



**“Introduction and Overview of OECD Bond
Markets”**

by: Hans Blommestein

**reprint from: OECD Public Debt Markets: Trends and
Recent Structural Changes, OECD, 2002.**

**Second International Roundtable on Securities
Markets in China**

6-7 June 2002, Shanghai

CHAPTER 1

INTRODUCTION AND OVERVIEW OF OECD BOND MARKETS*

I. Background

At its meeting in October 2000, the Committee on Financial Markets requested the Working Party on Public Debt Management to undertake a study on recent trends and developments in OECD bond markets. Subsequently, the study would be discussed at the meeting of the Committee in October 2001. The Working Party discussed this request at its meeting in November 2000. In response, a task force, consisting of delegates to the Working Party, was formed to draft the various chapters. Prior to the drafting of the contributions, guidelines were distributed to the authors and a first, complete draft of the study was reviewed by all the authors as well as the Steering Group of the Working Party. This chapter serves as an introduction and overview of OECD bond markets. Detailed information on countries, regions and background analyses can be found in the subsequent chapters.

II. The Development of Liquid Public Debt Markets in the OECD Area

Market-based financing of budget deficits has been a major factor behind the growth of the global sovereign bond market in the 1980s and 1990s. A large number of OECD governments adopted measures to strengthen the role of

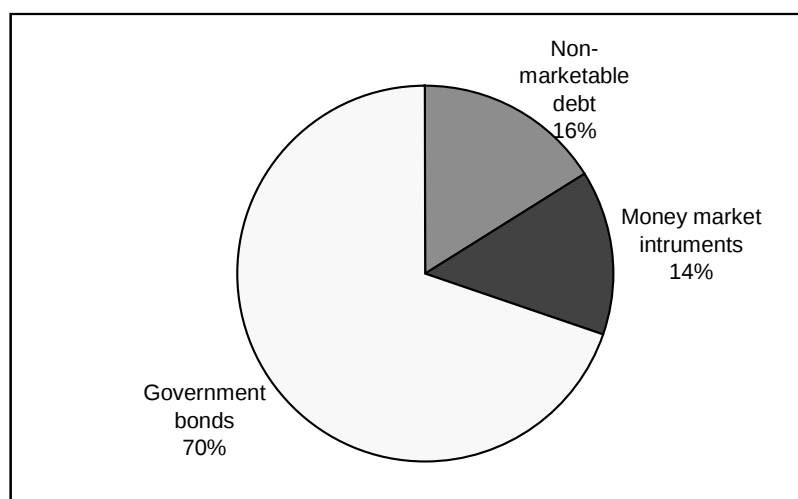
* This study, led by Paul Malvey (US Treasury) and Hans Blommestein (OECD), has been prepared for the Committee on Financial Markets by a task force consisting of the following members from the OECD Working Party on Public Debt Management: Paul Malvey (USA), Rob Stewart (Canada), Guenter Mueller and Axel Schaller (Germany), Eric Thedeen, Malin Holmlund and Tord Arvidsson (Sweden), Ove Jensen (Denmark), Richard Batley and Mike Williams (UK), Kunimasa Antoku (Japan), Peter McCray (Australia), Andrew Turner (New Zealand), Arkadiusz Kaminski (Poland), Demet Bozkurt and Nilgun Pehlivan (Turkey), Margarita Martinez and Felipe Izaguirre (Mexico), P.H. Shin (Korea), and Hans Blommestein (Secretary to the Working Party). Helpful comments were also provided by the members of the Steering Group of the OECD Working Party on Public Debt Management.

market principles in government debt management by improving primary and secondary market arrangements. Also, an increasing number of debt managers from emerging markets are emulating the best practices of their counterparts from advanced markets, including financing government deficits using marketable debt instruments. Along with an improved infrastructure -- including advanced clearing and settlement systems and modernisation of the regulatory framework -- as well as deregulation, the flow of government bonds helped to establish more liquid benchmark issues. Liquid government bond markets facilitated issuance also by private sector borrowers. Thus, in many countries the larger corporate borrowers stepped-up issuance of bonds and shorter dated paper such as commercial paper. Key corporate issuers as well as national and regional government borrowers in emerging markets became important issues in the international bond markets.

Until the later part of the 1990s, government deficits in the OECD area grew strongly. After that deficit era, many OECD governments (with the notable exception of Japan) started to run budget surpluses or were projected to do so in the near future. Most recently, however, some surplus OECD countries have entered a period where budget deficits are expected to return and to last for the next few years, brought on by the recession and budgetary consequences of the terrorist attacks of September 11, 2001. This contribution provides a concise overview of trends and recent structural changes in the main OECD public debt markets. In doing so, use will be made of a unique new database on OECD government debt¹.

An important part of OECD capital markets is fixed-income securities markets, which in most countries are dominated by public debt markets. Liquid public debt markets proved to be key for the development of corporate debt markets as the yield curve associated with government securities markets is important for the correct pricing of corporate bonds. Almost all OECD countries have developed their fixed-income government securities markets pressed by the necessity of financing fiscal deficits. Total outstanding debt of OECD central governments amounted to around US\$ 12860 billion at the end of 2000 [see **Table 1: Central Government Debt**]. The 1980s trend in OECD countries to improve the depth and liquidity of government debt instruments has continued during the 1990s when, on average, 84 per cent of government borrowing requirements were met through marketable instruments [**Chart 1: Marketable and non-marketable public debt instruments in OECD area 1990-2000**].

**Chart 1: Marketable and non-marketable public debt in OECD area
Average 1990-2000**



Source: OECD statistical yearbook on Central Government Debt, 2001.

This trend is in large part due to measures taken to strengthen the role of market principles in government debt management by improving primary and secondary market arrangements. A common objective of OECD debt managers is to foster market liquidity. Over the years, OECD debt managers have developed best practices for raising, managing and retiring debt at the lowest possible price and acceptable risk. Some key policy conclusions from past meetings on public debt management at the OECD² can be summarised in the form of the following best practices regarding primary and secondary public debt markets:

Primary markets

- Efficient primary markets for government securities are characterised by the following best practices:
- issuing strategy based on regular auctions;
- the issuance of benchmarks;
- abolition of privileged access by governments;
- a transparent debt management framework;
- a primary dealer framework with the capacity to develop markets.

