



THE CHAIRMAN

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

September 28, 1998

The Honorable John D. Dingell
Ranking Minority Member
Committee on Commerce
U.S. House of Representatives
2322 Rayburn House Office Building
Washington, D.C. 20515

Re: Bond Market Transparency

Dear Congressman Dingell:

Earlier this month, I gave a speech stressing the importance of transparency in the U.S. debt market. At that time, I outlined the findings of a recent Commission staff review of this market. I am now forwarding to you a copy of the results of that review.

The review found that, as a whole, the market for government securities is characterized by high quality pricing information. The review also cited significant improvements over the last few years in the transparency of the municipal securities market. However, the staff found that the quality of pricing information available in the markets for corporate bonds is relatively poor.

Consistent with the staff's findings, I have requested that the National Association of Securities Dealers do three things:

First, adopt rules requiring dealers to report all transactions in U.S. corporate bonds and preferred stocks to the NASD and to develop systems to receive and redistribute transaction prices on an immediate basis;

Second, create a database of transactions in corporate bonds and preferred stocks. This will enable regulators to take a proactive role in supervising the corporate debt market, rather than just reacting to complaints brought by investors; and

Third, in conjunction with the development of a database, create a surveillance program to better detect fraud in order to foster investor confidence in the fairness of these markets.

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I am pleased to report that the NASD has said that it will move forward on these recommendations. I am confident that this initiative will substantially improve the transparency of the corporate debt markets, increase investor confidence in those markets, and enhance surveillance.

One of the reasons that I am calling for transaction reporting in this area is that it will allow us to develop a better surveillance system for the corporate debt markets. Better surveillance, in turn, will enhance our ability to identify anticompetitive or collusive behavior.

I thank you for your interest in this area and look forward to continuing our efforts to improve our nation's securities markets.

Sincerely,

A handwritten signature in black ink, appearing to read 'A. Levitt', written in a cursive style.

Arthur Levitt
Chairman

Enclosure

MEMORANDUM

TO: Chairman Arthur Levitt

FROM: Richard R. Lindsey 
Director, Division of Market Regulation

RE: **Debt Market Review**

Introduction and Recommendations

In March of this year, you asked the Division of Market Regulation (“Division”) to undertake a review of the markets for debt securities in the U.S., with emphasis on the state of price transparency in those markets. The principal goals of the review were:

- to identify specific inadequacies, if any, in the availability of pricing information in the various market segments;
- to identify areas of actual or potential abuse in the markets for debt securities, if we encountered any; and
- to recommend what, if any, improvements in the regulatory framework should be considered, and means of accomplishing these improvements.

As a result of our review, we recommend that you call upon the NASD to do three things:

- **First**, adopt rules requiring dealers to report all transactions in U.S. corporate bonds and preferred stocks to the NASD and to develop systems to receive and redistribute transaction prices on an immediate basis;
- **Second**, create a database of transactions in corporate bonds and preferred stocks; and
- **Third**, in conjunction with the development of a database, create a surveillance program to better detect fraud in order to foster investor confidence in the fairness of these markets.

Finally, we recommend that you ask the Office of Compliance, Inspections, and Examinations (“OCIE”) to investigate possible suitability issues with respect to the sale of

collateralized mortgage obligations (“CMOs”) to retail customers, and possible misuse of inside information in relation to the syndication of certain bank loans.

I. Summary of Findings

Overall we believe the debt markets are functioning well. Of the market segments we reviewed, U.S. Treasury securities and other Federal Agency bonds are the most actively traded and are also the most transparent and efficient. We found no evidence in those markets that dealers have a substantial advantage compared to institutional clients in terms of market knowledge. Other market segments function effectively as well, though some are distinctly less transparent and efficient than the government securities markets. Specifically, we found that:

- The markets for “benchmark” U.S. Treasury bonds are highly transparent. Bids, offers and trade prices from the interdealer market are widely available through interdealer broker (“IDB”) screens, GovPX, Bloomberg and other vendors.
- Other Treasury and Federal Agency bonds, which trade in a relatively stable relationship to benchmark Treasuries, are ordinarily traded in terms of a basis point spread from the Treasury yield curve set by the benchmark bonds. Quotes in frequently traded securities are widely available, although the spreads are not as narrow as those for benchmark Treasuries. GovPx and others produce “valuations” on a real time basis for securities that do not have current dealer quotes. The combination of real time data for benchmark Treasuries and supplementary quotes and other information for the other securities appears to provide a very good level of pricing information for all government bonds.
- Mortgage Backed Securities (“MBS”), and other structured products such as Collateralized Mortgage Obligations (“CMOs”) and Asset Backed Securities (“ABS”) are primarily high credit quality securities with complex structures. Values are largely determined by a) the Treasury yield curve, b) the structure of the particular instrument, and c) the relationship of similar instruments to the Treasury yield curve. The relationship to Treasuries is established by markets in generic forward contracts called TBAs (“to be announced”) for which current dealer quotes are available from IDBs, Bloomberg and other vendors. Relatively sophisticated analytical tools to value MBS, CMOs, and ABS are available from Bloomberg, Bridge and other vendors. Dealers and some institutional investors have in-house analytical models as well. At least two services make such tools available over the Internet. Overall, the quality of pricing information and interpretive tools available to the market is good.
- High yield corporate bonds generally do not have a stable relationship to Treasuries. Therefore, the transparency of the Treasury market does not imply known values for high yield bonds. Interdealer trading is facilitated by IDBs, but prices are not shown on screens. Dealer indicated prices for selected securities generally are transmitted to customers each day by fax and/or e-mail. Overall, the quality of pricing information available in the market for

high yield corporate bonds is relatively poor, although dealers do not appear to enjoy a great advantage over their institutional clients.

