the establishment of the Public Debt Management Office (this has already been done).

## **II. Monetary Policy and Management**

BOT, established in 1942, is responsible for maintaining monetary policy and advising the Government on economic policy.

It conducts monetary policy with the following objectives: (i) to stabilize the country's fiscal balance to consolidate the budget deficit and control debt repayment over the medium term; (ii) to build a management mechanism to minimize financing costs and avoid bunching government debt; and (iii) to develop a bond market to promote public and private saving and support debt management.

### **Coordination of Monetary and Fiscal Policy**

BOT will have to take responsibility for the B555 billion remaining losses of the FIDF, as well as the burden of servicing IMF loans. This represents the first step in coordination between monetary and fiscal policies. Given the magnitude of the debt instruments to be floated on the domestic financial market in particular, further close cooperation will be required to avoid disruption of domestic stability, and also to foster longer-term development of an efficient bond market and ensure competitive costs of deficit financing. This is being proposed within the framework of inflation-targeting, whereby the monetary policy stance will be set under a projected set of macroeconomic variables, including fiscal deficit and financing needs two years ahead.

### **III. Overview of the Bond Market**

On the whole, Thailand's initiatives to develop its debt/bond market are still at an initial stage. The Asian crisis provided both the opportunities and political will to study the existing impediments to a stronger debt market, which is necessary as the financial requirements of the growing economy can no longer be served by the banking sector alone. The overregulated environment will soon have to give way to a more market-oriented, private sector-driven climate that is conducive to the development of new instruments and new institutions—in keeping with the demands of globalization—and better equipped to handle or prevent any repeat of the 1997 meltdown.

In 1991, the outstanding value of government and state enterprise bonds accounted for more than 90 percent of the market, compared with less than 2 percent for corporate bonds.

Increasing realization of its importance among Government and investors has seen the bond market grow rapidly since then, with the value of the total bond market surging from B215.1 billion at the end of 1992 to B519.3 billion at the end of 1996. Today, the bond market, as a ratio of GDP, stands at 12 percent, but this is still small compared with 97 percent in Singapore or 84 percent in the Republic of Korea.

Government and state enterprise bonds still comprise more than 75 percent of the bond market, although corporate debt instruments outstanding soared from B5.1 billion in 1992 to B182.4 billion in 1996. Moreover, the corporate debt securities offered increased 8.5 times between 1992 and 1996.

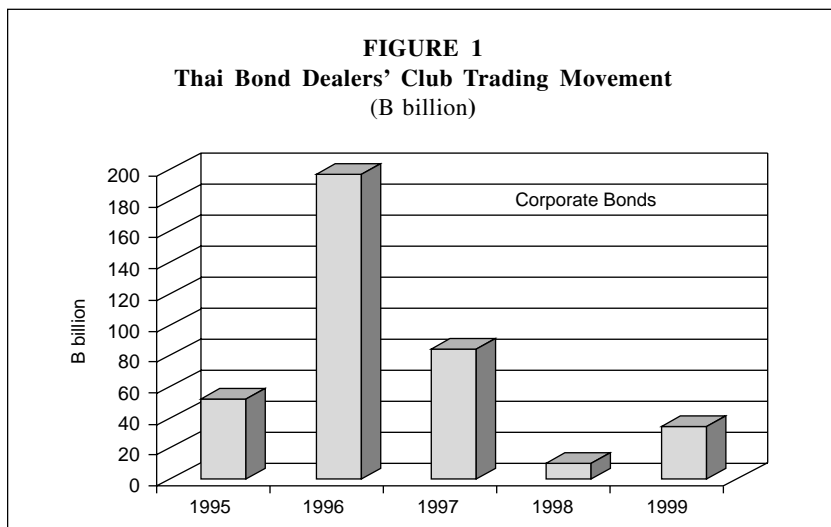
### A. Secondary Trading

Before the establishment of the Thai BDC, no bond trading statistics were available. Total trading value from January to December 1999 was B431.197 billion, which significantly increased from the level in 1998. Of this amount, 80 percent was in government bonds, 12 percent state enterprise bonds, and 8 percent corporate bonds.

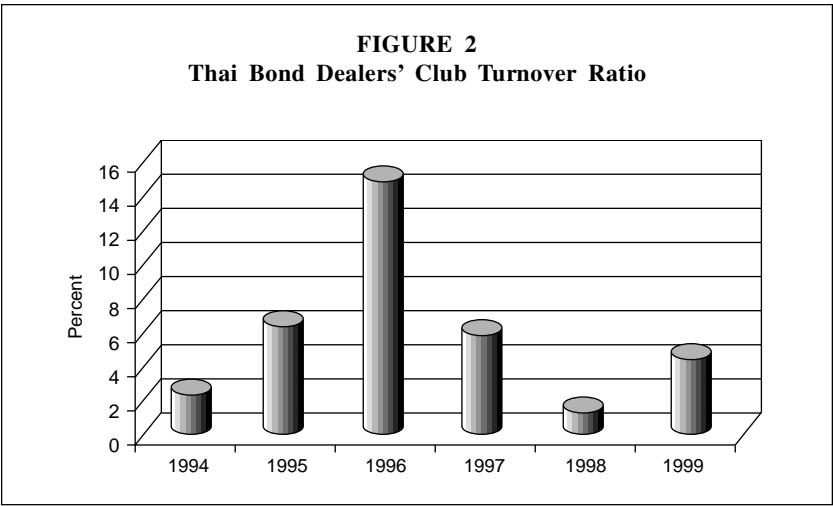
The secondary bond market is still illiquid, however. In October 1999, total turnover ratio in the secondary bond market was only 3.53 percent. Government bonds represented the highest liquidity, with a turnover ratio of 5.26 percent. Corporate bond trading had 3.32 percent turnover, while state enterprise bonds had only 1.12 percent, far lower than in well-developed bond markets.

Illiquidity can be attributed to the lack of a market-making system, electronic trading system, and efficient price discovery. Disclosure of both pricing and fundamental information is not fully transparent, and some investors still face investment constraints due to the inefficient regulatory framework. There is also a lack of common understanding of the pricing convention. These problems in both markets arise partly from the inefficiency of the supporting infrastructure.

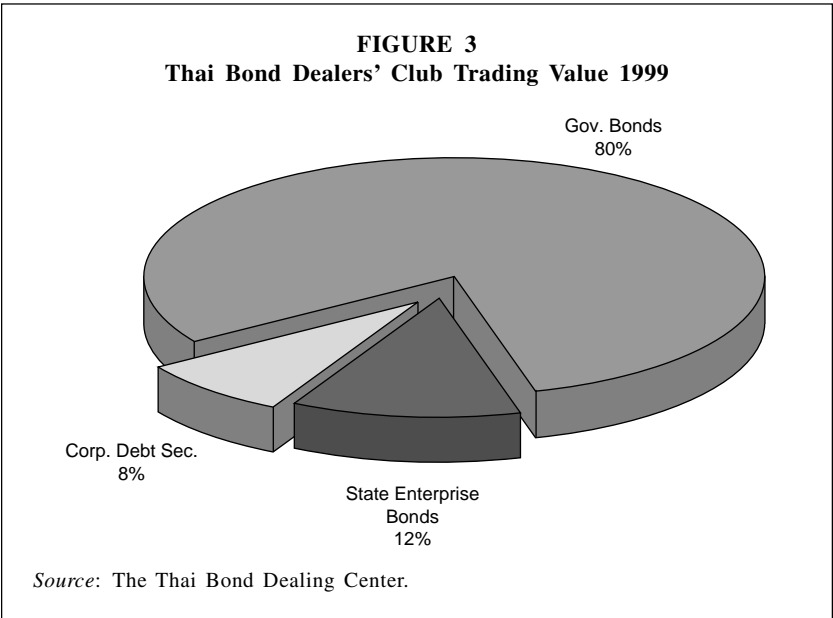
Infrastructure such as the tax environment and clearing and settlement system is also insufficient. In the primary market, investors or financial institutions are often unable to efficiently plan their investment portfolio due to irregular auction schedules. Moreover, they may not be able to purchase required amounts of bonds due to insufficient supply in the market.



**FIGURE 2**  
**Thai Bond Dealers' Club Turnover Ratio**



**FIGURE 3**  
**Thai Bond Dealers' Club Trading Value 1999**



Efforts to deepen and broaden the market are thus more urgent than ever to prevent the possibility of “debt indigestion” over the medium term. Barring this problem, the bond market in Thailand is predicted to reach its deepest point in 2001 (at around 64 percent of GDP), after which this depth is projected to decline gradually.

**B. Historical Overview**

While the Thai Government issued the first Thai bond in Europe as early as 1905, and the first domestic bonds in 1933, the Thai bond market did not really take off. The Government issued bonds to fund successive budgetary deficits as it tried to achieve the objectives of its 1961 National Economic and Social Development Plan. These were absorbed by a captive market (commercial banks, which were required to hold government debt securities or state enterprise bonds as part of the requirements for bank branching—a regulation that was gradually relaxed and finally removed in May 1993). A secondary market therefore failed to develop as institutions preferred to hold on to bonds until maturity.

In an attempt to solve the liquidity problem, BOT offered to buy back certain types of bonds from individual investors at fixed buyback prices announced in advance. This failed, however, as interest rates rose and bond market prices fell below these fixed prices.

