Treasury/Federal Reserve Study of Treasury Futures Markets Volume II: A Study by the Staffs of the U.S. Treasury and Federal Reserve System

Vignola, Anthony and Dale, Charles and Federal Reserve System, Federal Reserve Staffs

U.S. Department of the Treasury, U.S. Department of the Treasury

May 1979

Online at https://mpra.ub.uni-muenchen.de/62628/
MPRA Paper No. 62628, posted 09 Mar 2015 10:47 UTC
This paper is best cited as:


The principal contributing authors are listed on the Acknowledgements page.
ACKNOWLEDGMENTS

Peter Keir of the Board of Governors, along with Richard Kelly and Francis Cavanaugh of the Treasury were responsible for direction of this study.

Principal contributing authors were:

John Mingo, Frederick Struble, Leigh Ribble, Michael Assay and Brian Gendreau of the Board of Governors;

Paul Meek and Christopher McCurdy, of the Federal Reserve Bank of New York. Shelia Tschinkel (formerly of that bank) also contributed importantly to the study in its early stages.

Anthony Vignola and Charles Dale of the Treasury;

Kenneth Froewiss of the Federal Reserve Bank of San Francisco;

and

Paul Kasriel of the Federal Reserve Bank of Chicago.

Darlene Grant-Brown of the Board of Governors was responsible for overseeing the typing of the study and monitoring exchanges of editorial comments among the participants.
TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword.........................Purpose of Study</td>
<td>i - iv</td>
</tr>
<tr>
<td>Chapter I......................Structure and Regulation of Markets</td>
<td>1 - 18</td>
</tr>
<tr>
<td>for Financial Futures</td>
<td></td>
</tr>
<tr>
<td>Chapter II.....................Purposes and Functions of Futures</td>
<td>19 - 40</td>
</tr>
<tr>
<td>Markets--The Theoretical Framework</td>
<td></td>
</tr>
<tr>
<td>Chapter III.....................Futures Markets: Issues and Problems</td>
<td>41 - 100</td>
</tr>
<tr>
<td>for the Effective Operation of</td>
<td></td>
</tr>
<tr>
<td>Financial Markets</td>
<td></td>
</tr>
<tr>
<td>Chapter IV......................Summary of the Judgments and</td>
<td>101 - 111</td>
</tr>
<tr>
<td>Recommendations of those Interviewed</td>
<td></td>
</tr>
<tr>
<td>Appendix A......................Interviews with Market Participants</td>
<td>1 - 44</td>
</tr>
<tr>
<td>Appendix B......................Regulation of Interest Rate</td>
<td>1 - 41</td>
</tr>
<tr>
<td>Futures</td>
<td></td>
</tr>
</tbody>
</table>
FOREWORD

The 1978 legislation which renewed the authority of the Commodities Futures Trading Commission included a provision requiring the CFTC, when reviewing requests for new contracts in Treasury futures, to consider their likely impact on the "debt financing requirements of the United States Government and the continued efficiency and integrity of the underlying market for Government securities". While the CFTC had consulted with both agencies on an informal basis before authorizing earlier contracts in Treasury futures, the 1978 Act made the consultation procedure more formal and came at a time when the CFTC was receiving a rapidly growing number of new contract requests.

Several of these requested authority to extend futures trading to markets for medium-term Treasury securities, where no contracts had previously been authorized. Although the supplies of securities designated for delivery under these intermediate-term proposals were somewhat different for each contract, the maturity ranges specified were substantially overlapping. Moreover, CFTC approval of additional, essentially duplicative, contracts was being requested in the Treasury bill area as well.

Questions Raised by Contract Proliferation

This proliferation of contract requests, along with the further growth of trading in outstanding contracts, raised important questions regarding (1) the possible inadequacy of deliverable supplies, (2) the ability of the exchanges and the CFTC to maintain effective surveillance over the growing number of contract markets (particularly in cases where duplicative contracts would trade simultaneously on several exchanges),
and (3) the apparent plans of financial houses to expand their promotion of Treasury futures to a wider range of possibly less-knowledgeable market participants. Already the emphasis in the promotion of Treasury futures appeared to be on the high quality and marketability of the deliverable supply, without always making completely clear that futures themselves are obligations of the commodities exchanges, not the Treasury.

One basic question raised by these rapid changes in the futures market was whether they posed any appreciable threat to the effective performance of the cash market for Treasury securities. Any such development would, of course, have implications for the effective management of both Treasury financing and Federal Reserve open-market operations. In addition, the plan to trade futures contracts whose deliverable supplies would depend importantly on the expected availability of securities yet to be offered in regular cycles of Treasury note auctions raised the question whether the expectation that these securities will be available might at times constrain the flexibility of Treasury debt management.

The importance of these questions seemed to argue for a pause until problems that might result from this contract proliferation could be identified and dealt with before, rather than after, they developed. The need for such a study was being highlighted by scattered, unsolicited, and essentially unevaluated comments that Treasury and Federal Reserve officials were receiving from market sources, often expressing diametrically different judgments regarding the public benefits or costs of a further proliferation of Treasury futures contracts.
Request for Moratorium on New Contract Designations

In the face of these uncertainties, the Secretary of the Treasury and the Chairman of the Board of Governors wrote the CFTC in October, 1978, requesting a moratorium on the authorization of additional contracts in Treasury futures until the Treasury and the Federal Reserve could study more thoroughly the potential impact of further growth in these contracts on the cash market. New evidence for this study was to be obtained from two sources: one, in-depth interviews with representatives from various types of institutions that are active in Treasury cash and futures markets; the other, an expanded Government security dealer reporting system which would include new separate schedules on futures operations.

The initial date set for completion of the Treasury-Federal Reserve study was mid-1979. However, because the CFTC felt the need for a more rapid disposition of the backlog of pending requests for new contracts in Treasury futures, the timing of the study was accelerated. Consequently, new sources of information analyzed in the study had to be limited primarily to interviews with representative market participants. While the expanded reporting system for Government securities dealers will be inaugurated shortly, no new data from this source were available for the study.

Plan of Study

The results of the study are provided in two documents: (1) the official Treasury/Federal Reserve Summary and Recommendations, which was sent to the CFTC on May 14, and (2) the detailed staff study, which follows.
The second document includes an Appendix A, which summarizes the judgments and recommendations for action presented by those interviewed, and an Appendix B which discusses the organization of the commodity exchanges and the CFTC, as well as the procedures used for regulation of trading in Treasury futures.
CHAPTER I
STRUCTURE AND REGULATION OF MARKETS
FOR FINANCIAL FUTURES

Contracts in Treasury futures have proven to be highly successful. Several of the markets established for such contracts during the past 3-1/2 years have grown dramatically, with daily trading activity and the number of contracts outstanding both expanding at rates exceeding the expectations of their most optimistic promoters. Traditional traders in commodity futures contracts took the lead in the early development of these markets. But, since then, many of the major financial firms that deal in and/or broker Treasury securities and other financial instruments have also begun to promote futures. After first trading in futures for their own accounts, these firms have now begun to service the needs of customers as well, including banks, savings and loan associations, and other financial and nonfinancial firms. To date, most financial futures transactions appear to have been undertaken for speculative purposes, but there is increasing evidence that a growing number of participants are hedging against the risks of interest rate change.

Further rapid growth of markets for financial futures is in prospect. The established markets appear to have maintained their momentum in recent months. Late last year the CFTC authorized several new contract for trading, a large number of additional applications for new contracts markets are now pending, and additional applications are reported to be on the way. A number of the pending applications have been submitted by exchanges that have not previously traded financial futures.
Development of Financial Futures Markets

The trading of financial futures was pioneered in Chicago.¹/ The Chicago Board of Trade (CBOT) introduced a futures contract in October 1975, calling for delivery of $100,000 principal balance of GNMA pass-through certificates with a stated interest rate of 8 percent. Then in January 1976, the International Monetary Market (IMM), an affiliate of the Chicago Mercantile Exchange (CME), began trading a contract that calls for delivery of $1 million par value of 3-month Treasury bills.²/

From the start, both of these markets attracted substantial interest and proved profitable. By the end of 1976, daily trading volume...

¹/ Financial futures contracts are standardized agreements in which the buyer (seller) agrees to purchase (deliver) a designated security at a specified price on a specified date in the future. Securities to be delivered have a specified coupon rate (or, in the case of Treasury bills, are sold at a discount to par), and thus the yield is also set by the contract terms. Consequently, prices of futures contracts fluctuate as expectations change about interest rate levels likely to prevail at the time of delivery.

²/ In the case of the GNMA contract, a contract holder with a "long" position who decides to take delivery receives a Collateralized Depository Receipt—which is a claim on GNMA certificates being held in safekeeping by a specified depository—rather than the actual instruments. The "short" can, of course, meet his obligations by delivering to the "long" depository certificates bearing an 8 percent coupon. In addition, however, he can substitute issues with other coupon rates in amounts sufficient to provide the same yield as the specified GNMA 8's under certain assumptions about the payments that will be made over the lives of the mortgages. In the case of the Treasury bill contract, the "short" delivers either a newly auctioned 3-month bill or the outstanding bill, that has 3 months to mature, and was originally issued as a 182-day Treasury bill.
in each market was above 700 contracts, and open interest--or the number of contracts outstanding--had risen above 3,000 contracts in Treasury bill futures and 4,500 contracts in GNMA futures. As may be seen in Charts 1 and 2, these markets have expanded substantially further since 1976. Trading volume reached a record high near the end of last year in each market and, though declining since, remains in the 3 to 5 thousand contract range. The open interest in both markets has been running about 55 to 60 thousand contracts for several months.

Encouraged by these early successes, the CBOT established two more futures contracts in the late summer of 1977 based on Treasury bonds and 3-month commercial paper.¹/ The futures market for 3-month commercial paper has fared relatively poorly to date; daily trading volume, for example, has grown to only about 200 contracts.²/ In contrast, the Treasury bond futures market has developed extremely rapidly since its inception; in fact, during the early months of 1979, daily trading volume

¹/ The basic trading unit of the Treasury bond contract is $100,000 face value of instruments with a stated interest rate of 8 per cent and a maturity of 15 years or more. Any bonds neither due nor callable in less than 15 years can be delivered in fulfillment of these contracts. The commercial paper contract calls for delivery of $1,000,000 face value of prime commercial paper with a maximum maturity of 90 days that has been approved by the CBOT.

²/ The explanation for the slowness of the growth of the commercial paper futures market is not entirely clear. Some have argued that the contract itself may be a large part of the problem. Commercial paper futures are traded and quoted the reverse of other interest rate futures; that is, buyers of commercial paper futures deliver the paper when contracts expire and sellers take delivery, rather than the other way around. In addition, the contract may not be attractive because a trader deciding to take delivery in the futures market cannot know in advance which of over 40 corporations will have issued the paper he receives.
Table 1
Financial Futures Contracts Currently Traded

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GNMA Certificates 1/</td>
<td>CBOT 10/25/75</td>
<td>$100,000</td>
<td>$1,000</td>
<td>5,480</td>
<td>61,661</td>
</tr>
<tr>
<td>GNMA Certificates 2/</td>
<td>ACE 9/12/78</td>
<td>$100,000</td>
<td>$1,500</td>
<td>113</td>
<td>3,546</td>
</tr>
<tr>
<td></td>
<td>CBOT 9/12/78</td>
<td>$100,000</td>
<td>$1,000</td>
<td>162</td>
<td>3,032</td>
</tr>
<tr>
<td>90-day Commercial Paper</td>
<td>CBOT 9/26/77</td>
<td>$1 million</td>
<td>$750</td>
<td>173</td>
<td>1,202</td>
</tr>
<tr>
<td>Treasury Bills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90-day</td>
<td>IMM 1/06/76</td>
<td>$1 million</td>
<td>$800</td>
<td>5,342</td>
<td>55,963</td>
</tr>
<tr>
<td>1-year</td>
<td>IMM 9/11/78</td>
<td>$250,000</td>
<td>$600</td>
<td>48</td>
<td>1,293</td>
</tr>
<tr>
<td>Treasury Bond</td>
<td>CBOT 8/22/77</td>
<td>$100,000</td>
<td>$1,250</td>
<td>4,931</td>
<td>37,634</td>
</tr>
</tbody>
</table>

ACE--American Commodities Exchange
CBOT--Chicago Board of Trade
IMM--International Monetary Market (Chicago Mercantile Exchange)

1/ Contract calls for delivery of "Collateralized Depository Receipts" (or "Due Bills").
2/ Contract calls for actual delivery of GNMA certificates.
Chart 1

Open Interest in Futures Contracts
Monthly Averages of Daily Figures

Number of contracts

GNMA PASS-THROUGH CERTIFICATES
CDR Delivery

3-MONTH TREASURY BILL

TREASURY BOND

3-MONTH COMMERCIAL PAPER


-5-
Chart 2

Sales Volume in Futures Contracts
Monthly Averages of Daily Figures

Number of contracts
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0


3-MONTH TREASURY BILL
GNMA PASS-THROUGH CERTIFICATES
CDR Delivery
TREASURY BOND
3-MONTH COMMERCIAL PAPER

matched or exceeded that in the older GNMA and bill futures markets, and open interest moved above 40 thousand contracts.

Four additional contract markets were approved by the CFTC last fall. Two of these contracts, which are being traded on the American Commodity Exchange (ACE) in New York and the CBOT, are based on GNMA pass-through certificates and are virtually identical. They differ from the old contract on the CBOT in that they call for direct delivery of GNMA certificates, instead of delivery of "Collateralized Depository Receipts." The lead in designing the new GNMA contract was taken by ACE in response to what it perceived to be widespread dissatisfaction with the delivery provisions of the original CBOT contract. Despite their supposed superiority, these new contracts have gotten off to a slow start, while trading volume and open interest in the old contract have continued to grow.1/ In addition, two other contracts have been approved. One, for 1-year Treasury bills on the IMM, has also started slowly, and trading in the other, for 30-day commercial paper on the CBOT, has been delayed by the exchange until some changes in contract terms could be approved by the CFTC.

Twelve other applications have been filed with the CFTC. As can be seen in Table 2, many of these proposals would establish contract markets on New York exchanges that would essentially duplicate those currently in

1/ Thus, either contract terms on the original GNMA contract were not as unfavorable as was thought or such deficiencies may be more than compensated for by the liquidity provided by the large transactions volume in the old market.
operation in Chicago. A number of other proposals would introduce contracts for Treasury issues of 2- to 7-years maturity, an area not covered by existing contracts. Finally, several of the proposals would establish new futures contracts based on private financial instruments (including commercial bank CD's) and one would provide a futures contract on a common stock index.

Initially, trading in financial futures was dominated by floor traders on the exchanges and firms closely associated with the exchanges—which is, of course, generally true of new futures markets. Over time, however, a wider participation has developed. Government securities dealer firms have found it increasingly advantageous to operate in the futures markets in order to service their own and their customers' needs. Also, many of the major brokerage firms which offer customers a broad range of securities have entered the market or are in the process of doing so. In addition, the number of savings and loan associations, mortgage banks, pension funds, and commercial banks that are taking futures positions has grown significantly.

Settlement of Futures Contracts

Like futures contracts in commodities, financial futures contracts usually do not culminate in delivery, although the share of contracts on which delivery is taken tends to be higher in markets for financial futures than in those for nonfinancial futures. Most participants prefer to liquidate their contract positions through offsetting
trades prior to the delivery date. Thus, open interest normally declines substantially during the last two months before a delivery date. An example of this winding-down process can be seen in Chart 3, which shows the decline in open interest for the five most recent 3-month bill futures contracts. As a result of this process the number of deliveries actually made against each of these contracts was only about 4 to 8 percent of the largest open interest reached for that contract month. (See Table 3.) In the GNMA futures market, the ratio of deliveries to maximum open interest has generally been less than 15 percent. In contrast, in the Treasury bond futures market the volume of deliveries relative to maximum open interest has been quite large so far.

Organization and Structure of Exchanges

The exchanges on which futures contracts are traded are not-for-profit associations in which members are granted, among other privileges, the right to execute trades on the floor of the exchange for their own account and for the accounts of customers. These trading activities and other functions are conducted under the general supervision of the governing board of the exchanges (which consists of elected exchange members and appointed nonmembers of the exchange). The board is

1/ Membership in most cases is restricted to individuals. Thus partnerships, corporations, or cooperative associations desiring membership usually finance the membership of one of their employees. The number of exchange memberships is generally limited so that after their initial sale, it is necessary to purchase a membership in the "secondary market." New members must be approved by the exchanges' governing boards. To qualify an applicant must be of good moral character and have a sound financial position.
<table>
<thead>
<tr>
<th>Exchanges</th>
<th>Date of Application to CFTC</th>
<th>Contract Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMEX</td>
<td>7/31/78</td>
<td>$100,000</td>
</tr>
<tr>
<td>CBOT</td>
<td>11/8/78</td>
<td>$1 million</td>
</tr>
<tr>
<td>ACE</td>
<td>12/8/78</td>
<td>$1 million</td>
</tr>
<tr>
<td>CBOT</td>
<td>9/8/78</td>
<td>$1 million</td>
</tr>
<tr>
<td>ACE</td>
<td>8/1/78</td>
<td>$1 million</td>
</tr>
<tr>
<td>COMEX</td>
<td>7/31/78</td>
<td>$1 million</td>
</tr>
<tr>
<td>COMEX</td>
<td>7/31/78</td>
<td>$250,000</td>
</tr>
<tr>
<td>COMEX</td>
<td>7/31/78</td>
<td>$100,000</td>
</tr>
<tr>
<td>IMM</td>
<td>9/5/78</td>
<td>$100,000</td>
</tr>
<tr>
<td>CBOT</td>
<td>7/26/78</td>
<td>$100,000</td>
</tr>
<tr>
<td>ACE</td>
<td>10/5/78</td>
<td>$100,000</td>
</tr>
<tr>
<td>ACE</td>
<td>8/31/78</td>
<td>$100,000</td>
</tr>
<tr>
<td>KCBOT</td>
<td>10/28/77</td>
<td>*</td>
</tr>
</tbody>
</table>

1/ Delivery of GNMA certificates (rather than "Due Bills").
2/ Approved by CFTC on September 11, 1978; trading did not begin until mid-May, 1979, however, after this study was completed.
* After informal discussions with the CFTC, the KCBOT is in the process of reworking its proposal for establishing a futures contract based on a stock index.
### Table 3
Maximum Open Interest and Actual Deliveries
(Number of contracts)

<table>
<thead>
<tr>
<th>Month of Delivery</th>
<th>GNMA (CBOT)</th>
<th>3-Month Treasury Bill (IMM)</th>
<th>Treasury Bond (CBOT)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Max. 1/ Open Interest</td>
<td>Actual Deliveries</td>
<td>Per Cent 2/</td>
</tr>
<tr>
<td>Mar. 1979</td>
<td>7,435</td>
<td>477</td>
<td>6</td>
</tr>
<tr>
<td>Dec. 1978</td>
<td>9,709</td>
<td>1,448</td>
<td>15</td>
</tr>
<tr>
<td>Sept. 1978</td>
<td>5,371</td>
<td>373</td>
<td>7</td>
</tr>
<tr>
<td>June 1978</td>
<td>4,340</td>
<td>178</td>
<td>4</td>
</tr>
<tr>
<td>Mar. 1978</td>
<td>2,298</td>
<td>372</td>
<td>12</td>
</tr>
<tr>
<td>Dec. 1977</td>
<td>3,523</td>
<td>33</td>
<td>1</td>
</tr>
<tr>
<td>Sept. 1977</td>
<td>3,686</td>
<td>403</td>
<td>11</td>
</tr>
<tr>
<td>June 1977</td>
<td>2,319</td>
<td>773</td>
<td>33</td>
</tr>
<tr>
<td>Mar. 1977</td>
<td>1,601</td>
<td>247</td>
<td>15</td>
</tr>
<tr>
<td>Dec. 1976</td>
<td>1,087</td>
<td>183</td>
<td>17</td>
</tr>
<tr>
<td>Sept. 1976</td>
<td>1,353</td>
<td>162</td>
<td>12</td>
</tr>
<tr>
<td>June 1976</td>
<td>736</td>
<td>52</td>
<td>7</td>
</tr>
<tr>
<td>Mar. 1976</td>
<td>1,131</td>
<td>230</td>
<td>20</td>
</tr>
<tr>
<td>Dec. 1975</td>
<td>501</td>
<td>36</td>
<td>7</td>
</tr>
</tbody>
</table>

1/ Maximum number of contracts outstanding during the life of the contract.
2/ Actual deliveries as a percentage of the maximum open interest reached in the contract.
responsible for approving specifications for new contracts, establishing rules and regulations for ensuring that these contracts are traded in a fair and competitive manner, and monitoring developments in the various contract markets. Also, the Board can exercise broad emergency powers in cases where problems appear to be developing.

Each exchange also has a clearing house—either a division of the exchange or a separate corporation—to which qualified exchange members wishing to clear transactions may belong. The clearing house reconciles all trades made on the floor of the exchange. Once reconciliation is accomplished, the clearing house then becomes a party to both sides of every contract—a buyer to every seller and a seller to every buyer.

The interjection of the clearing house into the middle of all contracts together with other exchange rules provides virtual assurance to participants that contract provisions will be carried out. Exchange members acquiring contracts for their own account or for their customers must deposit assets with the exchange equal to a certain proportion of their contractual obligations. Such deposits, which can take several forms including cash, Treasury securities or other assets—in some cases, a letter of credit can be substituted—are commonly referred to as initial margins. They are, however, really in the nature of a bond that guarantees eventual performance of contract terms—rather than a true margin which limits the share of the purchase price of a security that can be borrowed. These performance bonds, which are
determined exclusively by the exchanges, are usually set sufficiently high to cover a loss that would be incurred if the price of a contract were to move to the maximum amount that the exchange allows on any given day. These limits, in turn, generally are set wide enough so that they are reached only under unusual conditions.

At the end of each day the clearing house "marks to market" each account on its books—that is, it calculates the gain or loss resulting from the day's price movement. The exchange member is then notified; and if a loss is incurred which depletes the level of the performance bond, he is required to send a certified check before the start of business the following morning to restore the margin account to its required level. The process of marking to market, then, results in losses being covered when they occur and margins being maintained to meet potential future losses.  

In addition to initial margin, the exchanges may ask members to post "variation" margin at any time during a trading session. Variation margin calls, which are usually made in response to a price move during the day that is adverse to the member, must be paid within one hour.

There are also other safeguards in place to help ensure contract performance. In joining the clearing house, members are required to

---

Though "marking to the market" is required of clearing member firms by the exchanges, there are no exchange or CFTC rules that require firms to mark their customers' accounts to market. Brokers generally do mark customer positions to the market, however, since they would be assuming their customers' market risk if they did not require daily cash settlement. In any event, the value of the customer's account cannot become less than the maintenance margin specified by the exchange.
subscribe funds which are then placed in a trust account for use in emergency situations. If these funds should become exhausted, the exchange has the power to require member firms to subscribe additional sums. Exchange rules also mandate that members must require their customers to post performance bonds with them, and such "margin" accounts are normally marked to market daily. These latter requirements, of course, protect the solvency of exchange members which in turn further assures the performance of contract terms.

Organization of the CFTC

The self regulatory responsibilities of the futures exchanges are carried out under the general oversight of the CFTC which, as administrator of the Commodity Exchange Act, has ultimate authority and responsibility for the regulation of futures markets. The CFTC is an independent Federal agency that was first authorized in 1974 and reauthorized in 1978. It is directed by a Commission composed of a Chairman and four other members, all appointed by the President. In carrying out its responsibilities, the CFTC has broad regulatory and enforcement powers. These include approving all futures contracts traded on U.S. exchanges, reviewing and approving all rules and regulations of the exchanges, and maintaining a close surveillance over developments in the futures markets. The CFTC also has the power to require an exchange to enforce its rules and regulations and to invoke its emergency powers when in the judgment of the CFTC this appears needed.
to promote competitive market conditions or to insure orderly liquidation of futures contracts.

Market Surveillance and Regulation

The surveillance and regulation of financial futures by the exchanges and CFTC are undertaken in part to insure that trades among exchange members are carried out fairly and efficiently and that the customer orders of exchange members are properly executed. Various committees are appointed by the exchange boards with responsibilities to enforce rules and regulations in these areas.

A second objective is to forestall market manipulation and other abusive practices and to promote orderly liquidation of expiring contracts. The exchanges and the CFTC recognize that a prime requisite for achieving this objective is that the security (or good) specified for delivery in a contract is in adequate supply. Obviously, the larger the supply the greater the resources required to capture a significant proportion of the total, and thus the greater the likelihood that those with "short" positions in the futures market will not encounter difficulties in obtaining securities (or goods) to meet terms of their contracts. Thus, a key question to be raised before a contract is approved for trading is whether the specified underlying supply appears adequate.

While adequate underlying supply is the first line of defense against market manipulation, the exchanges and the CFTC also have in place surveillance arrangements and broad powers to protect against the
development of such problems. Each exchange member is required to report the names of customers who have established positions above a minimum specified size in a contract for delivery in a given month. If the situation then appears to warrant, these customers can be required to indicate their objective in assuming this position and their intentions with regard to taking or making delivery. They can also be required to supply information on their positions in closely related futures contracts and in the underlying supply of the commodity or security eligible for delivery.

If after this information is collected it appears that individuals or groups of individuals are attempting to squeeze the market, there are a number of alternative actions which may be taken. These include terminating trading in a contract and requiring cash settlement, limiting trades to the closing of open positions (i.e., trading for liquidation only), altering conditions of delivery (i.e., specifying additional securities as eligible for delivery), and increasing margins. If the exchange fails to take action, the CFTC has authority under the Commodity Exchange Act to require that it do so. (The recent experience with the CBOT's March wheat futures contract has, however, raised questions about the willingness of the exchanges to use their emergency powers and the ability of the CFTC to require them to do so.)

In addition to problems of market manipulation or the inadvertent concentration of holdings, the emergency powers can also be used in instances in which the prospective underlying supply of a commodity or security is
changed suddenly by a substantial amount. Thus, if crops fail or if
the Treasury were to decide to forego an auction or to conduct an
advance refunding, the exchange has the authority to specify alternative
settlement arrangements, such as delivering an alternative security or
requiring cash settlement.

Another objective sought by the exchanges and the CFTC in their
surveillance and regulation of futures trading is to insure that partici-
pants in these markets are made aware of the risks involved. In this
regard required posting of performance bonds and daily marking to market
of customer accounts, in addition to protecting the solvency of exchange
members and insuring that customers meet their commitments, may also
serve to alert customers to the hazards involved in futures trading.
In addition, customers are required to read and sign a document that
spells out the potential dangers involved in futures trading.
To provide an analytical base for the discussion on issues and problems in the Treasury futures market (in Chapter III), it will be helpful first to review a few of the theoretical and empirical studies that have been done on the social welfare implication of commodity and financial futures markets—particularly with respect to their roles as allocators of risk and aggregators of information.

The discussion that follows is structured in four sections. The first outlines the economic roles played by hedgers and speculators and analyzes the social costs and benefits stemming from such activity; it draws on experience in both the commodity and financial markets. The second section details the ways in which hedging and speculating in financial instruments can be carried on through futures-like transactions in spot and forward markets. A third section discusses the specific benefits and costs of financial futures traded on organized exchanges, and the final section reviews ways in which market participants of different types can use, or mis-use, financial futures.

The Economic Roles of Hedging and Speculation

The traditional role assigned to "speculators" and a traditional use of forward contracts is the reallocation (from hedgers to speculators) of the risk of future price changes. The speculators are said to "insure"
the hedgers against future adverse price changes by agreeing to purchase
the harvested crop, or the security, for a price fixed today, thus allowing
the hedger to make plans and calculate his expected future profits with
greater certainty. Unless a speculator is perfectly risk-neutral, he will
provide the "insurance" for a fee. Thus, if there are more short hedgers
than long hedgers, the price of a forward contract between a speculator
and a hedger may be a downward-biased estimate of the expected future
spot-price—the bias representing the insurance "premium." Since the
hedger is, by assumption, more risk averse than the speculator, he is
willing to pay this fee.

Of course, hedgers can reduce the risks of future price changes
by engaging in transactions other than futures and forward trades. The
mortgage banker, for example, who has made a formal commitment to lend
at a fixed rate, is exposed to a rise in interest rates which could force
the cost of his funds to rise above the committed loan rate. To protect
himself he may engage in a futures contract (to sell a loan package at
a fixed price in the future), or he may use the spot market to hedge against
a rise in rates—say, by shorting GNMAAs or other securities in his port-
folio. However, as is discussed in detail later, using spot markets to
hedge (or to speculate) may be more costly than executing a futures or
forward contract.

In addition to providing hedgers with the "other side" to a
contract, speculators perform other social functions, including the
production of information about future events which may prove useful to
market participants when making consumption and investment decisions.
For example, if crop failure next period is a likely event, then it may be desirable to store some of today's crops for consumption rather than have a state of plenty today with low prices and a state of scarcity tomorrow with high prices. Speculators will perform this service, say, by purchasing and storing the good for resale at a future date.

If many speculators use this information to make storage decisions, the spot prices of the good will be affected, that is, their purchase decisions will drive up today's price and reduce tomorrow's price over what it would have been in the absence of their activity. Thus, the activities of speculators using information which proves to be correct have a tendency to stabilize spot prices over time (higher today and lower tomorrow in the example given). However, if the speculators' information proves to be wrong and too many goods are carried over from today to tomorrow, then spot prices are destabilized. Note that while such destabilizing speculation is possible, it involves, on average, speculators purchasing at relatively high spot prices and selling at relatively low prices, thereby incurring losses. Presumably, the market place would tend, in the long run, to weed out the poor (destabilizing) predictors.

An important benefit of speculation is that at least some of the speculators' information becomes impounded in the spot price where it is readily available to all at zero cost. That is, with knowledge of only today's crop (of goods or securities) and today's consumption demand,
other market participants can infer the information the speculator possesses on tomorrow's relative scarcity, which is that the current market price will be too high or too low to be consistent with today's supply and consumption demand. Access to such information about the future is of considerable value to producers; thus in a sense, the speculator, through his impact on prices in the spot market, helps to reduce business risk for the primary producer or security issuer.