- Investment grade corporate bonds fall between high yield corporates and government bonds both in credit quality and in terms of the quality of pricing information available. They are generally traded in terms of a spread from Treasuries but the relationship is less stable than for non-benchmark Treasuries and Federal Agency bonds. As with high yield corporates, interdealer trading is facilitated by IDBs but prices are not shown on IDB screens. “Investment grade” covers a spectrum of quality and the sensitivity of a bond’s price to company or industry specific developments tends to increase with lower credit quality. Similarly, the quality of pricing information available for investment grade bonds may be described as ranging from fairly good to fair.
- Convertible bonds are not ordinarily traded in fixed income departments. Their close relationship to equity is demonstrated by the fact that both buy and sell side firms typically trade convertible securities (including convertible preferred) in their equity trading departments.
- Municipal bonds also do not trade in a close relationship to Treasuries although Treasury prices are certainly very important. The municipal market has become somewhat more commoditized in recent years with more new issues carrying credit insurance. However, this market is highly fragmented -- and is characterized by an extremely large number of issues and issuers with a relatively small trading volume, and is highly regionalized. This is a market in which there are few real prices in comparison to the number of different securities. As a result, many securities are difficult to value either for portfolio valuation or trading. All market participants are impacted, but unlike other market segments, retail investors represent an important part of the municipal market (roughly 30% of holdings). The nature of the municipal market is such that price discovery is necessarily difficult, but the MSRB’s transparency efforts will improve the distribution of prices, and will also provide the tools that the NASD requires to assure that the municipal market is fair.
- Dollar denominated foreign sovereign debt securities, particularly from emerging markets, also do not trade in a close relationship to Treasuries. There are approximately 10 major dealers in this market. Brady bonds, which were largely responsible for the development of this market, now account for less than half of its trading volume and are declining steadily in significance. Interdealer trading is facilitated by IDBs and real time quotes and transaction prices for many of these securities are provided by IDB screens to the dealer community, but are not generally available outside that group. End-of-day prices are readily available.
- Electronic trading of bonds is rapidly becoming a reality, though its ultimate impact is far from clear. There are several single dealer systems in operation, most of them accessible through Bloomberg terminals, offering some form of electronic trading of Treasury securities. Some also offer Federal Agency securities and at least one offers municipal and mortgage backed securities as well. One multi-dealer system, Trade Web, is currently in operation with five

sponsoring dealers. Bloomberg, which provides access to several single dealer systems, is preparing to offer a more integrated facility providing access to the quotes of all participating dealers on a single screen. Several other electronic bond trading systems are known to be under development, including at least one that will focus on high yield corporate bonds. A recent survey by the Bond Market Association (“TBMA”) shows that there is a consensus in the industry that electronic execution in some form will be common within a few years.

II. Background

A. Regulatory Structure

Under the current regulatory structure, corporate debt securities are generally subject to the registration requirements of the federal securities laws. U.S. Treasury and other federal agency securities, securities issued by a “government sponsored enterprise” such as Fannie Mae and Freddie Mac, and municipal securities, are exempt from registration.

Although government and municipal securities are exempt from registration, firms that effect transactions in exempt securities are generally required to register with the Commission as broker-dealers. Broker-dealers that exclusively effect transactions in government securities are required to register under Section 15C of the Securities Exchange Act of 1934 (“Exchange Act”) and comply with rules adopted by the Treasury Department and certain Commission rules. Broker-dealers that exclusively effect transactions in municipal securities are required to register under Section 15B of the Exchange Act and comply with rules adopted by the Municipal Securities Rulemaking Board (“MSRB”). Broker-dealers that effect transactions in securities other than government or municipal securities must register under Section 15(b) of the Exchange Act. These broker-dealers must comply with applicable rules of the Commission, the NASD, and the exchange(s) of which they are members.

The Exchange Act contains several provisions that give the Commission the authority to require broker-dealers doing business in non-exempt securities to publicly display or report pricing information. For example, Section 17(a) of the Exchange Act authorizes the Commission to promulgate rules requiring registered broker-dealers to make and disseminate reports as necessary or appropriate in the public interest. Section 11A authorizes the Commission to require any person who has effected the purchase or sale of a qualified security to report that transaction to a national securities exchange, registered securities association, or registered securities information processor. Finally, Section 15(c)(2) of the Exchange Act authorizes the Commission to prescribe means reasonably designed to prevent fraudulent, deceptive, or manipulative acts or practices, and fictitious quotations.

B. Commission Initiatives

In recent years, the Commission has acted to encourage efficiency and fairness in the U.S. debt markets. These efforts have resulted in significant improvements in the transparency of those markets. Several instances of Commission action leading to such improvements are described below. In addition, a more recent Commission initiative relating to the regulation of alternative trading systems is described briefly.

1. *Transparency Initiatives*

a. Government Securities

In the late 1980s and early 1990s, the Commission and the General Accounting Office (“GAO”) advocated legislation to improve government securities market transparency. The Commission’s push for legislation ultimately provided the impetus for market participants to voluntarily disseminate pricing information.