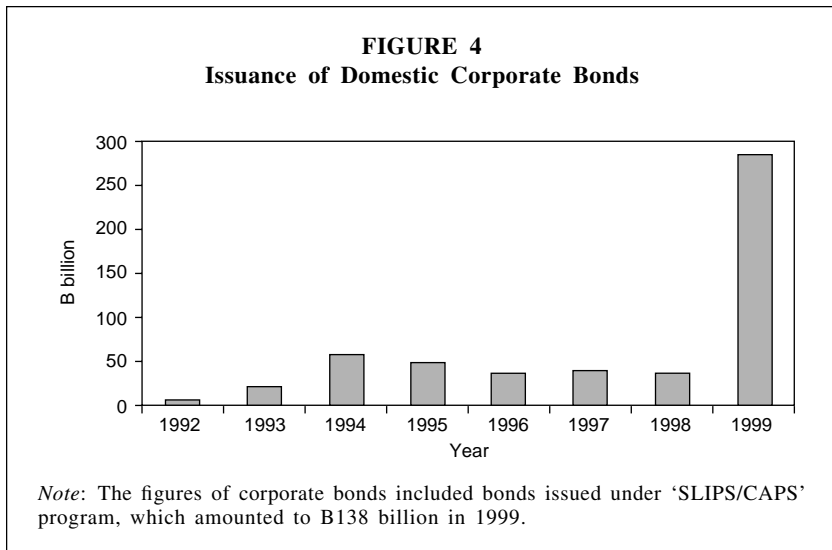
Several developments primed the secondary market between 1983 and 1986, among them the increased role of commercial banks in trading government bonds. In addition, exchange bonds were ineligible for reserve requirements and had to be sold in the secondary market. Also, some types of bonds were not eligible for BOT buyback, and had to be sold in the secondary market, and declining interest rates in the market raised bond prices to levels higher than BOT buyback prices. Trading of other bonds, such as the Telephone Organization of Thailand and the Government Housing Bank, also became eligible for secondary trading. However, the secondary market still remained moribund—especially from 1987 to 1989, when interest rates declined again and BOT buyback became attractive once more. Tax policies (on interest income and withholding tax on capital gains) were not favorable either, and an improved budget deficit resulted in fewer issues of new bonds, especially during Thailand's high growth period from 1990 to 1996.

New attempts to strengthen the bond market were made in the latter half of the 1990s. BOT started issuing short-term bonds (of one-three- and six-month maturities), with the aim of using these for open-market operations (OMO), establishing benchmark interest rates, and accommodating excess demand for government bonds for the reserve requirement purposes of financial institutions. The FIDF also issued one-three- and six-month bonds, which were later expanded to one- and two-year bonds. The Government encouraged state enterprises to issue bonds to fund their infrastructure projects. It also lifted interest rate ceilings in June 1992 and removed tax disincentives (capital gains tax for individuals who were not initial holders and stamp duty on bond transactions). Foreign

exchange controls were relaxed and asset management companies were increased to eight in 1995. Provident and contractual savings funds were also set up, and the types and proportions of securities in which these could invest were increased.

**C. Corporate Market**

Before 1992, the issuance of corporate bonds was limited to public companies and companies listed on the SET. As a result, private companies relied heavily on bank loans and equity as funding sources. This meant the proportion of outstanding value of corporate bonds was minimal compared to that of government and state enterprise bonds. In 1991, while the outstanding value of government and state enterprise bonds accounted for more than 90 percent of the total bond market, corporate bonds accounted for less than 2 percent. By December 1999, this figure had risen to 15.2 percent, worth B179,387 billion.



Various factors brought about this significant growth in the corporate bond market. First, the Public Companies Act and Securities and Exchange Act, passed in 1992, allowed public and private companies, listed and nonlisted, to issue bonds. Second, the first Thai rating agency, called the Thai Rating Information Service (TRIS), was set up in 1993. Third, Thai BDC was established in November 1994 as a secondary

market for bond trading. Fourth, issuers recognized the importance of raising funds by issuing debt securities as an alternative of direct financing. Also, investors have gained a better understanding of investing in debt securities, and institutional investors such as financial institutions, mutual funds, provident funds, government pension funds, and insurance companies have played significant roles in investing in the bond market because of their long-term investment horizon.

As a result, the value of the total bond market surged from B215.1 billion at the end of 1992 to B519.3 billion at the end of 1993. Corporate debt instruments outstanding soared from B5.1 billion to B182.4 billion in 1996, more than an eightfold growth.

**TABLE 4**  
**Current Status of Corporate Debt Market**

Type of Bond	1998		1999				Outstanding at Year-End
	Issuance	Outstanding at Year-End	Q1	Q2	Q3	Q4 <sup>a</sup>	
Corporate Debt Securities							
<b>Domestic</b>							
Secured	—		2.00	7.07	8.55	—	17.62
Unsecured	13.12		23.63	10.42	33.45	—	67.50
Subordinated	17.28		70.62	63.53	2.91	—	137.06
Convertible	6.00		0.20	3.36	—	—	3.57
Short-term	0.66		—	—	—	—	—
<i>Subtotal</i>	37.06		96.45	84.38	44.91	—	225.75
<b>Offshore</b>							
Secured	—		—	—	—	—	—
Unsecured	—		—	—	—	—	—
Subordinated	—		26.52	—	—	—	26.52
Convertible	—		—	—	—	—	—
<i>Subtotal</i>	—		26.52	—	—	—	26.52
<b>Total</b>	<b>37.06</b>	<b>177.65</b>	<b>122.98</b>	<b>84.38</b>	<b>44.91</b>	<b>—</b>	<b>252.27</b>
							<b>403.80</b>

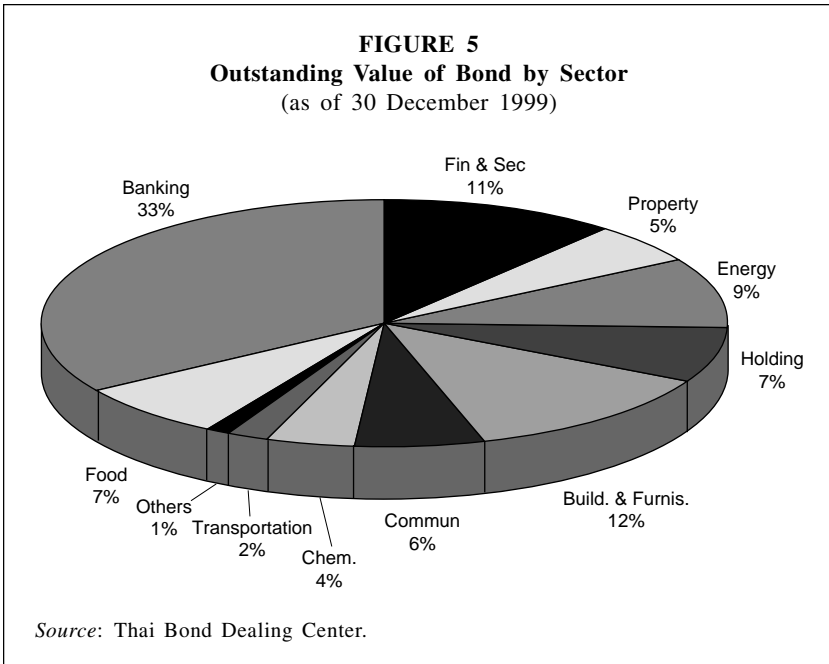
*Note:* The figures of corporate debt securities included bonds and subordinated bonds attached to preferred shares under "SLIPS/CAPS".

<sup>a</sup> Preliminary.

*Sources:* Bank of Ayudhya Public Co. Ltd., Bangkok Public Co. Ltd., Bangkok First Investment and Trust Public Co. Ltd., Trust Fund Bureau, Thailand Securities Depository Co. Ltd., etc.

Major issuers of corporate bonds are banking, finance, and securities (44 percent), the building sector (12 percent), energy sector (9 percent), food industry (7 percent).

The crisis in mid-1997, which brought massive problems of NPLs and low confidence, was another major factor as it resulted in a sharp decline in bank lending to the private sector—even to top-rated companies. The Government had to step in to support the distressed financial sector



with B500 billion in government bonds issued through the FIDF to recapitalize the system, and state enterprises and corporations had to issue debt to restructure their debts and fund new projects.

#### D. Types of Securities

**Government Bonds.** Government debt securities are made up of government bonds, state enterprise bonds, BOT bonds, FIDF bonds, Property Loan Management Organization (PLMO) bonds, and other government-related bonds. These are normally one- to 10-year fixed-rate instruments.

FIDF bonds were developed as a result of a royal decree empowering the Ministry of Finance to issue bonds to refinance FIDF's debt burden, which arose from an FIDF effort to save cash-strapped companies and other financial institutions from collapse. FIDF bonds pay regular coupons, and principal at maturity. They are normally fixed-rate instruments with maturities ranging from three months to three years.

State Enterprise bonds (either guaranteed or nonguaranteed by the Ministry of Finance), are fixed-rate bonds with maturities from two to 10 years. The guaranteed issues enjoy credit ratings similar to those of government bonds, while the nonguaranteed ones are usually issued by

state enterprises with sound financial standing. Financial institutions hold these bonds mainly to meet their liquidity reserve requirements, and trading them on the secondary market thus remains thin. PLMO bonds are typically seven-year fixed-rate bonds.