In the market for financial instruments, speculation about future interest rates can be carried out through a variety of futures, forwards, or spot market trades (see below). The impact of such trades will be transmitted to spot market prices—i.e., interest rate speculation will affect the shape and position of the yield curve. 1/ If speculators, acting on new information, expect rates to rise six months from now, their actions (for example, shorting 1-year and buying 6-month issues) will cause rates on maturities over six months to rise relative to shorter-term rates, and the yield curve will become steeper. As in the case of commodity speculation, the speculators' information (if correct) and as reflected in the yield curve, can help both producers (borrowers) and permanent investors (lenders) make decisions about their plans for the future.

Speculation, nevertheless, can entail some social costs. First, speculation could continually destabilize underlying spot prices. This could occur, say, if small, risk-seeking speculators place "bets"

---

1/ Of course, the yield curve will be shaped by factors other than speculators' information and expectations—e.g., liquidity premia, institutional factors, and government policy actions.
in the market not on the basis of any newly-generated information, but rather merely for the utility gained from speculation. Even if an individual speculator consistently loses, he may be replaced when his wealth is depleted by another risk-seeking individual. Thus, continued replacement of market speculators could lead to destabilized spot prices over an indefinite period—that is, the spot price would be bid higher (or lower) than in the absence of speculation, even though there is no new information to suggest that future prices will be higher or lower than at present.

Second, the act of speculation may induce excessive resources to be devoted to information collection. 1/ That is, private rewards from information collection about an uncertain future event may exceed the social benefits from having this knowledge. For example, considerable resources may be expended operating a race track to ascertain which horses are the fastest. Knowledge of the fastest, however, conveys little benefit to society, i.e., it does not change production decisions nor lead to a better contemporaneous allocation of goods; the participants merely transfer pecuniary wealth among themselves.

Speculating and Hedging in the Absence of Futures

In the absence of futures markets for financial securities, there are several methods by which market participants can profit from

information about the likely course of future interest rates (speculate) or protect themselves from such changes (hedge).

Forward and forward-like transactions. A forward contract is essentially similar to a futures contract except that a forward is not executed on an exchange; the size, maturity, and other terms of the contract are not standardized, and the contract is strictly between two parties (and not the intervening exchange). Also, a forward contract does not generally involve posting of margin or daily marking-to-market.

There are also several types of contracts which serve the same purpose as forwards and, like forwards, exist strictly between private contracting parties. These include "when-issued" trades, standbys, and repurchase (RP) agreements. A "when-issued" trade involves the purchase (sale) of a security that has not yet been issued by the Treasury. Most such trading occurs between the date awards are allocated in the auction of a security and the date that securities are actually issued, but in the case of Treasury bills, some such trading occurs prior to an auction.1/

The period between auction and settlement (delivery) dates may range from three days (generally for Treasury bills) to a month for some agency and municipal securities.

 Trades based on when-issued securities are essentially forward contracts—a participant agrees to sell a security, when issued to him,

1/ In the case of coupon securities, the Treasury will not award new issues to participants who have traded them on a "when-issued" basis.
at a fixed price. Although such trades generally are regarded as strictly spot transactions, the agreed-upon price can reflect expectations of both the buyer and seller regarding possible price changes between the initial award date and the settlement date.

Standby contracts are put options on securities (typically GNMAs). They are similar to forward contracts in that their profitability depends upon future security price changes but differ in that the future sale of the securities is optional. The seller or writer of a standby, in return for an immediate fee, agrees to purchase specified securities at the contract price within a given time period from the buyer of the standby if the buyer exercises his option to sell the securities. The buyer of the standby contract will gain (and the seller of the contract will lose) if securities prices fall below the contract price by more than enough to offset the option fee.

Repurchase Agreements (RP's) and reverse RP's also may be useful as vehicles for profiting from or hedging against possible price changes. For example, suppose a speculator expects security prices to rise (rates to decline). He may construct an implicit long forward contract as follows: buy a 6-month T-bill financed by its immediate sale under a 90-day repurchase agreement. In 90 days, he buys back the 6-month bill (which has 90 days remaining to maturity) at the previously agreed upon price; and, if 90-day bills then are selling for more than this price, he will have earned a profit.1/ A short position can be

1/ The amount of profit will depend on a) how much prices have risen and b) the borrowing cost, which in this example is the 90-day RP rate.
constructed by purchasing a security under a reverse-RP, and then selling it. The speculator hopes that security prices will fall and he can purchase the security at a low price in the future, thus making an additional profit (over and above the earnings on his reverse RP) when he delivers the security back to its original owner.1/ In a strict forward transaction (including a when-issued trade) there is no accounting cost-of-carry incurred by the speculator/hedger (unless margin is required by one of the parties). For example, the long forward participant simply agrees with another party to buy a security for a fixed price at a date in the future; until the future date arrives, no costs and often no balance sheet entries exist. The long participant will gain (lose) on the delivery date, if prices have risen (fallen) and he can immediately sell the delivered security for a higher (lower) price.

In the case of forward-like arrangements such as RP's, however, the speculator/hedger may incur a "cost-of-carry." In the long/RP example given above, the cost-of-carry is the difference between the rate on 6-month bills and the going rate on 90-day RP's. If this spread is negative, the long speculator in the example must have security prices rise sufficiently to offset this cost in order to make a profit.

1/ Of course, apart from its use as a hedging/speculating device the RP market is used widely by commercial banks and others as a source of collateralized borrowing.
Spot transactions. Speculators and hedgers can take strictly spot positions that accomplish the same goals as forward or forward-like transactions. Like RP arrangements, these transactions may involve carrying costs. In a short sale, the market participant sells a security he does not own in the expectation that its price will fall. Delivery on the sale is then made by borrowing the security from a third party. If the expected price decline develops, the security can then be bought back in the market and delivered to its original owner at a profit. This operation is similar to the reverse-RP described above, except that in this case the security is borrowed from its original owner rather than purchased and resold to him. Under the borrowing arrangement, the short speculator pays back the security, including accrued interest payments, plus a borrowing fee (usually around 50 basis points). Thus, in order for the speculator to make a profit, security prices must fall by more than enough to cover the implicit "cost-of-carry" on the transaction.1/

To cite another example of a spot market transaction, a long speculative (who expects security prices to rise) may simply purchase an asset with a longer-term maturity than the liability which is used to finance the asset. If rates fall and prices rise, the liability may

1/ The actual "cost-of-carry" is the borrowing fee plus any difference between accrued interest on the borrowed security and interest earned by investing the funds obtained from the "short" role of the security. It is the amount by which the security's price must fall in order for the speculator to just break even on the transaction.
be paid off with the proceeds from selling the asset (at a profit) before its maturity date. Moreover, there may be either positive or negative carry to this transaction. That is, if the yield curve is upward (downward) sloped, the interest income over the first six months on a 1-year security held as an asset may be greater than (less than) the interest cost of a 6-month liability (such as a CD).

In the opposite case, a short speculator may buy a short-term asset with the proceeds from a long-term liability. If security prices fall, the proceeds from the maturing asset may be used to buy back the outstanding liability at a discount (and, hence, at a profit). Like the case of a short-sale, "negative carry" may be involved in this transaction if the yield curve is upward sloped. That is, security prices have to fall by more than enough to make up for the cost-of-carry (the difference between the contemporaneous interest earnings on the short-term asset and the higher interest cost of the longer-term borrowing).

In sum, speculating and hedging can be carried out by a variety of spot, forward, or forward-like transactions. The attractiveness of one method over another often will depend on the accounting costs of the various transactions. In a simple forward contract, with no margin posted, no accounting costs are incurred; if security prices do not change, neither a profit nor a loss will be registered by the participants. In other cases, the market participant needs to borrow in order to execute
the transaction, and thus no change in security prices still could mean a net loss to the speculator (the loss of the borrowing fee).1/

The Costs and Benefits of Organized Futures Trading

Futures trading allows transactions to be made between strangers at reduced risk but at a cost for such reduced risk. As was shown in the previous section, hedging or speculation may occur in cash markets through the use of forward-like contracts. Unlike forwards, however, organized futures exchanges create instruments and establish trading rules that allow parties to make financial commitments without regard for the credit-worthiness of the party taking the opposite position. With forward contracts any two contracting parties or their agents may agree to deliver virtually any security at an agreed upon price on a specified future date. Future contracts can be made only on the floor of the exchange by parties which have met with the approval of their trading peers, and for only standardized quantities and delivery

1/ We use the term "accounting costs" to characterize the differences in cost among these various transactions because true economic cost differences may not exist. That is, "negative carry" may exist simply because the participant uses borrowed funds for the transaction rather than selling an existing asset in his portfolio (which he may not wish to sell because accounting convention requires that assets valued below book be "marked-to-market" only at sale). Nevertheless, speculation via futures/forwards markets may involve lower economic costs than in cash markets because futures/forwards markets may allow for some specialization of labor--i.e., information-collectors (speculators) need not be the same individuals who engage in spot transactions (such as warehousers of securities).
dates. Delivery under a futures contract is implicitly guaranteed by
the integrity and credit of its member traders, who are responsible
for the fulfillment of contracts executed for customers. The
exchange's clearing corporations treat each contract (to member traders)
as their own liability. Thus, failure to honor a contract would involve
first, a default by a customer, next a default by a member trader, and
lastly a default by a clearing corporation. Also, customers post
margins with exchange members and exchange members with the clearing
 corporation. And, of course, daily "marking-to-market" generally
takes place.

Futures thus facilitate trading among strangers; parties to
a futures contract need not be concerned about the identity of the
opposite party to their contract (because the exchange acts as inter-
mediary in all transactions), and do not have to incur the costs of a
credit investigation of the opposite party to the contract.\footnote{While some customers prefer futures to forwards, growth in futures
volume may lead to growth in forward trading. For example, a
dealer may use the futures market to hedge trades made in forward
markets, or he may arbitrage between the two markets.}

\footnote{While some customers prefer futures to forwards, growth in futures
volume may lead to growth in forward trading. For example, a
dealer may use the futures market to hedge trades made in forward
markets, or he may arbitrage between the two markets.}
In addition to the benefit of reduced credit risk, futures may enable market participants to trade at times closer to their preferences. In the absence of exchanges, spot and forward contracts would continue to be executed, but a participant might have greater difficulty in finding a trading partner with whom to arrange a specific transaction time—e.g., a T-bill to be delivered in 6 weeks. The organized exchange reduces search costs involved in finding the "other side" to a spot trade in the future. On the other hand, a well developed forward market, as is the case with GNMA forwards, may provide greater flexibility in choosing size, maturity, and type of contract at reasonable search and transaction costs.

Another potential benefit to organized futures exchanges is that surveillance procedures which forestall abusive practices are less costly to implement than in unorganized forward markets. For example, an organized futures exchange could easily monitor customers' combination future-spot positions to detect emerging attempts at "cornering" an underlying commodity (security) market. Or, if open interest positions were to raise dramatically relative to the likely supply of underlying securities available for delivery, the exchange could raise margin requirements. An increase in margin, because it is costly for the customer to maintain, would induce customers to close out positions by executing offsetting contracts before the delivery date; thus, the exchange could effectively reduce deliveries and expand the supply of the underlying security available for delivery. Such market supervision would not be as feasible in the cash (forward) market.
For the reasons given above, some participants will prefer futures contracts. Hence some speculation and/or hedging will occur on organized futures exchanges that would otherwise not take place. Futures markets may, therefore, facilitate and lead to increases in both hedging and speculation in financial instruments. Whether the net result is socially desirable is not clear. Presumably, more hedging by risk-averse individuals is desirable; but we do not know whether the existing level of speculation (other than speculation which is the "other side" to a hedge) is optimal. More speculation, based on new and accurate information, could result in a yield curve which more accurately anticipates the future course of interest rates. However, increased speculation, via organized exchange trading, could alter the yield curve in unwarranted fashion (if such speculation were to destabilize spot prices) or could entail other undesirable effects such as an increased potential for corners and squeezes. The possibilities are discussed in greater detail in Chapter III below.

Use of Futures by Market Participants

Participants in futures markets are commonly identified in the traditional literature as either speculators or hedgers. Speculators in futures are seen as taking the opposite side of hedgers' futures contracts, such that the risk of price fluctuation in the commodity or security underlying the futures contract is transferred to the speculator—hence, the frequent reference to hedgers purchasing price
"insurance" from speculators in the popular financial press.\(^1\) The simple hedger-speculator dichotomy does not, however, capture important distinctions among the varieties of transactions which may be termed hedging. Nor does it make allowance for the practical difficulties of distinguishing hedging from speculating, since the risk in a participant's futures position cannot be evaluated in isolation from the risk in a participant's spot position. Further, the hedger-speculator model can lead to implications about the risks involved in spot-futures transactions and the motivations for entering into those transactions which may be misleading.

**Hedging with Financial Futures.** Many discussions assume that the hedger is a **routine short hedger**, presumed to be a holder of a securities inventory subject to a price decline. An example may be a mortgage banker who enters the GNMA futures market to cover his loan production. Mortgage bankers are exposed to increases in interest rates between the time they commit to lending mortgage funds and the time they package and sell the mortgages to investors. Other examples may be any securities trader or financial trader who holds stocks of securities. Routine hedgers are thought not to make forecasts of interest rate movements, but to seek to avoid the price fluctuation risk in their

financial transactions by taking futures positions equal and opposite to their spot market positions.\(^1\) Under a routine hedging strategy, the market participant will be as well off whether interest rates rise, fall, or do not change at all.

Few financial institutions, however, are likely to be routinely hedged, because they typically seek to profit from changes in interest rates. For example, mortgage bankers do not consistently take short futures or forward positions exactly equal to their loan inventories. Instead, they act on their expectations of future interest rates in deciding how much "forward cover" to obtain—that is, how large their futures or forward position should be relative to their spot positions. Depending on their expectations, they may choose to take (1) a futures position equal to a fraction of their loan inventory; (2) a short-futures position that is greater than their inventory (an "over-hedge"); (3) no futures or forward position whatsoever; or (4) a short position exactly equal to the size of their inventory. Only the last will be a routine hedge; any other position will involve some exposure to rate risk and presumably will involve a forecast of future interest rates. Further, to be a routine hedger the mortgage banker will always have to obtain futures cover equal to the value of his exposed loan inventory. During any lapse in coverage the mortgage bank would be subject to interest rate risk.\(^1\)

\(^1\)/ When hedging is defined restrictively to mean only routine hedging, all other activity, including not entering the futures market at all, is by implication speculation.
Many futures positions can be taken in conjunction with spot positions to reduce exposure to rate risk, even though these positions—termed selective hedges—involve forecasts of future interest rates and their profitability will be affected by rate movements. An example is the mortgage banker who only partially hedges his loan commitments because he believes rates will rise by less than the market's expectations. Selective hedges to some degree constitute speculation, but they involve less interest rate risk exposure than unhedged spot market activity alone.

Reference is often made to market participants hedging anticipated spot market positions. Under this practice, termed anticipatory hedging, virtually any financial transaction which may be surmised to occur in the future may be a candidate for a hedge with a futures contract. For example, anticipated CD issues may be hedged by short futures positions to reduce the risk of a rise in interest rates. Anticipated government security purchases may be hedged with long futures positions. Because no spot market commitment has been made, the risk of a futures position taken as an anticipatory hedge is difficult to judge; almost any futures position can be termed an anticipatory hedge.\(^1\) Once a commitment to make a financial transaction has been made—even if the commitment, for

\(^1\) Some economists hesitate to describe the execution of a futures contract prior to making a spot market commitment as a hedge. G. W. Hoffman regards anticipatory hedging as "open speculation which may ultimately prove to be a wise policy."
example, involves no more than the assignment of staff resources to prepare a CD or commercial paper issue--the anticipatory hedge becomes a spot market hedge and its risk can be evaluated accordingly.1/

**Arbitrage and spread positions.** Market participants often maintain that a large portion of their futures activity is arbitrage and spread positioning rather than hedging. *Arbitrage* may occur when a price difference exists between two markets for the same security allowing a simultaneous purchase in one and sale in the other to result in a certain profit. An example may be the sale of a GNMA forward contract for September delivery with the simultaneous purchase of a GNMA futures contract with a September delivery month. No interest rate risk is involved, and a profit is made with certainty. Nevertheless, with respect to the GNMA *forward* contract portion of the arrangement, the arbitrageur incurs some "customer risk"—that is, the other side of the forward contract may not honor his commitment to buy (or sell) at expiration of the contract.

A variation of pure arbitrage is *holding period* arbitrage. If a market participant wishes to place his funds in earning assets for a predetermined period of time, a combination of a simultaneous purchase of a security and a futures contract extension may result in

---

1/ One other term that might cause confusion should be mentioned. This is the case in which someone is simultaneously long the spot market and long the futures market. This increase in risk using the futures market is sometimes sarcastically referred to as a "Texas hedge."
a higher return than a simple cash market security purchase. For example, if in January an investor wishes to place his funds in Treasury bills for 90 days, he has two alternatives. One is to purchase a 90-day T-bill and hold it until maturity. The other is to purchase a 180-day T-bill and at the same time sell a T-bill futures contract specifying that he will deliver a 90-day T-bill in three months (March). The market participant may earn a higher return by buying a 180-day T-bill, holding it 90 days, then delivering it to fulfill the terms of the futures contract than by simply buying a 90-day T-bill.¹ These operations are arbitrage in the sense that the market participant is taking advantage of misalignments between the term structure of spot T-bills and the T-bill futures market, and in that his return is known as of the date he executes the spot and futures trades regardless of future interest rate movements.

*Spread positioning* refers to the purchase of one futures contract and the sale of another with the expectation that the price relationship between the two will change so that a subsequent offsetting sale and purchase will result in a profit. An example of a spread is the taking of simultaneous long and short futures positions in different

¹/ Similarly, the relationship between 90-day and 180-day T-bill spot prices and futures contracts with a delivery date three months hence may be such that if a customer wishes to place his funds for six months beginning in January, he may earn a higher return by simultaneously buying a 90-day T-bill and a long T-bill futures contract calling for the delivery of a 90-day T-bill in March than by buying and holding a 180-day bill.
delivery months for the same security to take advantage of expected changes in the shape of the yield curve (also called a "straddle"). This is not true arbitrage since the return to the market participant is not known with certainty when the position is taken but rather varies with change in the relationship between the prices on different contracts. A trader may, for example, take a spread with a long position in June T-bill futures and a short position in December T-bill futures. He is betting that the yield curve as implied by futures prices will become steeper, that the prices of the December contracts will fall relative to the prices of June contracts. If he instead thought the yield curve would become flatter, he would sell the near maturities and go long in the more distant maturities. While spread positions can be risky, they generally involve less risk than simple open futures or forward positions because gains (losses) on the near maturities on a spread are likely to largely offset the losses (gains) on more distant maturities, regardless of the direction or magnitude of interest rate changes. The Chicago exchanges believe spread positions are relatively riskless and require little or no margin deposits on such transactions.

Another form of spread positioning refers to long and short positions taken in futures contracts for different securities. Market participants sometimes believe that yields on two different securities have deviated from their historical relationship, and will buy and sell
futures to profit from the expected correction in the misalignment.1/ If, for example, a dealer believes that T-bonds are expensive relative to GNMA's, he may sell a bond futures contract and purchase a GNMA future for a similar delivery month. If relative rates change such that T-bonds become cheaper relative to GNMA's, the gain he will make when offsetting the bond futures contract will likely more than cancel the loss taken when simultaneously offsetting the GNMA contract.2/

In summary, when reviewing the actions of futures market participants the distinction between hedgers and speculators loses importance. Hedging should be treated as an activity which often occurs simultaneously with speculating. Hedgers are risk averse, but nevertheless act on price expectations and in search of profits. Hedging becomes an activity which reduces risk as well as expected return, given spot positions, while speculation involves taking futures positions which add to risk and expected profits. No further distinction between hedgers and speculators is seen as meaningful. The important point, however, is that a "hedging" (risk-

1/ The futures market for Treasury issues may be more liquid than the cash market for other types of securities. Hence, some participants feel they can execute positions (including spread positions) with greater ease using futures rather than cash transactions.

2/ Caution should be used in interpreting market participant's descriptions of their futures activity as arbitrage. There is a tendency to call spread positioning arbitrage, though it is not riskless. Futures positions taken against spot market positions—for instance a T-bond future sold against the purchase of a spot U. S. Government agency bond—are similarly termed arbitrage, though they are better viewed as (1) cross-hedges against securities in inventory; or (2) a kind of spread position, where a profit is hoped to be made from the correction of a misalignment in the historical relationship between Treasury and agency debt prices.
reducing) activity cannot be judged as such unless one examines simultaneously the futures transaction and the associated cash market transaction as well as all other balance sheet and off-balance sheet commitments of the market participant.
CHAPTER III

FUTURES MARKETS: ISSUES AND PROBLEMS FOR THE EFFECTIVE OPERATION OF FINANCIAL MARKETS

In judging the potential benefits and costs of a rapidly expanding market in Treasury futures it is important to consider how such a development might be expected to affect the basic cash market in Treasury issues. The impetus for this study came largely from the desire of Treasury and Federal Reserve officials to assure that any expansion in trading of Treasury futures will not risk an erosion of the efficiency with which the cash market can accommodate the requirements of debt management and monetary policy. Thus, this chapter considers the likely effects of futures trading on (1) the stability of spot prices, and (2) the volume of trading and liquidity in the spot market. Additional questions considered are whether futures markets divert capital and professional expertise from markets where society needs them more; whether access to futures markets by banks creates unacceptable social risks for the economy; and whether additional regulations are needed to protect uninformed users of futures. The chapter concludes with a consideration of the two basic issues that prompted the study: first, whether futures contracts now trading or proposed are seriously vulnerable to market cornering, and second, whether these contracts pose any risks to the flexibility of Treasury debt management.

The Level and Stability of Spot Prices

There are two major ways in which futures trading in financial instruments could affect the level or stability of the spot prices of the
underlying securities. First, it is conceivable that an investor could so position himself in both the spot and futures markets as to "squeeze" those with short futures positions. In such cases efforts by the short plans to cover would drive up prices in both the futures and spot markets and perhaps lead to a failure to deliver on the futures. The possibility of such market manipulation is examined in a later section of this study. Here the concern is with a second type of spot-futures link which might exist even if the markets in question were perfectly competitive, so that no one individual could have a significant influence on prices. In this case the danger is that futures trading in Treasury securities could encourage speculation which could lead to wide swings in futures prices, and that spot-futures arbitrage would transmit these destabilizing impulses to the spot prices. The resulting greater variance in the spot prices, if substantial, could make it more expensive to finance the public debt because many participants might then view Treasury securities as less liquid and less attractive as investments.

The concern that futures trading may have a destabilizing effect on spot prices probably arises from the casual observation that the prices of commodities which are traded on organized futures markets are typically subject to large fluctuations. While the observation itself is perfectly correct, the inference that futures trading is the cause of the large variability in spot prices does not necessarily follow. In fact, economic theory suggests that variability in spot prices is the cause rather than the result of futures trading.
Large price movements provide incentive for speculators to assume the risks of buying a commodity when they believe it is cheap and to sell later when they hope it will be dear. By doing so, they should actually help to moderate the swings in the spot price. Speculation, of course, can exist apart from futures markets, but organized futures trading tends to encourage it by making it less costly (see analysis in preceding chapter). In sum, then, if futures markets encourage speculation, and if speculators tend to buy when prices are low and sell when they are high, and finally, if spot and futures prices are kept in line through arbitrage, futures trading should tend to stabilize spot prices, not to destabilize them.

If, however, speculators were to forecast poorly, they could affect spot prices perversely, increasing price variability. Friedman 1/ has argued that such tendencies could not persist for long, since destabilizing speculators would consistently lose money if they bought when prices were high and sold when they were low, and thus such speculation would be speedily eliminated from the market. However, destabilizing speculation could persist if a small body of professional speculators made money, while a continually changing group of amateurs regularly lost larger sums. The successful speculators would still be the ones with superior foresight, but they would use their forecasting skills to predict the psychology of the amateurs. In other words, it would be perfectly rational for the professionals to buy even when prices were too high, in terms of fundamentals, as long as

they could sell at even higher prices to the unsophisticated amateurs. One
cannot, then, on grounds of economic theory alone dismiss the possibility
that futures trading can have a persistent, destabilizing impact on spot
prices by making it easier for ill-informed investors to engage in specula-
tion. 1/ The issue can only be resolved empirically.

There have been a number of attempts to examine this question for
the agricultural commodities traded on futures markets. While caution must
be employed in transferring such findings to the different institutional
context of financial futures, the findings do provide evidence for longer
time spans than are available in any studies of financial futures. A common
approach is used in these investigations: the behavior of spot prices is

1/ See Harry G. Johnson, "Destabilizing Speculation: A General Equilibrium
Samuelson and Rakowski have developed a theorem which would seem to make
this welfare discussion of destabilization rather moot. In particular
they prove that should speculative activity be destabilizing, the losses
incurred by the speculators are more than sufficient to compensate the
rest of society for any loss of utility resulting from a worsening
allocation of resources. That is, ignoring the welfare of the speculator,
society will always prefer the presence of the speculator, whether the
effect on spot prices is stabilizing or destabilizing. Too much, how-
ever, should not be read into this theorem. It does not say speculation
in future markets could not open up additional avenues for fraud or that
slick salesman could not induce unwary individuals to take positions they
really do not want. Furthermore, the theorem ignores the problems of
bankruptcy, i.e., should the speculator be declared insolvent, his
creditors may suffer losses not accounted for by the theorem. See P.A.
Samuelson, "Proof that Unsuccessful Speculators Confer Less Benefit to
Society than their Losses," Proceedings of the National Academy of
Sciences, May 1972 pp. 1230-1233; James Rakowski, "Destabilizing
Speculation—Distinguishing the Speculators from the Non-Speculators,"
analyzed separately for periods in which futures trading has and has not existed, and then statistical tests are performed to see whether there are any systematic differences in the pattern of spot price movements in the two periods. Unfortunately, this procedure suffers from a major shortcoming in that it does not allow for the possible effects on spot prices of factors other than futures trading. As a result, observed differences in spot price behavior cannot be attributed with certainty to the existence of futures trading. But if futures trading does have a major impact on spot prices, it would at least be expected that signs of such an impact would be detected by this method.

Markets as disparate as live cattle, pork bellies, and onions have been examined along the lines outlined above. In the cases of live cattle and pork bellies, two studies by different authors using slightly different techniques both concluded that the size of purely random fluctuations in spot prices was significantly less for the periods in which futures trading occurred. 1/ In the case of onions, attention has been directed to the size of seasonal price variations. There is no evidence to suggest that these variations were greater before onion futures were banned in 1958, while there is some (inconclusive) evidence to suggest that they were smaller prior to

the ban. 1/ All of these studies suggest that futures trading may either have no effect on the variability of spot prices or may reduce that variability.

A recent article by Froewiss has applied the same general approach used in the agricultural studies cited above to the GNMA market. 2/ The pattern of weekly spot price movements of GNMA certificates for the two years prior to the start of futures trading is contrasted with the pattern for the succeeding two years. The statistical tests show that for the period since the start of GNMA futures trading, there has been significantly less purely random variability in the spot prices. However, that period has also seen the rapid maturation and growth of the GNMA market as well as Treasury's switch to a greater reliance on coupon financing (which deepened long markets in general); thus, it cannot be claimed that futures trading has been responsible for the greater week-to-week stability in the spot market. But, as in the case of agricultural commodities, there are no indications of destabilizing effects from futures.

Similar studies for Treasury bonds and bills are not available, but there is some indirect evidence to suggest that futures trading in these instruments should not destabilize prices in spot markets. Dale has found that the price movements in T-bill futures markets show no indication of the


kinds of swings associated with destabilizing speculation. 1/ He did, however, find that the futures market exhibited some price "sluggishness," i.e., futures prices tended to react too slowly to new information. However, the same tendency existed in the spot market. Similarly, Vignola and Dale concluded that one cannot reject the hypothesis that investors act as if they took the yield curve in the spot market as given, and priced T-bill futures accordingly. Rather than driving the spot market, then, the futures market may merely mirror the spot. 2/

All of the studies referred to so far have employed econometric techniques to analyze the behavior of spot and futures prices. While such an approach may be adequate to detect persistent trends in these prices, it may overlook isolated instances of aberrant price movements which, though not statistically significant, could still be of legitimate concern to regulatory authorities. One institutional peculiarity of futures markets that might be a source of such disruptive price behavior is the daily limit on price movements. If an investor is unable to close out a futures position because prices have already moved the daily limit, he may try to cover his futures position with an offsetting transaction in the cash market. The resulting additional price variation in the cash market would be destabilizing to the extent that it did not reflect the fundamental demand and supply for (spot) securities. So far Treasury bill futures prices

have never moved their daily limit, so the situation just described is only hypothetical for bills. Treasury bond futures have moved their daily limit on several occasions, but most market participants indicated in interviews that they did not believe there was a substantial spillover to the cash market. Some such spillover cannot be ruled out, however, because common forces affect both the cash and futures market. Yet it is unclear how such a spillover could be identified. Whatever factors caused futures prices to move their limit would presumably have led to large movements in the cash markets too, and there would be no way to tell to what degree those movements were exacerbated by the process described above.

To sum up, there does not seem to be any substantive evidence to support the view that futures trading in Treasury securities has had a generally destabilizing influence on the spot prices. Specific instances of a destabilizing effect are a possibility, however, and the potential for market manipulation must still be examined.

Trading Volume and Liquidity in the Spot Market

If market participants were to use futures to attempt to profit from expected price changes instead of taking positions in the underlying securities, trading volume in cash markets might be reduced. 1/ The magnitude of this diversion of trading activity would depend upon how many market participants use securities markets to profit from or to hedge against

1/ The term "cash" markets is used to encompass spot plus off-exchange "forward" transactions (including RP's and reverse-RP's).
anticipated trading gains. For such participants anticipated price changes can be speculated on or hedged against in one of two ways in the cash securities market:

a) By purchasing the spot security and holding it for an anticipated price rise which would exceed "costs-of-carry."

b) By executing a forward contract or forward-like transaction to buy or sell.

Many market participants are unlikely to find futures to be perfect substitutes for cash positions. For example, institutional and regulatory constraints restrain a shift from cash to futures markets for some market participants. These constraints include legal restrictions on permissible investments for banks, government entities, and pension funds, and pledging requirements such as Federal and State laws requiring public deposits to be backed by government securities. In addition, spot securities have utility as potential collateral for secured borrowing. While commercial banks—which are constrained by regulation—held approximately $671 million in Treasury bill and bond futures contracts on November 30, 1977 (the latest date for which such individual participant information is available) 1/, their cash holdings of Treasury securities on the same date totaled $98.5 billion. 2/

1/ Long plus short positions. Figure includes both positions classified as speculative and those taken as hedges. From Ronald B. Hobson, "Futures Trading in Financial Instruments," Commodity Futures Trading Commission, October 1978.