In 1987, after Congress established registration requirements for government securities brokers and dealers, the GAO conducted a review of market transparency. The GAO’s 1987 Report recommended increased transparency in the government securities market, but concluded that market participants should be given time to expand information access on their own. Responding to the 1987 Report, the Division expressed skepticism that market participants would act voluntarily. Accordingly, the Division recommended that Congress require transparency by legislation.

In 1990, the GAO issued a follow-up report assessing the progress made since 1987. The Report stated, “[i]t appears that the SEC’s skepticism has been borne out . . .” Thus, the GAO joined the Commission in recommending that Congress require government securities markets to make prices available to the public.

With the Commission and the GAO both asking for legislation, a consortium of interdealer brokers and primary dealers in the U.S. Treasury market was formed to develop a private information vendor called GovPX. GovPX, which began operation in 1991, distributes quotation and transaction information provided by five of the six interdealer brokers in Treasury bills, bonds, and notes. The sixth interdealer broker makes its prices available separately.

b. Municipal Securities

The Commission has worked closely with the MSRB to increase transparency in the municipal securities market. In January 1995, with the encouragement of the Commission, the MSRB began to distribute a daily report of interdealer transactions in municipal securities. The daily report summarized price and volume information for municipal securities that were traded in the interdealer market four or more times on the previous business day. In March 1998, again with the Commission’s encouragement, the MSRB required all dealers to report customer

transactions as well as interdealer transactions on a daily basis. In August 1998, the MSRB expanded its daily summary report to include customer as well as interdealer transactions. In addition, the MSRB has developed a database of transactions in municipal bonds that is available to the NASD for regulatory purposes. Finally, the MSRB has committed to move towards real time transaction reporting.

c. Corporate Debt Securities

In early 1991, the Division conducted a study of the corporate bond market in general, and the high-yield bond market in particular, based on discussions with self-regulatory organizations, broker-dealers, and institutional investors. The study was undertaken in part to encourage the NASD to develop a better surveillance system for corporate bonds, especially high-yield bonds, and led to implementation of the Fixed Income Pricing System ("FIPS") in April 1994.

FIPS collects transaction and quotation information on domestic registered,¹ non-convertible issues that are not part of a medium-term note program and that have a Standard & Poors rating below BBB -- the lowest rating for investment-grade bonds. Securities eligible for FIPS ("FIPS securities") consist of 50 "mandatory" issues and roughly 1350 "non-mandatory" issues. Mandatory issues are selected by a committee of NASD members from the most actively traded FIPS securities.

FIPS participants are required to report transactions in mandatory issues within five minutes of execution, and in non-mandatory issues by 5:00 p.m. on the day of the trade. FIPS disseminates hourly summaries of the reported trading activity *in mandatory issues only* to vendors. FIPS does not publicly disseminate reports regarding non-mandatory issues. Those reports are used by the NASD for examination purposes. FIPS dealer participants are required to maintain at least one-sided quotations for at least 100 bonds in mandatory issues. FIPS disseminates these quotations publicly through vendors, but the quotations are not considered to be representative of the true market in many cases.

The Office of Economic Analysis ("OEA") recently looked at volume and prices in mandatory FIPS bonds. OEA found that FIPS increases transparency in the mandatory issues but not in the non-mandatory issues, and concluded that: (1) the market interaction facilitated by transparency may lead to more efficient price discovery in FIPS securities; and (2) the increase in transparency resulting from FIPS did not cause trading to wither as some had predicted. OEA also concluded that investment grade issues could benefit from additional transparency as well.

¹ Securities exempted from registration under Rule 144A of the Securities Act of 1933 ("1933 Act") are thus not included in FIPS.

2. Regulation of Alternative Trading Systems

The Commission is also addressing the growing trend towards electronic trading of securities, including debt securities. Last April, the Commission proposed a new regulatory framework for alternative trading systems. Under this new framework, alternative trading systems could choose whether (1) to register as exchanges, or (2) to register as broker-dealers and comply with the additional requirements proposed as new Regulation ATS. This regulatory structure would be designed to allow for continued market innovation, without compromising basic investor protections. The Commission's proposal would apply to alternative trading systems trading debt securities. In this regard, several trading systems referred to in Section VII below may fall under Regulation ATS.

The Commission proposed a limited exclusion for alternative trading systems that trade solely government and certain other related securities. It is important to note that the Commission's proposal on alternative trading systems would not, by itself, impose any new transparency requirements on systems trading debt securities. Rather, it would require alternative trading systems that choose to register as broker-dealers to comply with certain audit trail, notice, and reporting requirements. Finally, the proposal would require alternative trading systems with high volume to provide fair access to market participants and ensure that their automated systems meet capacity, security, and contingency planning standards.

III. Scope of Review

Beginning in April of this year, we conducted a very broad review of the market for U.S. debt securities. For purposes of the project we divided the market into five categories, as follows:

1. U.S. Treasury and Federal Agency Bonds (excluding mortgage backed securities)
2. Mortgage Backed Securities and other structured products
3. Corporate Bonds
4. Municipal Bonds
5. Foreign Sovereign Bonds

Specifically excluded from the review were: money market instruments, non-dollar denominated bonds, and non-securitized debt of all kinds, such as loan participations, bank deposits, etc. Volumes associated with money market instruments, however, are included in several volume estimates obtained from industry sources.

Generally we focused on the most active market segments. We reviewed documentary information from various industry sources. TBMA provided a large amount of descriptive and statistical information about the operations of the market, filling six large binders.