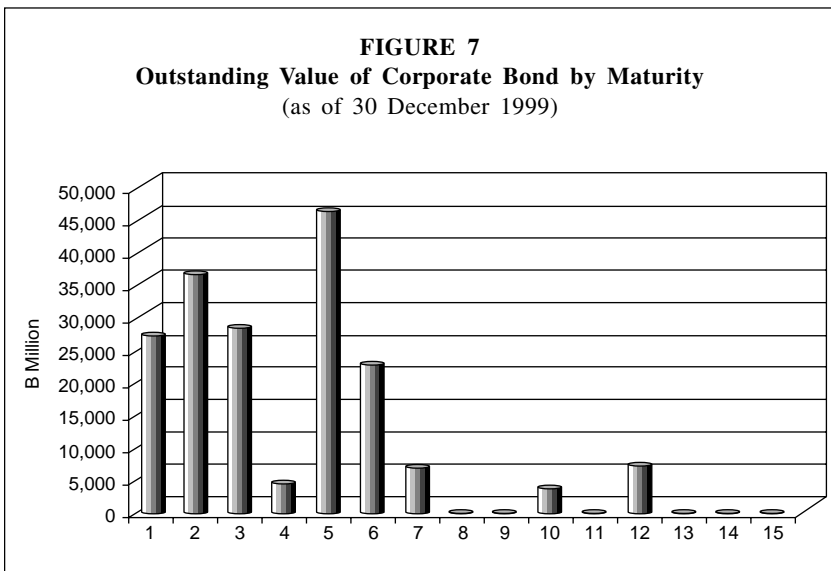
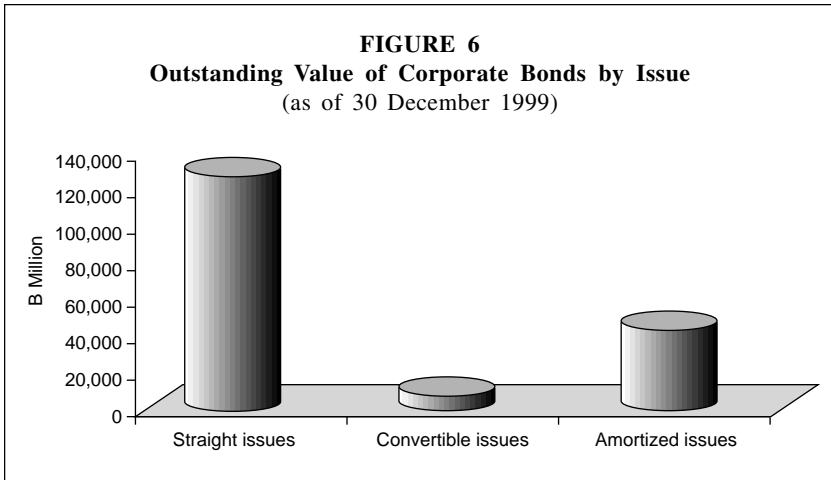
**Corporate Bonds.** Most corporate bonds outstanding in Thailand are subordinated, unsecured, and carry fixed interest payment. However there are also other features such as secured, floating rate, convertible or amortizing bonds, or any combination of these. The bonds that carry more complex features are likely to be increasingly issued. The maturity of corporate bonds generally ranges from one to 14 years. However, most of them are clustered around three to five years.

Normal bullet and floating rate bonds captured around 83 percent of the total corporate bond outstanding, while amortized bonds and convertible bonds took up 13 percent and 4 percent, respectively. Amortizing bonds have become increasingly popular among issuers due to the debt restructuring of distressed companies. This enables the companies to design cash flow payments that are more appropriate to their current and future incoming cash flows. Securitized bonds are another important type of fixed income instrument, and are expected to grow in popularity among both issuers and investors. Since the securitization process is the transfer of nonmarketable assets into liquid and marketable securities, the selling of assets of 56 closed finance and securities companies has increased the number of securitized bonds issued lately.

**Money Market Instruments.** Money market instruments traded comprise treasury bills (T-bills), commercial bills, negotiable certificates of deposit (NCDs), and transferable certificates of deposit (TCDs). T-bills are issued by the MOF and purchased mainly by the BOT and the Exchange Equalization Fund (EEF). Commercial banks and finance companies issue NCDs. Commercial bills include promissory notes, bills of exchange, and bankers' acceptances. They are mostly issued by highly rated corporations and foreign bank affiliates, such as the Industrial Finance Corporation Thailand (IFCT).

The Royal Thai Government stopped issuing T-bills in 1990 as a result of budget surpluses, and issuance of TCDs by commercial banks has declined drastically since 1987.

**International Bonds.** International bonds have been issued by the Electricity Generating Authority of Thailand (EGAT) in 1988 (US\$300 million) and 1999 (US\$300 million). These were World Bank guaranteed and priced at 285 bps over US treasuries.



**Lack of Diversity**

Overall, the products currently available in the Thai bond market cover only a narrow range of fixed income instruments. As different investors have diverse risk/return perceptions and differing investment horizons, a wider range of financial instruments should be introduced to help expand the investor base.

On the supply side, different types of fixed income securities will fit with different issuers, who have varied cash flow projections, and well-designed fixed-income instruments can reduce their financing costs.

The issuance of the following fixed-income instruments should be considered by the Government to better serve investor demand: (i) zero coupon bonds or strips, (ii) inflation-linked bonds, and (iii) long-term government bonds. The corporate sector needs to issue (i) longer-term bonds, (ii) credit-linked bonds, (iii) securitization instruments, and (iv) structured notes.

Although widening the range of fixed-income instruments has a great number of benefits, there are also some drawbacks. First, some types of instruments are complicated and hard to understand. This can lead to illiquidity of the product, and investors may require a higher yield to compensate for their unknown or black-box risk. Research publications explaining bond features and risk/return characteristics can help address this issue. Second, laws and regulations may create constraints that make the issuing process costly. Finally, investing in more complicated products without care and good knowledge may lead to disaster, since some securities are very risky. Care, education, and good information should reduce this problem.

### **E. Investor Base**

Besides financial institutions (60 percent), major players in the bond market are contractual savings funds, whose trading value contributed 32 percent of the total trading value from January to December 1999. Of this amount, 22 percent came from financial institutions, 20 percent from mutual funds, 17 percent from others, and 5 percent from insurance companies. There are also 757 pension funds in Thailand, with assets estimated at B31 billion (US\$1.2 billion), more than 30 percent of which is invested in state sector or corporate bonds.

Despite the important role of institutional investors in the Thai bond market, their participation is still limited because of various investment restrictions. For example, provident funds are currently allowed to invest only a limited amount of funds in the bond market, principally government bonds. This limits their opportunities to invest in high quality corporate bonds, and thus to enjoy a potential of higher return. Some of the restrictions are out of date and need to be reviewed to facilitate the access of these investors. Insurance companies, for example, are not allowed to purchase bonds sold above par value. Most of the bonds in which they invest are held to maturity, resulting in inactive trading in the secondary market. Therefore, investment controls on these institutional

investors should be relaxed to broaden the investor base for both the primary and secondary markets.

Thailand's low per capita income, compounded by limited market understanding among individual investors, has hindered participation by retail investors.

#### **IV. Bond Market Infrastructure**

##### **A. Structure of Primary Dealer System**

Market makers play a crucial role in the bond market. By continuously making bid and offer prices available to the market, they act as a "market" for those bonds they quoted. Thus, the network of market makers stimulates bond market activities and creates a liquid market.

In the Thai bond market, there are dealers who seemingly act like market makers. However, they do not have the commitment to make a consistent bid and offer. They act like discount brokers, earning spread from buying and selling bonds to different parties. Designated primary dealers are ABN Amro Bank NV, Dhana Siam Securities Company Ltd., Bangkok Bank PLC, Merrill Lynch Phatra Securities Company Ltd., Bank of Asia PLC, Siam Commercial Bank PLD, Citibank NA, Thai Farmers Bank PLC, and Deutsche Bank AG.

##### **B. Issuance Methods and Procedures**

###### *1. Government Bonds*

The Securities and Exchange Commission (SEC) is responsible for supervising and overseeing issuance practices. Government bonds are issued through auctions organized by the BOT. Primary market auction participants are financial institutions, institutional investors such as mutual funds, provident funds, and insurance companies. The auction originally followed the Dutch, or uniform price, system, but this was changed in September 1999 to the American, or competitive price, auction. The changeover period was August, when government bonds with maturities up to 10 years were auctioned under the American system, and those with maturities over 10 years under the Dutch system.

There is no fixed auction schedule. When there are new bonds, Thai BDC members are notified. Government debt securities are automatically listed once the auction process in the primary market is complete.

There is currently an attempt to develop a more systematic auction schedule for government bonds. With the schedule set and announced in

advance, investors will be able to effectively plan their investment program, and when issued yield curve, with a more appropriate maturity structure, constructed. Issuing authorities will be able to improve their financial planning and debt management. Although the Debt Management Office (DMO) aims to implement a regular government bond issuance program, details regarding maturities to be auctioned should be considered as well as just the type of bonds. Apart from the issuing schedule, the auction method should also be considered. Uniform price and multiple price auction systems each have advantages and disadvantages.

## *2. Corporate Bonds*

Issuance can be either through public offering (PO) or private placement (PP). To publicly offer issues, a company must first obtain approval from SEC and file the disclosure document for public investigation. However, this is relatively simple.

**Public Offering.** Due to the different risk and return characteristics of each type of security, the approval criteria for public offering vary. However, common qualifications for applicants are (i) having definite objectives for the use of proceeds raised from securities offering; (ii) their business must be of economic or social benefit to the country; (iii) the management must be competent, honest, socially responsible, and not have an adverse track record; and (iv) they must have good financial status, performance records, and strong potential for ongoing concern.