2/ All commercial banks total, Federal Reserve Bulletin.
Securities dealers, who commonly seek to profit from trading gains, held long and short positions in T-bill, T-bond, and GNMA futures totaling over $6,502 million on November 30, 1977. Many, if not most, futures positions taken by dealers, however, are routine hedges, spread trades, or arbitrage, and thus do not diminish cash market trading (i.e., they are taken in conjunction with cash positions and act to keep prices in the spot market in line with futures prices). Any diversion of activity from cash to futures is thus likely to occur on the part of individuals and nondealer traders. But many of the speculative futures positions established by individuals would probably not be taken at all in cash markets because such individuals are generally ill-equipped to assess the customer risk involved in forward trades and cannot obtain the favorable credit terms needed to establish cash positions.

It would be difficult to attribute any reduction in spot trading with certainty to futures trading, particularly in the absence of greater variation in spot prices. While some of the market participants interviewed noted that activity in the cash market for Treasury bills had been thin in some recent periods, it is not clear that this is attributable in developments in futures markets.

Diversion of Funds and/or Attention from Other Markets

A more general concern sometimes expressed is that the proliferation of interest rate futures contracts and markets will divert (1) the

---

1/ CFTC November 30, 1977 survey; out of total long plus short positions of $34.7 billion on that date.
funds and/or (2) the attention (and so liquidity and volume) devoted not just to the underlying cash markets for fixed-rate securities, but also to the stock market and venture capital markets. Some of these hypotheses appear to be based on the notion that there are a fixed number of speculative investors employing a fixed amount of capital, so that taking positions in the futures markets somehow reduces the funds available for other existing investments. However, care must be taken to distinguish between claims which result in physical capital formation or consumption (e.g., new stock and bond issues, business and consumer loans, etc.) and pure financial transactions such as the purchase of existing stocks and bonds, options, futures contracts and security loans. The latter place no demands on real production and so the net supply of funds available for investment in physical capital need not be diminished; funds are merely shuffled among market participants.

Cash does not necessarily change hands with futures when the contracts are opened. Existing assets in the investor's portfolio (such as T-bills) may be pledged as margin, or if cash is deposited, the broker and/or the exchange obtains the use of the funds for the duration of the contract. In neither case is there a reduction in the aggregate supply of loanable funds to underwrite real investment activity. 1/

1/ Since many brokers accept T-bills as collateral against futures contracts, it is possible that T-bill interest rates could be reduced if large numbers of investors posted them as margin (of course only to the extent that the required volume of T-bills exceeded what investors would have otherwise held).
An alternative view sometimes expressed is not that funds are diverted to or absorbed by futures markets so they are no longer available for financing real investment. Rather, it is argued that by taking large positions in futures, investors increase the risk to which their capital positions are exposed and may, therefore, adopt a more conservative attitude in deciding how to allocate their capital among investment alternatives.

For example, a wealthy owner who might otherwise have invested a significant proportion of his funds in high risk ventures may, once he has assumed large risk exposure in the futures market, decide to concentrate his investments in low risk securities such as Treasury securities or high grade corporate issues. If such a change in preference were to become reflected in the aggregate preferences of all investors, fewer funds would be available for risky investments, and interest costs charged in financing such projects would rise relative to rates on loans made for less risky projects. In this way, the mix of real investment projects undertaken in the economy might change, with funds being channeled more to large established firms than to new, small firms working aggressively to profit from innovation. While the logic of this contention is clear, there is no way to measure its significance.

The "diverted attention" hypothesis suggests that while the aggregate supply of loanable funds is not reduced by futures markets, individuals with a comparative advantage in information collection and financial decision-making will be induced to direct their energies toward
projecting the price of the commodity or security underlying the futures contract instead of projecting possible returns to real investment or returns to the underwriting of securities to finance real investment. This issue is similar to the issues surrounding the optimality of information collection, and as noted these have not been satisfactorily resolved. Grossman \(^1\) argues that since futures prices give away costly information for free, there will be a reduction in information collection activity on securities with futures markets and an increase in activity on those where the information is not revealed to all, i.e., markets without futures. On the other hand, if markets are imperfect so that not all of a speculator's costly information is fully revealed in futures and spot prices, then a futures market may divert information-gathering (speculative) attention from other markets.

Risks for the Banking System from Futures Trading

The management of interest rate risk is a major element in determining bank profits and losses, and banks are potentially heavy users of financial futures. Bank regulators—as well as bank directors, managers, and stockholders—have an interest in determining whether financial futures transactions pose an unacceptable threat to bank solvency.

Usefulness of Hedging. If a bank's spot position is hedged with a futures contract in the security, such as covering a Treasury bill inventory with Treasury bill futures contracts, the effectiveness of the hedge will depend upon the degree to which futures price changes offset spot price changes. A study by Dale and Vignola found that using the nearby maturity T-bill contract to hedge a spot position in deliverable Treasury bills resulted in a nearly perfect hedge, with two-week price changes in futures exhibiting an essentially one-to-one relationship to spot price changes. 1/ They found progressively weaker correlations and deviations from one-to-one relationships between futures and spot market price changes when more distant maturity contracts were hypothetically used to hedge spot Treasury bills. These results compare favorably with conclusions of studies of the usefulness of futures for hedging in commodities; these studies generally have found nearly parallel movement between spot and futures prices. 2/3/

1/ Charles J. Dale and Anthony J. Vignola, "A Note on the Usefulness of Treasury Bill Futures as Hedging Instruments, U. S. Treasury Department, 1978; Processed.


3/ An earlier study found only a weak relationship between T-bill futures and spot price changes. See L. H. Ederington and L. W. Plumly, The New Futures Markets in Financial Securities (Chicago: Chicago Board of Trade, 1976) pp. 84-97. These results, however, seem to have stemmed from (1) the use of data from the first 10 months of T-bill futures trading on the exchanges, and (2) the use of data on spot 90-day T-bills which cannot be delivered against T-bill futures since they mature before the delivery date of the futures contracts. Dale and Vignola used data for the 21 months after commencement of trading, and deliverable spot T-bill prices for their best results, and obtained poor results when using 90-day T-bill data and observations from the first 10 months of T-bill futures.
Thus under ideal circumstances—when a spot position is hedged with a futures contract for the same financial instrument—hedges seem likely to be effective. But because futures do not exist on all the financial instruments routinely purchased and sold by banks, many hedges are likely to be cross-hedges, where a spot transaction in one financial instrument is covered with a future on a different financial instrument.

A routine use of interest rate futures by a bank would involve a direct offset or hedge to a particular investment or portion of its investment portfolio; although, as indicated below, such a "hedge" reduces interest rate risk only when considered in the context of the bank's overall portfolio. For example, a bank wishing to limit interest rate risk could purchase a futures contract to deliver securities held in its portfolio. If interest rates then rose, profits on the futures contract would be used to offset the loss in the portfolio. Depreciated securities could then be sold at a loss without impairing current earnings. The sale proceeds could be reinvested at higher yields to insure improved future earnings. Failure to sell the depreciated securities would have the effect of improving current earnings at the expense of future earnings. On the other hand, if interest rates were to decline, even though the short futures contract would then be closed out at a loss, the loss could be offset by the sale of portfolio investments at a profit. But sale proceeds would have to be reinvested at lower prevailing yields and would thus impair future earnings.

Interest rate futures contracts may also be used to reduce the negative impact of interest rate fluctuations on fund management strategies.
Take the example of a banker who anticipates rising interest rates. He may attempt to increase the bank's ratio of variable rate assets relative to variable rate liabilities and to lock in fixed rate source funds at current rates. This would probably be done by extending liability maturities and simultaneously shortening maturities on fixed-rate earning assets. Under this arrangement, the banker would hope that the spread between interest earned and interest paid would widen as rates rose.

Interest rate futures could then be used to limit the level of interest rate risk associated with the funds management commitment by buying a futures contract to take delivery of securities. If, contrary to expectations, the general level of interest rates went down, the futures contract could be sold at a gain which might offset the losses on the funds management commitment.

Over the long run, yields on short-term financial instruments are highly, but not perfectly, correlated. Hence using a futures contract on one instrument (say a Treasury bill) whose price changes are assumed to be related in a stable way to its underlying security to hedge a spot transaction in another instrument (say a CD) will usually not result in a perfect hedge—the gain or loss on the futures transaction will likely not exactly equal the gain or loss on the spot transaction. Moreover, several participants interviewed commented on experiences with opposite price movements on cross-hedges with money market instruments and Treasury futures. Unfortunately, no studies of the effectiveness of cross-hedging in financial futures have been made to date. Losses on both futures and spot
positions in carefully chosen cross-hedges are possible, but are likely to be infrequent.

**Futures Trading and Bank Risk.** One approach to the supervision and control of bank futures trading has been to see that each futures contract in a hedge is paired to a specific spot position. In this regard, the guidelines to National banks, recommended by the Office of the Comptroller of the Currency (OCC) prohibit unmatched futures positions but permit anticipatory and general (non-specific) hedges. National banks are required to apply to the OCC for permission to engage in futures transactions. The application process is designed to encourage the management of the applicant bank to coordinate the objectives, policies, practices, and procedures of the various internal departments which will be responsible for monitoring futures activities. A great deal of stress is placed on the applicant's understanding of what they plan to do, why they are doing it, and how they plan on controlling the risks associated with the program.

Accounting policies are reviewed for appropriateness. Internal audit programs are studied to determine if the scope and frequency of audit coverage are adequate for the nature of the contemplated activities. Systems

---

of internal control are reviewed to determine if procedures and means to apply them have been established which can reasonably be expected to allow bank management to prevent and detect unduly speculative activities and unauthorized purchases or sales. OCC's Washington staff also reviews futures recordkeeping systems to assure that audit trails are maintained. The abilities of each bank's management and the overall condition of the bank are major factors in determining the appropriateness of the futures activity and the acceptable level of risk each bank can support.

Futures transactions do not exist in isolation from financial transactions subject to interest rate risk occurring elsewhere in the bank. Banks can take positions in futures which have no relation to any individual cash market transaction yet reduce the institution's interest rate risk. And certain futures positions may be taken and paired to specific cash market positions such that the bank's exposure to interest rate risk is increased. Many commercial bank cash market transactions are already hedged; many short-(long) term bank liabilities are matched by short-(long) term assets on the other side of the balance sheet. For example, a bank facing increased borrowing costs on a 90-day CD rollover may in fact be fully hedged if that CD is matched by a 90-day asset whose yield will rise with market rates upon reinvestment at maturity. A bank executing a futures contract to cover a transaction already matched in maturity on the other side of its balance sheet is not executing a hedge but instead increasing its exposure to interest rate risk. Conversely, the risk of any open or naked futures position may be offset by a cash market transaction undertaken
as part of the bank's normal business operations. Thus, the risk of a futures position must be judged against the interest rate risk of the bank as a whole (including all its subsidiaries) and not relative to any single transaction (or half of a transaction).

Futures and Bank Insolvencies. Regulators may be concerned that futures trading involves a risk of losses (whether through inadvisable trading or unauthorized trading) that is unacceptably high relative to the risks banks currently take in cash markets. To date no commercial bank appears to have failed or required supervisory attention as a result of involvement in financial futures markets. Solvency has been threatened, however, by trading in forward and standby contracts for GNMA securities in some banks, and injudicious trading in commodities futures was the proximate cause of the failure of the foreign banking subsidiary of a large U. S. bank (the United California Bank in Basel, Switzerland).

Supervisory problems with forward and standby trading have arisen in banks under the jurisdiction of all three Federal bank regulatory agencies. The Office of the Comptroller of the Currency has had to respond to problems in markets for the forward delivery of securities in over 25 National banks. The FDIC has identified problems in approximately 15 banks. Imprudent forward or standby positions have drawn Federal Reserve supervisory attention in four State member banks. In most instances these problems have been in small banks and have involved positions whose potential trading losses were excessive relative to banks' ability to absorb those losses.
The case of a $24 million asset bank with a $7 million forward position, or that of a $33,000 loss on a GNMA standby contract in a bank with $53,000 in 1977 earnings are not atypical of the problems encountered by regulators.

The inadvisably risky forward and standby positions taken in these banks appear to have been the result of various combinations of uninformed trading, poor management control, and unauthorized trading. In some cases misrepresentation and unethical sales practices by securities dealers may have initiated the difficulties. Some problems have arisen as the result of the failure of small securities dealers, leaving banks with unfilled forward contracts, but these failures served to highlight the regulatory problem. 1/

Caution should be used in reaching conclusions about the risks involved in bank futures trading on the basis of difficulties experienced in the GNMA forward market. Futures and forward contracts, while analytically similar, differ in important institutional respects. The credit risk present in forward contracts—is diminished in futures markets through the central role played by exchange clearing corporations and through daily...

1/ In a well-publicized case, the SEC has alleged that the Fort Lauderdale, Florida firm of Winters Government Securities Corp. engaged in illegal sales practices in making contracts for GNMA with banks. These practices, it is charged, included misrepresentations, unauthorized contracts with customers, recommendations for unsuitable speculative transactions, and "churning"—engaging in frequent purchases and sales with customers to increase the firm’s commission income. Winters Securities failed in May 1977 after many customers refused delivery on unprofitable contracts. See F. R. Rustin, "Securities Firm's Flop Reveals Big Risks Run by Some Small Banks," Wall Street Journal, 1977. See also U. S. D. C. Southern District of Florida Civil Action No. 77-6345-CIV-DLK.
marking-to-the-market. This forces the recognition of price movements as they occur (rather than on a lump sum basis as in the case for forward contracts, where gains or losses are realized only at settlement).

Unfortunately, there is currently no authoritative literature that deals with the proper accounting for interest rate futures. Various banks and CPA's advocate accounting treatment based on principles articulated in Financial Accounting Standards Board Statement of Financial Accounting Standard No. 8 (FASB #8) which seemingly permits the deferred recognition of loss or gain on futures contracts if the purpose is to hedge an identifiable banking commitment. Deferred accounting treatment as indicated in FASB #8 would eliminate current income statement recognition of increment losses. Moreover, a number of bank accountants advocate the reporting of the gain or loss on specific hedge contracts as adjustments to interest income or interest expense. This type of loss recognition would of course eliminate any specific income statement recognition of the results of futures activities and the self-regulatory benefits accruing from separate accounting recognition of futures gains or losses. The bank regulatory agencies have dealt with the appropriate reporting treatment for bank futures activities by requiring regulatory report filings to show gains or losses on futures activities under the captions other income and/or other expense. Regulatory report instructions require futures losses and gains to be recognized when sustained. However, many banks have chosen to prepare their published financial statements in accordance with FASB #8.
Are Additional Safeguards Needed to Protect Uninformed Users of Futures?

One of the salient characteristics of futures markets is the large amount of "leverage" involved. For example, an initial margin of $800 gives an individual a claim on $1,000,000 of Treasury bills for future delivery. As a result, the potential is great both for large gains and large losses. The fear naturally arises that unsophisticated investors, whether individuals or institutions, may easily meet the margin requirements to trade financial futures but not appreciate the degree of risk to which they are exposed.

In general it is in a broker's interest to make sure his customers are aware of the risks involved in futures trading. The brokerage firm is responsible to the exchange—either directly or through a clearing member—for the contracts of its customers. Furthermore, through the "mark-to-market" procedure described earlier, losses are generally recognized and covered daily. That is, the brokerage firm must cover its margin calls with the exchange daily, and also requires its customers to maintain timely margins.

The institutional structure of futures markets, then, includes built-in safeguards which serve to protect uninformed investors, safeguards which are lacking in the cash forward markets. It is no accident that the recent reports of small credit unions and savings and loans becoming overextended in GNMA\textsuperscript{s} have involved not the GNMA \textit{futures} on the Board of Trade but \textit{forward} contracts in GNMA\textsuperscript{s}. 
Still, there always is a need to be concerned that small investors are adequately informed before they enter into risky undertakings. In this regard it is important that brokers be required to make clear, by a formal statement of disclosure, that a Treasury future is not backed by the U. S. Government. The futures contract is with an exchange--whose credit may be excellent--but not with the Treasury. An explicit statement that Treasury futures are not Treasury obligations may help to ensure that failures in the futures market would have a minimal adverse impact on the integrity of the cash market for Treasury securities.

Some market participants have indicated that they were contacted by over-zealous salesmen from brokerage houses who were promoting futures actively but appeared to have an insufficient understanding of such transactions. Other participants described situations in which futures salesmen had recommended trades which would have been inappropriate for their institutions. While ill-informed, high pressure tactics of this type do not at present appear to be a serious problem, they would not be a surprising outcome where one market is expanding rapidly, at a time when profitability and employment in other financial markets have been steady or shrinking.

Nevertheless, it seems appropriate for the CFTC and the exchanges to explore approaches that could strengthen the surveillance of brokerage firms. Periodic review of sales and marketing techniques could contribute to this end. Also, it would be helpful for the CFTC and the exchanges to initiate educational programs designed to inform the public about the risks involved in highly "leveraged" futures transactions--since
these risks may not be sufficiently emphasized by private firms and individual salespersons. Such a program could also help to explain exchange emergency procedures and the conditions under which they would be activated.

Further growth of Treasury futures markets and an expansion of the maturities specified in contracts make it highly probable new participants will be attracted. The financial positions of some may not be especially strong. While existing safeguards and procedures, including the taking of margin and marking-to-market, appear to be adequate protection for those concerned in most cases, some brokers have independently established customer suitability standards and require larger margins on the riskier accounts for which they undertake transactions. Additional efforts in this direction—and perhaps the development of more formal customer suitability standards—might be encouraged.

Potential for Market Manipulation or Distortion

For the effective functioning of financial futures markets the deliverable supply of the underlying securities must be adequate to assure that speculators will not be able to manipulate their prices. The importance of this condition is acknowledged in the CFTC's guideline #1 for contract market designation which states that:

...the contract terms and conditions... (must) result in a deliverable supply which will not be conducive to price manipulation or distortion, and that such supplies can reasonably be expected to be available to
the short trader and saleable to the long trader at their economic value in normal cash marketing channels.

Whether this condition is met for any given contract will depend not only on the supply of securities readily available for delivery but also on the extent to which holders of long positions wish to take delivery. Deliveries actually taken have tended to be higher for Treasury futures contracts than is typical for nonfinancial futures. ¹/ Higher deliveries on Treasury futures could thus increase the potential for manipulation.

A critical test of the effectiveness of any financial futures market is thus whether it has shown significant vulnerability to price manipulation. In describing such situations, terms like "corner" and "squeeze" frequently are used. According to the CFTC Glossary, a "corner" means controlling enough of a commodity so that its price can be manipulated, while a "squeeze" refers to a situation in which those who are short cannot repurchase their contracts except at a price substantially higher than the value of the contract in relation to the rest of the market. These definitions are inexact and do not necessarily have any legal significance.

When asked about the vulnerability of existing and proposed futures contracts to the risk of a corner, market participants indicated that they could not rule out this possibility for some contracts in certain circumstances. They did not distinguish between squeezes and corners, as described above, but addressed themselves more generally to whether

¹/ Deliveries on Treasury bill futures and Treasury bond futures are shown in Table 4 below.
cash market supplies would become available in the event deliveries in
the futures market were high. However, they asserted that the chances
that a corner would be attempted were generally low and that the odds
that such an effort would actually succeed were even lower.

Three-month bill contract. Comments from those interviewed
regarding possibilities for cornering focused primarily on the 3-month
Treasury bill contract. Because delivery on 3-month bill futures can be
satisfied only with a single maturity, the supply of securities available
to cover any delivery is smaller than for the Treasury bond contract--on
which any outstanding issue with at least 15 years to maturity (or first
call) can be delivered.

Recently, the outstanding volume of such bonds held by investors
other than the Federal Reserve and Treasury trust accounts totaled nearly
$19 billion. The outstanding supply of deliverable 3-month bills is,
created in two different auctions--first as a 6-month issue, and
then (3 months later) as a 3-month issue. The total issue of 3- and 6-
month bills sums to roughly $6 billion. However, substantial amounts of
most issues are awarded to the Federal Reserve, foreign investors, and
noncompetitive bidders. Under the assumption that these three categories
of bill holders would not be likely to sell bills to shorts in the futures
market, the supply of 3-month bills actually available for delivery on
futures contracts averaged slightly less than $1 billion in 1977 and
$1.1 billion in 1978. The available supply of 6-month bills at the time
of auction (which would be less readily available in the market three months later) averaged $1.6 billion in 1977 but only $1.1 billion in 1978. Deliveries actually made on maturing bill futures contracts amounted to roughly 10 per cent of the available supply of 3- and 6-month bills in 1976, 4 per cent in 1977, and 15 per cent in 1978 (see Table 4).

If a speculator decided to try to corner the deliverable supply of 3-month bills against which futures were being traded, he would probably move on several fronts to build a long position. In addition to establishing a sizable long position in the futures contract, he would probably bid aggressively in the cash auction of the new deliverable issue, buy the bill on a "when-issued" basis from others who were bidding in the auction, and acquire the bill in the secondary market from holders who had obtained it when previously auctioned or traded as a 6-month bill. To bolster his chances for success, he might even want to take a cash position in other bills with immediately adjacent maturities. 1/

A number of market forces would be operating against any speculator who attempted to implement this cornering strategy. In the first place the bulk of those who establish positions in a futures contract close them out well in advance of the contract delivery date, so that

1/ One can postulate other possible scenarios that would produce a cornering result. For example, one or two operators holding a large long position in futures might find it desirable to play the same waiting game as one or two dealers that held virtually all of the deliverable supply of the cash bill. The marketing strategies of these two groups could produce a pricing result similar to that of a bilateral monopoly even though no overt collusion was involved.
Table 4
"Deliverable" Bills, Deliveries, and Per Cent Deliveries, Under T-Bill Futures Contracts ($ Millions)

<table>
<thead>
<tr>
<th>Contract Date</th>
<th>Deliverable Bills</th>
<th>Deliveries</th>
<th>Deliveries as Per Cent of Deliverable Bills</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3-Month</td>
<td>6-Month</td>
<td>Total</td>
</tr>
<tr>
<td>March 79</td>
<td>842</td>
<td>1163</td>
<td>2005</td>
</tr>
<tr>
<td>Dec. 78</td>
<td>1608</td>
<td>981</td>
<td>2589</td>
</tr>
<tr>
<td>Sept. 78</td>
<td>887</td>
<td>1019</td>
<td>1906</td>
</tr>
<tr>
<td>June 78</td>
<td>649</td>
<td>1305</td>
<td>1954</td>
</tr>
<tr>
<td>March 78</td>
<td>663</td>
<td>1463</td>
<td>2126</td>
</tr>
<tr>
<td>Dec. 77</td>
<td>865</td>
<td>1805</td>
<td>2671</td>
</tr>
<tr>
<td>Sept. 77</td>
<td>1259</td>
<td>1582</td>
<td>2841</td>
</tr>
<tr>
<td>June 77</td>
<td>957</td>
<td>1470</td>
<td>2427</td>
</tr>
<tr>
<td>March 77</td>
<td>710</td>
<td>1573</td>
<td>2283</td>
</tr>
<tr>
<td>Dec. 76</td>
<td>661</td>
<td>1263</td>
<td>1924</td>
</tr>
<tr>
<td>Sept. 76</td>
<td>671</td>
<td>1389</td>
<td>2060</td>
</tr>
<tr>
<td>June 76</td>
<td>688</td>
<td>1434</td>
<td>2122</td>
</tr>
<tr>
<td>March 76</td>
<td>980</td>
<td></td>
<td>34</td>
</tr>
</tbody>
</table>

Deliverable bills consist of total issue size minus Federal Reserve, foreign and noncompetitive purchases.
on most contracts no delivery is required. Moreover, some operators still holding open short-positions close to the contract delivery date will have arranged in advance for delivery from other sources—for example, by making forward contracts off the exchange.

If the price of the deliverable issue begins to rise in response to the actions of the cornerer, other holders of the issue are likely to sell in order to switch to adjacent lower priced, higher yielding maturities. Even if the holder of a long cash position thought that the bill might experience a heavier demand in the days just prior to contract expiration, he would still have an incentive to sell before delivery, because once delivery is made the issue is likely to move back in line with adjacent maturities. At the same time, the change in relative prices is likely to deter some potential buyers from acquiring the cash issue—encouraging them to shift instead to adjacent lower-priced maturities. Even if no adjacent alternatives are readily available, investors may be able to arrange a reverse-RP with the exact maturity date desired. In this way, they can use more distant Treasury maturities as collateral. Finally, any speculator seeking to take the long cash position required to implement a cornering strategy would need ready access, at a reasonable interest rate, to a large volume of borrowed funds—a condition which only a few major market participants can satisfy.

In the last analysis, the relative vulnerability of the 3-month bill contract to a cornering strategy will depend importantly on the tenacity with which other holders of the deliverable issue continue to hold it, even
after its price has risen relative to those of adjacent issues. While the overall size of bills eligible for delivery against futures ranges to $6.3 billion, as noted earlier, a major part of this total is often held by investors that are not very sensitive to relative interest rate changes. For example, the Federal Reserve gears its investment to the special needs of bank reserve management and does not usually respond to shifts in market rate spreads. Also, U. S. Treasury investment accounts and many foreign official accounts are relatively unresponsive to changing rate spreads in their investment strategies. Finally, many U. S. State and local governments and private investors acquire particular bill issues because they mature on or close to dates that are related to special needs for cash. Since other maturities serve these needs less effectively, such investors are said to be reluctant to accept any other issue, even when relative prices change significantly.

It is always difficult to know in advance how much investor preferences for a certain bill will inhibit the effectiveness with which the market arbitrages spreads that may develop between the rate on a particular bill and rates on other bills. However, dealers, from their regular contacts with customers, can usually tell which bill issues are likely to be more closely held than others. For such bills, dealers report that the share which can be readily bid away from cash holders to cover open short positions in bill futures may represent a fairly limited part of the total.

Interviews with market participants produced a wide range of opinion as to whether market manipulation is possible in the Treasury
securities market, and whether any risk of such manipulation is increased by the existence of the futures market. Most respondents indicated that a squeezing of the market with or without the aid of the futures market was a potential problem. Some felt that trades in the cash market—which would include forward and when-issued transactions, as well as bidding in the auction and trades in the secondary market—provided ample leeway to build a corner. While the futures market was thus not viewed as necessary to achieve a corner, participants nevertheless believed that it provided an additional means of facilitating this objective.

As noted earlier, in some Treasury bill auctions over the past year allotments to the Federal Reserve and foreign official accounts have absorbed all but $1 to $1.5 billion of the new 3-month issue, and in some auctions allotments to smaller bidders on a non-competitive basis have preempted another several hundred million dollars. Although the Treasury has followed a rough guideline of allotting no more than 25 per cent of any new bill offering to a single competitive bidder, 25 per cent of a $3 billion issue amounts to $750 million. This would have represented 75 per cent of the supply available to other than official accounts in the auctions noted. Thus, if in addition to the 25 per cent allotment in the auction, a dealer also took a sizable long position in the futures market, bought the new 3-month issue on a when-issued basis from other bidders in the auction, and had previously acquired a long position in the outstanding bill (auctioned originally as a 6-month issue), he might well be able to build a long position in the new bill that actually exceeded total auction awards to investors other than the Federal Reserve and foreign official accounts.
Interviews with market participants suggested that dealer positioning strategies of this kind may have succeeded in squeezing the secondary market price on one or two new bill issues during 1978. While market estimates of the resulting distortion in yield in those operations range from 10 to 40 basis points, such judgments cannot be effectively tested, due to the many other special factors that were influencing supply-demand relationships in the cash bill market at the same time. It is perhaps worth noting that observed spreads between yields on the 3-month issue and immediately adjacent maturities did not widen to these proportions.

One-year bill contract. Like the 3-month bill contract, deliveries under the one-year bill contract can be satisfied with only one maturity. However, this deliverable supply is provided through a single auction—the announced size of which may be adjusted significantly with only ten days notice.1/ Like the 3-month bill, a large share of the new issue supplied in the 1-year auction is pre-empted by bids from the Federal Reserve and foreign official accounts. Net new supply available to others on competitive bids typically runs around $1-1/2 billion.

If there were an active market for one-year bill futures, these inherent limits on the deliverable supply might be cause for concern.

1/ The vulnerability of this contract to unexpected changes in the 1-year bill auction was rather dramatically illustrated by the IMM's experience with the March 1979 contract. When Congressional delay on extension of the debt ceiling legislation required the Treasury to postpone the 1-year bill auction, the CME had to introduce standby procedures for alternative settlement. While delivery on the contract was finally accomplished (with some delay) after the debt ceiling was extended, trading in the contract had to be restricted to transactions for closing out positions.
However, in practice the substantially greater liquidity of 3-month bill futures—whose contract dates overlap 1-year bill futures—has apparently encouraged participants to operate in 3-month instead of 1-year futures contracts. This general lack of interest in the 1-year contract—together with the limited deliverable supply—has led some market participants to question whether the contract should be continued.

**Treasury bond futures.** Possibilities for the manipulation of

Treasury bond prices through joint action in the cash and bond-futures market appear to be minimal given the sizable number of issues deliverable under the existing contract. In adopting this "market-basket" approach to deliverable supply, however, the bond contract creates an associated uncertainty as to which of the available issues is likely to be delivered. Thus, it sacrifices some of the usefulness of the contract as a hedge. Nevertheless, since the structure of bond yields on maturities beyond 15 years is generally quite flat, the reduced effectiveness as a hedge is not so great as it would be for contracts in the intermediate and short-term sectors of the maturity spectrum, where the yield curve is steeper and more variable.

There are some problems with the existing bond contract which stem, in part, from the formula used for pricing. Since the basic trading unit of the contract is an 8 per cent bond with at least 15 years to maturity (or first call), prices of outstanding issues that have different coupons have to be converted to the 8 per cent basis. Under this arrangement certain callable bonds selling at discounts are, at times, the most advantageous to deliver. This is the case because the exchanges' factor conversions for bonds
with other than 8 per cent coupons are established on the basis of yield to call-date, whereas spot investors (and the market) take account of the possibility of the maturity extending beyond the call date. However, other factors, such as the preferential capital gains tax treatment of maturing bonds that have been purchased at a discount, also tend to complicate the market's pricing of certain bonds. As a result, the participant on the long side of the bond futures contract will have some difficulty predicting which issue will be delivered at the expiration of the contract.