Secondary Markets

- Efficient secondary government securities markets are characterised by the following features:
- liquid markets with a large stock of outstanding benchmark issues and repo market financing;
- safe and sound clearing and settlement systems;
- transparent and equitable regulatory and supervisory framework;
- a market-making structure based on primary dealers;
- liquid futures markets;
- good access by foreign investors to domestic debt markets.

As a result of implementing these best practices, liquidity in OECD public debt markets increased significantly and a yield curve of benchmark bonds was established. Also the internationalisation of domestic markets and investor bases played a major role in making these debt markets more efficient, liquid and transparent. As an asset class, government securities are assessed as virtually free from credit risk. These characteristics distinguish most OECD government debt markets from private debt markets. As a result, government bonds have been increasingly used for pricing corporate debt. Market participants started to use them also for hedging operations and positioning in both duration and volatility, as vehicles for managing liquidity, as instruments for investment, as collateral for secured borrowing, as a base for futures market contracts, and as a safe-haven during periods of market turmoil³.

Although OECD public debt markets are considered relatively liquid, market liquidity differs considerably across countries⁴. Moreover, liquidity is concentrated in specific instruments (or markets), often at the expense of liquidity in closely related markets. Especially in markets for assets that can act as substitutes for one another, liquidity is often concentrated in relatively few specific issues. For example, in public debt markets bid-ask spreads for on-the-run issues are usually much narrower than those for off-the-run issues⁵.

By the late 1990s, longer-term instruments accounted for the larger part of government debt [Chart 1: Marketable and non-marketable public debt instruments in OECD area 1990-2000; Chart 2: Composition of Central Government Debt in 2000] as debt managers sought to minimise re-financing risk as well as interest risk. Although most of the instruments are fixed (nominal), an interesting development during the last few years is that a number

of governments (the United States, France) have joined a number of OECD countries that were already issuing index-linked bonds: Australia, Canada, Iceland, New Zealand, Sweden and the United Kingdom. Also Mexico issues indexed bonds linked to the rate of inflation. Indexed debt is issued to assist with the overall debt management objective of raising, managing and retiring debt at the lowest possible price and acceptable risk. Specific objectives related to indexed debt include an opportunity to diversify and the provision of a real rate that is useful for policy makers and market participants. However, indexed markets tend to be less liquid, have fewer participants and have a narrower investor base than nominal markets.

III. Trends in North American debt markets

In this study this region encompasses the United States and Canada. These two countries have some similarities, including efficient financial market infrastructures. Additionally, the governments of both of these countries in recent years entered a period of fiscal surplus, which led to a decline in the amount of government debt being issued. Recently, however, the United States entered a period where budget deficits are expected to last for the next 2 to 3 years, brought on by a recession and fiscal responses to the terrorist attacks of September 11.

Outstanding debt levels of both Canada and the United States rose during the first half of the 1990s, peaked in 1997, and subsequently fell for the duration of the decade. In **Canada**, the government began to run budget surpluses beginning in 1997-98. Over the last four years, Canada's net public debt has fallen by C\$38.5 billion. As a percentage of GDP, Canada's net public debt has fallen from a peak of 71.2 percent in 1997-98 to below 53 percent at the end of the 2000-01 fiscal year (ending in March 2001). In the **United States**, federal budget deficits declined for 5 years, before a budget surplus was achieved in 1998. As a percent of GDP, publicly held debt peaked in 1993 at slightly more than 50 percent, and has since fallen to about 33 percent of GDP at the end of FY 2001.

The primary markets for government debt of Canada and the United States bear some resemblance to one another. Both governments maintain benchmark securities in 3- and 6- month treasury bills, and in 2-, 5-, and 10- year securities. Canada additionally maintains a benchmark in the 30- and 1-year sectors; maturity sectors which the United States recently eliminated altogether.⁶ Also, both governments issue inflation-linked securities: the U.S. issues 10-year inflation-indexed securities, while Canada issues Real Return Bonds with a 30-

year maturity. One notable dissimilarity is that, unlike the United States, Canada also issues foreign currency denominated securities.

Public debt plays an important role in the domestic economies of both Canada and the United States. Government debt is used by each country's respective monetary authority in carrying out monetary policy. Additionally, government debt of both countries is viewed as "risk free" and is used domestically as a pricing benchmark and hedging vehicle. Currently, U.S. Treasury securities also play a very active role in the global financial markets and are very much in demand as the only dollar-denominated credit risk free asset available to investors. They are actively used for hedging purposes by underwriters, portfolio managers, arbitrageurs, swaps desks and foreign central banks, as well as other investors and traders. At present, the United States has the deepest and most liquid private debt securities market in the world. Its size is bigger than all other private securities markets together⁷.

When the issuance of government debt instruments was declining, Canada and the United States had somewhat divergent experiences with regard to the development of surrogate pricing benchmarks. In the United States, both agency and swaps curves are regularly used as pricing benchmarks and high-grade corporate debt is also beginning to assume benchmark functions. In Canada, the domestic market has not had quite the same experience. Although Canada has federal agencies that borrow with the full faith and credit of the Canadian government, their level of activity is far less and they do not enjoy the same level of liquidity as Government of Canada debt. The situation is similar with Canada's domestic swap market, which, while active, does not offer the deep and liquid investment alternative and pricing benchmark it has become elsewhere.

More recently, however, economic sluggishness and the fiscal response to the aftermath of the tragic events of September 11, 2001 have also played a part in increasing near-term financing needs. In Canada, projected surpluses have declined in size. The US government has entered a period where budget deficits are expected for the next 2 to 3 years before forecasts for budget surpluses resume. The short-term budget situation has been affected by the recent economic downturn and the aftermath of the events of September 11, resulting in increased bill issuance, which in turn has helped to decrease the average length of the privately held marketable debt.