As well as gaining SEC permission, PO issues must be credit-rated by an approved credit rating agency. Only three kinds of debentures can be issued through public offering without SEC permission. These are (i) those offered by a state enterprise, (ii) those where MOF guarantees the interest and principal, and (iii) those offered in total to shareholders of a private limited company.

**Private Placement.** Private placement is defined as one of the following activities: (i) applicants have definite objectives for the use of proceeds raised from the securities offering; (ii) securities are issued to no more than 35 investors during a 12-month period; and (iii) securities are issued to the prescribed 17 types of institutional or sophisticated investors.

Most newly issued corporate bonds are offered on a private placement basis. With PP, much useful information, such as a financial statement and credit rating, does not have to be disseminated. This can lead to low demand for such bonds due to insufficient information. The problem worsens during any economic depression. The good news is that the

SEC recently announced a new regulation, effective from the second quarter of 2000, requiring PP issues to be credit-rated, with the exemption of issuing amounts of less than B100 million, or with transfer limits less than 10 holders.

### **C. Secondary Trading Systems**

Trading is usually on an over-the-counter (OTC) basis for both listed and nonlisted bonds. Dealers and institutional investors play a major role in the market. The Thai BDC is an organization that has the status of a bond exchange. It was first founded in 1994, known as the Bond Dealers' Club, and operated under the umbrella of the Association of Securities Companies. Initially, only corporate bonds were traded through the system provided by BDC. BDC changed its name to Thai BDC in April 1998 and has expanded its service to include government and state enterprise bonds as registered securities. Government securities are automatically listed as soon as the primary auction is completed. The emergence of the Thai BDC over the past five years has contributed significantly to the development of the bond market, with issuance of domestic bonds increasing by 140 percent.

The primary role of Thai BDC is to provide an environment for fair and secure trading, monitor trade, and disseminate market information. Members must be financial institutions with a license to trade securities or debt instruments. As of October 1999, it had 48 members (11 commercial banks, nine securities companies, one finance company, and 27 financial and securities companies).

A financial institution with a dealer license places bid and offer prices, usually on an indicative basis, either via online communication or newspaper. Interested parties can contact their prospect dealer. Dealers have to report all bond transactions to Thai BDC. Thai BDC compiles and disseminates trading information to the general public at the end of the day.

### **D. Electronic Trading System**

In the Thai market, an electronic trading system called BondNet, operated by BDC, was developed in 1994. BondNet provided BDC members with a market place where they could quote prices on a blind and firm commitment basis, and dealers could negotiate, put-through, and approve transactions. The agreed transaction was then put through the clearing and settlement process at the Thailand Securities Depository Co. Ltd. (TSD). Only corporate bonds and BOT and FIDF bonds could

be traded via BondNet, and only dealers who were BDC members were allowed to use the system. From 1995 to July 1997, the system worked quite well, resulting in improved liquidity in the market. However, due to the crisis, half of BDC's members stopped operating, and confidence in the corporate bond market diminished, along with the popularity of BondNet. In May 1999, Thai BDC decided to stop operating the BondNet system.

The lack of bias in an electronic trading system can contribute to market liquidity even in a market where securities are traded OTC. It can serve as real-time advertising page, where market makers or dealers can quote their bid and offer prices for particular bonds. The system should be able to facilitate the dealing process, where interested parties can communicate with each other and execute the transaction.

With declining interest levels making the bond market popular again, an electronic trading system would therefore be a useful tool for market participants. The system should be expanded to offer real-time bid-offer pages to dealers and investors, and the trading, clearing, and settlement processes should be integrated.

## **E. Market Conventions and Standards**

Trading of bonds is based on yields quoted up to six decimal places. Prices are quoted on a "clean" basis as a percentage to par value with six decimal places. Market convention for the price/yield calculation is actual/365 basis. Coupon payment on bonds is mostly on a semi-annual basis. In an attempt to create a uniform market practice, which would help increase liquidity and reduce trading confusion, Thai BDC has set up a listing standard for all corporate bonds registered with it since 1997. However, this has not yet covered those bonds carrying special features, such as securitization bonds or restructured bonds. Distressed bonds are usually traded at a flat price.

## **F. Repo Market**

The repo market provides market players with a cost-effective financing channel. It is also an alternative means of short-term investment with low risk. An efficient repo market is thus essential to the liquidity of the bond market. Currently, an official repo market is operated by BOT, allowing only banks and finance companies with accounts at the Central Bank to participate in the market. Only government bonds and guaranteed state enterprise bonds are accepted as eligible securities. Due to these limitations, a repo market outside BOT has developed to serve

a broader range of financial institutions, such as securities companies, and accept other types of securities, such as corporate bonds. However, the market is still inactive because supporting infrastructure, such as clear tax practice and market accepted contract agreements, are not yet in place.<sup>3</sup>

## **Bond Borrowing and Lending**

Short-selling and securities lending have been allowed by SEC since 1998 to help maintain bond market liquidity, but market activity has remained minimal due to inadequate knowledge.

## **G. Other Aspects**

### *1. Benchmark Yield Curve*

In early October 1999, Thai BDC developed the risk-free Thai Government Bonds Benchmark/ Yield Curve, derived from average bid prices quoted by nine counterparties of the BOT. Thai BDC publishes the yield curve at the end of each trading day. Benchmark bonds must have remaining maturities of approximately 1, 2, 5, 7, or 10 years, and amounts outstanding of at least B20 million.

Initially calculated only for up to three years, the issuance of government long-term bonds resulted in a yield curve span of up to 15 years. Government bonds are also selected to represent benchmark bonds.

Thai BDC also launched a government bond index in January 1999 to help market participants track bond market movements, compare market returns, and to be used as a frame for their fund performance. It is an index calculated from the weighted average executed yield of all government bonds registered at Thai BDC.

Despite the availability of this regular yield curve and bond index, however, some important tools are still needed to make the benchmark more meaningful.

**Risk-Free Zero-Coupon Yield Curve.** Yield curves available at present are constructed based on coupon-bearing bonds. Although this kind of yield curve has a number of benefits, a yield curve constructed using this method is subject to the coupon effect, since different bonds carry

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3. The Thai Bond Dealing Center is working with Internet Statistics and Metrics Analysis (ISMA) in finding an acceptable annex to add to the Global Master Repurchase Agreement, making it applicable in the Thai market.

dissimilar coupons. This may bias the spread of comparing bonds. In addition, yield from a zero-coupon yield curve can be directly used to calculate bond price more effectively. For state enterprise and corporate bonds, spread can be added to the zero-coupon yield to calculate the price. Moreover, forward curve can be directly constructed from a zero-coupon yield curve.

Without a broad range of government zero-coupon bonds or strip zero-coupon bonds, the zero-coupon yield curve cannot be directly created. However, synthetic zero-coupon yield curves may be constructed, although their use is subject to a set of assumptions.

**Well-Defined and Market-Accepted Benchmark Interest Rate.** In developed markets, there are accepted short-term and long-term interest rate benchmarks, e.g., London inter-bank offer rate (LIBOR) and Singapore inter-bank offer rate (SIBOR), which have proved to be very useful to both issuers and investors. They allow issuers to estimate their credit spread over an appropriate interest rate benchmark. Investors also use spread when evaluating alternative investment instruments. With a well-accepted interest rate benchmark, floating rate securities can be issued and traded more effectively.

At present, floating rate bonds in Thailand usually index their coupons with some type of interest rate benchmark, such as minimum lending rate (MLR), or the average fixed deposit rates of major banks. A major limitation of MLRs is that there is no known maturity structure and the rate is not consistently quoted. For fixed deposit rates, although their maturity structures are known, they have no known credit quality. Therefore, market-accepted interest rate benchmarks such as Bangkok inter-bank offer rate (BIBOR) should be created, as these will become important tools in the fixed income market.

## *2. Tax Treatment*

Taxation on bond trading and investment is rather complex since it involves many different types, and varies across investor classes.

For domestic institutional investors, there is no withholding tax on interest income and capital gains, but they are subject to corporate income tax at the end of the year. Foreign institutional investors are subject to 15 percent withholding tax on income and capital gains. The rates are lower for countries with double taxation treaties.

Individual investors were previously exempt from capital gains tax, but the rule was revised in July 1999. Both interest income and capital gains are now subject to 15 percent withholding tax. This could not

only discourage individual investors from investment in bonds, but also create an impediment to bond market liquidity. Unlike in the equity market, individual investors are exempt from capital gains tax.

Tax differentiation between the bond and equity markets should be eliminated to promote the participation of individual investors in the bond market as an alternative means of saving. In addition, a tax reduction should be considered for investors with long-term holding periods to promote long-term investment in bonds.

Some market participants consider the specific business tax for banks and finance companies as an impediment to bond market trading activity. Banks and finance companies are subject to 3.3 percent specific business tax on interest income, including bonds' coupon and capital gains from trading debt securities. Unlike corporate income tax (30 percent and applied at year-end), which is based on net profits, the specific business tax is applied on a gross basis, meaning that the capital loss of one trade cannot be deducted from the capital gains of another. To a certain extent, this tax adds friction to market making, in both the outright and repo markets.

In December 1999, the Revenue Department clarified the tax treatment for repo transaction, making it consistent with its content as a borrowing/lending, rather than trading, activity. Nevertheless the market is still waiting for announcement of the details of the tax practice.

### *3. Credit Rating*

TRIS was established in 1993 with the support of BOT and technical support of Standard and Poor's. It is owned by about 70 shareholders made up of public, private, and international financial institutions. It offers two kinds of ratings: (i) company assessment, which rates the company's overall creditworthiness; and (ii) issue rating, which assesses the issuer's ability to service the interest and principal of a particular debt issue.