_Treasury note contracts under consideration._ There is a range of suggested approaches to the delivery question for the note contract currently awaiting CFTC approval. Under the COMEX proposal for a 2-year note contract only a newly-auctioned 2-year note would be available for delivery. Under the IMM proposal for a 4-year note contract, any security with a maturity falling between 3-years and 9-months and 4-years and 3-months would be eligible for delivery. Under the CBOT and AMEX proposals for note contracts, any issue with a maturity between 4 to 6 years and 5 to 7 years, respectively, would be eligible for delivery.

It is difficult to judge in advance how vulnerable to squeezes such note contracts might be. Since the only issue deliverable on the proposed 2-year contract would be the newly-auctioned 2-year note, this contract would be most vulnerable, particularly if the Treasury elected to cut back the size of its offering. Total private competitive awards of the 2-year issue in recent auctions have averaged less than $2 billion.

[1/ The formula for factor conversion is described in detail starting on page 35 of Appendix B.]
The deliverable supply for the other proposed note contracts would depend importantly on regular additions to the total note supply through auctions of 4, 5, and 7-year issues, although outstanding securities carrying maturities within the specified ranges would also be eligible for delivery. To judge the importance to deliverable supply of the available outstanding maturities, one would need to know how much prices of these issues would have to rise in the secondary market before current holders would be willing to sell to operators with short positions in the futures. If the elasticity of investor responses to changes in relative prices is fairly low, the possibilities for price manipulation through joint action in the futures and cash markets would be greater.

At this point one can only guess how much relative prices on the deliverable issues might have to rise to flush out the supply needed to meet demands for delivery. Generally, investors appear to be more locked-in to portfolios of intermediate-term Treasury securities than they are for bills. Such investor behavior is affected by prior changes in yield levels that may intensify investor inhibitions arising from such considerations as accounting conventions, or management objectives that penalize the realization of capital losses. However, the importance of such institutional constraints on the overall responsiveness of investors to changing rate spreads can be easily exaggerated, since there is typically some group of investors at the margin that is not inhibited by such considerations.

One technical aspect of delivery would clearly be more difficult for the proposed note contracts than it has been for the bond contract.
Because issues deliverable on note contracts would fall at the part of the maturity spectrum where the yield curve often changes shape and hence is subject to wide fluctuation, the market-basket approach to deliverable supply would be more troublesome than it has been for the bond contract. In addition to major uncertainties regarding the particular issue that might be delivered, the secondary market value of the deliverable issue might be quite different from what the holder receiving delivery had expected. For these reasons contracts with market-baskets of securities for delivery would lose some of their attractiveness as hedging devices.

The Market-Basket Approach to Deliverable Supply

As indicated in the previous section, widening the range of securities deliverable under a futures contract may prove to be a solution to the problem of inadequate deliverable supply. Moreover, such a solution may become especially attractive if proliferation of futures—that is, duplicative contracts on several exchanges, or multiple contracts that cover a wider range of instruments—increases the potential for a shortfall in deliverable supply. However, the market-basket approach to deliverable supply entails some disadvantages. In addition to the possible reduction in the effectiveness of the contract for hedging already noted, it may increase actual deliveries because shorts find it cheaper to buy and deliver alternative maturities rather than execute an offsetting contract to close out their position.

There is some evidence on the potential problems of the market-basket approach in markets for nonfinancial futures. For example, before
1940, the Kansas City Board of Trade permitted delivery of only hard wheat on its futures contracts. In 1940, however, the contract was changed to a market-basket concept, wherein soft wheat was also permitted for delivery. The new contract worked well until 1953, when soft and hard wheat prices diverged to the point that the futures contract became essentially a soft wheat contract. In two months time open interest in the Kansas City wheat contracts abruptly dropped by one half.

Holbrook Working studied the situation at that time \(^1\) and demonstrated that the market-basket concept failed (when soft wheat became the deliverable item) because millers using the contract as a hard wheat hedge no longer found the contracts useful for hedging. The Kansas City Board of Trade then started trading a hard wheat contract, and subsequently dropped the market-basket contract. Currently, the Kansas City Board of Trade as well as the Minneapolis Grain Exchange have single deliverable grades which appeal to a very specialized group of hedgers. However, there are several successful market-basket contracts currently traded, such as the Chicago Board of Trade's wheat contract.

The CBOT's Treasury bond contract also seems to be a successful market-basket instrument. As indicated earlier, however, its success may be due in large measure to the yield characteristics of long-term bonds, where the yield curve is relatively flat and the various bonds are mathematically almost equivalent in their price responsiveness to changes in the level of

interest rates. For short and intermediate term securities, the equilibrating characteristics which make bonds close substitutes are not present, and the result is a considerably different set of price characteristics. 1/

Thus, market-baskets in intermediate and short-term securities may not be as viable as those in long-term securities and may not necessarily resolve the deliverable supply problem.

Proliferation of Contracts

Several proposals for new contracts now pending before the CFTC would be either similar to or the same as contracts already trading on other exchanges or proposed for other exchanges. An obvious question is if all these contracts were permitted to trade simultaneously, would the total volume of trading expand significantly, or would a roughly equivalent aggregate volume simply be divided among the various exchanges--leading to lower volume for each. Also, there is concern that proliferation of contracts would increase the potential for market manipulation either by increasing demand for deliveries or by reducing the effectiveness of the exchanges' surveillance of market activities.

Exchange officials familiar with other situations where essentially duplicative contracts were allowed to compete on more than one exchange assert that the proliferation of contracts, taken by itself, would not be

likely to produce much expansion in total activity or much increase in the demand for deliverable supply. They argue that customers would probably channel their business to the exchange that is expected to be most active and provide the greatest liquidity. As this process continued, they would expect one exchange to become dominant in the contract and ultimately to force the other to withdraw. They note that historically duplicative contracts in commodities such as metals have had high failure rates, and that in the GNMA market where essentially duplicative contracts are now trading the more established contract has remained dominant.

Cootner 1/ studied duplicative contracts and concluded that in the absence of special features that differentiated particular contracts many of the competing contracts could be expected to fail. Holbrook Working's study of commodity contracts 2/ further suggests that hedging businesses tend to concentrate in a single futures market and that smaller exchanges can exist only by offering hedgers some advantage, such as a specific contract feature not available on the large exchange. Examples which support these contentions are the failures of the Chicago beef carcasses contract and the New York soybean contract.

Similar contracts on more than one exchange may be manageable where transportation costs are high and localized products exist. However, since transportation costs are so small for Treasury securities, essentially

1/ Paul Cootner, op. cit.
2/ Holbrook Working, op. cit.
duplicative futures contracts in such issues may prove to be less viable. Indeed, hedgers have stated that the 3-month T-bill contract may be used to accomplish anything that the 1-year bill contract can accomplish, and this may help to explain the rather poor reception of the 1-year contract. Similarly, the first GNMA contract on the Chicago Board of Trade has remained the dominant contract despite the entry of a new exchange with an improved contract designed to overcome the shortcomings of the old one. To minimize problems for 3-month bill futures, the proposed AMEX contract calls for delivery of bills for different months than those specified by the IMM contract. However, the IMM currently has the right to list contracts in any months they choose, so approval of the AMEX contract as written might still leave open the possibility for congestion.

Impact on Treasury Debt Management

A key purpose of the Treasury—Federal Reserve study of the futures market has been to judge whether granting of the pending requests to establish additional contract markets for delivery of Treasury issues might exert unacceptable constraints on the flexibility of Treasury debt management. The Treasury futures contracts now trading or proposed are all based on a presumption that supplies of cash market issues with requisite maturities will be readily available to meet any demands for delivery that develop from market participants holding long positions in the futures. In other words, the exchanges promoting these contracts apparently believe that the criteria specified in CFTC Guideline #1—"...that the terms and conditions (of the
contract) will result in a deliverable supply which will not be conducive to price manipulation or distortion..."—will in fact, be effectively satisfied.

To help insure that this condition is met, the maturity ranges of securities eligible for delivery under some of the proposed note contracts have been defined to include a market-basket of outstanding issues. 1/

In addition, the specified maturity ranges include at least one of the new issues that the Treasury had been offering on a regular basis at the time the proposed contracts were submitted. For example, when the ACE 5-7 year note proposal was submitted (October, 1978), the Treasury had been issuing new 5-year notes in April and October, and 7-year notes in February and August. Both of those offering patterns have since been interrupted, and the Treasury has not issued any 5 or 7-year notes since April 1978 and August 1978 respectively. Inclusion of a recently auctioned issue in the deliverable supply is significant because such issues are much more likely to be readily available for delivery against futures than seasoned securities that have been outstanding for extended periods.

In any new security offering, a sizable share of the total will be taken by dealers and other market professionals who plan to redistribute the issue to more permanent investors at a small yield spread. When a new

1/ The CBOT 4-6 year note proposal and the ACE 5-7 year proposal both provide for delivery from a basket of outstanding securities with maturities ranging over a period of 2 years, and the IMM 3-3/4 - 4-1/4 year proposal provides for a 6-month basket. But the COMEX 2-year proposal is wholly dependent upon new 2-year note issues by the Treasury.
issue is part of the deliverable supply for a futures contract, any market participant with a short position in the futures is likely to assume that, if necessary, he can acquire that issue at a reasonable price, either in the auction or in the secondary market to satisfy his delivery requirement. If the only securities deliverable against his contract are issues that have been outstanding for an extended period, however, he might find it difficult to cover his short position without forcing a significant rise in their prices. Professional positions in such issues tend to be minimal, and many permanent holders are reluctant to sell. Consequently, unless the range of outstanding maturities eligible for delivery provides a sizable market-basket of possibilities, the changes of the deliverable supply being squeezed or cornered is greater when no newly auctioned issues are available.

If the CFTC were to authorize the various requested contracts in Treasury note futures, the market would undoubtedly begin trading them on the presumption that the Treasury's current pattern of note offerings will be continued, with new issues being offered at the regular monthly or quarterly intervals that have become accepted practice. Unfortunately, since the note contracts would begin to trade far in advance of their delivery date, the market would not know until about a week before delivery on the futures whether the expected new note would in fact be offered on its usual cycle date or, if offered, what size the issue would be.

The fact that the market trades futures in anticipation of cash supplies of securities that may not actually be outstanding at the maturity of the futures contract poses an obvious dilemma for the Treasury. If it
were considering a debt management action that would abruptly reduce the supply of securities eligible for delivery against futures contracts already being traded, it would have to assess the risk that this decision might trigger a significant disruption of the futures and cash markets. \(^1\) In situations where unexpected debt actions of this type did pose the possibility of market disruption the Treasury would clearly have to decide whether it was justified in taking this risk.

When these general Treasury debt management concerns were expressed to the CFTC and to officers of the commodity exchanges responsible for approving and developing proposed Treasury futures contracts, they responded with several questions and observations. First, they noted that the Treasury had expended considerable time and effort developing the regular auction cycles in coupon securities that are now an integral part of Federal debt management operations and asked why the Treasury would want to modify these obviously effective operating techniques.

Second, they asked why, in situations where a potential shortage of deliverable supply against a futures contract appeared to be creating a strong demand for the part of this supply that was about to be offered in a cash auction, would the Treasury not want to expand the size of the auction?

\(^1\) These concerns were recognized by Congress in Public Law 95-405, which requires the CFTC to consider the effect of contract market designations concerning Government securities on the "debt financing requirements of the United States Government and the continued efficiency and integrity of the underlying market for government securities."
and take advantage of what would likely be a relatively low borrowing cost.

Third, they suggested that market participants would not often be surprised by Treasury debt management decisions, because the market typically follows Treasury financing prospects closely and will usually have a fairly good perception of the option's available for debt management.

Fourth, they noted that the need to adjust to unexpected developments is a recognized fact of life in financial markets. Even before the advent of futures trading unexpected developments, including unanticipated Treasury debt management decisions, had occasionally caught Government securities market participants by surprise. While the yield adjustments were sometimes painful to particular individuals, they generally did not create serious market disruptions.

Finally, they noted that all of the exchanges have specified rules and procedures to deal with emergency situations in which the prospective supply deliverable against a maturing contract is abruptly and unexpectedly reduced. It was indicated that the exchanges should be expected to apply these rules promptly and decisively whenever deliverable supply problems threatened, and should not expect assistance from the Federal Reserve or the Treasury.

Debt Management strategy in the recent period of large cash deficits. The emphasis of Treasury debt management policy in recent years of regular cycle offerings of coupon securities sold through auctions has worked well. This approach has not only helped the Treasury to meet the new cash
requirements of large continuing deficits, it has also led to the development of more liquid markets in intermediate and long-term securities and thus has avoided an inordinate growth of short-term debt. Regularized coupon offerings have encouraged broader investor participation in the Government securities market and have contributed to price stability through a reduction of market uncertainty concerning the Treasury's financing plans. Despite the large cash financing requirements, the total amount of short-term debt has not experienced the type of massive buildup that had so often complicated debt management operations in past periods when large deficits developed at times of generally tight credit conditions.

The regular sales of coupon issues have taken the form of a series of auction cycles, involving 2-year, 4-year, and 5-year notes. The first 2-year note was sold in 1972, to help meet the 1972 budget deficit, but the cycle was not filled out with a full schedule of regular end-of-month offerings until 1975. The first note in the 4-year cycle was issued in July 1975, with issues regularly thereafter in the final month of each quarter. The first 5-year cycle note was issued in January 1976; since then additional issues of either 5-year notes (until April 1978) or 15-year bonds have been made in the first month of each quarter, with maturities arranged to coincide with the large regular mid-quarter Treasury refinancings.

During the fiscal years 1977 and 1978 all new money raised by the Treasury in the market was borrowed through offerings of coupon securities, and the supply of outstanding Treasury bills was slightly
reduced. This pattern of market financing was in sharp contrast to earlier years, when the Treasury generally met its new money needs chiefly in the Treasury bill market and offerings of new coupon issues were confined essentially to mid-quarter refunding operations. If the Treasury had modified its emphasis on financing through coupon securities in the recent period, the combination of record deficit financing and the shortening effect of the passage of time on outstanding debt could have produced a rapid ballooning of short-term debt maturities.

Any Treasury decision to increase the size of a particular bill auction as a means of assuring an adequate deliverable supply for those holding short positions in the bill futures market would thus be at odds with the strategy of emphasizing reliance upon coupon securities. While it is true that the Treasury might achieve a relatively low borrowing cost by increasing the size of such a bill auction, such an approach would upset the regular pattern of coupon debt roll-overs, increase the supply in the short-term market, and (over the longer run) possibly generate more than offsetting increases in the average costs of Treasury financing during periods of tight money.

Debt Management strategy in a situation of reduced deficits.

Over the past few quarters Treasury deficit financing has receded significantly from the totals common in immediately preceding years, and official budget projections for the years just ahead show a shift to Federal surpluses. Other changes in Federal financing, such as the proposal to control off-budget programs and thus reduce demands on the
Federal Financing Bank, would have the effect of further limiting Treasury debt expansion.

As Federal borrowing requirements are reduced, the Treasury will need to make more frequent debt repayments. This could lead to a different overall debt management strategy which places less emphasis on regular cycle auctions and frequently reduces or omits new issues in those cycles.1/

Also, if the Treasury should determine that liquid Federal debt were shrinking excessively relative to the size of the economy, it might rely to a greater extent on Treasury bill offerings. Further, the use of advance refundings might be necessary to provide for occasional restructuring of the supply of outstanding notes and bonds. If an advance refunding were to occur even the supply of outstanding intermediate maturities eligible for delivery on contracts in note futures could be substantially reduced.

Finally, even in their estimates of near-term Treasury needs for market financing, both the Treasury and private market analysts have frequently been substantially wide of the mark. When this is the case, market participants are sometimes surprised by the new-issue selection actually made by the Treasury in particular financings.

1/ In the February, 1979 quarterly refinancing, for example, a moderation in overall cash needs permitted the Treasury to forego offering its usual short note and to rely instead on just the two usual longer-term issues. Similarly, in October, 1978, and April, 1979, the Treasury was able to substitute 15-year bond issues for the usual larger-sized 5-year cycle notes, due partly to a continuation of declining cash needs.
Recent experience provides a number of examples of how quickly the outlook for Treasury financing can change. In its quarterly financing press conference on October 25, 1978, the Treasury announced that the October-December net market borrowing was estimated at $11 billion, assuming a $12 billion December 31 cash balance. Largely because of unanticipated increases in foreign official investments in Treasury securities, the Treasury was actually able to reduce its fourth quarter market borrowing to $6.4 billion and still swell its cash balance to $16.3 billion by December 31. The program announced on November 1 to borrow up to $10 billion in the form of Treasury issues of foreign currency denominated securities was a special factor that reduced the Treasury's need to borrow in domestic markets during late 1978 and early 1979. As the accompanying chart shows, the $6.4 billion of net market borrowing in the fourth quarter of last year was well below both the $19.4 billion borrowed in the fourth quarter of 1977, and the record $24.7 billion borrowed in the fourth quarter of 1975.

The Treasury's need to finance through auctions of marketable debt has also been significantly affected in recent years by variations in sales of non-marketable debt to domestic investors. Thus, while substantial amounts of new money were raised by the Treasury during 1977 and 1978 through special issues of so-called "arbitrage" bonds to State and local governments that were reinvesting the proceeds from advance refundings of their outstanding debt, this source of funds has largely dried up since the tightening of IRS rules on such financing last fall. Similarly,
TREASURY NET MARKET BORROWING

Calendar Year Quarters

$Bil

<table>
<thead>
<tr>
<th>Year</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>17.5</td>
<td>16.1</td>
<td>23.9</td>
<td>24.7</td>
</tr>
<tr>
<td>1976</td>
<td>8.3</td>
<td>14.2</td>
<td>17.1</td>
<td>14.8</td>
</tr>
<tr>
<td>1977</td>
<td>13.3</td>
<td>19.4</td>
<td>16.1</td>
<td>0.3</td>
</tr>
<tr>
<td>1978</td>
<td>10.8</td>
<td>6.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

COUPONS
- Over 10 yrs.
- 0-10 yrs.

BILLS

1/ Excludes Federal Reserve and Government Account Transactions.

Office of the Secretary of the Treasury
Office of Government Financing
from 1975 through 1978 the Treasury was gaining nearly $1 billion per quarter through net sales of savings bonds. But in early 1979 savings bond redemptions rose sharply as rates on competing savings instruments became increasingly attractive. As a result, the savings bonds program, which previously had been the most stable source of funds to the Treasury, has recently created a net drain on the Treasury's cash position.

When the pattern of Treasury market financing is subject to such wide short-run changes, there is considerable uncertainty whether supplies of new Treasury issues of particular maturities "can reasonably be expected to be available...in normal cash marketing channels." Since future contracts begin trading 2-to 3-years in advance of their delivery dates, it is apparent that any sudden shifts in Treasury debt management tactics prompted by unexpected changes in financing needs could result in a much smaller supply of deliverable securities for some contracts than had seemed likely at the time they began trading. Experience also suggests that, once a given type of contract has been authorized, there is a strong reluctance on the part of the exchanges to deny new contract maturities or to withdraw the contract completely, even when initial presumptions about the deliverable supply or conditions under which the contract would trade have not been realized.

Officials from the exchanges state that they monitor contracts closely, particularly as they approach delivery dates, and that they have well-developed procedures to deal with inordinately large open positions and unexpected changes in the deliverable supply. Some of these exchange
rules do look impressive; however, the comments of market participants suggest that on at least some exchanges these rules have not always been enforced as aggressively as situations seemed to require.

In the event that squeezes do develop, the Treasury would be in a different position from producers of other commodities in that it could easily add to the deliverable supply of a given Treasury issue on short notice. Since this fact would be generally recognized by participants in futures markets, pressures might at times be exerted on the Treasury to modify its longer-run debt management objectives in order to break an impending corner.
APPENDIX ON DEBT STRUCTURE

The two accompanying tables highlight the differences in potential deliverable supplies for the existing CBOT bond contract and the proposed IMM 3-3/4 - 4-1/4 year note contract. Table 1 on the bond contract shows that even when new maturities for the contract first start trading, there is a sizable volume of marketable debt already outstanding that will be eligible for delivery at the time the contract matures. Thus, the contract that started trading in February 1979 (for delivery in February 1981) already showed an outstanding deliverable supply of $17 billion.

If the proposed IMM note contract were now trading, however, the issues already outstanding that would be eligible for delivery on distant maturities would be quite limited. For example, on a contract slated for delivery in February 1981, only one security presently outstanding would be eligible for delivery—the 8's of 1985 (for which private holdings total only $2.7 billion).

Looking at recent history, the IMM could, of course, argue that the supply of securities eligible for delivery on its proposed note contract would be very likely to expand substantially as the contract approached maturity. Table 2 shows that if 4-year note contracts with the IMM specifications had matured in 1978, they would have been supported by deliverable supplies ranging from $11 to $15 million.

Looking to the future, however, there is no guarantee that the structure of outstanding marketable debt will continue to provide a similar
volume of intermediate term debt. The significant reduction of total Treasury borrowing in the market over the past year or so, the significant shift in Treasury emphasis from notes to bonds since mid-1978, and the prospects ahead for further sharp reductions in Treasury financing needs, all raise questions whether a note defined as narrowly as the proposed IMM contract would be assured of an adequate deliverable supply.

If the Treasury does not resume its 5-year note cycle and does not issue a 4-year note in December 1980, or otherwise add new issues maturing between November 1984 and May 1985, the potential deliverable supply for the February 1981 contract would still be limited to the small issue of 8's of '85. Moreover, the amount of this issue actually available for delivery might be reduced further by Federal Reserve purchases during the 2-year period before the delivery date, and some other holders might prove to be highly reluctant to sell in the secondary market. Finally, any Treasury decision to purchase or advance-refund the 8's of '85 would further reduce the deliverable supply.
<table>
<thead>
<tr>
<th>Contract</th>
<th>Issue</th>
<th>Issue Date</th>
<th>Age at Delivery (Months)</th>
<th>Private Holdings at Delivery (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar. 1978</td>
<td>8-1/4</td>
<td>5/15/00-05</td>
<td>2/15/78</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>7-7/8</td>
<td>11/15/02-07</td>
<td>11/15/77</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>7-5/8</td>
<td>2/15/02-07</td>
<td>8/15/77</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>7-7/8</td>
<td>2/15/95-00</td>
<td>11/15/76</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>8/15/96-01</td>
<td>8/17/76</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>5/15/93-98</td>
<td>5/17/76</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>8-3/8</td>
<td>8/15/95-00</td>
<td>11/17/75</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>8-1/2</td>
<td>5/15/94-99</td>
<td>11/15/74</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total 10276</td>
</tr>
<tr>
<td>Jun. 1978</td>
<td>8-3/8</td>
<td>8/15/95-00</td>
<td>5/15/78</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>8-1/4</td>
<td>5/15/00-05</td>
<td>2/15/78</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>7-7/8</td>
<td>11/15/02-07</td>
<td>11/15/77</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>7-5/8</td>
<td>2/15/02-07</td>
<td>8/15/77</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>7-7/8</td>
<td>2/15/95-00</td>
<td>11/15/76</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>8/15/96-01</td>
<td>8/16/76</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>8-1/2</td>
<td>5/15/94-99</td>
<td>11/15/74</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total 10958</td>
</tr>
<tr>
<td>Sep. 1978</td>
<td>8-3/8</td>
<td>8/15/03-08</td>
<td>8/15/78</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>8-3/8</td>
<td>8/15/95-00</td>
<td>5/15/78</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>8-1/4</td>
<td>5/15/00-05</td>
<td>2/15/78</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>7-7/8</td>
<td>11/15/02-07</td>
<td>11/15/77</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>7-5/8</td>
<td>2/15/02-07</td>
<td>8/15/77</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>7-7/8</td>
<td>2/15/95-00</td>
<td>11/15/76</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>8/15/96-01</td>
<td>8/16/76</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>8-1/2</td>
<td>5/15/94-99</td>
<td>11/15/74</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total 13791</td>
</tr>
<tr>
<td>Contract</td>
<td>Coupon</td>
<td>Maturity</td>
<td>Issue Date</td>
<td>Age at Delivery (Months)</td>
</tr>
<tr>
<td>-----------</td>
<td>--------</td>
<td>----------</td>
<td>------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Dec. 1978</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-3/4</td>
<td>11/15/03-08</td>
<td>11/15/78</td>
<td>1</td>
<td>1676</td>
</tr>
<tr>
<td>8-3/8</td>
<td>8/15/03-08</td>
<td>8/15/78</td>
<td>4</td>
<td>1370</td>
</tr>
<tr>
<td>8-3/8</td>
<td>8/15/95-00</td>
<td>5/15/78</td>
<td>7</td>
<td>2580</td>
</tr>
<tr>
<td>8-1/4</td>
<td>5/15/00-05</td>
<td>2/15/78</td>
<td>10</td>
<td>2067</td>
</tr>
<tr>
<td>7-7/8</td>
<td>11/15/02-07</td>
<td>11/15/77</td>
<td>13</td>
<td>1231</td>
</tr>
<tr>
<td>7-5/8</td>
<td>2/15/02-07</td>
<td>8/15/77</td>
<td>16</td>
<td>2696</td>
</tr>
<tr>
<td>7-7/8</td>
<td>2/15/95-00</td>
<td>11/15/76</td>
<td>25</td>
<td>2177</td>
</tr>
<tr>
<td>8</td>
<td>8/15/96-01</td>
<td>8/16/76</td>
<td>28</td>
<td>753</td>
</tr>
<tr>
<td>8-1/2</td>
<td>5/15/94-99</td>
<td>11/15/74</td>
<td>49</td>
<td>763</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>15313</strong></td>
</tr>
<tr>
<td>Mar. 1979</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-3/4</td>
<td>11/15/03-08</td>
<td>2/15/79</td>
<td>1</td>
<td>3684</td>
</tr>
<tr>
<td>8-3/8</td>
<td>8/15/03-08</td>
<td>8/15/78</td>
<td>7</td>
<td>1370</td>
</tr>
<tr>
<td>8-3/8</td>
<td>8/15/95-00</td>
<td>5/15/78</td>
<td>10</td>
<td>2580</td>
</tr>
<tr>
<td>8-1/4</td>
<td>5/15/00-05</td>
<td>2/15/78</td>
<td>13</td>
<td>2067</td>
</tr>
<tr>
<td>7-7/8</td>
<td>11/15/02-07</td>
<td>11/15/77</td>
<td>16</td>
<td>1231</td>
</tr>
<tr>
<td>7-5/8</td>
<td>2/15/02-07</td>
<td>8/15/77</td>
<td>19</td>
<td>2696</td>
</tr>
<tr>
<td>7-7/8</td>
<td>2/15/95-00</td>
<td>11/15/76</td>
<td>28</td>
<td>2177</td>
</tr>
<tr>
<td>8</td>
<td>8/15/96-01</td>
<td>8/16/76</td>
<td>31</td>
<td>753</td>
</tr>
<tr>
<td>8-1/2</td>
<td>5/15/94-99</td>
<td>11/15/74</td>
<td>52</td>
<td>763</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>17321</strong></td>
</tr>
<tr>
<td>Jun. 1979</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-3/4</td>
<td>11/15/03-08</td>
<td>2/15/79</td>
<td>4</td>
<td>3684</td>
</tr>
<tr>
<td>8-3/8</td>
<td>5/15/03-08</td>
<td>5/15/78</td>
<td>10</td>
<td>1370</td>
</tr>
<tr>
<td>8-3/8</td>
<td>8/15/95-00</td>
<td>5/15/78</td>
<td>13</td>
<td>2580</td>
</tr>
<tr>
<td>8-1/4</td>
<td>5/15/00-05</td>
<td>2/15/78</td>
<td>16</td>
<td>2067</td>
</tr>
<tr>
<td>7-7/8</td>
<td>11/15/02-07</td>
<td>11/15/77</td>
<td>19</td>
<td>1232</td>
</tr>
<tr>
<td>7-5/8</td>
<td>2/15/02-07</td>
<td>8/15/77</td>
<td>22</td>
<td>2696</td>
</tr>
<tr>
<td>7-7/8</td>
<td>2/15/95-00</td>
<td>11/15/76</td>
<td>31</td>
<td>2177</td>
</tr>
<tr>
<td>8</td>
<td>8/15/96-01</td>
<td>8/16/76</td>
<td>34</td>
<td>753</td>
</tr>
<tr>
<td>8-1/2</td>
<td>5/15/94-99</td>
<td>11/15/74</td>
<td>55</td>
<td>763</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>17321</strong></td>
</tr>
</tbody>
</table>
### TABLE I (cont'd)
Deliverable Treasury Bonds