IV. The emergence of a pan-European public debt market

The size of debt markets in the countries of the European Union (EU) varies considerably, both in absolute and relative terms. Italy has the largest government debt market standing at EUR 1200 billion at the end of 1999, followed by Germany, the UK and France with a market debt of around EUR 650 billion. Public debt of Spain, Belgium, the Netherlands and Sweden is in the range EUR 150-300 billion, while the debt of the other EU member states is below EUR 130 billion. Not surprisingly, this picture changes when the countries are ranked in terms of the debt relative to GDP. While Belgium, Greece and Italy have a ratio of debt to GDP of more than 100 per cent, Germany has one of the lowest ratios of debt to GDP at 35 per cent.⁸

In the wake of the introduction of the Euro, the creation of a truly **pan-European** government-bond market would provide benefits similar to those of the US government securities market: a large and liquid market along the entire yield curve. To that end, important developments within the euro-area have been the conversion of the existing stock of government debt denominated in the former domestic currencies into euro, the convergence of the composition of debt (by type of instrument and maturity), the co-ordination of issuing procedures and the harmonisation of market conventions. These developments reflect the efforts by EU debt managers to promote liquid, transparent and efficient government-securities markets in individual countries. Increased competition between EU governments to attract investors and the standardisation of instruments and market practices also encouraged the introduction of electronic trading platforms (Euro-MTS and BrokerTec).

But this same competition has also been mentioned as an obstacle in the creation of an euro area-wide government debt market⁹. Liquidity is mostly concentrated in the debt instruments of the three biggest issuers (Germany, France and Italy). Consequently, a pan-European benchmark yield curve is missing. However, the euro derivatives markets, especially the futures and interest rate swaps markets, became quite quickly highly integrated. In the absence of a homogeneous sovereign yield curve, the swap curve is instead used as a reference by financial market participants.

In recent years, central-government borrowing requirements in EU countries have shown a declining trend. Declining borrowing requirements and greater competition have encouraged EU countries to use **buy-back and switching operations** to concentrate their debt in fewer, larger series. The smaller euro-zone countries have restructured their debt around a limited selection of benchmark securities which provide adequate liquidity to the large international investors. In most EU member states high priority is given to the 10-year segment, with

outstanding volumes of between EUR 5 and 24 billion, depending on the borrowing requirement of the issuer. The smallest outstanding volume of EUR 5 billion corresponds to one of the criteria for participation in the electronic trading system EuroMTS. There is a tendency for expansion of electronic trading at both domestic and European levels. This reduces the costs of trading certain government bonds, and at the same time increases liquidity.

V. Trends and recent developments in the Asian-Pacific public debt markets

The markets for government debt in this region vary significantly, with similarities existing between New Zealand and Australia, while Japan shows marked contrast.

During the 1990s, both New Zealand and Australia achieved improvements in their fiscal situations, allowing them to reduce their levels of outstanding government debt by the end of the decade. Also, during this time, both countries began to develop a debt portfolio of benchmark securities, concentrating issuance in relatively few securities (from 8 to 13) in order to make their debt more liquid and desirable for investors. The volume of outstanding debt in **New Zealand** in absolute terms increased significantly between 1991 and 1993 before improvements in its fiscal position stabilised debt levels within a relatively narrow band throughout the rest of the decade. In **Australia**, outstanding debt rose for most of the 1990s and peaked in 1997, before falling significantly for the remainder of the decade, again, due to an improved fiscal situation. The volumes of Australian and New Zealand government bonds outstanding have been equivalent to 10 to 15 per cent of GDP and 15 to 25 per cent of GDP, respectively, for most of the 1990s.

In contrast, **Japan's** debt levels increased throughout the 1990s, and rose from around 58 percent of GDP in 1991 to around 118 percent of GDP in 1999; in 2000 it stood at 104 percent of GDP. The Japanese government bond market is expanding rapidly [*Chart 3: Central Government Debt of OECD countries* and *Chart 4: Central Government Marketable Debt of OECD countries*]. In 1999, the Japanese government bond market became -- in absolute terms -- the largest in the world, with outstanding stock of central government debt of more than US \$ 4620 billion, followed by the United States with around US \$ 3665 billion; In 2000, these stocks stood at US \$ 4321 billion for Japan and US \$3395 billion for United States. With the fiscal deficit relative to GDP projected to remain high, Japanese bond issues are expected to account for the bulk of total net OECD government bond issuance in the next few years.

The primary market for debt of each country in this region has its own salient features. Japan offers most of its securities via price auctions in which the coupon, maturity and issue amount are all predetermined. In New Zealand, securities are sold through a multiple-price auction system and without the presence of primary dealers or officially appointed market makers. In Australia, dates and amounts for its competitive auctions are not pre-announced, unlike some other government debt issuers.

Public debt plays similar roles in all three countries. Government debt serves as a low risk instrument for investors and is used for hedging purposes. Yield curves provide a reference for pricing. In addition, government debt plays an important role in the implementation of monetary policy.

With regard to the market effects and policy implications of the budget environments of the three sovereign debt issuers in this region, there are many differences. In **New Zealand**, the mid-1990s brought forecasts of large surpluses and implications of large reductions in debt issuance. However reductions in outstanding debt did not materialise and current projections are for increasing levels of outstanding Government bonds in nominal terms, although relatively stable levels as a percentage of GDP. **Australia**, on the other hand, is in a position where gross debt elimination may be seen as quite possible in the near term.

Japan, in contrast to New Zealand and Australia, is operating in an environment of budget deficits. The envisaged rapid build-up in net debt will make debt management a key issue in Japan. This includes further improvements in the infrastructure for Japanese government bonds (JGB) by eliminating the sources of fragmentation such as reform of the withholding tax regime, improvements in the clearing and settlement infrastructure and the further development of benchmark issues along the entire yield curve. These reforms would result in liquid and deep Japanese government bond markets, including a well-functioning JGB repo market. This in turn would generate an increasing volume of government debt more palatable and more easily absorbed by foreign and domestic investors, thereby limiting the government's financing costs. Some changes have already been made to increase liquidity, decrease the tax burden and to smooth the maturity structure of the debt. For example, several initiatives have recently been taken to further improve the functioning of primary and secondary markets such as the creation of benchmarks at 30-year, five-year, and one-year maturities.