We interviewed over thirty organizations, including trade associations, SROs, government agencies, interdealer brokers, information vendors, bond dealers, institutional investors, clearing agencies, and electronic trading system operators. Most interviews related directly to one or more of the market segments listed above. However, a few were focused on similar markets in other countries, specifically in Canada and Europe. Exhibit A contains a complete list of the organizations interviewed, though not the individuals.

Because private label mortgage backed securities and low rated asset backed securities are not as actively traded, the interviews did not focus on them as much. In addition, because the fixed income departments we interviewed were not responsible for convertible bonds, our interviews did not focus on those securities. We did, however, develop volume estimates for convertible bonds.

IV. Bond Market Size

By any measure, the U.S. bond markets are enormous. Treasury securities alone account for more than \$3.4 trillion outstanding, over \$2 trillion in 1997 issuance, and trading of more than \$200 billion per day in 1997. NYSE listed equities, in comparison, accounted for about \$10.7 trillion in market value (May, 1998), but only about \$26 billion per day in 1997 trading and \$28 billion in 1998. In addition, the level of outstanding debt in the U.S. has grown sharply. For example, in the past 13 years, corporate debt outstanding has more than tripled -- from \$720 billion in 1985 to \$2.3 trillion today (see chart, Exhibit B).

Bond market size is measured by amounts outstanding, by amounts issued (i.e., primary market volume) and by trading volume, usually making no distinction between primary and secondary market trades. Dollar amounts are measured in face value. The term "issue" as used herein, corresponds to a unique CUSIP number. Table 1 below contains our best estimates for bond market sizes in various market segments.²

² It is difficult to obtain reliable, comparable estimates of trading volume for some segments of the bond market and this data especially should be used with caution. Estimates of value outstanding and 1997 issuance come from TBMA and are comparable. The numbers of taxable issues are counts from the Bridge Fixed Income Database and represent the number of unique CUSIP numbers in each category. Bridge issue counts include privately stripped Treasury bonds (Zeroes). The number of municipal issues was provided by the MSRB and represents the approximate number of CUSIP numbers for unexpired municipal bonds. Definitions and conventions are not always compatible. For example, the source of volume estimates for government securities and agency mortgage backed securities is the New York Federal Reserve Bank, and is derived from reports from primary dealers. These estimates exclude customer volume of non-primary dealers, but include volume in Treasury and Agency money market instruments. Volume estimates for corporate bonds are derived from two sources: dealer/customer transactions settled through DTC, and interdealer trades cleared through NSCC. Commercial paper is excluded, as are retail customer transactions. Volume estimates for foreign sovereign bonds are based on surveys done by the Emerging Markets Traders Association ("EMTA") and excludes developed country bonds, but includes at least some non-dollar denominated bonds. Volume estimates for municipal bonds come from the MSRB and are based on sample results from the MSRB's new Daily Report. All volume estimates are for the year 1997 except those for Corporate Bonds and Asset Backed Bonds which are based on the period January - April, 1998, and those for municipal bonds which are derived from a week in June 1998.

| | Outstanding | | 1997 Issuance | Avg Daily |
|---------------------------------------|-------------|----------------------|----------------------|-----------------------|
| | Issues | Value (\$billion) | Value (\$billion) | Volume (\$billion) |
| U. S. Treasury and Agency Securities | | | | |
| Treasury Securities | 2192 | \$3,457 | \$2,168 | \$212 |
| Agency Securities | 15396 | \$984 | \$5,729 | \$40 |
| Total Government Securities | 17588 | \$4,441 | \$7,897 | \$252 |
| Mortgage and Asset Backed Bonds | | | | |
| Agency Mortgage Backed Bonds | 875426 | \$1,827 | \$368 | \$47 |
| Agency CMOs(tranches) | 35393 | \$562 | \$167 | |
| Private Label MBS and CMOs | 9011 | | | |
| Asset Backed Bonds | 4292 | \$516 | \$185 | \$4 |
| Total Mortgage and Asset Backed Bonds | 924122 | \$2,905 | \$720 | \$51 |
| Corporate Bonds | | | | |
| Investment Grade Bonds | 20971 | | \$563 | \$8 |
| High Yield & Unrated Bonds | 5062 | | \$124 | \$4 |
| Variable Rate Notes | | | | \$2 |
| Convertible Bonds | | | | \$1 |
| Total Corporate Bonds | 26033 | \$2,300 | \$687 | \$15 |
| Municipal Bonds | 1500000 | \$1,366 | \$267 | \$9 |
| Foreign Sovereign Bonds | | | | |
| Emerging Market Bonds | | | | \$23 |
| Developed Country Bonds | | | | |

Table 1: Estimated Size of U.S. Bond Markets

Because of lack of uniformity in the basis of the estimates and the unavailability of estimates in several categories, we have elected not to show totals across different market segments. It is reasonable to assume, however, that total trading volume in all bond markets approaches or exceeds \$350 billion per day.

Medium Term Notes (MTNs), which are issued under “shelf registrations”, are treated as a separate category by some sources. According to TBMA, recent issuance of MTNs has been predominantly investment grade (91.6%), with the rest unrated (8.2%) and non-investment grade (0.2%). These percentages were used to allocate outstanding MTN issue counts in Table 1.