<table>
<thead>
<tr>
<th>Contract</th>
<th>Coupon</th>
<th>Issue</th>
<th>Maturity</th>
<th>Issue Date</th>
<th>Age at Delivery (Months)</th>
<th>Private Holdings at Delivery (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep. 1979</td>
<td>8-3/4</td>
<td>11/15/03-08</td>
<td>2/15/79</td>
<td>7</td>
<td>3684</td>
<td>3684</td>
</tr>
<tr>
<td></td>
<td>8-3/4</td>
<td>8/15/03-08</td>
<td>8/15/78</td>
<td>13</td>
<td>1370</td>
<td>1370</td>
</tr>
<tr>
<td></td>
<td>8-3/8</td>
<td>8/15/95-00</td>
<td>5/15/78</td>
<td>16</td>
<td>2580</td>
<td>2580</td>
</tr>
<tr>
<td></td>
<td>8-1/4</td>
<td>5/15/00-05</td>
<td>2/15/78</td>
<td>19</td>
<td>2067</td>
<td>2067</td>
</tr>
<tr>
<td></td>
<td>7-7/8</td>
<td>11/15/02-07</td>
<td>11/15/77</td>
<td>22</td>
<td>1231</td>
<td>1231</td>
</tr>
<tr>
<td></td>
<td>7-5/8</td>
<td>2/15/02-07</td>
<td>8/15/77</td>
<td>25</td>
<td>2696</td>
<td>2696</td>
</tr>
<tr>
<td></td>
<td>7-7/8</td>
<td>2/15/95-00</td>
<td>11/15/76</td>
<td>34</td>
<td>2177</td>
<td>2177</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>8/15/96-01</td>
<td>8/16/76</td>
<td>37</td>
<td>753</td>
<td>753</td>
</tr>
<tr>
<td></td>
<td>8-1/2</td>
<td>5/15/94-99</td>
<td>11/15/74</td>
<td>58</td>
<td>763</td>
<td>763</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total 17321</td>
<td>17321</td>
</tr>
<tr>
<td>Dec. 1979</td>
<td>8-3/4</td>
<td>11/15/03-08</td>
<td>2/15/79</td>
<td>10</td>
<td>3684</td>
<td>3684</td>
</tr>
<tr>
<td></td>
<td>8-3/8</td>
<td>8/15/03-08</td>
<td>8/15/78</td>
<td>16</td>
<td>1370</td>
<td>1370</td>
</tr>
<tr>
<td></td>
<td>8-3/8</td>
<td>8/15/95-00</td>
<td>5/15/78</td>
<td>19</td>
<td>2580</td>
<td>2580</td>
</tr>
<tr>
<td></td>
<td>8-1/4</td>
<td>5/15/00-05</td>
<td>2/15/78</td>
<td>22</td>
<td>2067</td>
<td>2067</td>
</tr>
<tr>
<td></td>
<td>7-7/8</td>
<td>11/15/02-07</td>
<td>11/15/77</td>
<td>25</td>
<td>1231</td>
<td>1231</td>
</tr>
<tr>
<td></td>
<td>7-5/8</td>
<td>2/15/02-07</td>
<td>8/15/77</td>
<td>28</td>
<td>2696</td>
<td>2696</td>
</tr>
<tr>
<td></td>
<td>7-7/8</td>
<td>2/15/95-00</td>
<td>11/15/76</td>
<td>37</td>
<td>2177</td>
<td>2177</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>8/15/96-01</td>
<td>8/16/76</td>
<td>40</td>
<td>753</td>
<td>753</td>
</tr>
<tr>
<td></td>
<td>8-1/2</td>
<td>5/15/94-99</td>
<td>11/15/74</td>
<td>61</td>
<td>763</td>
<td>763</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total 17321</td>
<td>17321</td>
</tr>
<tr>
<td>Mar. 1980</td>
<td>8-3/4</td>
<td>11/15/03-08</td>
<td>2/15/79</td>
<td>13</td>
<td>3684</td>
<td>3684</td>
</tr>
<tr>
<td></td>
<td>8-3/8</td>
<td>5/15/03-08</td>
<td>5/15/78</td>
<td>19</td>
<td>1370</td>
<td>1370</td>
</tr>
<tr>
<td></td>
<td>8-3/8</td>
<td>8/15/95-00</td>
<td>5/15/78</td>
<td>22</td>
<td>2580</td>
<td>2580</td>
</tr>
<tr>
<td></td>
<td>8-1/4</td>
<td>5/15/00-05</td>
<td>2/15/78</td>
<td>25</td>
<td>2067</td>
<td>2067</td>
</tr>
<tr>
<td></td>
<td>7-7/8</td>
<td>11/15/02-07</td>
<td>11/15/77</td>
<td>28</td>
<td>1231</td>
<td>1231</td>
</tr>
<tr>
<td></td>
<td>7-5/8</td>
<td>2/15/02-07</td>
<td>8/15/77</td>
<td>31</td>
<td>2696</td>
<td>2696</td>
</tr>
<tr>
<td></td>
<td>7-7/8</td>
<td>2/15/95-00</td>
<td>11/15/76</td>
<td>40</td>
<td>2177</td>
<td>2177</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>8/15/96-01</td>
<td>8/16/76</td>
<td>43</td>
<td>753</td>
<td>753</td>
</tr>
<tr>
<td></td>
<td>8-1/2</td>
<td>5/15/94-99</td>
<td>11/15/74</td>
<td>64</td>
<td>763</td>
<td>763</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total 17321</td>
<td>17321</td>
</tr>
<tr>
<td>Contract</td>
<td>Issue</td>
<td>Age at Delivery</td>
<td>Private Holdings at Delivery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>-------</td>
<td>-----------------</td>
<td>-----------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Months)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jun. 1980</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-3/4</td>
<td>11/15/03-08</td>
<td>2/15/79</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-3/8</td>
<td>8/15/03-08</td>
<td>8/15/78</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-3/8</td>
<td>8/15/95-00</td>
<td>5/15/78</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-1/4</td>
<td>5/15/00-05</td>
<td>2/15/78</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-7/8</td>
<td>11/15/02-07</td>
<td>11/15/77</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-5/8</td>
<td>2/15/02-07</td>
<td>8/15/77</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-7/8</td>
<td>2/15/95-00</td>
<td>11/15/76</td>
<td>43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>8/15/96-01</td>
<td>8/16/76</td>
<td>46</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-1/2</td>
<td>5/15/94-99</td>
<td>11/15/74</td>
<td>67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total 17341</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sep. 1980</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-3/4</td>
<td>11/15/03-08</td>
<td>2/15/79</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-3/8</td>
<td>8/15/03-08</td>
<td>8/15/78</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-3/8</td>
<td>8/15/95-00</td>
<td>8/15/78</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-1/4</td>
<td>5/15/00-05</td>
<td>2/15/78</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-7/8</td>
<td>11/15/02-07</td>
<td>11/15/77</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-5/8</td>
<td>2/15/02-07</td>
<td>8/15/77</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-7/8</td>
<td>2/15/95-00</td>
<td>11/15/76</td>
<td>46</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>8/15/96-01</td>
<td>8/16/76</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-1/2</td>
<td>5/15/94-99</td>
<td>11/15/74</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total 17341</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dec. 1980</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-3/4</td>
<td>11/15/03-08</td>
<td>2/15/79</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-3/8</td>
<td>8/15/95-00</td>
<td>5/15/78</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-1/4</td>
<td>5/15/00-05</td>
<td>2/15/78</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-7/8</td>
<td>11/15/02-07</td>
<td>11/15/77</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-3/8</td>
<td>8/15/03-08</td>
<td>8/15/78</td>
<td>38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-5/8</td>
<td>2/15/02-07</td>
<td>8/15/77</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-7/8</td>
<td>2/15/95-00</td>
<td>11/15/76</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>8/15/96-01</td>
<td>8/16/76</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-1/2</td>
<td>5/15/94-99</td>
<td>11/15/74</td>
<td>73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total 17341</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Office of the Secretary of the Treasury
Office of Government Financing

*For Contracts after February 1979, private holdings as of February 1979.
## Table 2

### Hypothetically Deliverable Four-Year Notes

<table>
<thead>
<tr>
<th>Contract</th>
<th>Issue Coupon</th>
<th>Maturity</th>
<th>Issue Date</th>
<th>Type of Note at Original Issue</th>
<th>Age at Delivery (Months)</th>
<th>Private Holdings at Delivery (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb. 1978</td>
<td>7-1/4</td>
<td>12/31/81</td>
<td>12/1/77</td>
<td>4-year</td>
<td>2</td>
<td>3434</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>5/15/82</td>
<td>4/4/77</td>
<td>5-year</td>
<td>10</td>
<td>2599</td>
</tr>
<tr>
<td></td>
<td>6-1/8</td>
<td>2/15/82</td>
<td>1/6/77</td>
<td>5-year</td>
<td>13</td>
<td>2663</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>11/15/81</td>
<td>10/12/76</td>
<td>5-year</td>
<td>16</td>
<td>2460</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>5/15/82</td>
<td>5/15/75</td>
<td>7-year1/</td>
<td>33</td>
<td>1305</td>
</tr>
<tr>
<td></td>
<td>7-3/4</td>
<td>11/15/81</td>
<td>11/15/74</td>
<td>7-year1/</td>
<td>39</td>
<td>2606</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total 15067</td>
<td></td>
</tr>
<tr>
<td>May 1978</td>
<td>7-7/8</td>
<td>3/31/82</td>
<td>3/6/78</td>
<td>4-year</td>
<td>2</td>
<td>2661</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>5/15/82</td>
<td>4/4/77</td>
<td>5-year</td>
<td>12</td>
<td>2585</td>
</tr>
<tr>
<td></td>
<td>6-1/8</td>
<td>2/15/82</td>
<td>1/6/77</td>
<td>5-year</td>
<td>16</td>
<td>2653</td>
</tr>
<tr>
<td></td>
<td>8-1/8</td>
<td>8/15/82</td>
<td>8/15/75</td>
<td>7-year1/</td>
<td>33</td>
<td>1767</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>5/15/82</td>
<td>5/15/75</td>
<td>7-year1/</td>
<td>36</td>
<td>1290</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total 10956</td>
<td></td>
</tr>
<tr>
<td>Aug. 1978</td>
<td>8-1/4</td>
<td>6/30/82</td>
<td>6/7/78</td>
<td>4-year</td>
<td>2</td>
<td>2537</td>
</tr>
<tr>
<td></td>
<td>7-1/8</td>
<td>11/15/82</td>
<td>10/17/77</td>
<td>5-year</td>
<td>10</td>
<td>2571</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>5/15/82</td>
<td>4/4/77</td>
<td>5-year</td>
<td>16</td>
<td>2585</td>
</tr>
<tr>
<td></td>
<td>7-7/8</td>
<td>11/15/82</td>
<td>11/17/75</td>
<td>7-year1/</td>
<td>21</td>
<td>2154</td>
</tr>
<tr>
<td></td>
<td>8-1/8</td>
<td>8/15/82</td>
<td>8/15/75</td>
<td>7-year1/</td>
<td>24</td>
<td>1777</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>5/15/82</td>
<td>5/15/75</td>
<td>7-year1/</td>
<td>27</td>
<td>2585</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total 14209</td>
<td></td>
</tr>
<tr>
<td>Nov. 1978</td>
<td>8-3/8</td>
<td>9/30/82</td>
<td>9/6/78</td>
<td>4-year</td>
<td>2</td>
<td>2439</td>
</tr>
<tr>
<td></td>
<td>7-1/8</td>
<td>11/15/82</td>
<td>10/17/77</td>
<td>5-year</td>
<td>13</td>
<td>2539</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>2/15/83</td>
<td>2/17/76</td>
<td>7-year1/ 2/</td>
<td>21</td>
<td>5800</td>
</tr>
<tr>
<td></td>
<td>7-7/8</td>
<td>11/15/82</td>
<td>11/17/75</td>
<td>7-year1/</td>
<td>36</td>
<td>2137</td>
</tr>
<tr>
<td></td>
<td>8-1/8</td>
<td>8/15/82</td>
<td>8/15/75</td>
<td>7-year1/</td>
<td>39</td>
<td>1762</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total 14677</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 2 (cont'd)

**Hypothetically Deliverable Four-Year Notes**

<table>
<thead>
<tr>
<th>Contract</th>
<th>Issue Date</th>
<th>Type of Note at Original Issue</th>
<th>Age at Delivery (Months)</th>
<th>Private Holdings at Delivery (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Feb. 1979</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-3/8</td>
<td>12/31/82</td>
<td>4-year</td>
<td>1</td>
<td>2707</td>
</tr>
<tr>
<td>7-7/8</td>
<td>5/15/83</td>
<td>5-year</td>
<td>11</td>
<td>2484</td>
</tr>
<tr>
<td>7-1/8</td>
<td>11/15/82</td>
<td>5-year</td>
<td>15</td>
<td>2522</td>
</tr>
<tr>
<td>8</td>
<td>2/15/83</td>
<td>7-year&lt;sup&gt;1/2&lt;/sup&gt;</td>
<td>36</td>
<td>5821</td>
</tr>
<tr>
<td>7-7/8</td>
<td>11/15/82</td>
<td>7-year&lt;sup&gt;1/2&lt;/sup&gt;</td>
<td>39</td>
<td>2138</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>15672</td>
</tr>
<tr>
<td><strong>May 1979</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-1/4</td>
<td>3/31/83</td>
<td>4-year</td>
<td>2</td>
<td>2500</td>
</tr>
<tr>
<td>7-7/8</td>
<td>3/15/83</td>
<td>5-year</td>
<td>13</td>
<td>2484</td>
</tr>
<tr>
<td>8</td>
<td>2/15/83</td>
<td>7-year&lt;sup&gt;1/2&lt;/sup&gt;</td>
<td>39</td>
<td>5821</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>8305</td>
</tr>
<tr>
<td><strong>Aug. 1979</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-7/8</td>
<td>5/15/83</td>
<td>5-year</td>
<td>17</td>
<td>2484</td>
</tr>
<tr>
<td>7</td>
<td>11/15/83</td>
<td>7-year&lt;sup&gt;1/2&lt;/sup&gt;</td>
<td>33</td>
<td>2200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>4684</td>
</tr>
<tr>
<td><strong>Nov. 1979</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-1/4</td>
<td>2/15/84</td>
<td>7-year&lt;sup&gt;1/2&lt;/sup&gt;</td>
<td>33</td>
<td>4526</td>
</tr>
<tr>
<td>7</td>
<td>11/15/83</td>
<td>7-year&lt;sup&gt;1/2&lt;/sup&gt;</td>
<td>36</td>
<td>2200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>6726</td>
</tr>
<tr>
<td><strong>Feb. 1980</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-1/4</td>
<td>2/15/84</td>
<td>7-year&lt;sup&gt;1/2&lt;/sup&gt;</td>
<td>36</td>
<td>4526</td>
</tr>
<tr>
<td>7</td>
<td>11/15/83</td>
<td>7-year&lt;sup&gt;1/2&lt;/sup&gt;</td>
<td>39</td>
<td>2200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>6726</td>
</tr>
<tr>
<td><strong>May 1980</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-1/4</td>
<td>8/15/84</td>
<td>7-year&lt;sup&gt;1/2&lt;/sup&gt;</td>
<td>33</td>
<td>2491</td>
</tr>
<tr>
<td>7-1/4</td>
<td>2/15/84</td>
<td>7-year&lt;sup&gt;1/2&lt;/sup&gt;</td>
<td>39</td>
<td>4526</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>7017</td>
</tr>
<tr>
<td>Contract</td>
<td>Coupon</td>
<td>Issue</td>
<td>Maturity</td>
<td>Issue Date</td>
</tr>
<tr>
<td>----------</td>
<td>--------</td>
<td>-------</td>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td>Aug. 1980</td>
<td>7-1/4</td>
<td>8/15/84</td>
<td>8/15/77</td>
<td>7-year 1/</td>
</tr>
<tr>
<td>Nov. 1980</td>
<td>8</td>
<td>2/15/85</td>
<td>2/15/78</td>
<td>7-year 1/</td>
</tr>
<tr>
<td></td>
<td>7-1/4</td>
<td>8/15/84</td>
<td>8/15/77</td>
<td>7-year 1/</td>
</tr>
<tr>
<td>Feb. 1981</td>
<td>8</td>
<td>2/15/85</td>
<td>2/15/78</td>
<td>7-year 1/</td>
</tr>
</tbody>
</table>

Office of the Secretary of the Treasury
Office of Government Financing

1/Issued in mid-quarter refunding.
2/Subscription or fully priced issue.
3/For contracts after February 1979, private holdings as of February 1979.
CHAPTER IV

SUMMARY OF THE JUDGMENTS AND RECOMMENDATIONS OF THOSE INTERVIEWED

The opinions of those interviewed on the key question whether futures markets based on Treasury securities should be permitted to develop further were divided. On one side, exchange officials and a majority of the participants interviewed offered an affirmative answer to this question. It was their view that financial futures markets provide important social benefits by enabling financial market participants to hedge their exposure to interest rate risk and by improving the general liquidity of markets. At the same time, they contended that the potential problems that can arise from futures trading can be effectively controlled by appropriate regulation and surveillance by the exchanges and the CFTC. There were some differences in judgments, however, as to whether, and to what extent, there is need to strengthen exchange and CFTC regulations and to improve surveillance procedures.

A second group of participants held a negative view of financial futures. They contended that such markets are used mainly by wealthy operators and market professionals to take speculative positions on low margins, and only to a minor degree by users seeking to hedge interest rate risks. For this reason, in their view, financial futures are offering few benefits to the society at large. In addition, they expressed the concern that futures trading could trigger serious price distortions and instability in the cash market, and thus complicate the tasks of Treasury debt management and Federal Reserve open market policy.
The specifics of these opposing views are developed more fully in the pages that follow. The objective is to flesh out the logic of the opposing positions with statements that are reasonably representative of the opinions expressed by interviewees. No single party interviewed, however, would necessarily subscribe to all of the statements presented in either the pro or con cases.

Affirmative Position on Treasury Futures

The impressive growth of markets in Treasury financial futures provides ample evidence that they are satisfying a significant public need. Trading thus far has been undertaken mainly for speculative purposes and to arbitrage between the futures and cash markets. But as futures markets have continued to develop in size and depth, banks, Government security dealers and other financial and nonfinancial institutions have been entering the market to hedge their exposure to interest rate risk. The management of rate risk is, of course, fundamental to operations of financial institutions and large corporations with specialized financial departments. While such firms have long relied on various traditional balance sheet management techniques to control their risk exposure, they recently have been discovering an increasing number of situations in which the opportunity to modify rate risk in the futures market is advantageous. As some firms successfully accomplish these hedging objectives, it is reasonable to expect others to begin to enter the market to achieve similar ends. The promotional efforts of security
dealers and brokers who have recently become active in the futures markets (or are about to do so) will reinforce this trend.

The rapid development of markets in Treasury financial futures does not appear to pose any threat to the efficiency of the cash market; on the contrary, efficiency of the cash market is probably being improved. It is possible that the low cost of speculation in Treasury futures does occasionally create short-run volatility in futures prices that reflects back on daily price movements in the cash market. For the most part, however, fluctuations in futures prices simply mirror changes in cash market prices. Moreover, over the longer-run futures trading—by enhancing general liquidity—helps to stabilize cash market prices of Treasury issues, and thus tends to reduce the Treasury's financing costs.1/

The few market problems that have developed in the Treasury and the GNMA cash markets since the inception of financial futures were traceable to the over-the-counter forward market, not the futures markets. These problems emerged in part because unsophisticated investors were persuaded by high pressure salesmen to make commitments today to buy securities some months ahead at today's prices without giving full consideration to the interest rate risks involved. By the time the

1/ The volatility of 3-month Treasury bill rates has increased since the inauguration of trading in bill futures, but this appears to be strictly a coincidence, since the particular developments responsible have occurred in the cash rather than the futures market. Two factors in particular appear to account for this change. One has been the net reduction in the market supply of bills that has resulted from the Treasury's debt management emphasis on sales of coupon issues. The other has been the abrupt swings—from heavy bill buying to heavy bill selling—that in recent years have characterized foreign central bank operations in the bill market.
delivery date arrived, interest rates had risen appreciably and the investor faced the prospect of paying a price well above current market value. In some cases, these investors backed away from their commitments and in the process triggered the eventual failure of the under-capitalized firm from which they were buying; in other cases, they took delivery and seriously impaired their own capital positions.

It is highly unlikely that such problems would have developed had positions been taken in futures rather than forward contracts. The commodity exchange regulations, which require the posting of performance bonds and "marking to market," guard against nonperformance of contracts and also alert participants to losses as they begin to develop. In addition, exchange rules require that customers be made aware of the risks of futures transactions before a position is taken. Admittedly, participants may not always fully comprehend these warnings, and some firms, particularly those that are not members of the exchanges, may not fulfill their responsibilities. On balance, however, the exchange rules will tend to minimize the types of problems recently encountered in the forward market.

With the growth of trading in futures and the increased understanding of the advantages of these contracts over forward contracts, many previous users of the forward market have discovered that they can achieve the same objective effectively and with less risk through operations in the futures market. To the extent futures trading thus substitutes for forward transactions, the general vulnerability of the
cash market to failures arising from the participation of unsophisticated and uninformed firms and individuals is reduced.

The questions being raised by the Treasury and Federal Reserve regarding the adequacy of deliverable supply under some of the proposed contracts still pending before the CFTC are understandable, since an insufficient supply might create occasional problems. It should be stressed, however, that it is in the best interest of the exchanges to design contracts that function smoothly and fairly. Since, the exchanges in developing proposals for new contracts—and the CFTC before approving a new contract—carefully assess the prospective deliverable supply in order to insure that it will be sufficient to preclude the possibility of market manipulation, there is no need for concern on this question. Moreover, the commodities exchanges and the CFTC have well-developed regulatory procedures that are adequate to insure that supply shortages cannot be used to manipulate delivery prices. These procedures include a monitoring system designed to detect potential supply problems well in advance of delivery, and the exchanges possess emergency powers to enable them to deal with such problems.

The concerns expressed by Treasury officials regarding the possibility that futures markets based on Government securities may place appreciable constraints on their debt management options are unfounded. Futures markets have functioned for years with prospective deliverable supplies subject to sudden, unexpected changes. Participants are, therefore, fully aware that unexpected changes in supply are
possible and are prepared to adjust to them if they occur. Moreover, if the supply available for a contract is reduced sharply--say, because of a Treasury decision to advance-refund a number of outstanding intermediate-term issues or to postpone an auction--the exchange's emergency powers will enable it to adjust delivery terms or take other measures required to insure an orderly liquidation process. Futures market participants acknowledge that the Treasury should not be expected to adjust to debt management operations to help counter a squeeze on the securities deliverable under futures contracts, and they are aware that the Treasury does not intend to do so.

Negative Position on Financial Futures

Speculation in financial futures is little more than betting on the future course of interest rates. To justify such activity on economic and social grounds, it must be shown that futures trading is used to an important degree by firms and individuals seeking to hedge exposure to interest rate risk. The GNMA market has apparently been widely used for this purpose. This was, of course, to be expected, since the normal "production process" for mortgages requires commitments to be made for future delivery of securities at prices and yields set today. The desire to hedge the risks involved in these forward arrangements thus provides a ready made constituency for GNMA futures.

Aside from this special mortgage market case, however, participants in financial markets have no substantial need for the hedging assistance provided by financial futures. Financial firms are expert in
appraising prospects for changes in interest rates and can make appropriate adjustments in their assets and liabilities through operations in cash markets. While smaller borrowers and lenders may have less in-house expertise for assessing and adjusting to interest rate risks, they do have ready access to the expert advice of others and thus can deal adequately with their exposure to interest rate fluctuations without resort to futures.

Given these basic techniques of financial management, it is hardly surprising that Treasury futures markets have failed to generate a significant volume of routine hedging operations. Most transactions have been for purposes of arbitrage or speculation. Moreover, some volume of transactions has apparently been undertaken to promote tax avoidance, which, of course, detracts rather than adds to the general welfare.\(^1\) In short, since the management of interest rate risk is fundamental to the operations of financial institutions, there seems little prospect that a significant demand for hedging will develop in the future.

Even if hedging does have a greater potential than this assessment suggests, there remain good reasons to discourage the development of futures markets based on Treasury issues, since the speculative

\(^1\) A Taxpayer goes short in one contract and long in another. If interest rates then change he will have a loss in one position and a gain in the other. Then, just before the end of his taxable year he sells the contract on which he has a loss, thus reducing his taxable income for that year. His gain in the other position is realized after the new tax year begins.
activity on which such markets are based can lead to significant problems. While major financial firms can already engage in highly leveraged speculation in the cash markets, smaller, less sophisticated firms and individuals are effectively screened from such activity. They cannot obtain the financing needed to carry long positions and to borrow securities for delivery against short positions.

Through operations in futures markets, however, small and ill-informed participants can build speculative positions to levels greatly in excess of capital without an adequate appreciation of the risks they are taking. Not only is this option open, firms and individuals are apparently being encouraged to use it. Representatives of medium-sized financial institutions already report, for example, that they are being contacted by aggressive salesmen who show little understanding of appropriate futures transactions for such institutions and who seem to have an insufficient appreciation of the risks inherent in speculating against interest rate changes. It is recognized, of course, that the exchanges have rules which require members to inform potential customers of the risks inherent in futures transactions. But the enforcement of these rules varies from exchange to exchange, and the fidelity with which exchange members adhere to them may not be uniformly high. In addition, there will be many firms that are not directly subject to regulation by the exchanges which offer indirect access to futures markets.

If excessive speculative positions were taken by under-capitalized and unsophisticated investors just prior to a major market
move, this could trigger dislocations in both the futures and cash markets. Exchange rules that require maintenance of performance bonds by "marking to market" do not preclude the possibility that in circumstances such as a marked alteration of inflationary expectations, prices on the futures markets will move to daily limits for several days in a row and keep a large share of transactions from clearing. In such cases, if speculators were unable to liquidate positions rapidly, their capital positions could be wiped out and even those of some exchange members could be severely strained, if not placed in jeopardy. Since these same firms and individuals also typically hold positions in the cash markets, events of this type would be likely to spill over and exacerbate similar problems developing in the cash market.

This spreading deterioration could seriously weaken the functioning of financial markets generally and aggravate developing instability in the real economy. Political responses to situations of this kind—for which there are a number of precedents—have sometimes led to the adoption of an array of regulatory constraints that, while well intentioned, have the ultimate effect of impairing the overall efficiency of markets, and thus reducing the benefits provided by competition.

Trading in the futures markets could also lead to greater volatility of cash market prices even at times when no abrupt cyclical turn in interest rates was underway. For example, trading in futures has significantly heightened the risks that squeezes will be exerted on the 3-month Treasury bill rate through coordinated operations in both the cash
and futures markets. Although efforts have been made occasionally to squeeze the 3-month bill rate through actions in the cash market alone, the ability to position in bill futures tends to increase the temptation for such maneuvers—because it adds to potential profitability. Unfortunately, actions by the exchanges and the CFTC in approving new Treasury futures contracts suggest that they are not sufficiently sensitive to problems of this type.

The potential for corners and squeezes, as well as for greater price volatility, could also place constraints on the Treasury in its debt management decisions. Clearly, if it appeared that holders of short positions were likely to fail to deliver on contracts in the event of a corner or squeeze, cash and futures market participants might urge the Treasury—as well as the Federal Reserve—to take steps to alleviate the resultant market pressures. These authorities—unlike producers of tangible commodities—are perceived as being able to take immediate steps to deal with shortages of issues. Increasing the market supply of such issues would clearly be preferable to the exchanges, in lieu of forced liquidation of open interest or other steps available to them. While such actions could limit the Treasury's financial flexibility or complicate the effective implementation of Federal Reserve policy, it is easy to lose sight of such costs when a pressuring market problem is at hand. Thus, undesirable precedents could be established. Even though the CFTC and futures exchanges have indicated absolutely no desire or need to turn to the Treasury or the System in such cases, it may be difficult
for public authorities to defend a policy of no action when a response from them could, in fact, avert a market problem.
APPENDIX A

INTERVIEWS WITH MARKET PARTICIPANTS

This section presents the results of more than thirty interviews with market participants as part of the Treasury/Federal Reserve study of futures trading in Treasury securities. In these interviews respondents were asked to describe their interest and participation in the market and to answer questions on these subjects and on broad issues of importance to the Treasury and the Federal Reserve. Those interviewed are listed on pages 40 through 44. The range of opinions expressed is summarized by issue and by the type of institution interviewees represented. The table of contents on the next page provides a convenient guide to the subjects covered.
# Table of Contents

REGULATION OF FINANCIAL FUTURES .......................................................... 1

   Self Regulation of Exchanges ................................................................. 1

USES OF FUTURES BY MARKET PARTICIPANTS ........................................... 5

   Can Hedging and Speculating be Accomplished in the Spot Market? ........ 5

   Hedging with Financial Futures .............................................................. 6

   Arbitrage and Spread Positions with Futures Contracts .......................... 12

DO FUTURES MARKETS AS NOW ORGANIZED POSE ANY PROBLEMS FOR THE EFFECTIVE OPERATION OF FINANCIAL MARKETS? ................................................................. 17

   The Spot-Futures Relationship .............................................................. 17

      Stability of spot prices ................................................................. 17
      Level of spot prices ................................................................. 19
      Liquidity of spot market ............................................................. 20
      Diversion of funds from underlying cash market to the futures market .. 22

   Potential for Market Manipulation ...................................................... 22

      Three-month bill ................................................................. 22
      Bond market ................................................................. 24

      Manipulation because of essentially duplicative contracts and of exchange proliferation ............................................. 25

   Futures Markets vs. Forward Markets .................................................. 27

   Do Operations in Futures Markets Pose Unacceptable Risks for Banks? .... 27

   Are Additional Safeguards Needed to Protect Uninformed Users of Futures Markets ................................................................. 28

IMPACT ON TREASURY DEBT MANAGEMENT ............................................. 30

IMPACT ON MONETARY POLICY ............................................................... 32
SUGGESTIONS RELATING TO EXISTING CONTRACTS ........................................... 32
  Treasury Bills .................................................................................. 32
  Bonds ............................................................................................. 34
SUGGESTIONS ABOUT PROPOSED CONTRACTS .............................................. 36
  Coupon Securities ............................................................................. 36
  Exchange Rules ................................................................................ 37
SUGGESTIONS ON SURVEILLANCE AND REPORTING ................................. 38
SUGGESTIONS ON OTHER SUBJECTS ....................................................... 38
Self-Regulation of Exchanges

The exchanges reported that they monitor daily price movements and the volume of contracts traded in their markets. In watching price changes, they try to identify changes that reflect events which occur elsewhere -- for example, in other futures markets and the cash market -- as well as the economy generally. Price movements that cannot be explained easily by such events are examined more carefully -- to try to discover whether there is any basis for suspecting price manipulation. One exchange indicated that it can easily differentiate between trades by customers and floor traders. However, the exchanges do not record the exact time that each floor transaction is made -- an important item of information for detecting manipulations.

The exchanges do not feel that it is important to monitor open positions in a given contract until quite close to delivery, usually beginning about a month before the contract expires. In this period, they watch to see whether open interest is running high compared to deliverable supplies and to recent experience with other similar contracts, and whether positions are very concentrated. In judging whether firms with open positions are likely to take or make delivery, they consider the types of firms involved. If positions are concentrated at firms that generally deal with the retail public or speculators, as opposed to final investors or users, they do not feel that delivery will necessarily be high just because open interest is high or concentrated. If open positions are high because they are a part of spread trades, there would also be less cause for concern. Representatives of one exchange reported that when making judgments on the relatively new
financial contracts, they are more likely to err on the side of asking unnecessary questions of clearing house members than is the case with the more established commodities futures contracts.