VI. Trends in emerging debt markets

The development of bond markets in different emerging regions has taken very different courses, and is at different stages of development. The resulting major differences between individual countries make a comprehensive and consistent overview of these markets very difficult or even impossible. Hence, the focus in part V of this study is on the generic structural problems and policy issues that many of the debt managers from emerging markets are facing.

The overall stage of development in emerging markets can be characterised as follows. Governments are the dominant issuers in all local debt markets. Most local debt markets are only liquid at the short end of the market. In other words, there is a relatively well-functioning money market, but not a bond market. A few markets have introduced a limited range of derivatives. Moreover, most emerging fixed-income markets consist solely of public debt instruments.

In **Asia**, maturities of active instruments are focused on one year; exceptions are some corporate instruments in Korea and Malaysia. Treasury bills dominate in **Central Europe**. In **Latin America**, only Chile has been issuing for some time fixed-rate bonds with longer-term maturities. Mexico has started to issue 3-year fixed-rate in February 2000, and, more recently, 5-year and 10-year fixed-rate bonds. (Longer-term bonds for index-linked and floating-rate bonds have been available for a longer period.) In Asia, fixed-rate instruments are the most common, while floating rate instruments proliferate in Central Europe and Latin America.

While in Latin America and Eastern Europe, government bonds have spearheaded the establishment of the markets, in some Asian countries, the corporate sector has led the development (e.g. decrease and cessation of government bonds in Malaysia and Thailand before the Asian financial crisis, paralleled by an increase in the bond issues by Malaysia's Cagamas, and Thailand's government enterprises). Another relevant characteristic that differentiates East Asian from Latin American emerging market economies is the higher saving propensity in East Asian countries.

Underdeveloped capital markets with a weak and inefficient infrastructure entail financial stability risk, higher transaction costs, a narrower financing base for enterprises, as well as higher investment risk. The higher level of uncertainty associated with such markets could discourage capital investment or raise the cost of capital formation. The international financial crises in 1997-1998 have brought sharply into focus the risks and costs associated with underdeveloped fixed-income securities markets, in particular, that **underdeveloped** markets have encouraged excessive reliance on foreign and domestic bank financing.

VII. Policy issues during periods of budgetary surpluses and declining public debt

After the era of large budget deficits, many OECD governments started to run budget surpluses or were projected to do so in the near future. Most recently, though, some surplus OECD countries have entered a period where budget deficits are expected to return and to last for the next few years. Nonetheless, after that deficit period, surpluses are expected to resume.

Surpluses reduce net borrowing requirements by governments and lead to a reduction in the supply of securities on issue. Thus, in some cases in the recent past, strong demand had encountered reduced supplies, which had resulted in shortages of selected bonds with the usual pricing anomalies.

Clearly, in case further reductions in the supply of bonds and the stock of gross debt will materialise over the medium-term, OECD debt managers will continue to face the policy implications of lower liquidity in traditional benchmark markets. As a consequence of their reduced need to borrow and the effect this has had on some market segments, governments in a number of jurisdictions had implemented a reduction in auction sizes and frequencies (sometimes to zero), buy-back programmes or reverse auctions and conversions (including re-issuing or re-opening). Most of these programmes are targeting less liquid outstanding issues so as to boost overall liquidity in debt markets; for example, buy-back operations are being used to restructure the outstanding debt (mainly to smooth the redemption profile of the debt and building up of new issues). Partly as an alternative to extensive debt buybacks, some governments might use their expected budget surpluses to acquire financial assets; for example, by acquiring foreign currency or government paper. For most issuers, though, details as to the volume and type of assets to be acquired have not yet been finalised.

The key challenge for governments with budgetary surpluses will be to manage the decline in debt in such a way that many of the benefits of deep public debt markets that currently exist are maintained to as large a degree as possible. Against the backdrop of budgetary surpluses, two general financial policy issues can be distinguished.

First, there is the issue of the benefits and costs of fully paying down national debt. Some debt managers have argued that complete elimination of the debt is not desirable. This view is based on the reasoning that a minimum volume of issuing activity is necessary to sustain the government debt market infrastructure and minimise **future** cost of borrowing, given expectations that deficits will return in the foreseeable future. Maintaining a minimum level of

gross debt would eliminate the costs of re-building the government bond market infrastructure over the next several decades — when the budgetary needs of an ageing population are expected to result in an increase in net debt.

It may be necessary therefore to maintain a minimum level of liquid, gross public debt despite the reduction in net debt. As mentioned above, buying back less liquid issues, conversions and changing issuing calendars are being used to maintain liquid debt markets, even when issuing volumes are decreasing. Even if net debt would drop to zero, governments could continue to nurture smaller but liquid debt markets by investing government surpluses in private financial assets (domestic or foreign). Some issuers have indicated the minimum level of gross debt they consider sufficient to maintain liquidity in the government bond market, so as to permit to continue issuing in a few benchmark segments and for supporting private securities markets based on government bond markets, such as derivative markets.

Other have argued that, while there would be start-up costs associated with a possible need for re-entry of the government into the financial markets, they could be offset by the many benefits that eliminating the publicly held debt would yield for the economy as a whole. Eliminating the publicly held debt will increase national saving and make more funds available for private use. Individuals should see the relative costs of mortgages, automobile and other consumer durable loans decline as pressures on interest rates ease. On the corporate front, as reduced government borrowing frees up more funds for the private sector, the cost of capital should decline on a relative basis. The resulting additional resources should lead to increased productivity and output growth, creating increases in earnings. The government will also obviously save on interest costs.