Many corporate bonds are issued under Rule 144A which restricts resales to “qualified institutional buyers” (QIBs). In 1997, 78% of *high yield* corporate bonds issued (measured by par value) were issued under Rule 144A. In the first quarter of 1998, 81% were issued under Rule 144A. The corresponding percentages for *high grade* corporate bonds are much lower at about 12% for 1997 and 10% for the first quarter of 1998.

V. Basic Market Structure

All the debt markets share certain structural similarities. First, nearly all trading is over-the-counter.³ Dealers, interdealer brokers, and large institutional investors are principal participants in all markets.⁴ Dealers also act as underwriters or distributors. Trades between dealers (other than syndications) are normally effected anonymously through interdealer brokers (IDBs).⁵ Most transactions are done by telephone although electronic trading is expected to grow rapidly over the next few years.

There are three broad groupings of bonds. The first two are based on credit quality--which may be called "the liquidity group" and "the credit group". The liquidity group includes U.S. government securities and other developed country sovereign debt, about which there is little or no question of credit quality. The credit group includes municipal, corporate and emerging market debt. Mortgage Backed Securities and other structured products constitute a third group characterized by complex structures requiring sophisticated analytical methods to evaluate. The liquidity group is characterized by relatively small numbers of benchmark securities which establish the level of interest rates and determine the values of everything else. The credit group is characterized by greater dependence on judgments concerning the credit quality of particular issuers. In the liquidity group, positions in securities can ordinarily be hedged by an offsetting position in some combination of benchmark securities. Hedging positions in the credit group may be difficult or impossible.

There is little relationship between the number of dealers in a market and the size of the market. The municipal market probably has the largest number of dealers--over 2000 registered, and a few hundred regularly involved. At the other extreme, emerging market bonds are traded by a small group of about ten dealers which includes several foreign banks. With respect to U.S. government securities, the Federal Reserve designates "primary dealers" for purposes of carrying out its open market activities. The number of primary dealers varies, but is approximately 32 and includes both banks and securities dealers. The primary dealers are generally regarded as the principal, but not the only, dealers in Treasury and Agency securities, and also in Mortgage Backed Securities. Corporate bond dealers consist largely of the non-bank "primary dealers".

Treasuries, Agencies, mortgage TBAs and emerging market securities are traded in the interdealer market based on screen displayed quotes. Except for emerging market securities, for which quotes are restricted to dealers, the screen quotes are widely distributed and available to investors. In those markets which make screen quotes available to investors, they are an accurate guide to the price an investor should pay or receive. Municipal and corporate bonds are also

³ Although Treasury notes and bonds and many corporate bonds are listed on the NYSE and other exchanges, the volume of trading on exchanges is insignificant. The NYSE averaged \$20 million per day in 1997 bond volume.

⁴ Individual investors account for over 30% of holdings of municipal bonds, but only about 5% or less in the other market segments.

⁵ Mortgage Backed Securities are an exception because most trading is in TBAs, which have long settlement periods. As a result, interdealer trades in these securities are normally effected on a "give-up" basis.

traded through IDBs, but prices are not usually shown on screens. Municipal bonds are often sold through a screen based auction in both primary and secondary markets, but bids are given only in response to a solicitation (i.e. "bids wanted") and prices are not usually made public even when a transaction is completed. For high grade corporate bonds, dealer inventories and offering prices are often available in electronic form (primarily on Bloomberg), so that investors can search the inventories of many dealers for bonds that fit their needs. For high yield bonds, inventory lists are more likely to be sent by fax from dealers directly to customers making searching a tedious procedure. Investors usually get bids from several dealers before selling bonds.

In most segments of the bond market, Bloomberg is the most important information vendor. It is important as a source of prices, inventory information, descriptive information, analytical tools, and ability to communicate with other participants. Bloomberg's terminals are ubiquitous, and its proprietary services are a virtual necessity to most market participants.

VI. Price Discovery in the Bond Markets

The "fair" value of a bond is the present value of its expected cash flows. Given known cash flows and interest rates or discount rates, a fair value may be readily calculated. A difficulty, of course, is that cash flows may be uncertain and the appropriate interest rates must usually be derived from other market prices. Therefore, two participants may calculate somewhat different values for the same bond. Nevertheless, pricing bonds involves a high degree of computation in a way that pricing equities ordinarily does not, and the value of most bonds is closely related to the value of other (not necessarily similar) bonds.

For example, the value of high credit quality non-callable bonds depends largely on the value of Treasury securities. Most such bonds will trade at a "spread from Treasuries" usually described in basis points of yield (i.e. hundredths of a percent). For instance, a AAA corporate bond with 6.5 years to maturity might be described as priced at 50 basis points over the corresponding Treasury. The meaning of such a statement is approximately the following: The current prices of benchmark Treasuries when converted to yield and interpolated, imply a Treasury yield curve for all maturities up to 30 years. The corporate bond in question is priced to yield 50 basis points above the 6.5 year point on the implied Treasury yield curve. As a result, the current prices of benchmark Treasury bonds are the foundation upon which other bonds are priced.

Two other elements that determine bond prices are i) imbedded options, and ii) credit risk, each of which may affect expected cash flows. First, the valuation of imbedded options is the domain of quantitative analysts, or "quants," who develop analytical models that are used to evaluate complex securities containing imbedded options. Dealers and many institutional investors employ their own "quants" and have proprietary analytical tools. Bloomberg and other vendors provide similar analytical tools which cover the more common security types. There are even bond analytical tools available over the Internet, though these were not evaluated.