TRIS largely rates corporate debt, while Standard & Poor's and Moody's rate government, some financial institutions, and corporate debt. A second local rating agency is expected to be established soon.

### *4. Transparency of Information*

Information is a vital factor to increase market efficiency. In a developed market, information is highly transparent and efficient. This means it is disseminated to all market participants accurately, promptly, and comprehensively, so that nobody can benefit from gaining more information, and there is no moral hazard due to asymmetric information. In

other words, no investor need worry that someone else has access to more information about the product. Asymmetric information can cause moral hazard and lead to higher premia, reluctance to trade, and higher costs of fund to issuers. Finally, the lack or nontransparency of information can lead to an illiquid and higher-cost market.

Presently, attempts are ongoing to improve bond market information disclosure. Technological innovations, such as the Internet, have greatly contributed to lower-cost information dissemination.

BOT continuously disseminates not only information on the government bond market, but also other useful economic indicators, via the Internet without any charge to interested investors. However, information regarding the bond market covers only government bonds. In addition, the data collected by BOT are based on settlement dates, not trade dates. Information on bids and offers is not yet available to investors either.

To enhance market transparency for bond trading, Thai BDC has developed a bond information system called the Thai BDC System, available to market participants via the Internet. It contains a broad range of bond market information, such as trading data and statistics, information on registered bonds, and a brief rundown on bond issuers and market news and development. Trading data are directly reported by Thai BDC dealer-members. The information is available in many forms, such as real-time, end of day and historical trade, and covers government bonds, state enterprise bonds, BOT/FIDF/PLMO bonds and corporate bonds.

There are still some points of concern, however. For example, information provided through Thai BDC system does not cover nonregistered bonds, and there is still no real-time bid/offer facility. In addition, the Thai BDC system depends on trading data reported by its dealer-members, so care should be taken to ensure the accuracy and reliability of the information.

### *5. Hedging Instruments and Derivative Market*

Hedging instruments and derivative markets are essential tools in stimulating bond market activities. With a derivative market, derivative products such as interest rate options, interest rate futures, and interest swaps can be constructed. With derivative products, some types of risks can be segregated and transferred among market participants. In principle, there are three types of players in the derivative market: (i) hedgers, who use derivative instruments to hedge against the risk of the underlying asset; (ii) speculators, who speculate on the movement up or down in prices of derivative products; and (iii) arbitrageurs who look for riskless profit in the markets.

These three types of market players stimulate trading between derivative markets and the underlying securities in spot market activities in both the derivative and fixed-income markets.

As a first step to creating a derivative market, supporting infrastructure, such as a market-maker network, electronic screen trading, clear tax practices and an efficient clearing and settlement, should be implemented. Moreover, well-accepted yield curves and bond indexes also play a crucial role as benchmarks and underlying assets.

## **H. Clearing and Settlement**

Currently, government and state enterprise bonds are cleared and settled at BOT, which acts as the registrar for government securities. As BOT requires physical evidence of the transfer of ownership, the process is rather cumbersome. On settlement, market participants prefer to use checks as a means of settlement, because “Bahtnet,” a real-time money transfer network developed by BOT, is too costly. In addition, only a limited range of financial institutions are allowed to open accounts with BOT. Therefore, credit risk emerges from a clearing time lag, and results in incomplete delivery-versus-payment (DvP). Moreover, electronic book entries for all government securities are not yet fully developed, and most government securities are still in script format. This results in transfer inflexibility.

Corporate bonds, which are mostly issued in scriptless form, can be cleared and settled through TSD, set up in 1994 as a subsidiary of SET. It acts as a depository, registrar, and clearinghouse for equities and debt instruments, but due to incomplete DvP, settlement risks exist similar to those in government securities. Therefore, to further facilitate the development of the bond market, a more efficient and reliable clearing and settlement system, which incurs minimal costs, should be developed. There are plans to link TSD with BOT’s Bahtnet to facilitate clearing and settlement of government bonds.

**Market Conventions.** The market convention for settlement, value date, ex-dividend, day count basis, holidays, and calculations are for bonds to be settled on a T+2 basis, with a value date equal to the settlement date. The day count basis is actual/365, with bonds ex-dividend the same as the coupon.

## V. Regulatory Structure and SROS

A Debt Management Office (DMO) was established in 1999, with the objective of centralizing debt management activities previously conducted by the Fiscal Policy Office, the Comptroller General's Department, and the BOT. This office is responsible for the country's debt policy and management, and is tasked to raise funds with consistency, predictability, and transparency.

SEC, established in 1992, has responsibility for the supervision and development of the primary and secondary markets, with power and duties to supervise, promote, and develop the securities markets.

## VI. Major Policy Issues and Recommendations

As already pointed out, the development of a bond market presents numerous advantages, which include noninflationary deficit financing, effective implementation of monetary policy, and efficiency of domestic savings mobilization. In light of the Asian crisis, where volatility in short-term capital flows played a critical role in setting off the panic, the merit of a deeper and more stable debt market with greater transparency and longer maturity becomes even clearer. This is particularly important when considering the high savings ratios, but poorly developed bond markets, in the region.<sup>4</sup>

### A. Short-Term Strategy

Based on a survey of 41 active bond market participants and regulators (72 distributed, with 58 percent response rate), three main areas have been identified for urgent attention in the key bottlenecks to market development efforts in Thailand.

First, on the supply side wish list, the four most commonly identified issues are (i) improved regularity and predictability of bond supplies; (ii) increased varieties of tenor (type) of bonds (see below); (iii) accelerated centralization of public debt and treasury management; and (iv) rationalized tax structure on financial services toward neutrality where possible.

On the demand side, efforts are needed to (i) expand the investor base, especially among individuals; (ii) establish an information network,

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4. Asia and Pacific Economic Cooperation (APEC), *Compendium of Sound Practices: Guidelines to Facilitate the Development of Domestic Bond Markets in APEC Member Economies*, August 1999.

particularly on investment opportunities through issuers, securities companies, Thai Bond Dealing Center, and mutual funds; (iii) update guidelines and remove investment constraints for institutional investors, especially insurance companies and pension funds; and (iv) enhance market liquidity through equal tax treatment of repo outside BOT.

The development of market infrastructure could be accelerated through (i) augmented capabilities of PDs and market makers fulfilling predetermined performance criteria; (ii) separation of trading rights in Thai BDC from membership rights (to prevent members from stalling introduction of new members); (iii) effective enforcement of fair market practices via coordination of Thai BDC, SEC, and BOT; and (iv) strengthening the capability of credit rating agencies.

In terms of increasing the variety of bonds on offer, the following are recommended.

**Zero Coupon Bonds or Strips.** A zero coupon bond is the simplest kind of fixed-income instrument, with a single cash flow paid out at the end of maturity. It thus enables investors to adjust their portfolio more efficiently. One of its major benefits is that it can be used to create a more meaningful benchmark yield curve as compared to a yield curve constructed from coupon bonds.

Instead of issuing zero coupon bonds, the Government can “strip” standard coupon-bearing bonds. Each coupon is torn off and can be separately traded in the market as a zero coupon bond, of which maturity date equals the payment period for each coupon. In this way, a strip zero coupon yield curve can be constructed.

**Inflation-Linked Bonds.** Inflation-linked bonds are similar to floating rate bonds in that the coupon payment is tied to the inflation index, i.e., consumer price index (CPI) inflation-linked bonds thus provide investors with a real rate of return above inflation, and help investors hedge the inflation risk.

**Long-Term Government Bonds.** Issuance of government bonds with a broader range of maturities would be beneficial to the construction of a benchmark yield curve. A benchmark would greatly facilitate the pricing of bonds in both the primary and secondary markets. Therefore, it could provide a foundation for the issuance of corporate and state enterprise bonds at longer maturity, which would contribute to the development of the bond market. Moreover, investors with a long-term horizon investment will find a greater range of products in which to invest.

## **Corporate Bonds**

**Longer-Term Bond.** This would match cash flows for long-term projects better than rolling over short-term bonds. Investors with an appetite for higher yield will find a place to put their money.

**Credit-Linked Bond.** The coupon spread of this bond can be adjusted according to its future credit rating. Credit-linked bonds should benefit both issuers and investors. Investors will be protected against a future fall in credibility of the issuer, while issuers who expect better future prospects can reduce costs of fund over the long term.

**Securitization Instruments.** These include those structured in the simplest form, such as pass-through securities, collateralized mortgage obligations (CMOs), and more complicated securities such as interest only (IO) and principal only (PO). Asset-backed bonds are not only limited to mortgages but also include other assets, such as receivables, and car loans. Securitization is the process of transforming illiquid and non-marketable assets into more liquid and marketable securities. It offers a number of benefits to both investors and issuers and adds value to the overall economy. It gives investors a greater range of securities and a pattern of cash flow to match their requirements. Issuers, meanwhile, are able to transform nonmarketable assets into marketable ones, thus reducing the need to maintain high capital reserves.

**Structured Notes.** This is a bundle of fixed income instruments and other types of securities on interest rate/currency swap, etc. Structured notes are designed to meet specific investor demand and lower the cost of fund for issuers. Although widening the range of fixed-income instruments has a great number of benefits, there are also some drawbacks. First, some types of instruments are complicated and hard to understand. This can lead to illiquidity of the product, and investors may require a higher yield to compensate for their unknown or black-box risk. Research publications explaining bond features and risk/return characteristics can help to address this issue. Second, laws and regulations may create constraints, which make the issuing process costly. Finally, investing in more complicated products without care and knowledge may lead to disaster, since some securities are very risky. Care, education, and good information should reduce this problem.