Second, opinions are divided whether private debt can fulfil all the desirable functions of public debt. Some debt managers and other analysts argue that high-quality corporate securities or government-sponsored instruments **cannot** achieve the same status as government debt and that therefore they cannot act in a satisfactory fashion as a substitute benchmark for this risk-free rate. This in turn may hamper the proper pricing of private assets and negatively affect the development of corporate securities markets (including derivatives).

Others are of the opinion that certain classes of high-grade corporate debt could fulfil similar functions as public debt despite (somewhat) higher credit risk. Also the curves of government-sponsored institutions and swap curves offer in the United States widely accepted benchmarks for pricing purposes. Market participants could use collateralisation techniques and/or employ implicit government guarantees to upgrade certain types of private debt (thereby

reducing credit risk). This could make them a close substitute for central government debt with regard to risk characteristics. In this regard, debt issues of government-sponsored companies are bonds backed (indirectly) by private mortgages or public sector loans, and may be seen as reasonably comparable to government debt. US government-sponsored institutions such as Fannie Mae and Freddie Mac enjoy a considerable funding advantage through a perceived government guarantee, while the issuers of German Pfandbriefe and French Obligation Fonciere seem to benefit mainly from the strict regulations and high standards regarding their collateralisation and their excellent payment track record. The issuers in these markets are increasingly emulating the best practices of the primary and secondary government bond markets. They are issuing on a regular basis bonds with a small set of maturities and in relatively large sizes in order to create liquid markets -- i.e. they are creating benchmark bonds, sometimes by using similar selling technique such as auctions.

Finally, some analysts point out that even when the risk and liquidity characteristics of private (or government-sponsored) debt securities differ (somewhat) from those of government debt, they may be still able to fulfil **some** functions of the latter. Thus, in the large US corporate bond market high-quality, liquid alternative benchmarks are being established. These benchmark issues can be used for hedging purposes and to price other private debt. Also some short-term liquidity and funding activities were being shifted toward high-grade, liquid alternatives to the United States Treasury bill and repo markets. However, it seems that not in all jurisdictions with budget surpluses viable substitutes to public debt instruments were being developed.

VIII. The growing importance of electronic trading systems

An important recent development is the impact of new electronic trading systems (ETS) on debt management and government securities markets. The advance of ETS is inevitable and will reshape the fixed income markets. They could improve national markets by extending access to, and awareness of, the markets.

Various types of ETS can be distinguished, including dealer-based ones, matching systems, competitive bidding and auction systems. When choosing a system, issues to consider include participation, market-making obligations, vendors, international alliances and consultation of primary dealers. Three types of **primary** market systems are usually distinguished: competitive bidding systems (issuer to dealers), online selling systems (dealer to clients), and direct primary issuance systems (issuer to clients). And two types of **secondary**

trading systems: single and multiple (co-mingled) dealer systems (to clients), and cross-matching systems (between dealers and client to client).

This is an extremely fast-moving area in which it is not clear which business model will succeed. The number and types of fixed-income ETSs are growing rapidly. Markets and governments will have to adapt to this new reality. Several forces shaping the greater use of ETS can be observed. The first is technological change. This is forcing globalisation of the markets, and allowing the creation of cheaper communications networks. It is enhancing pricing engines and security, and also making the transfer of information cheaper and more timely. A second driving force is transparency. Previously, fixed-income markets were not highly transparent as dealers preferred having privileged access to information. ETS improve access to information, reduce information asymmetries, and allow market-wide integration of real-time trading information. A third important driving force is cost-reduction. ETS cut resource costs of all parties - sales, trading and back-office. They are most attractive in commoditised securities markets such as those for government bonds where access can be offered at minimal costs.

Some types of securities are traded on several electronic platforms. As a result, it is sometimes hard to assess the market penetration of ETS. However, it is clear that the OTC-market has still an important market share. This may in part be due to impediments to market access, but also preferences play a role (e.g. for large, complex transactions, institutional investors seem to prefer to trade directly with dealers).

ETS are mostly focused on dealers. Institutional investors have in most cases no direct access. It is expected that this gap will be filled by either electronic broking systems or by customer-to-dealer systems. Intermediation will also remain important as ETS are not a substitute for committed dealers.

The regulatory status of the electronic trading systems varies. In some countries they have the status of an official (regulated) market, while in others ETS are regulated as a broker. The differences in regulatory approach raise the issue of the need for a level playing field. While transparency is critical, and will naturally improve, it may need public support. Other regulatory concerns include access, member and market rules, and market soundness, namely the reduction of systemic and credit risks.

Another point of concern is the impact of order-driven electronic trading platforms on market liquidity. It has been argued that electronic order books may suffer from “fair weather liquidity”, that is, sufficient liquidity in normal times but vanishing liquidity during periods of market stress. Analysts have

pointed out that there is a tendency of limit orders, the ultimate source of liquidity in order-driven systems, to be removed from the electronic order book during periods of serious market turmoil. A key policy question is whether this vanishing liquidity is worse than the reluctance of dealers in quote-driven markets to provide liquidity during periods of market stress.

It has been argued that liquidity in a wide range of financial markets may have been reduced by the fragmentation of trading activity associated with the growth of ETS¹⁰. However, the possibility of market fragmentation seems predominantly to be related to the impact of ETS on the centralised equity markets. The situation is different for fixed-income markets because they are already more decentralised than equity markets. In fact, it has been argued that ETS are pushing the development towards more centralised fixed-income securities markets. The move to multi-dealer and cross-matching systems is having a centralising effect. This is leading to a bigger pool of liquidity. Competition for liquidity, in turn, is stimulating fewer trading systems and strengthening the centralisation trend. This is very clear in the Euro-zone where the MTS electronic inter-dealer broker systems have been established, using a common technology. Also in the United States there are incentives for dealers to concentrate liquidity in fewer trading platforms.

IX. Trends in the organisation of debt management offices

An increasing number of OECD governments are giving the **operational arm** for debt management greater independence. The emphasis is on more autonomy for the execution of debt management policies by debt management offices (DMOs). This independence is therefore not the same as the autonomy given to central banks to set and execute (monetary) policy. Sometimes greater autonomy takes the form of a separate DMO outside the Ministry of Finance (and Central Bank). Other countries opt for a separate entity within the Ministry of Finance (sometimes in a different geographical location) or within the central bank.