Second, credit risk, while not a factor in valuing U.S. government bonds, is a major factor in valuing corporate, municipal and emerging market bonds. Although credit risk is, to a great degree, reflected in the ratings assigned by rating agencies such as Moody's, and Standard and Poor's, credit analysts and traders continuously make and refine judgments about issuers as information becomes available. Their judgments are reflected in the supply and demand for bonds of particular issuers. In the case of corporate bonds, especially high yield corporate bonds, credit analysis is much like common stock analysis, focusing on a company's prospects for the future. In fact, the price of an issuer's stock, and the prices of stock of other companies in the same industry, are important factors in determining corporate bond prices. The more important credit risk is, the more important equity prices are as an indicator of bond values. Thus high yield corporate bond prices, especially, are determined largely by the same factors that affect the corresponding equity prices.

In summary, the pricing of bonds by the market arises from a combination of valuation by participants and a competitive process of bids and offers. The valuations in turn arise from highly variable processes representing a combination of i) valuing cash flows, ii) valuing imbedded options, iii) adjusting for tax effects and other special factors, and iv) adjusting for credit risk. Thus some bonds are valued simply by comparison to a benchmark bond, others require extensive computational analysis, and still others are valued much like equities. Putting it another way, if only cash flows and imbedded options need to be considered, then a bond's value may be calculated using analytical models from Treasury prices and the bond's attributes. But the more that credit risk is a factor the more "equity like" a bond's valuation will be.

Specifically, with respect to particular market segments:

- The market for "benchmark" U.S. Treasury bonds is the most important market segment because of its size and because it establishes the interest rate basis for valuing all other bonds. Bids, offers and trade prices from the interdealer market are widely available through interdealer broker ("IDB") screens, GovPx, Bloomberg and other vendors. Neither credit risk nor imbedded options are an important factor (although the long bond is callable after 25 years).
- Other Treasury and Federal Agency bonds are priced in terms of a spread from the benchmark Treasury yield curve. Credit risk is not a major factor, although bonds of government sponsored entities ("GSEs") are not backed by the full faith and credit of the U.S. government and are considered to carry slightly higher risk. Agency bonds are often callable, so that valuation of imbedded options may be necessary, but is relatively simple. Commonly they are priced in a straightforward relationship to benchmark Treasuries.
- Agency MBS and CMOs are also guaranteed by the Treasury or by GSEs, so that credit risk is not an issue. Prepayment risk associated with the underlying mortgages and the complex structure of some of the securities themselves requires the use of relatively sophisticated analytical tools to evaluate these securities. Many dealers and some institutional investors use proprietary models, but more standard tools are widely available. Option adjusted spreads ("OAS"), which give a comparison to Treasuries

after accounting for imbedded options are the standard of comparison. However, because there is no universally accepted method of computing OAS, at least small differences in computed values persist.

- Asset Backed Securities (“ABS”) and private label CMOs are usually of high credit quality (through over-collateralization, insurance or other method of credit enhancement) and so are priced using the same or similar tools as those used for agency CMOs. Some, however, are of lower quality, and these are priced at spreads to reflect the credit risk involved, not unlike lower rated corporate bonds.
- Corporate bonds have varying degrees of credit risk. They often contain imbedded options as well. The highest quality corporate bonds are usually priced in a close relationship to Treasuries, while lower quality (or, high yield) bonds are more closely related to equities. Traders on both the buy and sell sides are typically supported by credit analysts who provide regular input.
- Municipal bonds also have varying degrees of credit risk and may contain imbedded options. Pricing of municipal bonds is further complicated by the tax treatment of coupon payments and the different tax situations of market participants. Because of their unique tax considerations, municipal bonds have a degree of independence from Treasury markets, and it is customary for market participants to estimate a baseline AAA municipal yield curve, similar to the benchmark Treasury yield curve used for pricing taxable bonds. Municipal bonds are then priced in relationship to the baseline AAA yield curve, taking into account the degree of credit risk and the value of imbedded options. Other factors, such as regional tax differences and other special factors, further complicate the valuation of municipal bonds. Credit analysis for municipalities, while somewhat different from credit analysis for corporations, is a significant determinant of valuations. Credit analysis has probably declined somewhat in importance with respect to municipal securities as the use of credit insurance and letters of credit has increased.⁶
- Foreign sovereign debt securities, particularly from emerging markets, also do not trade in a close relationship to Treasuries, although they are sometimes described in terms of the spread from Treasuries. Current quotes and last trade prices for the most commonly traded dollar denominated bonds, including Brady bonds, are available to dealers on IDB screens. There are approximately 10 major dealers, led by J.P. Morgan, Chase, and Deutsche Bank. Most of the major dealers in sovereign debt securities are banks. Brady bonds, which were largely responsible for the development of this market, now account for less than half of trading and are declining steadily in significance. Most trading is now in Eurobonds which are also heavily traded in London. According to the EMTA, trading in emerging market debt is now about 2/3

⁶ According to TBMA, over 55% of new long term issues in 1997 carried some form of credit enhancement, compared to about 32% in 1987.

in New York and 1/3 in London, with New York dominating trading in Latin American debt while London dominates the markets in European debt.