A member of a nonbank dealer firm indicated that, although he supported the market, his biggest misgiving was the virtually automatic approval by exchange committees of new distant contracts when maturing contracts expired. He suggested that committee approval was likely to occur without a careful determination of whether there would be deliverable supplies available in the maturity area when the added contract neared expiration -- which could be as long as two years later. He thought the exchange committees might feel pressured to approve distant contracts because, otherwise, the viability of the market might be questioned. Representatives of one exchange maintained that contracts are seriously reviewed before new maturities are added, citing as an example the recent modifications made in the pork bellies and lumber contracts as a result of changes in the spot market for these commodities.

Exchange procedures which have been established to provide for orderly liquidation of outstanding contracts. As noted in the body of the report, representatives of the exchanges stated that they have a variety of emergency powers which give them wide latitude to act in emergencies.1/

Market participants report that the exchanges' power to increase margins, up to 100 percent (or more) of the face value of the contracts, can

1/ Exchange emergency powers are described in some detail in Appendix 3.
be quite effective in forcing the liquidation of open positions. However, reservations about the advisability of certain exchange emergency powers were expressed by some market participants. In particular, the authority to force liquidation of contracts seemed bothersome to some of those who oppose the market. Thus, two dealers indicated they could take long positions that depend upon the eventual delivery of a particular security to a customer. In the event of forced liquidation they would have to scramble in the cash market to fill the order -- presumably at a much higher price -- or face the embarrassment and costs of explaining to the customer, or to their management, that they were unable to fulfill the firm's commitment. Exchange power to allow a cash settlement of contracts was felt by one interviewee to be a legally ambiguous solution because a disinterested party must set the settlement price.

One exchange representative said there is a great need for good judgment in determining what action to take in cases where there might be manipulation because the exchange should not place itself in the position of just helping those who made costly trades. Also the exchanges admit that there are costs to taking sweeping action because that could call into question the integrity and viability of the contract involved (particularly if intervention were frequent).

One futures market participant asserted that the potential for problems developing would be effectively limited, because clearing house members insist that their customers be capable of making delivery. He declared there is no such thing as a failure to deliver on a futures contract
because exchange rules are very explicit about the responsibilities of clearing members. He understood that the member is obligated to buy the security in the cash market if a customer fails to deliver, and that if the member cannot perform, the clearing house has the obligation to settle. The purpose of taking margins was viewed as serving to protect the members and the exchanges in such cases, though if need be the underlying capital of exchange members would also be employed to avoid failures.
USES OF FUTURES BY MARKET PARTICIPANTS

Can "hedging" and speculating be accomplished in the spot market, without need for futures? If so, why are futures markets needed?

There seemed to be general agreement with the following assessment made by a nonbank dealer (who was opposed to the market): it is much easier to take a short position in the futures market than in the cash market because it is very difficult (and expensive) to borrow the specific securities needed to establish a short cash position. Thus it is inconvenient, and sometimes impossible, to carry out operations in the cash market which are equivalent to those in the futures market. A futures market customer drew the distinction between a "generic" short position which is obtained by selling a futures contract and a "specific" short position stemming from the short sale of a particular cash market security. The former allows a participant to be short against the market in general. There were very few comments about long positions. Some noted that since the return on securities typically exceeds the cost of financing them during periods when rates are falling, the futures market might not be used as extensively when rates turn around.

One nonbank dealer also indicated that large portfolios could not be altered very rapidly through cash market transactions without adversely affecting prices (the implication being that the equivalent futures market operations would have less impact on prices). Opinions on the liquidity of each market varied, however. Other respondents felt that some institutional investors such as banks might prefer not to book a loss on the sale of a
coupon security at a price well below cost. The sale of a coupon futures contract would protect them against further price declines. A commercial banker mentioned a particular advantage of the futures market for banks is that it allows a choice of accounting treatment for gains and losses. A bank can make or take delivery against a contract and show a gain or loss on a securities transaction or it can liquidate a contract and record a gain or loss as positive or negative operating income. Not all of the bankers interviewed were aware of this choice and some believed it was not available to them. Apparently different accounting firms have sanctioned different procedures. Some comments were addressed to the problems of differences in accounting practices and the need to adopt uniform procedures in this area to alert management to the exposure and risks associated with futures.

Hedging with Financial Futures. Hedging was difficult to define and often depended on the type of business or interest in the market that was being discussed. Hedging has often been thought of as an activity undertaken, at a small cost, for the purpose of reducing exposure to a possible loss of large magnitude — not unlike the purchase of insurance or a futures contract to offset a cash position. It has also been applied to transactions made in order to establish losses or gains in advance, in contrast to those undertaken on the basis of a forecast and realized at a later date. Many respondents were, in fact, risk takers who typically sought to profit from forecasts of the future. But even they often described their activities as "hedges" — if only partial ones against the possibility that their forecast would be incorrect or
where their transactions were actually cross-hedges. In other cases, institutional constraints make desired cash market position adjustments costly and so the adjustment is made in the futures market. The kinds of hedging activities that do occur can be best delineated by the comments of the interviewees. In this section, actual or contemplated hedges are outlined first. Subsequently, the comments of those who felt that little, if any, hedging occurs are presented.1/

Officials responsible for dealer operations at commercial banks cited hedging operations that the parent bank might employ. A parent bank that needs to hold securities for collateral purposes might sell futures contracts against this holding at times when it expects securities prices to decline. One dealer also mentioned that a bank might wish to hedge its cost of CD issuance against anticipated interest rate increases by selling futures contracts before the CDs are actually sold in order to fix financing costs. For example, a bank may be at the upper limit of the amount of outstanding CDs that its management is willing to tolerate. If it expects

---

1/ The reader should keep two factors in mind when evaluating the comments of interviewees pertaining to "hedging". First, as indicated in the main body of the report, pp. 35-36, only a true hedge will leave the participant equally well off no matter in which direction, or by how much, rates change. However, much of the "hedging" operations described in this section involve, to varying degrees and narrowly defined, speculation on future changes in rates. Second, the inherent degree of interest rate risk in an operation described by a participant often depends on knowledge of other factors not elaborated upon in the interviews. For example, an "anticipatory hedge" against a future commercial paper issue may involve little, or considerable, interest rate risk depending on the intended use of the commercial paper proceeds.
interest rates to rise it could sell Treasury bill contracts short in the hopes of refinancing the CDs when they mature. Unless rates on CDs and bills move in opposite directions the bank can be protected against rate movements in the future. There seemed to be some confusion, however, about whether the Comptroller of the Currency's regulations permit such anticipatory hedges.1/ One bank dealer felt they were not allowed while the representative of another bank thought they were.

Bank dealers also cited the value of transactions in financial futures as hedges against securities, such as CDs, that they hold to accommodate customers, or bankers' acceptances that they hold to accommodate their parent. A large regional bank which indicated that it had a CD dealer operation noted that it will sometimes hedge its holdings of the CDs of other regional banks. These instruments are not as liquid as CDs sold by money center banks. As a market maker, it does not run a hedged position as a normal condition but does when there seems to be a significant risk of adverse market conditions. One dealer bank indicated, without going into detail, that it had hedged the financing costs of bonds it had accumulated to meet commitments for the forward delivery of Treasury securities to state and local governments in connection with their recent sales of invested sinking fund bonds.

A futures market customer indicated that he had hedged against interest rate increases while his company was considering the issuance of

1/ National banks must obtain approval from the Comptroller of the Currency if they wish to use the futures markets. They must describe the activities they wish to undertake in their application. The Comptroller's Circular 79 describes the rules applicable to futures transactions.
commercial paper. He sold Treasury bill futures short and the hedge proved successful as interest rates did move higher before the paper was sold. (This operation took place before trading in the commercial paper contract began.)

Nonbank dealers indicated similar hedging activities. One maintained that his firm was now able to take larger positions in Treasury bills to meet potential customer demands because it is able to reduce the risk associated with such holdings through transactions in the futures market. Similarly, another noted that his firm was seeking to enlarge its market presence in Treasury bills and was using the futures market to hedge the larger inventories it now held to better service customers. Finally, one firm indicated that its corporate bond department often used the Treasury bond futures contract to hedge positions even though price movements in the two markets are not always identical.

Commercial banks gave examples of hedging both liabilities and assets. One representative indicated that his bank would short Treasury bill futures contracts while it was executing a program of CD issuance. He said the futures position was typically open for about a week and indicated that this is an especially valuable technique for a regional bank that cannot issue CDs as rapidly as some major banks. Another bank established a hedge position from the time it wins a bid on public deposits until it receives the funds. In effect it is hedging the known cost of issuing a deposit at some date in the future since it does not want to estimate the likely interest earnings that can be obtained at that time. Upon receipt of the funds, the bank lifts the hedge and decides how to invest them.
An example of an asset hedge was given by a bank that has decided to enlarge its portfolio of home mortgages, a process that is expected to continue for some time and over a period in which interest rates may begin to fall. Interestingly, it uses Treasury bill contracts, rather than GNMA's, to lock in particular rates. Another bank sold GNMA futures short while it was reducing its mortgage portfolio. It said the use of the futures market allowed the bank to fix the price ahead of time and to undertake an orderly divestiture.

A representative of one bank contended that some of his colleagues actually "unhedge" themselves through futures transactions because they disregard the underlying asset and liability structure of their bank. He noted an example presented at the ABA Investment Seminar which showed a bank hedging the future costs of a variable rate CD with sales of Treasury bill contracts. The bank might feel that he had hedged against interest rate changes, but if the CD was used to fund a floating rate loan, he had actually "unhedged" the bank and exposed it to greater interest rate risk. That is, if interest rates began to decline the bank is worse off because the return on the loan declines while that on the variable rate CD is "hedged" or fixed at a high level. If rates increase the bank is better off. In this regard some respondents mentioned that the overall structure of a bank's balance sheet must be considered to determine the role of futures contracts in the bank's operations.

Some respondents who opposed the markets, however, did not think a great deal of hedging activity was taking place, while others, who supported the markets and emphasized the potential benefits of hedging, admitted that the hedging role of the markets has not yet been fully developed.
One representative from a bank dealer department maintained that there was very little genuine hedging occurring and that most activity involved some degree of speculation or arbitrage. He could see no need to hedge his bank's Treasury bill inventories; if his management felt the outlook for the bills had changed, he would simply sell out the position rather than hedge.

Several nonbank dealers asserted the market was dominated by speculators and arbitrageurs and that hedging activity constituted a very small share of activity. One said it is a myth that dealers hedge their cash market positions in the futures market or that they carry larger positions because of the ability to do so. A second dealer admitted that his customers were not the "classic" hedgers typically described in the promotional brochures on the futures markets, but were more speculatively minded. Another maintained that there is little demand to hedge interest rate risk on short-term instruments anywhere from six months to two years into the future. (A trader from a nonbank dealer firm that supported the futures market agreed that the activity taking place in the more distant contracts is generally designed to profit from anticipated changes in the relative prices on those contracts.) One dealer stated that the market was dominated by speculators and arbitrageurs but he believed there is potential for hedging activity and was planning to expand the firm's commitment to educating clients about these opportunities.

1/ Most respondents described arbitrage as activities based on expectations of relative price changes. These arbitrage operations would involve offsetting operations in two instruments whose prices were thought to be "out of line" with the intent of profiting as they move back into alignment, at which time the arbitrage is unwound.
Representatives from two exchanges indicated that hedging activity had not yet developed in the financial futures markets to the extent that it has developed in commodities futures markets, which are much older. One felt that while trading was dominated by arbitrage operations, this was a necessary base in order to build the liquidity required for hedging.

Arbitrage and spread positions with futures contracts. In the view of many participants an arbitrage activity could be considered an operation designed to take advantage of an expected change in the relative prices of two different securities. These securities may differ in maturity, in issuer (Treasury, agency, private firm), or in form (actual securities versus contracts for future delivery).\footnote{This use of the term "arbitrage" by market participants differs from the definition of arbitrage provided in the main body of the text, see pp. 38-41. Only a pure arbitrage is not subject to rate risk in the sense that profit is taken immediately and is unaffected by future price changes (i.e. the amount of profit is known with certainty). An example of a pure arbitrage would involve buying a specific security on one market (say on one exchange) and immediately selling it in another market (on another exchange) at a price high enough to cover the transaction costs involved.} A futures market spread transaction, which involves the purchase and sale of two different contracts, could also be considered arbitrage. Spread operations are designed to take advantage of anticipated changes in the structure of yields in the futures market. In contrast, a speculative operation would be considered one in which the participant is willing to take a naked position in an effort to profit from an expected change in the absolute price of a particular security. For example the speculator may buy a security in hopes that it will rise in price or he may
execute a long futures market contract in anticipation that the price rise will be greater than that expected by the rest of the market (e.g., by the other side of the contract).

Bank dealers had little to say about arbitrage operations involving futures contracts, possibly in view of the Comptroller of the Currency's ruling. One dealer mentioned that his customers have been actively using the bill futures market in conjunction with a program of purchasing the new bills auctioned every week. This program, called "rolling" the weekly bill, involves the purchase of a six-month bill, its sale a week later and the simultaneous purchase of the new six-month issue. The participant hopes that the price of the bill will rise over the week as it is "digested" by the market and as its maturity shortens. The process is repeated in subsequent weeks. An operator engaged in this bill rolling technique will, at times, sell a bill futures contract to protect against a possible rise in the general level of interest rates (fall in prices) and to pick up some additional return since rates on the cash bill and the contract converge as they approach maturity. With respect to this latter point participants said futures contract rates were typically higher than implied cash market rates from the inception of the market until sometime during the summer of 1978. The yield curve in the futures market was steeper than that in the cash market until the cash market curve took on a negative slope over a portion of maturities. It is said that differences in the yield curves in the two markets are likely to persist because the market yield for a particular contract contains an estimate of the cost of financing at the time of the expiration of the contract.
One nonbank dealer mentioned a popular operation involving the purchase of a bond contract and the short sale of an outstanding cash market bond. Delivery is taken at the expiration of the contract and used to close the short position. He reported that this operation, until recently, would often result in a profit of three-quarters of one point, but lately the profit has been closer to one-quarter of a point. (In this case there is interest earned on the funds obtained through the short sale and a cost to borrowing the security to make delivery until the bond contract expires and delivery is taken. These cash market costs and returns are included in computing the net gain from the transactions.) Aside from these examples, many respondents indicated that their arbitrage operations were based on expected changes in the shape of the yield curve. For example, if the participant expects that very short-term bill rates will rise relative to rates on more distant bills (or even on notes due in one to two years) he might sell a nearby Treasury bill futures contract and buy a more distant contract. Regardless of changes in the overall level of rates, the participant will make a profit if the rate on the shorter term contract rises (falls) by more (less) than the rate on the longer-term contract.1/

Arbitrage operations can also take place between essentially similar contracts that are traded on different exchanges. The representative of one  

1/ Actually, in examples involving futures contracts, speculative profit is made only if future spot prices change in a way unexpected by the rest of the market. Thus, the trader in this example will profit only if the relationship between the rates changes by more than the rest of the futures market anticipates.
exchange indicated that he feels a fair amount of activity can be generated in this fashion. To date, only contracts on GNMA are traded on more than one exchange. Customers and futures market participants also indicated that a significant portion of their trading activity in futures could be considered arbitrages. These would either be spreads or attempts to take advantage of over- and under-supply in different sectors of the market. It appeared that the particular participants did not engage actively in hedge operations or outright speculation in their futures market activities.

A futures market participant said that one of his accounts has begun purchasing six-month bills -- instead of purchasing three-month bills as it was accustomed to doing -- and selling a three-month bill futures contract if he can gain an additional 20 basis points or so.

In assessing the factors creating some arbitrage opportunities one customer noted that they are likely to result from inefficiencies in the market which allow discrepancies to develop between prices of different securities. One source of such inefficiency is constraints imposed on the investment policies of certain types of participants. Some investors are limited by operating rules that restrict their security holdings to a particular type of instrument or maturity while others are confined solely to the cash market.1/

1/ It was said that some thrift institutions are apparently not permitted to buy or sell on margin. While this would ordinarily seem to prevent them from dealing in futures contracts, they are said to be able to undertake trades for forward delivery with a dealer -- who can offset with futures transactions. Some pension funds apparently operate in forwards because of similar constraints.
Other major market participants, such as the Federal Reserve, the Treasury, and many official foreign accounts are not standard profit maximizers and hence are often not very sensitive to changes in cash market prices. Inconsistencies in the rules used to account for securities transactions on a firm's balance sheet were put forward as another source of rigidity; some firms carry Treasury securities at market while others carry them at cost. And futures contracts are generally carried at net equity value (contract margin adjusted for profits or losses). It was noted that this latter valuation procedure tends to understate a firm's commitments to buy or sell.
DO FUTURES MARKETS AS NOW ORGANIZED POSE ANY PROBLEMS FOR THE EFFECTIVE OPERATION OF FINANCIAL MARKETS?

The Spot-Future Relationship

**Stability of Spot Prices.** Some interviewees suggested that the bill futures market may have accentuated price volatility in the cash market for bills. However, it was generally agreed that the increased volatility of three-month bill rates over the past year had probably been mainly attributable to the thin market supply of bills, due to heavy demand by foreign investors and the Treasury's de-emphasis on bills in its debt management policy. It was noted that each of several explanations for the recent volatility of bill rates seemed to be equally plausible. One **bank dealer** indicated that there were a number of situations when bill rates moved by sizable amounts for no apparent reason that could be explained by cash market factors. However, there was a fairly widespread opinion expressed that it has become necessary to monitor the futures markets to understand developments and price movements in the cash market. Another **bank dealer** felt the rally in the Treasury coupon sector in the summer of 1978 was greater than it would have been had there been no futures markets. Before the rally began, the dealers had borrowed as many securities as they could (in order to sell short in the cash market) and they had taken sizable short positions in the futures market as well. When prices then turned unexpectedly, the move tended to be exacerbated because dealers were forced to scramble to cover their short positions.

A **futures market participant** provided another explanation of a process through which the availability of futures trading could add to the
volatility of the cash market. He said astute futures markets traders could "run" that market, that is to exert pressure on the price of a particular contract in the expectation of activating investor standby orders to buy or sell a contract if the price reaches a certain level. For example, professionals would short a contract expecting to cover at lower prices after generating sales by traders executing the standby or "stop" orders. It was said that this can affect the cash market as arbitrageurs stepped in to profit from the price distortions created by the "run". (In a similar vein, representatives of a commercial bank said that when the futures prices move for a reason unrelated to cash market fundamentals the movement is frequently carried through to the cash market.) The futures market participant also said that the futures market was more volatile on a day-to-day basis than the cash market and might add to the latter's volatility. In the long run, however, he felt the availability of a futures market could reduce the amplitude of fluctuations in cash market prices.

On the other hand, a futures market participant and a nonbank dealer both maintained that the cash market was less volatile because of the existence of the futures market. Representatives of several commercial banks indicated that they had not observed any effect on cash market prices emanating from the futures market. However, one expected that auctions of the deliverable bills will be somewhat affected by the futures market.

Only a few respondents thought that cash market prices became more volatile in situations when futures trading was forced to stop because contract prices had moved their daily limit. Two nonbank dealers who felt that
Cash market prices did become more volatile indicated that they saw some customers enter the cash market to cover futures markets positions after the market for bond futures had moved the limit on a few days in August and again in November of 1978. Also a futures market participant felt that the cash market for bonds became more illiquid when limit moves occurred in the bond futures market. The representatives of a bank dealer noted that although many traders might be caught by such limit restrictions, the futures market trader ordinarily does not switch over to the cash market. Traders who are mainly cash market participants will switch to the cash market when a limit move is reached, but they will not ordinarily "pay more than a security is worth" and consequently do not bid prices to unrealistic levels. One of the respondents suggested that the customers who were forced to cover short futures market positions in these two episodes would, in the absence of a futures market, actually have been short in the cash market.

A commercial banker made the point that a large proportion of futures market participants cannot transfer their activity to the cash market. And one exchange representative asserted that the volatility that developed in the cash market following the limit moves in the futures market simply reflected the backlash of a sharp price adjustment that had originated in the cash market.

Level of Spot Prices. Several respondents thought the futures markets benefited the Treasury because they served to reduce the level of interest rates on Treasury securities. Two bank dealers maintained that the futures market had added another layer of participation to Treasury bill auctions and produced better bids. In part, this was due to the dealers' ability
to distribute bills more effectively. One representative felt the market had not cost the Treasury any money and had probably saved it a considerable sum. Two nonbank dealers expressed somewhat similar views. One said that the growth of the futures market, and the consequent increased involvement of many current and prospective participants, will lead to greater stability in interest rates and hence a lower overall level of rates. Another asserted that if the futures market ceased to exist, relative rate levels on Treasury bills would rise and the wide spread between bills and other money market instruments would be reduced considerably.

A bank dealer, however, felt that tight bidding for the deliverable bill harms the Treasury because it makes the market more volatile and causes investors to drop out of the market. He said that small banks, which he considered the backbone of the market, would participate less if the market becomes too volatile and this would presumably lead to higher interest rates on Treasury issues.

**Liquidity of the Spot Market.** Several interviewees maintained that the growth of the futures markets had not detracted from the liquidity of the cash market. (Liquidity is defined as the ability to execute sizable transactions quickly without adversely affecting prices.) One nonbank dealer felt the liquidity of the cash market had increased dramatically as a result of the futures market. Another argued that the burden of proof is on those who insist that the futures market does not add liquidity to the cash market because he believes the futures market helps provide for a steady stream of buy and sell orders in the cash market, as a result of arbitrage operations.
Other interviewees discussed characteristics or benefits of the futures markets which could be considered to augment the liquidity of the cash market. For example, a bank dealer noted that the futures market allows a dealer to accommodate a customer who needs to buy a large amount of securities by selling them short to the customer and hedging the risk in the futures market. Several dealers indicated that the two markets have become very well integrated and price discrepancies between them have diminished. As a result, the substitutability of securities between the markets has grown and the cash and futures markets can now be considered "one market". Thus they felt the futures markets have added to the depth and efficiency of the cash market.

On the other hand, one bank dealer argued that as a result of the growth of the futures market, the trading supply of bills tends to dry up to the extent that bills are "put away" as part of arbitrage operations. He also asserted that speculation -- which he said is encouraged in the futures market by ease of entry and low margins -- does not provide liquidity, but instead uses it, because there is a limit to the commitments a market maker can undertake based on the size of his capital. One nonbank dealer said the cash market for bills had thinned out because speculators have moved from the cash market to the futures market.

A fair number of those interviewed felt that the bill futures markets was more liquid than the cash market. One bank dealer indicated that it was possible to sell four to five times more futures contracts than the equivalent amount of cash Treasury bills without adverse effects. As
one nonbank dealer said, "it is possible to do more size, more quickly, with less 'give' to the market." Another said the futures market provided better opportunities to buy or sell on unexpected news.

**Diversion of funds from underlying cash market to the futures market.** Members of one nonbank dealer firm indicated that some of their more aggressive customers, after initially arranging trades for forward delivery of securities with them, had begun to trade in the futures market. This shift, however, may not result in any net loss of business if these customers purchase securities after they close out their futures contracts. The timing of cash market trades would, of course, be altered.

Examples given by other interviewees also tended to show that, while the composition or timing of their customer's purchases of Treasury securities might be altered by their activities in the futures markets, the size of their investments did not seem to be different as a result. In an example provided by a futures market participant, an account shifted its purchase of three-month bills to six-month bills coupled with a sale of a futures contract. Another account, normally an investor in long-term securities, was then purchasing higher yielding short- and intermediate-term securities and was also buying bond futures to be in a position to benefit from the expectation that the yield curve would change back to its normal upward sloping shape.

**Potential for Market Manipulation**

**Possibilities for manipulation of three-month Treasury bill rates.** In discussing the possibility of a corner in a deliverable bill, most seemed to think that it was dependent upon capturing a large portion of the auction...
and at the same time taking a large long position in either "when-issued" trading and/or the futures market. This operation was said not to depend on the use of the futures market in that it could be accomplished through operations in the cash market alone. Two dealers who seemed to think the market could be manipulated in this manner felt such an operation could result in a profit of about 25 to 50 basis points (or $625 to $1,250 per million of three-month Treasury bills). Other dealers estimated the profits would be more on the order of 10 to 15 basis points. Dealers who were very much opposed to the futures market said that a squeeze was possible partly because a significant number of investors were insensitive to relative rate movements and hence would not be willing to take an alternative nearby maturity in lieu of the deliverable bill, nor would they be willing to sell from any cash holdings of the deliverable bill.

One nonbank dealer said that because of the possibility of a corner he would not presell bills in the cash market (i.e., make a forward commitment) based on a long position in the futures market. He was concerned that he might not get the bills to fulfill the commitment to the customer. Another dealer said his firm does not like to have a short position in a bill that is deliverable on futures contracts.

Several respondents considered the concern about a corner to be exaggerated, feeling that its consequences would not be serious for a variety of reasons. For example, there are limits imposed on the amount one dealer can obtain at auction—25 per cent—and that would curtail the scope of any operation. In addition, it would be necessary to buy up a lot of the surrounding bills. Many interviewees maintained that investors
holding outstanding deliverable bills would be willing to sell as the price moved higher in order to shift into higher yielding adjacent maturities.

One nonbank dealer maintained that investor willingness to substitute bills with very close maturities would wreck any attempted corner. A bank dealer asserted that even some foreign official accounts are responsive to day-to-day price movements and would sell their bills if the prices of issues moved significantly out of line.

Another factor which would impinge on the profitability of a corner would be the need for secrecy. Dealers, customers, and futures market participants argued that if the identity of the firm attempting to corner the market become known, most other participants would retaliate. Also, one futures market participant maintained that very strong pressure from the exchanges can be brought to bear against those who attempted to manipulate the futures market.

A representative of a commercial bank did not seem concerned about the possibility of a corner. He felt the exchanges had the controls in place to prevent abuses. He said a corner would be easier to achieve in the GNMA forward market. A nonbank dealer felt that anyone who tried to corner the market would "go to jail."

Another point made by several interviewees, including a nonbank dealer and the representatives of an exchange, was that the Treasury would actually benefit from very aggressive bidding for its bills. However, a nonbank dealer asserted that the Treasury's reputation in foreign countries would not be enhanced if it became known that a Treasury auction had been cornered.

Manipulation of bond prices in the cash market and the futures market. There seemed to be less concern that manipulation of futures could be used to obtain a corner in the long bond contract. In part this reflects
the opinion that deliverable supplies are plentiful for the contract. One nonbank dealer pointed out that the deliveries in the December contract were easily met by one outstanding bond and that many of the bonds were delivered and re-delivered and thus the supply used was actually smaller than total deliveries. Participants prefer to have a variety of deliverable securities -- a market basket of bonds as the present contract provides -- so that they would have something to deliver even if the most preferred item were unavailable. Moreover, one nonbank dealer maintained that if trading supplies of all of the deliverable items became thin as someone tried to corner a bond contract and their prices rose relative to those on other long-term taxable assets, many investors would begin selling their Treasury bonds into the corner to replace them with corporate bonds.

Manipulation because of essentially duplicative contracts and of exchange proliferation. Two nonbank dealers thought that the inadequacy of deliverable supplies, and thus the enhanced possibility of a corner, would present problems from trading essentially similar contracts on two exchanges. Also a futures market participant and a commercial bank representative thought that duplication of contracts would mean a loss of liquidity in the market because trading would be dispersed. Respondents seemed uncertain as to whether current surveillance was sufficient to preclude cornering through trading on more than one exchange and in cash and forward markets.

The representatives of an exchange that has applied for several contract designations contended that it would be more difficult to manipulate fledgling markets because they would be thinner than the older markets (which
presumably meant that price variations resulting from manipulations would be more readily apparent). Representatives of an exchange with a developed Treasury futures contract contended that a proliferation of contracts could create some risk to the Treasury and Federal Reserve if the new exchanges are so weak that they could not govern themselves effectively. He said the potential for manipulation on such exchanges could represent a significant source of trouble.

One nonbank dealer felt that it would be possible to have two exchanges trading the same contract but not more. He thought better execution of orders would result from competition between exchanges, cryptically stating that execution of orders now is not as good as it could be. An exchange representative and some others said that the benefits of competition would be partly offset by increased complexity, paperwork and monitoring requirements.

A futures market participant agreed and added that contracts that have not been popular be closed down so that another exchange could try them. A representative of an exchange said that it was unlikely that similar contracts would be proposed by several exchanges because it is difficult for a new contract to compete with one already established on another exchange. He also expected little increase in the trading population from proliferation. Another pointed out that two successful contracts on one instrument are an exception rather than a rule in futures markets. He and several others felt that the market should determine the viability of a contract and that competition would eliminate the weaker ones. Some respondents thought that little
additional information would be provided via duplicate contracts and it would create costs because activity would need to be watched.

**Futures Markets versus Forward Markets**

Respondents drew the distinction between the organized futures markets, which require posting initial margin and daily marking-to-market, and unorganized forward trading which does not have these safeguards. A commercial banker expressed a consensus when he stated that the futures markets are superior to forward trading because there is less credit risk and better price information. He said margin posting is valuable for monitoring activities of traders and accounts because unauthorized trading could not be so easily hidden when margins must be adjusted daily. He added that corners would be easier to achieve in the GNMA forward market than in the futures market where controls are in place. A representative of a nonbank dealer firm said that his firm would not have experienced the trouble in its GNMA forward trades that it had actually encountered if the safeguards present in the futures markets had existed. Some dealers indicated that they currently undertake or would consider related forward trades with customers. This could occur because some customers were not permitted to trade in futures (thrifts and some pension funds) or preferred forwards because no margins were required.

**Do Operations in Futures Markets Pose Unacceptable Risks for Banks?**

One commercial banker said that the Comptroller of the Currency's regulations force a bank to think about using the market safely and with
discretion. Specifically he thought they require a bank to establish a solid accounting system and they demand a reporting system that informs top management of futures activity and the bank's exposure. (The kinds of activities undertaken by banks in the futures markets were described earlier.)

In one respect, at least, there seemed to be confusion about the activities allowed by the Comptroller's ruling which permits only "hedging" activities. A representative of one commercial bank, whose request to engage in futures transactions was approved by the Comptroller, said he considered hedging to include anticipatory transactions -- futures transactions entered into with the intent of matching them in the cash market at a later date. Representatives of a bank dealer, on the other hand, thought these activities were prohibited by the Comptroller's ruling -- possibly because there is no specific simultaneous offset. However, these latter representatives considered arbitrage activity to be hedging and therefore felt it permissible to establish offsetting futures positions to take advantage of anticipated changes in spread relationships. In this regard they considered spread trading in futures to be acceptable, since a long position in one contract is offset by a short position in another, even though such a transaction may not reflect the hedging of an outstanding asset or liability.