In spite of the diversity in terms of location and other institutional features of DMOs, there is general agreement that the agency should have sufficient autonomy from the political sphere, and that it should be principally concerned with the operational aspects of the management of sovereign debt. There is also unanimous agreement that the management of State debt should be clearly separated from the implementation of monetary policy (which is the responsibility of the Central Bank). Otherwise debt management decisions could be perceived to be influenced by inside information on interest rate decisions.

More specifically, the reasons for establishing debt management offices with more independence from both the ministry of finance (the political and fiscal powers) and central banks are several: (1) to create clearer accountability and greater transparency; (2) greater sophistication of financial management in general and debt management in particular, given the growing emphasis on the control of risk; and (3) to overcome problems of recruiting and retaining staff with special expertise in the area of finance in a central government agency (which may be especially difficult for a ministry of finance that needs to set a good example in terms of wage restraint for other ministries).

It is especially during the last few years that we are witnessing the establishment of an increasing number of **independent** debt management offices (DMOs) in OECD countries. In addition to Sweden (whose debt office dates back to the 18th century) and Finland (from the 19th century), there are now such DMOs in Australia, Austria, Belgium, France, Germany, Greece, Hungary, Iceland, Ireland, the Netherlands, New Zealand, Portugal, and the United Kingdom.

DMOs can have additional functions to that of debt management, such as **cash management** (an important function of the UK debt office), and the management of **contingent liabilities** (where the Swedish debt office has a long experience). In fact, country experiences show that a range of functions, in addition to debt management, can benefit from being executed jointly with the management of debt.

Lately, the trend to more autonomous DMOs is accompanied by an increased emphasis on **risk assessment and risk management**. In parallel with, and support of, this development, governments are giving greater importance to **transparency** and **accountability** in the debt management process¹¹

X. The use of derivatives

Derivatives have become important instruments for many sovereigns to manage the risks related to debt management operations as well as for improving the profile of the debt. The use of these instruments by market participants adds to the liquidity in secondary government securities markets. In general, derivatives and risk management instruments can be used by both the debt managers and market participants to protect the value of an investment or transform the characteristics of assets or liabilities into alternative, more desirable forms.

However, not all OECD debt managers participate actively or directly in the derivative market activity. For example, the United States introduced in 1985 its

Separate Trading of Registered Interest and Principal of Securities (STRIPS) programme. Strips are a zero-coupon Treasury derivative securities instrument. But, the United States Treasury neither issues nor sells STRIPS directly to investors. Although United States Treasury derivative contracts are actively traded over the counter and on organised exchanges, it is the exchanges, bond dealers and investors that are directly involved in issuing, buying or selling them.

Futures and forward contracts provide the ability to hedge risks. Also **options** have become indispensable risk management tools. The generally strong correlation between yields on sovereigns and on private debt securities means that government securities can be used to hedge general interest rate risks. A special type of forward transaction is the **when-issued market**, where government securities are sold before and immediately following the auctions, but before settlement. As dealers can distribute primary issues before their participation in the auction, this contributes to deepen the primary market. Also the functioning of the secondary market can be improved by opening new avenues for pre-auction distribution and encouragement of price discovery leading into auctions.

Also STRIPS can be used to improve the functioning of primary and secondary debt markets. Currently, many debt managers in the OECD are using them. By separating future coupon payments and principal payment at maturity from a treasury bond, investors can purchase **separate** series of coupon payments or principal separately. This feature of strips is creating more demand for government securities because by buying them some institutional investors (e.g. pension funds) can generate a stream of future cash flows that matches better their liabilities.

Swaps are simple but important tools of risk management, which have long been used by debt managers. For example, in Denmark the central government has been using swaps to reduce the costs of borrowing, and to manage the currency composition and interest rate risk on the stock of debt. Canada is regularly using cross-currency swaps of domestic obligations as part of its management of international reserves.

An important policy issue for debt managers and market participants is the relationship of market liquidity between the cash and derivative markets for public debt instruments, especially the use of futures and swaps for trading and hedging purposes. There are two important types of links¹². The first link is based on a **complementary effect**, whereby liquidity in the two markets tends to be positively related, with trading in the cash market leading to more hedging activities in the futures market. The second link follows from the situation that

cash issues (especially benchmarks) and futures contracts may act as **substitutes** for each other, because both markets reflect the same underlying risks. In that situation, liquidity would be inversely related in the two markets. There is evidence that both effects are present within the public debt markets of individual countries¹³. For example, in the United States cash-market volume tends to decline as maturity increases, while the opposite is true for the trading volume in futures markets. In Canada, volume measures in the two cash and futures markets are positively correlated. After the introduction in Japan of a futures market on the Tokyo Stock Exchange, short-term trading shifted from the 10-year benchmark to the corresponding futures market.

Recent structural developments in the cash markets are having an important impact on derivative markets. In the United States cash market the benchmark status shifted from the 30-year bond to the 10-year note. As a result, positions in 10-year note futures now exceed positions in 30-year bond futures¹⁴. There is also evidence that participants in United States markets are relying increasingly on futures contracts on government-sponsored agency paper and LIBOR-based OTC interest rate swaps. As mentioned above, this development is mirroring the recent trend that cash instruments such as government-sponsored agency paper and bank deposits have begun to replace United States Treasury paper in some roles.

Large imbalances between activities in cash and futures markets positions may create the potential for market manipulations. For example, the introduction of the euro accentuated the disproportion between the broad use of the 10-year German bond futures for risk management purposes in the euro-zone and the relatively narrow basis of the underlying on-the-run cash bonds. This has led to several market squeezes, the last one in March 2001¹⁵.