VII. Electronic Trading

In July 1997, TBMA surveyed its members regarding their opinions and attitudes with respect to electronic trading systems for bonds. Some of the responses included:

- 65% thought most dealers would offer electronic executions to institutional customers within two years.
- Almost 75% expected institutions to demand multi-dealer systems within two years, but less than half expected multi-dealer systems to be in operation within two years.
- There was a consensus that the most liquid markets such as treasuries and agencies are the most amenable to electronic trading.⁷

Even before the survey was published in October 1997, Trade Web, a multi-dealer bond trading system, announced that it would begin operation in 1998. Trade Web actually began trading in January 1998 and currently has five dealer participants: Credit Suisse First Boston, Goldman Sachs, Lehman Brothers, Salomon Smith Barney, and Merrill Lynch.

As this example illustrates, electronic trading of bonds is rapidly becoming a reality, though its ultimate form and impact are by no means clear. Trade Web, for instance, does not provide executions against published quotes. Firm bids (offers), which are executable, are entered by dealers only in response to a request for bids (offers) from a subscribing client. Although volume has so far been modest, there appears to be considerable interest. Another contender, Bloomberg, already offers access to the execution systems of several individual dealers and is preparing to offer an integrated facility which will display, and give access to, the quotes of all participating dealers on a single screen. The Bloomberg service will be offered first for Treasury securities and may be extended to other securities later. Like Trade Web, the Bloomberg service will not provide anonymity to users. Separately, Bloomberg has considered, but is not currently pursuing, an automated IDB facility. The Bloomberg IDB, if implemented, will be restricted to dealers and trading will be on an anonymous basis.

TBMA also published a research report on electronic trading systems that identified eleven such systems available in the bond markets. One has since ceased operations though it may return in a different form (InterVest). Of the remaining ten, seven are single dealer systems offered to institutional clients, one is Trade Web described above, one is an auction system for municipal issuers (MuniAuction), and one is an IDB system for corporate bonds (BondNet) which is offered in conjunction with a traditional IDB desk. BondNet is also available to non-dealer clients of the Bank of New York, which controls BondNet.

⁷ Although commercial paper is not part of this review, it is worth noting that according to TBMA's survey respondents the vast majority of commercial paper transactions, primary and secondary, are already in electronic systems.

In addition, Cantor Fitzgerald has an automated IDB system that is used by its own brokers. Cantor may be considering making this system available to its customers, both dealers and institutions. Several other automated bond trading systems are known to be under development, including systems that focus primarily on corporate bonds, and would be open to both dealers and institutional customers.

VIII. Other Issues

One of the initial goals of the review was to report any actual or potential abuses that might come to our attention in the course of gathering information and interviewing market participants. During the course of the review we heard a number of complaints, but only a few were suggestive of abusive behavior. Two that deserve mention follow:

1. In 1992 the Division investigated the practices of brokers marketing certain CMO tranches to retail investors. The NASD made a parallel effort focused primarily on advertising practices. As a result, the NASD adopted a revised rule governing advertising by its members, and the Commission adopted amendments to the confirmation rule requiring disclosures relating to CMOs.⁸ During the course of interviewing professional traders and others we heard on several occasions that the sale of complex, and possibly unsuitable, CMO tranches to retail investors is still a common practice. We obtained no direct evidence, but the anecdotal reports are troubling. On the other hand, we are aware of few specific complaints related to CMOs.⁹ We believe that the reason there are so few complaints may be the stable to declining interest rate environment of the last few years. As a result retail purchasers of CMOs have at worst gotten their money back “too soon” and had to reinvest at a lower rate. We believe that retail investors are unlikely to complain about such events.
2. We were told that, in the market for high yield corporate securities, it is relatively common for investment bankers and investors to participate in the syndication of bank loans for the same companies that issue high yield debt securities. Participants in loan syndications are entitled to send representatives to monthly meetings with the borrowing company’s management and bankers. Presumably, attendees are required by the company to keep the proceedings confidential. In any case, we were told that in certain instances, the information disclosed in these meetings appears to have been leaked, and such information affected the prices of bonds of the same companies.

⁸ The amended confirmation rule, Rule 10b-10 under the Exchange Act, requires broker-dealers to disclose to their customers, at or before completion of the transaction: (1) a statement that the yield of the CMO may vary according to the rate at which the underlying receivables or other financial assets are prepaid, and (2) a statement that the factors affecting yield will be furnished to the customer upon written request.

⁹ At the beginning of our review of the debt markets we reviewed complaints related to debt instruments received by the Office of Investor Education and Assistance in the past few years. That Office received very few complaints that related to CMOs in any way, only 13 in 1997 and only one in the first four months of 1998. In addition, there have been a number of enforcement actions in the past relating to the sale of CMOs. Similarly, the NASD reported that it had received filings for only 43 CMO advertisements in 1997, and only nine in the first four months of 1998.

Although the we did not focus on operational issues, we talked to some operations support personnel and to information vendors who supply information for back office use, as well as to industry clearing agencies. One of the requirements of dealing or investing in bonds is to maintain security master files of all the relevant information describing a bond, including its most recent ratings, and any other information affecting its valuation. The large number of instruments (about 1.5 million tax-exempt and nearly 1.0 million taxable) and the large number of new issues and new developments with respect to existing issues makes it a formidable and costly task to keep the databases current and accurate. Errors can also be very costly. As a result, the Depository Trust Company (“DTC”) has a project to create an industry “securities glossary” which would centralize this effort. We will monitor DTC’s efforts.