**Are Additional Safeguards Needed to Protect Uninformed Users of Futures Markets?**

Two nonbank dealers expressed serious concerns that small-scale investors might be drawn into the market without a full understanding of the
financial ramifications of their actions. For example, they might believe they were actually purchasing Treasury securities. This concern was usually linked to another, namely, that further pressures to regulate the cash market would be generated if financial difficulties developed in the futures markets and subsequent investigations then revealed that many investors had been misled by sales personnel. (On this latter point one futures market customer felt that existing statutes were adequate to govern the representations a salesman is allowed to make to investors.)

Two representatives of commercial banks expressed concern about the calls they had received from futures market sales personnel. One reported that the salesman had little knowledge of banking operations and suggested inappropriate transactions. The other representative expressed uneasiness about the aggressiveness of the sales people and felt this might draw in participants who did not realize the risks inherent in the market.

Several interviewees indicated that these concerns might be exaggerated. One nonbank dealer said most firms that deal with the retail public, such as his, impose higher margins than the minimum levels required by the exchanges. The provision of margin along with daily marking-to-market (adjusting the margin to reflect daily price changes) would prevent many problems, they felt. One futures market participant said that his firm expects customers to respond quickly to calls for additional margin. He reported that accounts with margin calls outstanding for five days are closed out, noting that the CFTC takes a hard line on calls outstanding beyond that limit.
The representatives of an exchange also said some firms impose net worth standards on the customers they accept -- possibly requiring minimum net worth of $20,000 to $50,000. (Representatives from another exchange thought that individual customers would be above the middle income category.) One exchange considered imposing customer suitability standards on the member firms but did not require them for fear of placing that exchange at a competitive disadvantage. While these representatives initially appeared to agree that suitability standards imposed by regulators might be a good idea they later opposed them because they thought there would be high costs in ensuring compliance and that the disclosure statements and monitoring would be unwieldy. A representative from a third exchange also opposed the suitability standards but noted that the futures markets have risk disclosure rules that are helpful. He also seemed to think that the industry's self-policing standards will probably expand over the next few years.

IMPACT ON TREASURY DEBT MANAGEMENT

Virtually all interviewees emphasized that the Treasury should not feel compelled to issue a specific security merely to provide an adequate supply of issues deliverable against futures market contracts. Many respondents felt that market participants have properly considered the possibility that deliverable supplies might not be sufficient, although one said that most participants disregarded this risk. Some also felt that many participants presumed that the Treasury would take action to increase supply in such cases. To guard against the problem, several participants indicated
that the exchange (or the CFTC) had the power to change the deliverable item unilaterally if supplies were insufficient. Indeed, representatives of one exchange with a proposed contract for future delivery of Treasury notes said they had not designated alternative deliverable issues since they felt it would be better to allow the exchange latitude to designate alternative securities should a problem develop.

On the other hand, a commercial banker said it was conceivable that the Treasury would lose some debt management flexibility if futures contracts in notes were established. He said the Treasury would be forced to recognize the lack of sufficient supply in the market if a large short position in the deliverable security or a large long futures position influenced prices. He felt that the Treasury could not avoid being pressured if such circumstances were to develop.

Two respondents, one from a nonbank dealer firm and the other a futures market participant, said that at times the futures market had added to demands in Treasury auctions. Both cited an instance before the bond auction in the November 1978 refunding when it was profitable to sell the December futures contract and bid aggressively in the auction. At that time, the yield on the contract had been lower than the one that appeared likely to emerge at auction, so a profitable arbitrage opportunity was taken advantage of. When they were asked about the opposite case in which it might be profitable to buy the contract and sell the bond on a "when issued" basis and thus be prevented from bidding in the auction itself, one agreed that the bidding could be harmed in that case.
IMPACT ON MONETARY POLICY

Only two interviewees, both from the same nonbank dealer firm, addressed the issue of whether futures markets could influence monetary policy. One expressed the opinion that, at some point, futures markets could possibly delay and reduce the impact of monetary policy. He indicated that as participants, especially banks, become more able to hedge interest rate risk, the effects of any shift in policy would tend to be delayed, because the bite of higher interest rates would be diminished. However, the other respondent expressed the opinion that there would always be another participant taking the opposite side on futures transactions so that the bite of higher interest rates would be felt somewhere.

SUGGESTIONS RELATING TO EXISTING CONTRACTS

Treasury Bills: No respondent recommended withdrawal of the three-month bill futures contract but some of those interviewed felt that the one-year bill contract might well be withdrawn -- both because it had attracted little market interest and because if it did develop a following it might pose a problem with respect to the adequacy of underlying supply. It was also noted that hedgers could use a series of three-month bills to accomplish the same objective. In addition, a number of suggestions were made for possible improvements in the three-month bill contract. Some suggestions were also made about steps that the Treasury might wish to consider.

(1) One nonbank dealer suggested that several bills should be deliverable rather than just one.
(2) Another nonbank dealer suggested that a proliferation of contracts to include adjacent maturities might alleviate supply problems by encouraging more arbitrage and "swapping". Other respondents were less certain about this.

(3) One nonbank dealer indicated that if the Treasury was warned about the possibility of a corner it could reduce the amount that any one participant could win in the auction from the 25 percent limit now imposed. A bank dealer suggested that the 25 percent limit apply to the competitive amount of bills available in an auction, rather than to the total size of the issue as is now the case. (Respondents viewed the 25 percent limit, referred to above, as a rule rather than a guideline which the Treasury may or may not impose.)

(4) Several of those interviewed agreed with a suggestion that bidders in bill auctions be required to attach to their bid a statement showing their positions in the outstanding three-month issue (auctioned initially as a six-month bill). This would include any commitments on the issue made in the futures, forward and cash market. The Treasury could then use this information to prevent awards of the issue from leading to overconcentrated positions in the bill.

(5) Representatives of one nonbank dealer proposed banning "when issued" trading in bills; that is, pre-auction trading. A bank dealer, however, maintained that "when issued" trading...
builds interest in the weekly auction and should not be prohibited. Others indicated that any such prohibition would be difficult to police.

(6) There was some feeling that a limit should be placed on the amount of open interest a single participant could have -- either in the number of contracts or as a percentage of the market. Others felt that such a prohibition could threaten the viability of a contract. It was noted that such a limit might be unenforceable in practice, though reasons why surveillance and monitoring would not spot violations were not spelled out.

**Bonds:** In general, participants viewed the experience with the bond contract favorably. They believed that underlying supply was adequate -- generally in comparison to bills and other proposed maturities -- given the range of alternative bonds that can be delivered. A number said the bond contract was good for hedging since it had been easy to determine which particular cash issue would be most likely to be delivered. They were asked about the "conversion factors" for deliverable securities (see below) but in most cases showed little technical familiarity with the complexities they involved: they were aware of a "rigidity" in these factors but generally said that it had not affected cash market prices.

Each security eligible for delivery on the bond futures contract is priced to yield 8 percent to its nearest call date. When the futures price is used as a base, a conversion factor is applied to determine the
price of each deliverable bond that has a coupon different from 8 percent. In the cash market, bond yields are calculated to call date when their coupon rate is above prevailing yields and to maturity when their coupon rate is below them. Partly as a result, the specific cash market bond that is the "cheapest" to deliver for futures contracts is not always the bond with the highest yield to maturity in the cash market. (This latter concept might also be considered an alternative definition of the cheapest security.) As a consequence of this factor and the overall relationships involving the array of coupons and maturities on outstanding bonds, a shift in the level of yields, with no change in the shape of the yield curve, can cause one cash market security to take the place of another as the "cheapest" to deliver. It is possible that this would have an impact on cash market prices (that differs from the impact of the change in yield levels). The "cheapest" security for the contract, for example, might trade at a higher price and lower yield than indicated by its coupon and actual maturity relative to the yield curve.

In the past year or so, the deliverable cash market bonds were all at discounts and were all priced to yield to maturity. They would probably also have been at discounts if priced to call date. Thus, any distortions were probably minimal. But it is possible that if yields moved somewhat lower the difference in pricing could introduce some distortions to cash market prices. There could also potentially be some churning in the cash market as hedgers adjusted positions. (The ACE has proposed a bond contract where the deliverable security is the cash bond with the highest yield to
maturity of those selling below par. In that case, the deliverable item would be the bond with the highest coupon and longest maturity that is at a discount.) It was also noted that changing the conversion factors on the existing contract could pose a problem because distant contracts would have different specifications than nearby ones.

There was a mixture of opinion on the impact of limit moves as noted earlier. A bank dealer thought margins should be high enough so that no limits were in effect while the representatives of an exchange indicated that futures market participants are not used to trading without them.

SUGGESTIONS ABOUT PROPOSED CONTRACTS

Coupon securities: Representatives of commercial banks indicated they thought it would be good to have a contract for notes to provide additional hedging opportunities. One representative from an exchange thought it would be good for hedging term loans while another respondent thought it would be useful as a hedge against the cost of longer-term CDs (which are often variable rate instruments). There was some difference of opinion on whether a two- or a four-year maturity was preferable. They also indicated a preference for contracts in private instruments to avoid the risk implicit in "cross hedges."

Futures market firms and some bankers said there was a need to fill in the gap in the yield curve since, at present, it is not possible to hedge or speculate against interest rates on instruments with maturities between 2 and 12 years. They typically saw a need for an intermediate-term maturity but had no strong preferences.
Several dealers were concerned about the adequacy of the underlying supply of coupon securities, noting that securities are "locked" into many portfolios when they are trading below cost. They felt that participants might not be sufficiently aware that advance refundings or a change in debt management would significantly change the outlook for supply -- or could exert pressure on the Treasury. A dealer noted that corporate securities were substitutable for Treasury long bonds (however, intermediate-term private debt securities were not traded much). Several thought that vigilant surveillance and possibly a change in Treasury procedures in making auction awards (such as noted for bills) could mitigate the potential for corners and squeezes. A commercial banker said that using a "market basket" could lead to price distortions in the cash market as shifts in the most deliverable issue occurred. The high yield value of a 32nd in the intermediate area and more frequent changes in the shape of the yield curve for such maturities would make pricing difficult. Several respondents noted that the contract would be a poor hedge in view of this potential.

Exchange rules.

(1) As contract expiration neared, one nonbank dealer thought speculators should be required to put up increasingly higher margin.

(2) The representative of an exchange put forth the possibility that when prices move the limit, trading be halted for only a part rather than all of the trading day as is now the case. After a respite, trading could be allowed
to begin again with new higher limits in force. The limits are used partly to permit exchange members to make margin calls and the respondent did not indicate whether such calls could be made -- or margin increased -- in a short interval.

SUGGESTIONS ON SURVEILLANCE AND REPORTING

(1) Several dealers felt that there should be better reporting on futures market activities of dealers. The feeling was also expressed that there should be some centralized monitoring of positions held by all participants in the cash, futures, and forward markets. As part of this, one nonbank dealer proposed an early warning system on the concentration of positions by firm and by customer.

(2) Two cash market participants felt that the Treasury and Federal Reserve should have a larger role in regulating the futures market (if it is to be regulated to a greater degree). That is, the agencies that have experience with and a stake in the market should be involved in its regulation.

(3) One customer recommended that the exchanges use a serial tape to record the time, price, and size of cash order traded to prevent manipulations.

(4) Another customer suggested that better accounting techniques be employed to depict adequately each institution's exposure to interest rate risk on its futures positions.

SUGGESTIONS ON OTHER SUBJECTS

(1) At least two interviewees felt that the Treasury should pay more attention to futures markets prices to determine the cheapest way to finance

1/ Most had not yet studied the proposed new reporting forms which include data on futures.
its debt. In this vein, several suggested that the Treasury consider selling additional amounts of securities that are in demand for delivery in the futures markets since this would reduce financing costs.

(2) A nonbank dealer who proposed abolishing the Treasury bond futures contract supported the development of a corporate bond futures contract, because there are legitimate needs to hedge in that market.

(3) Several commercial bankers supported contracts on other private assets and liabilities that could serve as better hedges. Futures contracts on such items as Eurodollars, CDs, and tax-exempt securities were recommended by those who said they still were taking considerable risk by using Treasury futures as a cross-hedge.
Individuals Interviewed as Part of Study

ACLI Government Securities, Inc.

Joseph Hickey, President
Allen Donald, Vice President

Amex Commodities Exchange, Inc.

Alfred J. Patti, Vice President
Michael Mullan, Director of Market Development

Bankers Trust Company

Allan W. Rogers, Senior Vice President and Manager
Kim B. Engelbert, Vice President
Jay L. Pomrenze, Vice President

A. G. Becker, Inc.

John F. Donahue, Jr., President
Robert J. Flynn, Vice President
William Coleman

Blyth Eastman Dillon Capital Markets, Inc.

David L. Rosenau, President
Richard B. Whiting, Executive Vice President, Managing Trader

Chemical Bank

Robert L. Hatcher, III, Vice President

Chicago Board of Trade

Thomas Coleman, Director, Economic Analysis and Planning
Chicago Mercantile Exchange

Clayton Yeutter, President
Michael Weiner, Vice President of Law & Compliance
Dr. Frank J. Jones, Vice President of Research and Chief Economist
Jack Denis, Senior Vice President, International Monetary Market (IMM)

Citibank, N. A.

Mark F. Kessenich, Jr., Vice President
Kenneth Rempell, Assistant Vice President

Commodities Exchange, Inc.

Lee H. Berendt, President

Continental Illinois National Bank and Trust Company of Chicago

Michael O. Rigg, Vice President

Discount Corporation of New York

Ralph F. Peters, President
Anthony J. Hanlon, Head Trader

Donaldson, Lufkin & Jenrette

William M. Kidder, Senior Vice President

J. F. Eckstein and Company

John F. Eckstein, Managing Partner

First National Bank of Dallas

Timothy H. Sidley, Senior Vice President
First Pennco Securities, Inc.

John L. Knight, Senior Vice President-Manager
Richard Appel, Vice President-Deputy Manager
Anna Rossi
Richard Landau

First Pennsylvania Bank, N.A.

Lawrence J. Geraghty, Senior Vice President

Fischer, Francis, Trees, and Watts, Inc.

Stephen Francis, Vice President

Goldman, Sachs & Company

Victor Chang, Vice President
Robert Frahm
Mark Winkelman

E.F. Hutton & Company, Inc.

Martin Boorstein

Aubrey G. Lanston & Company, Inc.

C. Richard Youngdahl, Chairman & Chief Executive Officer

Merrill Lynch Government Securities, Inc.

Emanuel Falzon, Senior Vice President,
Merrill Lynch Money Markets, Inc.
Thomas Riordan, Vice President
Allan Rosenberg, Assistant Vice President
Steven Jacobs
Morgan Guaranty Trust Company of New York

Paul Bellica, Vice President
David Booth

National City Bank (Cleveland, Ohio)

Michael J. McMennamin, Senior Vice President

Paine Webber, Jackson and Curtis, Inc.

In New York:

Edwin W. Dean, Senior Vice President

In Chicago:

David Ganis, Vice President
Jerry Laurain, Vice President-Commodities

Pittsburgh National Bank

Ernest A. Erdeky, Vice President

Republic National Bank of Dallas

Nicholas F. Roberts, Executive Vice President

Salomon Brothers

Thomas Strauss, General Partner

Norton Simon, Inc.

Thomas Sullivan, Vice President
Society National Bank of Cleveland

James W. Wert, Senior Vice President

Thomas McKinnon Securities, Inc.

Laurence Mollner, Vice President
Commodity Futures Trading Commission

The Commodity Futures Trading Commission (CFTC) is an independent Federal agency currently charged with the responsibility of regulating futures trading. The establishment of the CFTC in 1975 was the culmination of a series of Federal legislative efforts in the area of futures trading.

Presented below is a chronology of this legislation:

1914 -- The Cotton Futures Act was approved establishing the first major attempt to regulate the marketing of farm products, specifically, cotton.

1922 -- The Grain Futures Act was passed by Congress, marking the first Federal regulation of grain futures trading. Under this Act, futures trading in Federally regulated commodities (i.e., grains and flaxseed) could be conducted only by exchanges that were Federally licensed or designated as contract markets (i.e., boards of trade). Exchanges themselves were to take major responsibility for prevention of market manipulation. Failure to do so would result in the revocation of their designation as licensed contract markets.

1936 -- Under the Commodity Exchange Act, regulatory provisions of the Grain Futures Act were amended and strengthened. Regulatory coverage was extended beyond grains and flaxseed to include cotton, millfeeds, butter, eggs, potatoes, and rice. Over the years the list of commodities falling under Federal regulation expanded to wool tops (1938), fats and oils, cottonseed, cottonseed meal, peanuts, soybeans, soybean meal (1940), wool (1954), and onions (1955). In 1958, futures trading in onions was prohibited. Futures trading in livestock products and frozen concentrated orange juice came under Federal regulation in 1968.

-- Under the Commodity Exchange Act of 1936, the Secretary of Agriculture was given major responsibilities for regulating futures markets covered in the Act. Most of these regulatory responsibilities were carried out by the Commodity Exchange Authority (CEA), a separate agency of the Department of Agriculture. The major responsibilities of the Secretary of Agriculture and the CEA under the Commodity Exchange Act were:
1. to designate which boards of trade may operate as a contract market;

2. to approve futures commission merchants and floor brokers for registration and the conduct of business;

3. to suspend, revoke, or deny the registration of futures commission merchants and floor brokers;

4. to suspend the trading privileges of persons found to have violated the law;

5. to issue rules and regulations needed to achieve the purposes of the law or carry out its provisions;

6. to issue complaints of violations leading to disciplinary proceedings;

7. to investigate trading and market operations;

8. to provide information, statistics, and reports on trading and marketing to the public;

9. to require reports from firms and from traders who hold positions of a size fixed by the Secretary;

10. to establish minimum financial requirements which must be met by futures commission merchants; and

11. to disapprove certain by-laws and rules of contract markets relating to contract terms and other trading requirements.

The Act also provided for the establishment of the Commodity Exchange Commission composed of the Secretary of Agriculture (Chairman), the Secretary of Commerce, and the Attorney General. The main responsibilities of the Commodity Exchange Commission were to set position and trading limits on speculators and order disciplinary actions against exchanges regarding trading in regulated commodities.

1974 -- The Commodity Futures Trading Commission Act (CFTCA) was signed by President Ford on October 23, 1974. The CFTCA substantially revised the Commodity Exchange Act to provide comprehensive regulation of all commodities, goods, and services traded in the futures markets. The CFTCA also provided for the establishment of the Commodity Futures Trading Commission (CFTC), an independent Federal agency, which,
on April 21, 1975, became the sole administrator of the Commodity Exchange Act, replacing the Secretary of Agriculture, the Commodity Exchange Authority, and Commodity Exchange Commission.

CFTC Authority and Responsibility

As administrator of the Commodity Exchange Act, the CFTC has broad regulatory authority over all aspects of futures trading except for the setting of levels of margin on futures contracts, which is the exclusive prerogative of the individual exchanges. Major areas of CFTC authority and responsibility are summarized below:

1. To approve all futures contracts traded on U.S. exchanges.

2. To review, approve, and/or change rules and regulations of exchanges and require the exchanges to enforce their approved rules. If, after a hearing, it is found that an exchange is not enforcing its rules and regulations and/or that an exchange or its officials are in violation of the provisions of the Commodity Exchange Act and/or rules and regulations of the CFTC, then the CFTC has the authority to suspend up to six months trading in any of the exchange's listed futures contracts or to permanently revoke approval of any of the exchange's contracts. Furthermore, civil penalties up to $100,000 may be assessed against the exchange or its officials for these violations. The exchanges have the right to a court appeal.

3. To require exchanges to make readily available to the public and news media daily data for each future (delivery month) of all listed contracts pertaining to trading volume, open interest, deliveries, opening price(s), closing or settlement price, and price range.

4. To establish trading and open position limits in particular futures contracts for individual traders or concerted trading groups who are not classified as bona fide hedgers. Currently, the CFTC has no such limits in effect for any of the interest rate futures contracts.
5. To direct an exchange to take action needed to maintain or restore orderly trading in or liquidation of any futures contract whenever the CFTC has reason to believe than an emergency exists. Threatened or actual price manipulation or corners are included in the definition of "emergency."

6. To register and regulate all futures commission merchants (FCMs) such as brokerage houses, persons associated with FCMs who deal directly with customers such as registered commodity representatives (RCRs), floor brokers, commodity pool operators (similar to managers of mutual funds), and commodity trading advisers. The CFTC has the authority to suspend or revoke the registration of any registrant if, among other things, it is found that the registrant has violated the provisions of the Commodity Exchange Act or the rules and regulations of the CFTC, was convicted of a felony, made misstatements in the registration application, or manipulated or attempted to manipulate any futures price. The CFTC has the authority to establish minimum financial requirements for FCMs and requires them to segregate customer funds.

7. To require the exchanges to file a daily report to the CFTC that includes contracts traded, long and short positions, and deliveries for each future in every listed contract market. These data must identify the clearing member involved in each trade, position, and delivery.

8. To require FCMs to report to the CFTC reportable futures positions of their customers. A reportable position is any open contract position in any one delivery month of any one futures contract, which, at the close of the trading day, equals or exceeds a quantity specified by the CFTC. If there are different futures contracts in the same commodity in the same delivery month, then the combined position of open contracts in the same delivery month of the different futures contracts is used to determine the existence of a reportable position. The reportable position for interest rate futures is 25 contracts. The FCM must file these reports daily for each customer that has a reportable position.

9. To require any trader with a reportable position in any futures contract to report daily to the CFTC his trading activity, open contracts, and deliveries and receipts in all

\[1/\text{Registered commodity representatives are employees of futures commission houses engaged in sales of futures to the public. They are analogous to registered representatives in securities brokerage firms.}\]
delivery months of all futures contracts. Each position is to be classified as to whether or not it is a hedge. These position data for all reporting traders are aggregated and published by the CFTC for the last trading day of the month for all futures contracts. A trader with a reportable position in a futures contract is to keep detailed records of his positions and transactions in the related cash commodity and is required to furnish these records to the CFTC upon request.

10. To affirm, modify, set aside, or remand, after review, any disciplinary actions taken by an exchange against its members.

11. To seek court injunctions against any exchange or person engaged or about to engage in violations of the Commodity Exchange Act and/or the rules and regulations of the CFTC. The CFTC may conduct administrative disciplinary proceedings for violations of the Commodity Exchange Act and/or rules and regulations of the CFTC by either an exchange or individual with authority to assess civil penalties of up to $100,000 per violation. Under the Commodity Exchange Act, it is a felony punishable by a fine of up to $100,000 and/or imprisonment of up to five years for any person to manipulate or attempt to manipulate the price of any commodity in interstate commerce as for future delivery against an exchange-traded futures contract or to corner or attempt to corner any such commodity.

12. To conduct reparation proceedings for money damages by any person alleging damage by any registrant (FCM, RCR, etc.) for violation of the Commodity Exchange Act and/or rules and regulations of the CFTC by the registrant.

CFTC Organization

Commission

The Commission is composed of a Chairman and four other Commissioners appointed by the President and confirmed by the Senate to serve staggered five-year terms. All functions and powers of the Commission are delegated by Congress to the Commissioners, except executive and administrative functions conferred on the Chairman. In order to carry out their
responsibilities, the Commissioners were granted by Congress authority and legal power of the following nature: (1) legislative (rulemaking and policy setting); (2) executive (authority to establish programs to implement and enforce rules and policies of the CFTC); and (3) judicial (hearing cases involving disputes over or infractions of the Commodity Exchange Act and/or rules and regulations of the CFTC).

**Executive Director**

By law, the Commission is required to appoint an Executive Director. The Director is responsible for the management and coordination of operations in accordance with the general policies of the Commission.

**General Counsel**

By law, the Commission is required to appoint a General Counsel who is the chief legal officer of the Commission, who represents the Commission in various legal capacities, and performs other legal and review functions for the Commission.

**Operating Divisions**

The CFTC is organized functionally in three operating divisions: (1) Enforcement; (2) Economics and Education; and (3) Trading and Markets. These operating divisions have staffs in the Washington, D.C. headquarters as well as the following regional offices: (1) Eastern (New York City); (2) Central (Chicago); (3) Southwestern (Kansas City); and (4) Western (San Francisco).
Exchange Regulation of Futures Trading

Although, as administrator of the Commodity Exchange Act, the CFTC has ultimate authority and responsibility for the regulation of futures trading, each commodity futures exchange is expected to assume a self-regulatory role that reinforces that of the CFTC. In order to accomplish this, the exchanges are given latitude in formulating their own rules and regulations with the proviso that these rules be consistent with the Commodity Exchange Act and be approved by the CFTC. What follows is a discussion of the organizational structure and the major rules pertaining to exchange regulation of futures trading of the Chicago Board of Trade (CBOT) and the Chicago Mercantile Exchange (CME). It is on these two exchanges where the greatest volume of trading in interest rate futures is conducted. Although the discussion is limited to the CBOT and CME, it is believed that other exchanges have similar structures and rules.

Exchange Organization and Government

Membership

Most exchanges are nonprofit associations whose membership is, in most cases, composed of individuals. Although generally restricted to individuals, many memberships are effectively controlled by partnerships, corporations or cooperative associations. These organizations often finance the membership for the individual who is an employee, officer, or agent of the organization and simultaneously secure an agreement that the membership will be surrendered when the individual severs ties with the organization. These
"controlled" memberships must meet with the approval of the governing body of the exchange. The number of memberships at the exchanges are fixed by the governing body. At the CBOT, there are 1,402 full memberships entitling the member to trade any futures contract listed on the exchange and 100 financial instruments memberships entitling the member to trade only those listed contracts based on financial instruments and gold.1/ At the CME, there are 500 full memberships entitling the member to trade any futures contracts listed on the CME and its divisions (i.e., the International Monetary Market (IMM) and the Associate Mercantile Market (AMM)), 650 IMM memberships entitling the member to trade only those futures contracts listed on the IMM (i.e., financial instruments, metals, coins, and foreign currencies) and 300 AMM memberships entitling the member to trade only those futures contracts listed on the AMM (i.e., lumber, potatoes, eggs, milo, and turkeys).

Privileges of membership include: (1) direct execution of trades for one's own account on the floor of the exchange or through another member at rates and/or margins generally lower than those charged nonmembers; (2) not (3):

1/ In addition to the financial instruments memberships there exist floor activity permits totaling 50 each for 90-day commercial paper futures, U.S. Treasury bond futures, and gold futures and 100 for certificate-delivery GNMA futures. A permit holder pays a quarterly fee to the exchange for floor trading privileges in the specific futures contract. The fee varies according to the contract-designated permit. In addition, if the permit holder has traded in sufficient specified volume over three years, then the holder has the option to purchase a newly created financial instruments membership at $40,000. (This option is not extended to certificate-delivery GNMA permit holders.) Permit holders' quarterly fees will be applied to the purchase price of the membership if the option is exercised.
(2) execution of trades on the floor of the exchange for members and nonmembers and collection of a brokerage (execution) fee for so doing; (3) direct communication (e.g., by telephone) with customers from the trading floor; and (4) voting at exchange meetings and in exchange elections.

A member may sell his membership to another individual. Bid and asked membership prices are posted daily. If a sale is consummated, the buyer must apply for membership. In order to be eligible for membership, the applicant must be an adult "...of good moral character, reputation and business integrity, with adequate financial resources and credit to assume the responsibilities and privileges of membership..." (CME Rule 101). The applicant's qualifications are evaluated before a membership committee for membership recommendation. If so recommended, the board of governors or directors then makes the final decision as to the applicant's membership acceptance. If a member trades on the floor of the exchange, he must participate in an indoctrination program and pass a written examination.

Board

The governing body of an exchange ultimately responsible for establishing major policies, enacting and enforcing rules, and invoking major disciplinary actions is the board of directors (CBOT) or board of governors (CME). The CBOT board is composed of an elected chairman and vice chairman (CBOT members), the president of the exchange (nonmember), fifteen elected directors (CBOT members), and three directors (nonmembers)
nominated by the president and approved by the board. The board of the
CME is composed of twelve CME members elected by the CME membership, four
IMM members elected by the IMM membership, two AMM members elected by the
AMM membership, and up to three nonmembers appointed by the chairman and
approved by the board. The chairman of the board, who must be a CME member,
is elected by the board. The boards at both exchanges are responsible for
appointing an exchange president (nonmember) and appointing members to vari-
ous exchange committees. The board, alone, has the power within the exchange
to suspend for a prolonged period or expel a member and impose major fines
for rule violations. In addition, the board has all encompassing emergency
powers as evidenced by the following:

The Board shall have power to declare an emergency and
to adopt such temporary regulations or resolutions as it deems
necessary by virtue thereof. Any such temporary regulation or
resolution receiving the affirmative vote of two-thirds of the
directors present and voting shall supersede all contrary or
inconsistent Rules or Regulations during the pendency of the
emergency, and may be rescinded by two-thirds vote when the
directors determine the emergency has ceased. All Exchange
contracts shall be subject to the exercise of such power. Such
contracts shall also be subject to the exercise by the Clearing
House by its Charter, By-Laws, and Resolutions. (CBOT Rule 251.)

In the event that the Board determines that an emergency
situation exists in which the free and orderly market in a com-
modity is likely to be disrupted, or the financial integrity of
the Exchange is threatened, or the normal functioning of the
Exchange has been or is likely to be disrupted, it may upon a
two-thirds vote of the members present or upon a two-thirds vote
of the members who respond to a poll take such action as may in
the Board's sole discretion appear necessary to prevent, correct
or alleviate the emergency condition. Without limiting the fore-
going, the Board may: (1) terminate trading, (2) limit trading
to closing of open positions, (3) order the liquidation of all
or a portion of the open contracts in a members' proprietary
and/or customer's accounts, (4) order that trading be limited
to a confined price range, (5) alter the conditions of delivery, (6) fix a settlement price at which contracts are to be liquidated and (7) order special or advance margins or funds to be deposited with the Clearing House from individual member(s), clearing member(s) or from longs, shorts or both. All Exchange contracts shall be subject to the Board's emergency powers and the specifications of each shall be deemed subject to this rule.

Any authority or discretion by these rules vested in the Chairman, President, Clearing House manager or any committee shall not be construed to deprive the Board of such authority or discretion and in the event of a conflict, the determination of the matter by the Board shall prevail. (CME Rule 230(1).)