Table 1. Central Government Debt

<i>Million US dollars</i>		Amounts outstanding at the end of / Montants en cours à la fin de									
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
COUNTRIES											
Australia	19718	21768	27930	44104	54675	74752	77733	65153	61812	52041	46488
Austria	80675	87222	87400	91335	110664	133831	129418	118423	133863	123377	118142
Belgium	233203	247876	249813	251260	293237	323965	300133	265603	282240	247887	233628
Canada	254612	272807	280282	278355	299626	329406	346177	342764	317093	326838	301058
Czech Republic	..	..	..	5301	5606	5803	5680	4827	6480	6346	7652
Denmark	90738	93570	98336	107293	122900	137635	131066	113877	116629	99860	88429
Finland	14887	20434	31570	44230	64834	82014	84658	76529	81432	68364	59024
France (1)	..	..	370646	401832	523018	636327	643689	598029	682841	656559	631489
Germany	366789	388925	386730	407525	470424	531341	539968	507045	598625	688772	655264
Greece	..	..	..	93957	117148	134966	146797	138201	147094	134243	129951
Hungary	22553	24457	27454	31252	33877	33939	29890	26370	28178	27269	25364
Iceland	2152	2481	2526	2723	3235	3634	3613	3383	3450	3082	2727
Ireland	41544	40868	44824	41871	43712	48433	47857	46524	42065	40036	33829
Italy	1114993	1226958	1084605	1036292	1186087	1308695	1441972	1279748	1388961	1199947	1133376
Japan	1536695	1686229	2057222	2597086	3264943	3070656	2863017	2939429	3313603	4623079	4320918
Korea	19239	22379	25334	25823	27915	30051	30532	16847	38718	57909	60297
Luxembourg	249	192	227	291	352	541	680	668	824	701	649
(1) 1990-1991, only non marketable debt											

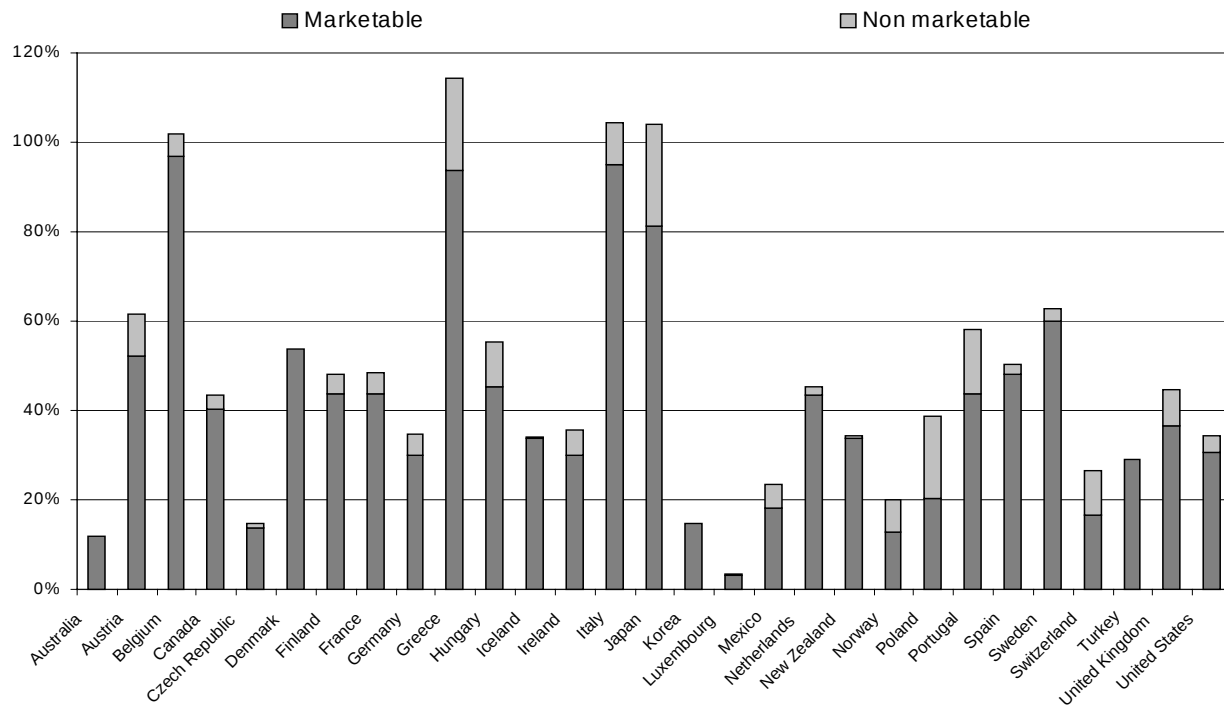
Source: OECD statistical yearbook on Central Government Debt, 2001.

Table 1. Central Government Debt (cont.)

<i>Million US dollars</i>		Amounts outstanding at the end of / Montants en cours à la fin de									
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Mexico	116321	117628	101546	102344	94193	98172	100110	100569	108460	123560	133381
Netherlands	185612	195863	196304	189890	211969	247060	232975	201452	219981	190545	169248
New Zealand	..	..	26664	27100	28288	30414	28238	25243	19710	20033	17158
Norway	27909	29802	31341	39419	42923	46027	44215	37759	33575	32447	32468
Poland	..	..	63170	64716	62464	67777	64553	63015	67753	63739	64449
Portugal	42862	49880	49249	48017	59881	70687	71064	62167	68080	63251	61558
Spain	198588	216205	205819	217367	257465	314454	330354	296812	326717	296202	283960
Sweden	94438	125702	114293	147241	177514	204516	210331	186006	183790	164950	137223
Switzerland	31207	33555	37978	46926	59302	71406	67210	66683	79637	63929	65920
Turkey	19535	19241	22702	24716	20661	22874	29292	30688	37135	42437	54216
United Kingdom	240710	273144	291998	397187	490645	554355	631642	703600	728664	686752	593714
United States	2426100	2760200	3064200	3297400	3483700	3636300	3778400	3814800	3760400	3665600	3395500
Total OECD	7181329	7957386	8980163	10062853	11611258	12250031	12411263	12132214	12877810	13769755	12857080