IX. Recommendations

As discussed further on page 1 of this memorandum, as a result of our review, we would suggest the following:

A. Corporate Debt Securities

We recommend that the Commission require, or cause the NASD to require, that transactions in corporate bonds and preferred stocks be reported in real time and publicly disclosed. Further, we believe that modification of Nasdaq’s Automated Confirmation Transaction (“ACT”) Service to provide for transaction reporting and comparison services for bonds and preferred stock, will be a practical method of achieving the desired result.

In preliminary discussions, the management of the NASD has indicated that it would be able to make the necessary changes to its systems.

Real-time transaction reporting will substantially improve transparency of the corporate debt markets, add to investor confidence in those markets, and provide a sound basis for surveillance of those markets. Also, we note that a modified ACT for bonds will provide a logical facility for real time transaction reporting of municipal bonds as well as corporate bonds. The MSRB is already committed to a goal of real time reporting of municipal bond transactions, but has not indicated how its goal could be achieved.

B. Abusive Practices

Finally, we recommend that OCIE be asked to follow up on anecdotal reports of i) sales of CMOs to retail customers, raising questions of suitability, and ii) possible misuse of inside information obtained by syndicated loan participants. Division staff members have already met with OCIE representatives to brief them on the findings of our review and these reports of possible abuses.

Interviews

Explanatory note: The following organizations were interviewed in preparing this memorandum. The views expressed in this report, however, are solely those of the Division. They should not be attributed to these organizations, either individually or collectively.

Trade Associations

The Bond Market Association
Emerging Markets Traders Association
Mortgage Bankers Association of America
International Securities Markets Association (Zurich, Switzerland)
Investment Dealers Association (Toronto, Canada)

Self-Regulatory Organizations

National Association of Securities Dealers
Municipal Securities Rulemaking Board

Government Agencies

Federal Reserve Bank of New York
Ontario Securities Commission

Interdealer Brokers

J.J. Kenny Brokerage
EuroBrokers Maxcor
Garban Securities
Cantor Fitzgerald

Information Vendors

Kenny S&P
GovPX
Bloomberg LLP
Bridge Information Systems, Inc.
Reuters

Bond Dealers

Merrill Lynch
Morgan Stanley, Dean Witter Discover
Goldman Sachs
J.P. Morgan Securities

Clearing Agencies

Depository Trust Company
National Securities Clearing Corporation
Mortgage Backed Securities Clearing Corporation

Institutional Investors

Fidelity Management and Research
T. Rowe Price Associates, Inc.
Turnberry Capital Management, L.P.

Electronic Trading System Operators

Trade Web
State Street Securities (BondConnect)
Trading Edge (BondLink)
LimiTrader
InterVest
Bloomberg (also listed as information vendor)

Outstanding Level of Public & Private Debt

1985 - 1997*
(\$ Billions)

| | Municipal | Treasury(1) | Agency Mortgage Backed(2) | U.S. Corporate | Federal Agencies | Money Market(3) | Asset Backed | Total |
|------|-----------|-------------|---------------------------------|-------------------|---------------------|--------------------|-----------------|----------|
| 1985 | 859.5 | 1,360.2 | 372.1 | 719.8 | 293.9 | 847.0 | 2.4 | 4,454.9 |
| 1986 | 920.4 | 1,564.3 | 534.4 | 952.6 | 307.4 | 877.0 | 3.3 | 5,159.4 |
| 1987 | 1,010.4 | 1,724.7 | 672.1 | 1,061.9 | 341.4 | 979.8 | 5.1 | 5,795.4 |
| 1988 | 1,082.3 | 1,821.3 | 749.9 | 1,181.2 | 381.5 | 1,108.5 | 6.8 | 6,331.5 |
| 1989 | 1,135.2 | 1,945.4 | 876.3 | 1,277.1 | 411.8 | 1,192.3 | 59.5 | 6,897.6 |
| 1990 | 1,184.4 | 2,195.8 | 1,024.4 | 1,333.7 | 434.7 | 1,156.8 | 102.2 | 7,432.0 |
| 1991 | 1,272.2 | 2,471.6 | 1,160.5 | 1,440.0 | 442.8 | 1,054.3 | 133.6 | 7,975.0 |
| 1992 | 1,302.8 | 2,754.1 | 1,273.5 | 1,542.7 | 484.0 | 994.2 | 156.9 | 8,508.2 |
| 1993 | 1,377.5 | 2,989.5 | 1,349.6 | 1,662.1 | 570.7 | 971.8 | 179.0 | 9,100.2 |
| 1994 | 1,341.7 | 3,126.0 | 1,441.9 | 1,746.6 | 738.9 | 1,034.7 | 205.0 | 9,634.8 |
| 1995 | 1,293.5 | 3,307.2 | 1,570.4 | 1,912.6 | 844.6 | 1,177.2 | 297.9 | 10,403.4 |
| 1996 | 1,294.8 | 3,459.0 | 1,715.0 | 2,055.9 | 925.8 | 1,393.8 | 390.5 | 11,233.9 |
| 1997 | 1,339.8 | 3,456.8 | 1,827.0 | 2,300.0 | 1000.0 | 1,685.0 | 490.0 | 12,098.6 |

* The Bond Market Association estimates

(1) Interest bearing marketable public debt.

(2) Includes only GNMA, FNMA, and FHLMC mortgage-backed securities.

(3) Includes commercial paper, bankers acceptance, and large time deposits.

Sources:

U.S. Department of Treasury

Federal Reserve System

Federal National Mortgage Association

Government National Mortgage Association

Federal Home Loan Mortgage Corporation