## B. Long-Term Strategy

Longer-term strategies can be divided into nine categories: (i) distribution methods, in particular the auction system; (ii) interest rate determination; (iii) coordination between the MOF, BOT, and other agencies; (iv) currency and maturity of scheduling structures; (v) promotion of PDs and market makers; (vi) derivative markets and risk management; (vii) accounting practice and transparency issues; (viii) general infrastructure, including regulatory framework, settlement system, benchmark yield curve, and credit rating agencies; and (ix) artificial impediments, including explicit and implicit taxes. Some of the most important features include:

**Distribution Methods.** In terms of longer-term development, access to distribution systems should be fair and open to all potential participants. In particular, there should be a consistent treatment between members and nonmembers (in case of exchange or association) with consistent tax policies for all financial instruments and market participants. The conditions for listing and delisting should be set out a priori and available to everyone involved.

In the maturing stage of a bond market, strategies are needed to ensure consistency between the Central Bank's OMO and the government's sovereign debt and risk management. At this stage, some of the auction methods may be considered to enhance the efficiency of bond issuance.

Auctioning at the early stage of market development can nevertheless create problems of fragmented participation, and thus high transaction costs. In such a thin market, the authorities may restrict trading to certain periods to allow buying and selling orders to accumulate, thus making them easier to match. Lower transaction costs permitted by economies of scale with deeper and broader participation improve both liquidity and market activities. Since each transaction represents a price discovery, more matches also imply more fluid information flows, which in turn allow closer market monitoring, and fuel further transactions.

**Interest Rate Determination.** Transactions records of bonds at various maturities may then be used to construct a benchmark yield curve, which is a set of reference prices on which borrowing and investment decisions can be made. Based on this information, efficient pricing of risks and return can be achieved, contributing to improved financial resource allocation efficiency. Clearer risk, return, and liquidity profiles improve participation, and thus liquidity.

Underlying this is the assumption that bond yields are market-

determined, and that the government represents only another individual player subject to the uniform treatment of the market. The authorities thus have to refrain from coercive measures, such as reserve requirements, which allow them to raise funds at submarket interest rates. Such an implicit tax not only distorts transactions in the primary market, but also discourages trading in the secondary market. Since the primary buyers who wish to sell their bonds on the secondary market have to recognize a book loss, they tend to hold on to these bonds rather than sell them.

In the case of Thailand, the fact that the reserve requirement has been gradually lowered over time and eventually abolished (for branch opening requirements) is in line with this view. Here, it is important that the policy is not reversed if and when the Government is faced with rising needs for deficit financing over the medium term.

**Coordination between MOF, BOT, and Other Agencies.** Due to the dynamics and complex structure of a market with diverse participants, such as nonresidents, custodians, and settlement banks, many layers of supervision are required to prevent regulatory gaps, overlaps, and conflicts. Some of these involve fiscal discipline versus bond market deepening strategy, and monetary policy independence versus fiscal costs. To alleviate potentially disastrous tension between policy objectives, an explicit set of priorities based on mutual understanding among the authorities is required to enhance credibility, which is essential for orderly market operations.

**Currency, Maturity, and Scheduling Structures.** The ease of arbitrage and hedging, and thus market liquidity, depends largely on “bond fungibility” or standardized bond lines (preferably with a simple structure not complicated by redemption or call features). Larger volumes on issue relative to the market’s total size and the average market transaction size also help improve liquidity.

Regular bond issuance of various maturities leads to the development of a yield curve essential in the price discovery process in both primary and secondary markets. As a market development strategy, efforts could be focused first on the treasury bill markets that may be expanded into longer maturities later. Moreover, market fragmentation may be reduced by reopening maturities after initial issuance (particularly among the most popular lines). Less fragmented markets lower the risk premia demanded by dealers.

To meet its various objectives, including cost effectiveness, bond issuance needs to be timed to fit the market’s absorptive capacity. Here, forecasting capability needs to be strengthened by government cash

management. At the same time, market participants' confidence may be improved by preannouncing issuers' plans, e.g., on schedules, maturities, and volumes. To this end, the recently established Thai DMO has initiated a bond calendar, although this does not include the full details as done in more developed markets.

**Promotion of Primary Dealers and Market Makers.** For the OTC market, the roles of PDs and interdealer brokers may be enhanced to improve market depth and liquidity. This could involve granting bidding privileges for them in primary markets. Where such an arrangement is not available, encouraging an active interbank market, or active trading among institutional investors, may be a good start. The experiences of more developed markets have shown that it is essential that any privileges be based on performance-linked criteria, such as trading volume, contributions in terms of bringing in new market players, and market stability enhancement; these criteria should be subject to annual or semiannual reviews.

Excessive privileges open opportunities for dealers to "corner" the market, which has led some OECD countries to revise their policies. The relative costs and benefits of this policy should therefore be regularly reviewed.

**Derivatives Markets and Risk Management.** To strengthen risk management, promotion of a bond or interest futures market may be considered after the bond spot market has been firmly established. Better risk management encourages broader participation, which, in turn, helps increase the volume of transactions and thus market liquidity. Where bond supply is still somewhat thin, short-selling also improves availability, making bond markets more liquid. Developing a repo market, for example, permits dealers to create or cover their short and long positions rapidly, enabling them to respond to market needs flexibly.

In the case of Thailand, policy direction has gradually shifted in favor of derivative markets, with legal frameworks, e.g., for short sales, being set up. Fully fledged derivative markets, however, require time for the development of both understanding and basic infrastructure, such as the settlement system, security lending, repo outside BOT, and respective tax treatments.

As in the case of PDs and market makers, derivatives markets are also subject to abuse. For example, repo and futures markets may be used as a means of "squeezing" the cash market. From this perspective, activities in these markets, as well as their cash counterparts, need to be monitored closely. When abuse is detected, the relevant authorities may

intervene through a securities lending facility to alleviate shortages of stocks, or restrict short-selling by increasing margin requirements, or prohibit short-selling below the best offer price.

**Accounting Practice and Transparency Issues.** In more developed countries, mark-to-market accounting has fostered a more active secondary market, and should thus be encouraged. In a broader framework, the whole transparency issue relating to the adequacy of accounting, auditing, and disclosure standards will need to be addressed, for example by strengthening the bond market information dissemination mechanism. Here, transparency standards may be monitored and enforced for compliance. In the case of Thailand, developments along these lines are well under way.

While disclosing government issuance strategy improves market confidence, regular reports on secondary market price and trading are essential for constructing a market-based yield curve, which reinforces pricing efficiency. This is also essential for evaluating participants' exposures (e.g., in case of a crisis), or forming the basis for good investment decisions (under normal circumstances). It may be noted, however, that in OTC trading among institutional investors, price and volume information may be more difficult to obtain.

**Regulatory Framework.** An orderly bond market needs a set of rules and procedures that are enforceable, with predictable consequences, and that do not provide participants with a false sense of security.

While the common aims are to promote sound business practices and address systemic risks to protect investors, rules and procedures can vary significantly across nations with different market structures and institutional arrangements. For example, institutional investors may be regulated based on good governance principles (e.g., a checks and balances system by active participation of shareholders or an internally appointed autonomous body in management), or through a set of guidelines governing investment decisions subject to external assessment by credit rating agencies.

**Settlement System and Legal Enforceability.** One of the most important impediments to bond market development is the principal risk, i.e., the risk arising from failure to deliver bonds or pay for them by either one of the counterparties. To minimize this risk, the DvP is used. However, other settlement procedures, such as marking-to-market of unsettled trades, have also been used to address replacement cost risks, or simple shortening of the trade settlement lag (to no more than three days)—also

intended to address principal and liquidity risks—although in a more lenient form than DvP. There are also a number of versions of DvP itself, e.g., the Real-Time Gross Settlement System (RTGS) and RTGS with net cash settlement at the end of the day.

To prevent the risk of the settlement bank failing, the funds accounts used for settlement should be placed with the Central Bank.

**Benchmark Yield Curve.** Given the importance of a benchmark yield curve in the price discovery process, as well as in risk management, concerted efforts should be made to promote its development. Here, the Government, as issuer, may assist in exchanging more liquid issues for less liquid (or more fragmented) issues from dealers, or to redeem maturing bonds prior to the maturing date, or reopen issues to prevent disruption of refunding operations.

**Credit Rating Agency.** As a bond market becomes more mature, there is a tendency to shift toward market-based regulation from merit regulation (evaluation by regulators), which tends to prevail in the emerging stage, and credit rating agencies thus take on a more prominent role.

For rating agencies to function properly,<sup>5</sup> however, they need to be equipped with a number of important characteristics, including objectivity, transparency, credibility, international access, adequacy of resources, and recognition by regulatory authorities.

The rating policy, however, should avoid setting a minimum rating for issuers to enter the market. Such a policy would tend to deflect bonds into unregulated markets, such as CP, which is even harder to monitor, let alone regulate. Moreover, “tough” rating institutions that seek to maintain high standards may find it relatively harder to find corporations to rate. Most importantly, such a policy would subject the bond quality of the whole market to technical validity and the capability of rating agencies rather than market judgment—raising the possibility of costs arising from analytical errors in the rating process. Here, an exceptional case can be made for repo markets, where certain grades of bonds may be required to ensure substitutability between these assets and Central Bank liabilities.