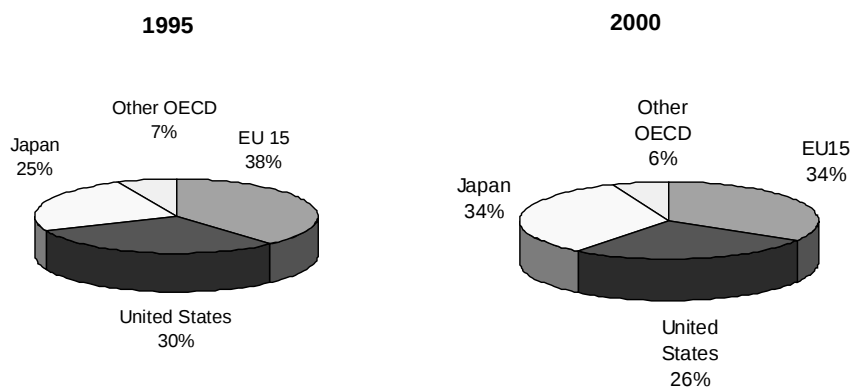
Source: OECD statistical yearbook on Central Government Debt, 2001.

Chart 2 – Composition of Central Government Debt in 2000
As a percentage of GDP



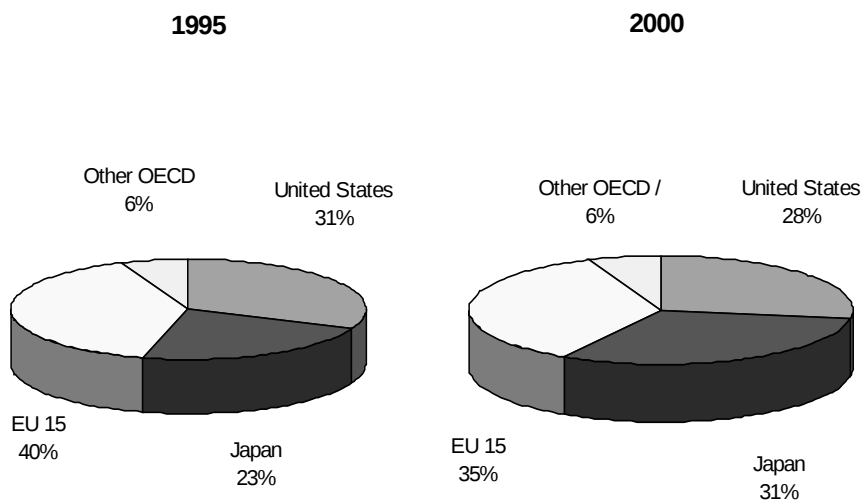
Source: OECD statistical yearbook on Central Government Debt

Chart 3 – Central Government Debt of OECD countries
Amounts outstanding at the end of



Source: OECD Statistical Yearbook on Central Government Debt, 2001.

Chart 4 – Central Government Marketable Debt of OECD countries
Amounts outstanding at the end of



Source: OECD Statistical Yearbook on Central Government Debt, 2001.

-
- 1 The new OECD publication, *Central Government Debt: Statistical Yearbook*, provides comparative statistics on marketable and non-marketable debt of OECD central governments. This means that the debt of state and local governments, as well as social security funds, are not included. Statistics are derived from national sources based on a questionnaire prepared under the auspices of the OECD Working Party on Public Debt Management. Concepts and definitions are based, when possible, on the System of National Accounts. The reader is referred to the new publication for additional information on institutional coverage and method of calculation and to take note of the methodological country notes that provide a unique and detailed overview of the various debt instruments in each country.
 - 2 This work started in a specialised forum at the OECD in 1979. In that year *the OECD Working Party on Debt Management* was set up as a special working group of the OECD's Committee on Financial Markets. Since its creation, the Working Party has been a unique policy forum for government debt managers and experts from OECD Member countries to exchange their views and experiences in the field of government debt management and government securities markets. Over the years, the Working Party has compiled a comprehensive pool of knowledge on best practices in this special field of government activity and policy. Information about the best practices for primary and secondary markets has also been shared with debt managers from emerging market economies. To that end, the Working Party initiated in 1990 a policy dialogue with transition countries and, later on, with emerging markets in several regional and global policy forums, including the *Annual OECD/World Bank Workshop on the Development of Fixed-Income Securities Markets in Emerging Market Economies*, the *OECD's Annual Baltic-Nordic Forum on Public Debt Management*, and the *Annual OECD Meeting on Government Securities Markets and Public Debt Management in Emerging Markets*.
 - 3 In recent history, during periods of severe international (or regional) financial market turmoil, investors have traditionally fled to the United States Treasury market. The emergence of a pan-European public debt market raises the possibility that an alternative, international safe-haven would become available.
 - 4 BIS, *Market Liquidity: Research Findings and Selected Policy Implications*, Committee on the Global Financial System, 3 May 1999.
 - 5 BIS, *Market Liquidity: Research Findings and Selected Policy Implications*, Committee on the Global Financial System, 3 May 1999.
 - 6 The US Treasury sold marketable fixed-rate and inflation-indexed bonds prior to its announcement on October 31, 2001 that new sales of all 30-year Treasury bonds were being suspended.
 - 7 IMF *International Capital Markets* 2001.
 - 8 These data concern central-government debt, and not the debt of the general-government sector as defined in the EU Treaty.
 - 9 IMF *International Capital Markets* 2001.
 - 10 See BIS, (2001), *The Implications of Electronic Trading in Financial Markets*, Report by Committee on the Global Financial System.
 - 11 For details, see upcoming OECD publication, *Public Debt Management and Government Securities Markets in the 21st Century*

-
- 12 BIS, Market Liquidity: Research Findings and Selected Policy Implications, Committee on the Global Financial System, 3 May 1999..
 - 13 BIS, Market Liquidity: Research Findings and Selected Policy Implications, Committee on the Global Financial System, 3 May 1999.
 - 14 IMF International Capital Markets 2001.
 - 15 See IMF International Capital Markets 2001 for a description of the mechanics of this squeeze.