**Artificial Impediments, Explicit and Implicit Taxes.** In addition to removing reserve requirements as a means of eliminating implicit taxes and enhancing secondary market development, other developing countries

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5. Basle Committee on Banking Supervision, *Consultative Paper on a New Capital Adequacy Framework*, June 1999.

have demonstrated the merits of restricting access to alternative Central Bank rediscount windows as a supportive measure. Since these windows represent an alternative liquidity adjustment facility, such a measure tends to drive participants more toward the bond market. More positively, Central Bank bond repos tend to increase private demand for them (due to the lower liquidity risk). Thus, in a more general framework, the Government should seek to rationalize all tax distortions by removing any legal and regulatory impediments to competition in bond investments and trading, such as clouding accrued interest calculations by withholding tax.

Although a large part of Thailand's implicit taxes under reserve requirements have already been removed, the broader tax structures on financial services, such as taxes on repo outside BOT, capital gains taxes (for zero-coupon bonds), and withholding taxes, may be further rationalized. Also, very importantly for long-term development, policy, regulation, and intervention should not be allowed to get in the way of market innovation.

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## Appendix 1

## The Evolution of Thai Bond Market

**TABLE A.1.1**  
**Composition of Thai Bond Market**  
 (B billion)

Type of Bond	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Government	213.1	201.4	195.2	150.8	133.9	100.7	62.5	52.5	58.5	64.4	411.9	630.2
Guaranteed												
State Enterprise	7.4	10.4	16.6	49.4	62.9	109.7	159.8	208.7	239.7	247.3	255.7	309.1
Nonguaranteed												
State Enterprise	1.6	1.6	1.6	1.3	13.2	25.3	30.6	29.6	38.7	46.5	44.9	47.3
Corporate	—	—	—	—	5.1	26.3	86.1	133.6	182.4	187.7	177.6	403.8
Total	222.1	213.4	213.4	201.5	215.1	262.0	339.0	424.4	519.3	545.9	890.1	1,390.4

Source: Bank of Thailand, Securities Exchange Commission.

**TABLE A.1.2**  
**Breakdown of Debt Securities in Thai BDC as at 30 December 1999**  
 (B million)

Type of Bond	Value	Percent
Government	538,846.29	49.68
Guaranteed State Enterprise	309,090.64	28.50
Nonguaranteed State Enterprise	47,278.89	4.36
FIDF	9,000.00	0.83
PLMO	1,000.00	0.09
Corporate	179,386.61	16.54
<b>Total</b>	<b>1,084,602.43</b>	<b>100.00</b>

Source: The Thai Bond Dealing Center.

**TABLE A.1.3**  
**Outstanding Value of Corporate Bond Classified by Sector in Thai BDC**  
**(as of 30 December 1999)**  
 (B million)

Sector	Value	Percent
Banking	58,901.345	32.80
Finance	18,884.210	10.52
Property	8,269.724	4.60
Energy	17,013.008	9.47
Holding	13,370.482	7.45
Building and Furnishing	22,273.714	12.40
Communication	10,754.126	5.99
Chemical	7,100.000	3.95
Transportation	3,500.000	1.95
Commerce	1,000.000	0.56
Machinery	600.000	0.33
Agribusiness	500.000	0.28
Electric Products	500.000	0.28
Health	500.000	0.28
Textile Company	1,200.000	0.67
Others	2,500.000	1.39
Hotel and Travel Services	900.000	0.50
Food	11,820.000	6.58
<b>Total</b>	<b>179,586.609</b>	<b>100.00</b>

Source: The Thai Bond Dealing Center.

**TABLE A.1.4**  
**Thai BDC Trading Movement 1995–1999**  
 (B billion)

Type of Bond	1995	1996	1997	1998	1999
Government <sup>a</sup>	0.93	4.83	15.24	55.67	347.59
State Enterprise <sup>b</sup>	—	—	—	7.53	50.78
Corporate	50.60	195.77	90.95	8.90	32.82
<b>Total</b>	<b>51.53</b>	<b>200.61</b>	<b>106.19</b>	<b>72.10</b>	<b>431.20</b>

<sup>a</sup> Government bonds have been listed in Thai BDC since April 1998, before that there were only corporate bonds, Bank of Thailand, FIDF, and PLMO. <sup>b</sup> State Enterprise bonds have been listed in Thai BDC since April 1998.

Source: The Thai Bond Dealing Center.

## Appendix 2

## The Thai Bond Market Structure

**TABLE A.2.1**  
**Summary of Registered Bond in Thai BDC (as of December 1999)**

	Number of Issues	Outstanding Value (B million)	Percent of Total Outstanding
<b>Government Debt Securities</b>			
Government Bonds	36	538,846.29	49.68
Investment bonds	4	4,804.81	0.44
Loan bonds	17	499,041.48	46.01
Saving bonds	15	35,000.00	3.23
State Enterprise Bonds	224	356,396.52	32.86
Guaranteed	206	309,090.63	18.50
Nonguaranteed	18	47,278.89	4.36
FIDF Bonds	4	9,000.00	0.83
PLMO Bonds	1	1,000.00	0.09
<b>Subtotal</b>	<b>265</b>	<b>905,215.81</b>	<b>83.46</b>
<b>Corporate Debt Securities</b>			
Straight Issues	103	130,674.80	12.05
Convertible Issues	5	6,679.53	0.62
Amortized Issues	14	42,032.28	3.88
<b>Subtotal</b>	<b>122</b>	<b>179,386.61</b>	<b>16.54</b>
<b>Asset Securitization</b>	—	—	—
<b>Total</b>	<b>387</b>	<b>1,084,602.42</b>	<b>100.00</b>

Source: Thai Bond Dealing Center.

**TABLE A.2.2**  
**Thai BDC Government Bond Yield Curve**

Term (years)	Yield (in percent)					
	1999				1998	
	Q1	Q2	Q3	Q4	Q3	Q4
1	3.72	2.99	3.45	3.57	7.60	4.92
2	4.77	4.28	4.41	4.6	7.93	5.47
3	5.14	4.79	5.14	5.25	8.26	5.79
5	6.33	6.06	6.34	6.48	9.26	6.73
7	7.22	7.02	7.22	7.25	—	7.66
10	7.55	7.71	7.95	7.92	—	8.19
14	—	—	8.30	8.28	—	—
15	8.00	8.13	—	—	—	—

Source: Interpolated by Thai Bond Dealing Center.

**TABLE A.2.3**  
**Thai BDC Government Bond Index, 1999**

Date	Gross Price Index	Clean Price Index	Total Return Index	Date	Gross Price Index	Clean Price Index	Total Return Index
4 Jan 99	100.00	100.00	100.00	5 Mar 99	102.36	101.63	103.22
5 Jan 99	100.02	99.99	100.02	8 Mar 99	101.86	101.05	102.72
6 Jan 99	100.08	100.03	100.08	9 Mar 99	101.61	100.76	102.47
7 Jan 99	100.19	100.11	100.19	10 Mar 99	101.53	100.66	102.39
8 Jan 99	100.27	100.17	100.27	11 Mar 99	101.44	100.54	102.30
11 Jan 99	100.36	100.19	100.38	12 Mar 99	101.36	100.44	102.22
12 Jan 99	100.43	100.24	100.46	15 Mar 99	101.02	100.02	101.89
13 Jan 99	100.51	100.30	100.54	16 Mar 99	100.48	99.44	101.34
14 Jan 99	100.75	100.50	100.77	17 Mar 99	99.73	98.65	100.58
15 Jan 99	101.00	100.73	101.02	18 Mar 99	99.76	98.66	100.61
18 Jan 99	101.10	100.78	101.15	19 Mar 99	99.93	98.81	100.79
19 Jan 99	101.19	100.84	101.24	22 Mar 99	99.98	98.78	100.84
20 Jan 99	101.22	100.84	101.27	23 Mar 99	100.45	99.24	101.32
21 Jan 99	101.29	100.90	101.35	24 Mar 99	101.05	99.81	101.92
22 Jan 99	101.34	100.92	101.40	25 Mar 99	101.18	99.92	102.06
25 Jan 99	101.36	100.88	101.45	26 Mar 99	101.25	99.96	102.12
26 Jan 99	101.39	100.89	101.48	29 Mar 99	101.26	99.91	102.15
27 Jan 99	101.40	100.87	101.49	30 Mar 99	101.33	99.95	102.22
28 Jan 99	101.37	100.81	101.46	31 Mar 99	101.89	100.50	102.79
29 Jan 99	101.38	100.79	101.46	1 Apr 99	101.95	100.53	102.85
1 Feb 99	101.39	100.75	101.51	2 Apr 99	101.98	100.54	102.88
2 Feb 99	101.44	100.78	101.56	5 Apr 99	102.00	100.50	102.92
3 Feb 99	101.56	100.87	101.67	7 Apr 99	102.09	100.54	103.01
4 Feb 99	101.76	101.04	101.87	8 Apr 99	102.10	100.52	103.02
5 Feb 99	102.12	101.39	102.24	9 Apr 99	102.15	100.55	103.07
8 Feb 99	102.48	101.69	102.62	12 Apr 99	102.26	100.59	103.20
9 Feb 99	102.92	102.11	103.06	16 Apr 99	100.40	100.39	103.09
10 Feb 99	103.01	102.18	103.15	19 Apr 99	100.55	100.47	103.24
11 Feb 99	103.20	102.34	103.34	20 Apr 99	101.05	100.96	103.76
12 Feb 99	103.41	102.53	103.56	21 Apr 99	101.29	101.18	104.00
15 Feb 99	103.49	102.56	103.67	22 Apr 99	101.35	101.22	104.06
16 Feb 99	103.53	102.57	103.70	23 Apr 99	101.32	101.16	104.03
17 Feb 99	103.52	102.54	103.70	26 Apr 99	101.34	101.12	104.06
18 Feb 99	103.65	102.64	103.82	27 Apr 99	101.29	101.04	104.00
19 Feb 99	103.75	102.72	103.93	28 Apr 99	101.20	100.93	103.91
22 Feb 99	103.68	102.62	103.91	29 Apr 99	101.25	100.95	103.96
23 Feb 99	103.61	102.52	103.83	30 Apr 99	101.12	100.79	103.82
24 Feb 99	103.62	102.51	103.85	4 May 99	101.17	100.75	103.87
25 Feb 99	103.56	102.42	103.79	6 May 99	101.18	100.72	103.88
26 Feb 99	103.56	102.39	103.79	7 May 99	101.19	100.71	103.89
2 Mar 99	102.93	102.28	103.79	10 May 99	101.15	100.60	103.86
3 Mar 99	102.89	102.22	103.75	11 May 99	101.05	100.47	103.75
4 Mar 99	102.79	102.09	103.65	12 May 99	100.19	99.58	102.87

**TABLE A.2.3**  
(continued)

Date	Gross Price Index	Clean Price Index	Total Return Index	Date	Gross Price Index	Clean Price Index	Total Return Index
13 May 99	100.24	99.61	102.92	15 Jul 99	100.56	100.42	105.08
14 May 99	99.96	99.30	102.63	16 Jul 99	100.60	100.44	105.12
17 May 99	100.07	99.35	102.75	19 Jul 99	100.65	100.43	105.17
18 May 99	100.01	99.26	102.69	20 Jul 99	100.62	100.39	105.15
19 May 99	99.99	99.21	102.66	21 Jul 99	100.61	100.36	105.15
20 May 99	100.10	99.31	102.78	22 Jul 99	100.62	100.35	105.15
21 May 99	100.61	99.80	103.30	23 Jul 99	100.65	100.36	105.19
24 May 99	100.69	99.81	103.38	26 Jul 99	100.71	100.36	105.25
25 May 99	100.74	99.84	103.43	27 Jul 99	100.75	100.38	105.28
26 May 99	100.59	99.80	103.41	29 Jul 99	100.78	100.37	105.31
27 May 99	100.21	99.39	103.02	30 Jul 99	100.76	100.34	105.30
28 May 99	100.37	99.54	103.19	2 Aug 99	100.83	100.34	105.37
1 Jun 99	100.04	99.55	103.29	3 Aug 99	100.85	100.34	105.39
2 Jun 99	100.50	100.00	103.77	4 Aug 99	100.87	100.35	105.41
3 Jun 99	100.60	100.08	103.87	5 Aug 99	100.97	100.43	105.52
4 Jun 99	100.72	100.18	103.99	6 Aug 99	101.06	100.50	105.61
7 Jun 99	100.93	100.33	104.21	9 Aug 99	101.11	100.49	105.66
8 Jun 99	100.22	100.59	104.50	10 Aug 99	101.16	100.52	105.71
9 Jun 99	100.43	100.79	104.72	11 Aug 99	101.19	100.52	105.74
10 Jun 99	100.72	101.06	105.02	13 Aug 99	101.21	100.51	105.76
11 Jun 99	100.75	101.07	105.05	16 Aug 99	101.25	100.49	105.80
14 Jun 99	100.82	101.07	105.12	17 Aug 99	101.29	100.50	105.84
15 Jun 99	100.77	101.05	105.12	18 Aug 99	101.29	100.48	105.84
16 Jun 99	100.79	101.05	105.14	19 Aug 99	101.32	100.50	105.87
17 Jun 99	100.56	100.93	105.03	20 Aug 99	101.30	100.47	105.87
18 Jun 99	100.42	100.77	104.89	23 Aug 99	101.37	100.49	105.94
21 Jun 99	100.36	100.71	104.89	24 Aug 99	101.39	100.48	105.96
22 Jun 99	100.14	100.46	104.65	25 Aug 99	101.33	100.40	105.89
23 Jun 99	99.97	100.26	104.47	26 Aug 99	101.30	100.35	105.87
24 Jun 99	99.86	100.14	104.36	27 Aug 99	101.33	100.36	105.90
25 Jun 99	99.68	99.93	104.17	30 Aug 99	101.39	100.37	105.96
28 Jun 99	99.71	99.92	104.20	31 Aug 99	100.90	100.39	106.00
29 Jun 99	100.19	100.39	104.70	1 Sep 99	100.89	100.37	106.00
30 Jun 99	100.34	100.51	104.85	2 Sep 99	100.92	100.38	106.03
2 Jul 99	100.39	100.53	104.91	3 Sep 99	100.97	100.41	106.08
5 Jul 99	100.45	100.53	104.97	6 Sep 99	100.62	100.43	106.15
6 Jul 99	100.47	100.53	104.99	7 Sep 99	100.63	100.41	106.16
7 Jul 99	100.46	100.50	104.98	8 Sep 99	100.61	100.38	106.14
8 Jul 99	100.46	100.46	104.98	9 Sep 99	100.59	100.33	106.11
9 Jul 99	100.43	100.40	104.94	10 Sep 99	100.61	100.33	106.13
12 Jul 99	100.48	100.40	105.00	13 Sep 99	100.61	100.30	106.16
13 Jul 99	100.50	100.40	105.02	14 Sep 99	100.62	100.28	106.16
14 Jul 99	100.54	100.42	105.06	15 Sep 99	100.62	100.27	106.17

**TABLE A.2.3**  
(continued)

Date	Gross Price Index	Clean Price Index	Total Return Index	Date	Gross Price Index	Clean Price Index	Total Return Index
16 Sep 99	100.62	100.24	106.16	9 Nov 99	99.85	99.78	106.78
17 Sep 99	100.60	100.20	106.14	10 Nov 99	99.86	99.77	106.79
20 Sep 99	100.60	100.16	106.16	11 Nov 99	99.86	99.75	106.79
21 Sep 99	100.58	100.12	106.14	12 Nov 99	99.82	99.69	106.75
22 Sep 99	100.44	99.95	105.98	15 Nov 99	99.87	99.68	106.80
23 Sep 99	100.35	99.84	105.89	16 Nov 99	99.89	99.69	106.82
24 Sep 99	100.30	99.77	105.84	17 Nov 99	99.87	99.65	106.81
27 Sep 99	100.26	99.69	105.81	18 Nov 99	99.91	99.67	106.84
28 Sep 99	100.43	99.84	105.99	19 Nov 99	99.90	99.64	106.83
29 Sep 99	100.50	99.89	106.06	22 Nov 99	99.97	99.65	106.91
30 Sep 99	100.55	99.92	106.12	23 Nov 99	99.98	99.64	106.92
1 Oct 99	100.58	99.93	106.14	24 Nov 99	100.00	99.65	106.95
4 Oct 99	100.67	99.97	106.24	25 Nov 99	100.06	99.69	107.02
5 Oct 99	100.75	100.03	106.33	26 Nov 99	100.06	99.67	107.01
6 Oct 99	100.84	100.11	106.43	29 Nov 99	100.09	99.65	107.05
7 Oct 99	100.80	100.04	106.38	30 Nov 99	100.09	99.63	107.05
8 Oct 99	100.81	100.04	106.40	01 Dec 99	100.09	99.61	107.05
11 Oct 99	100.80	99.98	106.40	02 Dec 99	100.12	99.62	107.08
12 Oct 99	100.32	99.97	106.41	03 Dec 99	100.17	99.65	107.13
13 Oct 99	100.34	99.97	106.43	07 Dec 99	100.11	99.61	107.17
14 Oct 99	99.52	99.94	106.42	08 Dec 99	99.46	99.62	107.21
15 Oct 99	99.60	100.01	106.51	09 Dec 99	99.48	99.63	107.23
18 Oct 99	99.46	99.81	106.36	13 Dec 99	99.49	99.63	107.31
19 Oct 99	99.55	99.88	106.46	14 Dec 99	99.52	99.63	107.34
20 Oct 99	99.63	99.94	106.54	15 Dec 99	99.30	99.67	107.40
21 Oct 99	99.68	99.97	106.59	16 Dec 99	99.34	99.68	107.43
22 Oct 99	99.68	99.96	106.60	17 Dec 99	99.37	99.70	107.47
26 Oct 99	99.75	99.95	106.67	20 Dec 99	99.42	99.72	107.56
27 Oct 99	99.74	99.92	106.66	21 Dec 99	99.38	99.67	107.52
28 Oct 99	99.73	99.89	106.65	22 Dec 99	99.42	99.68	107.55
29 Oct 99	99.74	99.88	106.66	23 Dec 99	99.46	99.70	107.60
1 Nov 99	99.76	99.85	106.68	24 Dec 99	99.47	99.70	107.62
2 Nov 99	99.78	99.84	106.70	27 Dec 99	99.53	99.70	107.67
3 Nov 99	99.80	99.85	106.73	28 Dec 99	99.54	99.69	107.69
4 Nov 99	99.80	99.83	106.73	29 Dec 99	99.57	99.70	107.72
5 Nov 99	99.80	99.80	106.72	30 Dec 99	99.56	99.83	107.76
8 Nov 99	99.84	99.79	106.77				