Committees

Each exchange has various standing and ad hoc member committees that advise and assist the board, investigate suspected violations of exchange rules and regulations, and take prescribed actions against a member or nonmember found in violation of the rules and regulations. Most exchanges have committees that have responsibilities including, but not restricted to, the following areas:

1. arbitration of disputes between members only and between members and nonmembers;
2. supervision of commodity deliveries;
3. management of exchange property and finances;
4. supervision and investigation of the business conduct of members;
5. examination of qualifications of membership applicants;
6. supervision of market quotations;
7. supervision of floor trading activities;
8. nomination of board candidates and exchange officers;

9. examination and supervision of RCRs;

10. supervision of trading in and contract modification recommendations for each listed futures contract;

11. development of new contract markets; and

12. amendments to rules and regulations.

Staff

The management and administration of an exchange is carried out by executive officers and administrative staff of the exchange. Executive officers, who are nonmembers, are appointed by the board. The administrative staff (also nonmembers) is appointed by the executive officers.

The chief executive officer of an exchange is the president. He also serves as a board member. In addition to routine administrative authority, the president has broader investigative prerogatives with regard to suspected violations of the rules and regulations. To aid in the latter, the president has at his disposal an exchange department with broad authority to investigate and audit the trading and financial activities of exchange members.\[1\]

The services of this investigative department (whose staff is composed of nonmembers) are also available to the board and several committees responsible for rule enforcement. If, after an investigation and a hearing before the president, a member is judged to have violated a rule or regulation, the president

---

\[1\] This department is known as the Office of Investigations and Audits and the Department of Compliance and Audits at the CBOT and CME, respectively.
of the CME has the authority to assess a penalty within certain prescribed limits against the guilty party. According to CBOT Rule 74, the president of the CBOT has no disciplinary authority.

**Rule Enforcement and Disciplinary Actions**

Rule enforcement and disciplinary actions are shared responsibilities among the president, the board, and certain investigative and hearing committees. As mentioned in the previous section, the authority of the president of the CBOT in this area is largely investigative whereas the president of the CME has some additional disciplinary authority. The committees have broad investigative powers and "cease and desist" authority. The CME committees generally have more disciplinary and emergency action authority than their CBOT counterparts. The boards at both exchanges have the broadest authority in these matters and are the only exchange governing body that can expel or suspend a member for more than 10 days. Below is a partial list of offenses common to both CBOT and CME rules and regulations:

1. to engage in bucket-shop activities;
2. to make or report a fictitious trade;
3. to attempt extortion;
4. to buy or sell any commodity intending to make default on such purchase or sale;
5. to act as both buyer and seller in the same transaction;
6. to manipulate prices or corner a market or attempt to do so;
7. to make a material misstatement to the board or to a committee or on any information supplied to the exchange or its officials;
8. to knowingly disseminate false, misleading, or inaccurate information;

9. to trade or accept margins after insolvency;

10. to refuse to appear before the board, president, or any investigative and hearing committee and/or to refuse to fully answer all questions and produce all books and records at such hearings or investigations, or to testify falsely;

11. to commit an act which is substantially detrimental to the interest or welfare of the exchange; and

12. to refuse to comply with an order of the board, the president, (where applicable) or any hearing committee.

If found guilty of any of these offenses, the member is subject to expulsion, suspension, fine, or suspension and fine. At the CBOT, the maximum aggregate fine for all rule and regulation violations is $10,000 per disciplinary hearing. At the CME, the maximum fine per offense is $25,000.

Investigative and Hearing Committees

Business Conduct Committee

The major responsibilities of this committee are to prevent or stop price manipulation, the development of corners, and the undue concentration of positions. Supervision of the general business conduct of exchange members also falls under the purview of this committee. If the committee finds that a member is in violation of rules and regulations under its jurisdiction, then the committee may order the member to cease and desist from such past or proposed conduct.

The CME business conduct committee has greater enforcement powers than its CBOT counterpart. For example, the CME committee has the authority
on its own to impose higher margin requirements against a member or his
customer in order to protect the integrity of open contracts. The CBOT
committee can recommend such action to the board chairman, but has no
authority to take independent action. Other enforcement powers held by
the CME business conduct committee include:

1. to order the member to liquidate such portion of
the open contracts in the member's proprietary or customers' accounts, or both, as deemed necessary to insure the integ-
rety of the contracts or to insure an orderly and liquid market;

2. to suspend a member up to ten days;

3. to fine a member up to $10,000; and

4. to prescribe position limits. (CME Rule 412A.)

If the Committee decides that a violation is of major importance or might
warrant a penalty in excess of its own authority, then it can refer the
matter to the board. Finally, if the CME business conduct committee deter-
mines that an emergency situation exists that "threatens the integrity,
liquidity, or orderly liquidation of any contract," then the committee may
take the following actions:

1. terminate trading;

2. confine trading to liquidation of contracts
   only;

3. order liquidation of all or a portion of a
   member's proprietary and/or customers' accounts;

4. confine trading to a specified price range;

5. alter conditions of delivery;

6. fix a settlement price at which contracts are
to be liquidated; and
7. order special advance margins or funds to be deposited with the clearing members or from longs and/or shorts. (CME Rule 412B.)

Floor Practices (CME) or Floor Governors (CBOT) Committee

The major responsibility of this committee is to enforce the rules and regulations pertaining to floor practices and floor trading ethics. If a member is found to have violated the rules and regulations, then the committee can order the member to cease and desist from such conduct and can suspend the member for up to ten days (CME) or deny the member floor privileges for up to ten days (CBOT). The CME committee is also empowered to fine the member up to $5,000 and can refer the matter to the board if it is believed that more severe penalties are warranted.

Clearing House Committee

Areas of responsibility for this committee include:

1. the determination of qualifications and approval to applicants to membership in the clearing house (subject to board approval);

2. the adoption of regulations pertaining to clearing house membership (subject to board approval); and

3. the enforcement of rules and regulations pertaining to the clearing of trades, functioning of the clearing house, margin and financial integrity of clearing members; and the business conduct and compliance with rules and regulations of clearing members (except as jurisdiction over manipulations and corners is assigned to different committees).

The Committee may conduct hearings and investigations concerning rule violations falling within its jurisdiction. If, after investigation and hearing,

1/ The discussion of the clearing house committee applies to the CME. The clearing house at the CBOT is a separate corporation with its own by-laws and regulations.
the committee determines that a member is in violation of the rules and regulations or is in a financial condition that actually or potentially jeopardizes the integrity of the exchange, the committee is empowered to:

1. order the member to cease and desist from the conduct found to be in violation or contrary to the best interests of the exchange;

2. order the member or his customer to make additional margin requirements deemed necessary;

3. impose additional capital requirements on the member as deemed necessary;

4. impose position limits as deemed necessary;

5. impose a fine up to $10,000 against the member;

6. suspend a clearing member if it is determined that the financial condition of the clearing member actually or potentially jeopardizes the integrity of the exchange subject to the approval of any two of the following: the president, the board chairman, or the clearing house committee chairman; and

7. refer the matter to the board if the committee believes that more severe penalties are warranted.

Customer Complaints

Each exchange is required by the Commodity Exchange Act to provide for a means of arbitrating customer (i.e., nonmember) complaints against members and their employees (e.g., RCRs) for claims up to $15,000. At the CME, the commodity representative/customer complaint committee is charged with this responsibility. If this committee finds that a member or RCR is in violation of the exchange rules and regulations, then it can:

1. order the member and/or RCR to cease and desist such conduct found to be in violation of the rules and regulations;
2. impose a period of probation against the member and/or RCR;

3. impose a fine against the member and/or RCR up to $1,000;

4. terminate or suspend the registration of the RCR;

5. order the member and/or RCR to make a compensatory payment up to $15,000 against a nonmember's claim of damages if such claim is found to be valid; and

6. refer the matter to the board if the committee believes that more severe penalties are warranted.

A reading of the CBOT Rules and Regulations would indicate that its committee of arbitration, member services committee, and business conduct committee might share responsibilities for acting on customer complaints. The committee of arbitration is responsible for hearing customer versus member as well as member versus member disputes and awarding damages. The membership services committee, which is responsible for approving RCRs, also has authority to suspend or withdraw approval for RCRs for:

1. conduct inconsistent with equitable principles of trade;

2. misstatements to the exchange;

3. violations of the rules and regulations of the exchange; and

4. commission of acts detrimental to the welfare of the exchange.

The business conduct committee also has broad investigatory and hearing authority in this area.
Reports Required or Produced by Exchanges

As mentioned in a previous section, each exchange is required by the CFTC to make available to the public and news media daily data pertaining to trading volume, open interest, deliveries, and futures prices for all delivery months of all of its listed futures contracts. The rules and regulations that apply to the collateralized depository receipt (CDR) -- delivery GNMA, U.S. Treasury bond, and 90-day commercial paper futures contracts at the CBOT require that all customer or member positions totaling 50 contracts or more in any one contract delivery month are to be reported to the office of investigations and audits by the clearing member. At the CME, the clearing house requires that clearing members report and identify the total position in a listed futures contract of any account with 25 or more open contracts in any one delivery month or 5 or more open contracts in the spot contract month (i.e., the contract month that is also the current calendar month).

Emergency Powers Pertaining to Deliverable Supply

Both exchanges confer broad emergency powers to either the board or various committees or both that would be applicable to situations when an "adequate" deliverable supply of a financial instrument did not or was not perceived to exist. For example, CBOT Rule 251, cited in an earlier section, gives the board carte blanche authority to take any emergency actions it so desires. Equally broad are the emergency powers conferred upon the CME board in its Rule 230(1) (cited in an earlier section). CME Rule 412B(d) allows the
business conduct committee to take emergency actions deemed necessary in
response to "(a)ny action taken by the United States or any foreign govern-
ment...which may have a direct impact on trading on the contract market."
Furthermore, the contract specifications of the CME's interest rate futures
contracts include exchange emergency powers "(i)f delivery or acceptance or
any precondition or requirement of either is prevented by strike, fire,
accident, act of government, act of God, or other emergency..." It would
seem that this emergency power authority would be applicable in the event
that the deliverable supply of a financial instrument were judged to be
inadequate because of the U. S. Treasury's decision to alter the supply of
its debt in specific maturity categories. Emergency action options include
trading for liquidation only (i.e., no new open positions could be estab-
lished), substitution of another U. S. Treasury issue(s) for delivery, or
a financial settlement of contracts in lieu of settlement by delivery.

The Clearing House Arrangement

Each exchange maintains a clearing house either as a division of
the exchange (CME) or as a separate corporation (CBOT) to clear or reconcile
all trades made on the floor of the exchange. The clearing arrangement is
set up so that the clearing house acts as a third party in every futures
trade—a buyer to every seller and a seller to every buyer. The other two
parties to the trade are the buyer's and seller's clearing members.
Clearing members must control a specified number of exchange memberships,
meet and maintain financial requirements that are adjusted to the amount
of clearing business done, purchase stock in the clearing corporation, or
post a security deposit with the clearing house. Generally, clearing members
are corporations, partnerships, or cooperative associations. The CBOT
clearing corporation allows individual clearing members provided they clear
trades for their personal accounts. The clearing house deals directly and
solely with clearing members in that all trades on the exchange are made
in the names of clearing members.

Clearing members are required to deposit with the clearing house
prescribed amounts of initial or standing margin against their positions
in the futures markets.1/ At the CBOT, the clearing member is required to
post initial margin against its net position in a futures contract.6/ The
CME clearing house requires initial margin against gross positions (i.e.,
both long and short). The amount of initial clearing margin per contract
is determined by the clearing house and is usually (but not always, as
will be seen below) large enough to cover the dollar value change per con-
tract of a daily maximum price fluctuation. Clearing member initial margin
and the contract value change of a daily limit price move for each interest
rate futures contract traded on the CBOT and CME/IMM are listed below:

1/ Discussions of margin in this section refer to clearing members'
margin as opposed to customer margin which will be discussed in a
later section.

2/ For example, if a clearing member had a long position of 10 contracts
and a short position of 5 contracts in U. S. Treasury bond futures,
then it would be required to deposit initial margin against a net
position of 5 contracts.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CDR-delivery GNMA</td>
<td>CBOT</td>
<td>$750</td>
<td>$750</td>
</tr>
<tr>
<td>Certificate-delivery GNMA</td>
<td>CBOT</td>
<td>$750</td>
<td>$750</td>
</tr>
<tr>
<td>U. S. Treasury bond</td>
<td>CBOT</td>
<td>$1,000</td>
<td>$750 1/</td>
</tr>
<tr>
<td>90-day commercial paper</td>
<td>CBOT</td>
<td>$600</td>
<td>$625</td>
</tr>
<tr>
<td>90-day Treasury bill</td>
<td>CME/IMM</td>
<td>$600</td>
<td>$1,250</td>
</tr>
<tr>
<td>1-year Treasury bill</td>
<td>CME/IMM</td>
<td>$400</td>
<td>$1,250</td>
</tr>
</tbody>
</table>

1/ Pending before the CFTC is a CBOT regulation change that would widen the daily price limit to one full point (32/32nds) per contract, thus increasing the contract value change of a limit move to $1,000.

At the CBOT, initial margin can be posted in either cash or obligations of the U. S. Government. At the CME, initial margin can be posted in cash, U. S. Treasury bills (clearing member can authorize the clearing house to purchase Treasury bills with any cash margin in excess of $25,000 in the clearing member's margin account), or bank-issued margin letters of credit for IMM traded commodities (provided the clearing member has in excess of $50,000 cash in its margin account and liquid capital of $500,000 or more).

In addition to initial margin, the clearing house may call upon a clearing member to deposit additional margin at any time during a trading
session. This is called variation margin and must be paid by certified check within one hour of the issuance of such a margin call. Variation margin calls are usually made in response to an adverse price move to a clearing member during the day. Variation margin is applied to the settlement for the day and does not go into the initial margin account.

Each day the clearing house adjusts each account on its books as to gain or loss as determined by the difference between the day's settlement price for each contract and the price at which the contract was entered into. Each clearing firm is notified of its net gain or loss. Losses must be covered by certified check prior to the open of the next day's trading. Gains are either credited to the clearing member's account or the clearing house issues a check to the clearing member.

Specific Areas of Exchange Autonomy

Each exchange enjoys complete autonomy in setting the levels of margin (both clearing and customer) on its futures contracts. The Commodity Exchange Act specifically excludes the setting of margin levels from the powers of the CFTC. Although subject to CFTC approval, the exchanges have rules and regulations pertaining to maximum daily price fluctuations on a contract (daily limit price moves) and approval of RCRs allowed to solicit customer business on exchange listed futures contracts.
Marg in 1/

Exchanges have the exclusive authority to set minimum margin levels that clearing firms must require to their nonmember customers. A clearing firm, at its own discretion, may require a margin level higher than the minimum prescribed by the exchange. Since all futures transactions are in the name of a clearing member, customer margin is analogous to a performance bond in that it protects the clearing member against an adverse price movement on a contract entered into on a customer's behalf. Unlike the case of margined securities, the customer in futures markets does not owe the clearing member the difference between the value of a contract at which a futures position was initiated and the margin deposited.

There are two types of customer margin—initial or original margin and maintenance margin. Initial margin is the dollar amount per contract that the exchange requires a customer to deposit with a clearing member for each open contract in the customer's account. Initial margin may generally take the form of cash, U. S. Government securities (valued at par or market price, whichever is lower), securities listed on the New York and American Stock Exchanges (valued at 70 per cent of market

1/ This section relates to customer margin. For a discussion of clearing margin, see the preceding section on the clearing house arrangement. It is this author's understanding that the initial margin posted by a nonclearing member is largely a matter between the nonclearing member and his clearing firm but usually as a minimum is equal to the initial clearing margin.
prices for CME and 75 per cent for CBOT), letters of credit (for IMM traded commodities) and foreign currencies (at CBOT only and valued at current exchange rates). On the CBOT, the margin rules treat securities posted as initial margin as collateralized loans and require that the clearing member charge the customer a rate of interest no lower than the Chicago or New York bank prime rate except for U. S. Government securities with a maturity of less than one year, in which case a lower rate or no interest may be charged.

Maintenance margin is the equity value which the customer must maintain in his account with the clearing member at all times. If the equity value of the account falls below the prescribed maintenance level, then the clearing member is required to issue a margin call to the customer for the amount (which must be in cash) necessary to restore the equity value of the account to the initial margin level. For example, the minimum initial margin on U. S. Treasury bond futures is $1,250 per contract to be maintained at $1,000. Thus, if the equity value of a customer's account falls below $1,000 per contract, the clearing member is required to issue a margin call for the amount necessary to restore the equity value of the account to $1,250 per contract. The levels of both initial and maintenance margins are generally increased during periods of expanded daily price limits. (Expanded price limits will be discussed in a later section.) Listed below are the minimum per contract initial and maintenance margin requirements believed to be currently in effect for interest rate futures contracts traded on the CBOT and CME/IMM:
Aside from additional margin funds deposited to the account, the equity value of a customer's account varies daily according to the difference between the day's settlement price for each contract and the price at which the contract was entered into. Amounts in excess of the initial margin may be withdrawn from the account by the customer.

At the CBOT, the minimum initial margin required of a nonmember whose position in any of the CBOT listed interest rates futures contracts qualifies as a bona fide hedge is the maintenance margin level listed above.1/ Evidently, the rationale for lower hedge margin is that the hedger has a lower risk exposure due to an actual or anticipated cash market position opposite to that of his futures position. There is no real distinction between initial and maintenance margin for qualified hedge positions since the margin level is required to be maintained at the initial level.

---

1/ For CME/IMM listed interest rate futures contracts, no distinction is made between hedge and speculative (nonhedge) margin. The minimum margin is the same as listed above for all nonmembers.
Whether one qualifies for the lower hedge margin on CBOT listed interest rate futures contracts is evidently a matter between the customer and the clearing member as evidenced by the following.

It shall be incumbent upon each member to require satisfactory evidence that all hedging trades are bona fide hedging trades. A letter from a customer so stating will be considered "satisfactory evidence" under this paragraph unless there is reason to suspect otherwise. (CBOT Rule 822(a)).

It is noteworthy that the definition of what constitutes a bona fide hedge is not given.

It would appear that the reason for making the speculative/bona fide hedge distinction for some futures contracts has more to do with CFTC or exchange speculative position limits than margin purposes. Traders who can be approved for bona fide hedge status from the CFTC and/or the exchange are exempt from position limits.¹ Since there currently exist no CFTC and/or exchange speculative position limits on interest rate futures contracts, the speculator/hedger classification is of no significance for this matter in these markets.

¹ Under the Commodity Exchange Act, the general definition of hedging is as follows:

Bona fide hedging transactions and positions shall mean transactions or positions in a contract for future delivery on any contract market, where such transactions or positions normally represent a substitute for transactions to be made or positions to be taken at a later time in a physical marketing channel, and where they are economically appropriate to the reduction of risks in the conduct and management of a commercial enterprise... (General Regulations under the Commodity Exchange Act, Regulation 1.3(z)).
Daily Price Limits

Each exchange is permitted to include in futures contract specifications maximum daily price movements (or daily price limits) above or below the contract settlement price from the preceding trading day. When the price of a contract for an individual delivery month rises (falls) to its prescribed limit, then no transactions can take place in that one contract for the remainder of the session at prices above (below) the limit price. The daily price limits then prescribe a maximum price range in which an individual delivery month contract for the remainder of the session at prices above (below) the limit price. The daily price limits the prescribe a maximum price range in which an individual delivery month contract may trade during a trading session. The normal price limits for interest rate futures contracts currently traded are as follows:

<table>
<thead>
<tr>
<th>Contract</th>
<th>Daily Price Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDR-delivery GNMA</td>
<td>24/32nds</td>
</tr>
<tr>
<td>Certificate-delivery GNMA</td>
<td>24/32nds</td>
</tr>
<tr>
<td>U. S. Treasury bond</td>
<td>24/32nds 1/</td>
</tr>
<tr>
<td>90-day commercial paper</td>
<td>25 basis points</td>
</tr>
<tr>
<td>90-day Treasury bill</td>
<td>50 basis points</td>
</tr>
<tr>
<td>1-year Treasury bill</td>
<td>50 basis points</td>
</tr>
</tbody>
</table>

1/ The CBOT is seeking CFTC approval to change the daily price limit on U. S. Treasury bond futures to one full point (32/32nds).
The word "normal" above is emphasized because under certain circumstances these daily price limits do not apply. At the CME/IMM, no price limits exist on the last day of trading of an expiring contract. Similarly, at the CBOT, no price limits are in effect on a contract whose expiration month coincides with the calendar month (e.g., the March '79 U.S. Treasury bond contract during March 1979).

Furthermore, the exchange rules prescribe expanded daily price limits if contracts settle at limit prices in the same direction over a specified number of trading sessions. The expanded daily price limit rule for interest rate futures at the CME/IMM reads as follows:

Whenever on two successive days any contract month closes at the normal daily price limit in the same direction (not necessarily the same contract month on both days) an expanded daily price limit schedule shall go into effect as follows:

1. The third day's daily price limit in all contract months shall be 150 percent of the normal daily price limit.

2. If any contract month closes at its expanded daily price limit on the third day in the same direction, then the fourth day's expanded daily price limit and each successive day thereafter, shall be 200 percent of the normal daily price limit, so long as any contract month closes at its expanded daily price limit.

3. Whenever the foregoing daily price limit schedule is in effect and no contract month closes at the price limit in the same direction which initiated or maintained the expanded schedule, then the normal daily price limit shall be reinstated on the following day. (CME Rules 3208 and 3607.)
The expanded daily price limit rule for CBOT interest rate futures reads as follows:

If three or more contracts within a...(calendar) year (or all contracts in a...(calendar) year if there are less than three open contracts) close on the limit bid for three successive business days or on the limit sellers for three successive business days, then the limit would be raised to 150 percent of the current level for all contract months and remain there for three successive business days.

If three or more contract months (or all contracts in a ...(calendar) year if there are less than three open contracts) in a given...(calendar) year close on the limit bid for the next three business days or on the limit sellers for the three successive business days then the limits will remain at 150 percent of the original level for another three day period.

The limits would remain at 150 percent for successive periods of three business days until three or more contracts in a...(calendar) year (or all contracts in a...(calendar) year if there are less than three open contracts) do not close at the limit on one day during that period. If at any time during a three day business period the three or more contract months (or all contracts in a...(calendar) year if there are less than three open contracts) do not close on the limit bid or limit sellers then the limits would revert to their original level at the end of the three day period. (CBOT Rule 1823.)

Approval of RCRs

Although the CFTC has the authority and responsibility for registering RCRs, an individual exchange has the right to approve RCRs for the solicitation of customer business in its listed futures contracts. Currently, CFTC registration of RCRs consists mainly of personal background checks on the applicant. Although the CFTC has the authority to administer a written examination to test the applicant's competency to handle customer business, it does not currently do so. However, both the CME and CBOT require
an RCR applicant to pass a written competency exam in addition to submitting to a background investigation before the applicant can become an exchange-approved RCR. At the CME, the commodity representative/customer complaint committee is responsible for approving RCRs and enforcing the rules that apply to them. The member services committee has chief responsibility for overseeing RCR activities at the CBOT.

**Market-Basket Approach to Deliverable Supply**

From the preceding discussion of the rules and regulations of the CFTC and the exchanges, it is apparent that price manipulation and corners of futures markets are a major concern. One way to decrease the probabilities of occurrence of price manipulations and/or corners is for the futures contract to be written in such a way so as to provide for a larger rather than smaller deliverable supply of the commodity in question. If the deliverable supply of a commodity is sufficiently large, then the financial impracticalities of any market participant or coalition of participants acquiring a large enough cash-futures position to corner a futures contract are increased.

One way to enlarge deliverable supply is to prescribe a market-basket of varieties or grades of a specific commodity acceptable for delivery against a futures contract. This market-basket approach to deliverable supply is quite common for many futures contracts involving agricultural products and is employed by the CBOT in its interest rate futures contracts. In contrast, the current CME/IMM Treasury bill futures contracts specify, in essence, the delivery of a particular Treasury bill issue.
Although a market-basket approach helps to prevent price manipulation in a futures contract, it can increase a hedger's basis risk.\footnote{\textbf{1/ Basis is defined as the difference between the spot or cash price of a commodity and the futures price of the same or related commodity. When one hedges, he ceases to speculate on the future course of the absolute price level of the commodity in which he is dealing, but commences to speculate on the future \textit{relationship} between the price of the commodity and the price of the futures contract in which he has hedged, i.e., the basis.}} If there is a range of grades of a commodity acceptable for delivery against a futures contract, then the contract is usually priced in relation to the deliverable grade that is most advantageous to deliver in terms of price.\footnote{\textbf{2/ It will be assumed that the prices of GNMA and U.S. Treasury bond futures contracts are closely related to the market prices of the issues most advantageous to deliver in terms of price less (plus) carry profits (losses) to the date of delivery.}} The more constant the price relationship between the grade of the commodity in which the hedger is dealing and the grade most advantageous to deliver, the less additional basis risk the hedger is exposed to. A variation on this basis-risk issue is the problem encountered when, for whatever reason, a different grade becomes the most advantageous to deliver. What follows is a discussion of the market-basket approach to deliverable supply of CBOT GNMA and U.S. Treasury bond futures contracts.

\textbf{CDR-Delivery GNMA Futures}

The delivery method of this contract is not by GNMA certificate directly but rather by a GNMA collateralized depository receipt (CDR). A CDR is a negotiable instrument signed by a CBOT approved depository to...
warrant that there is $100,000 principal balance of GNMA 8 percent certificates or equivalent deposited in safekeeping with the depository. The holder of a CDR receives an interest payment of $635 per month per CDR. A CDR may be held in perpetuity or it may be surrendered at any time for GNMA certificates with ±2-1/2 percent of $100,000 principal value of GNMA 8 percent certificates or equivalent principal value of GNMA certificates with coupon rates other than 8 percent. After notice of surrender, the CDR originator must deliver GNMA certificates to the party that surrendered the CDR within 15 business days.

Although any party may make or take delivery of CDRs, only those parties classified as "regular for origination" by the CBOT may originate CDRs. The requirements for becoming regular for origination are: (1) to deposit $1,000 face value of Treasury bills with the CBOT for each CDR to be originated (with a minimum $50,000 deposit) and then (2) apply to and receive approval from the CBOT for classification as regular for origination. Regularity takes effect 30 days after the above terms and conditions have been met.

The basis trading unit of the CDR-delivery GNMA futures contract is GNMA certificates with a principal balance of $100,000 and a coupon of 8 percent. However, for delivery purposes (i.e., redemption of CDRs for GNMA certificates), certificates bearing different coupons may be substituted in an amount equivalent to $100,000 of GNMA 8 percent coupon certificates when calculated at par and under the assumption of a 30-year certificate prepaid in the 12th year.

Equivalent principal balance amounts for delivered GNMA certificates bearing coupons other than 8 percent are determined as follows:
...The price at which the delivered GNMA yields the same as an 8 percent GNMA priced at par (i.e., 7.96 percent) is found from yield tables.... The price arrived at is used as the denominator and 100 as the numerator of a ratio between the amount of GNMA to be delivered and the amount of 8 percent GNMA which should be delivered.... (CBOT Rule 9051.)

The value of this ratio for a given coupon defines a conversion factor, which, when multiplied by $100,000, determines the principal balance amount for the given coupon that may be delivered in fulfillment of a CDR redemption. For example, by linear interpolation from a yield book, the CBOT has determined that the price of a GNMA 9 percent certificate to yield 7.96 percent is 107.3333. The above-mentioned ratio, then, is $100 \times 107.3333 = .931677.$ Therefore, GNMAs with principal value of $93,167.70 ($100,000 \times .931677) may be delivered in fulfillment of a CDR redemption. Listed below are CBOT determined conversion factors for various GNMA coupons:

<table>
<thead>
<tr>
<th>GNMA Coupon Rate(%)</th>
<th>Conversion Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.50</td>
<td>1.121233</td>
</tr>
<tr>
<td>7.00</td>
<td>1.078167</td>
</tr>
<tr>
<td>7.25</td>
<td>1.058201</td>
</tr>
<tr>
<td>7.50</td>
<td>1.038062</td>
</tr>
<tr>
<td>7.75</td>
<td>1.018675</td>
</tr>
<tr>
<td>8.00</td>
<td>1.000000</td>
</tr>
<tr>
<td>8.25</td>
<td>.982198</td>
</tr>
<tr>
<td>8.50</td>
<td>.965018</td>
</tr>
<tr>
<td>9.00</td>
<td>.931677</td>
</tr>
</tbody>
</table>
By multiplying the market prices of the different GNMA coupon issues by their respective CBOT conversion factors, one can determine which coupon issue will generally be most advantageous to deliver in terms of price at a point in time. This price conversion exercise is carried out below using immediate-delivery cash GNMA prices (asked side) for January 30, 1979, as reported in the *Wall Street Journal*.

<table>
<thead>
<tr>
<th>Coupon</th>
<th>Yield</th>
<th>Price (decimal equivalent)</th>
<th>Conversion Factor</th>
<th>Equivalent 8s Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.50%</td>
<td>9.09%</td>
<td>82.0000</td>
<td>1.121233</td>
<td>91.941106</td>
</tr>
<tr>
<td>7.50%</td>
<td>9.24%</td>
<td>87.7500</td>
<td>1.038062</td>
<td>91.089941</td>
</tr>
<tr>
<td>8.00%</td>
<td>9.25%</td>
<td>90.7500</td>
<td>1.000000</td>
<td>90.750000</td>
</tr>
<tr>
<td>8.25%</td>
<td>9.29%</td>
<td>92.2500</td>
<td>.982198</td>
<td>90.607766</td>
</tr>
<tr>
<td>8.50%</td>
<td>9.31%</td>
<td>93.8750</td>
<td>.965018</td>
<td>90.591065</td>
</tr>
<tr>
<td>9.00%</td>
<td>9.55%</td>
<td>95.6875</td>
<td>.931677</td>
<td>89.149843</td>
</tr>
</tbody>
</table>

Thus, on January 30, 1979, GNMA 9s, with the lowest equivalent 8s price, were the most advantageous coupon in terms of price to deliver into the CDR-delivery GNMA market.

Due to cash-futures arbitrage, the CDR-delivery GNMA futures market will tend to be priced in relation to the cash GNMA coupon most advantageous to deliver. At times, however, expectations may develop that a different coupon will become most advantageous to deliver. Thus, the futures contract

---

1/ Another factor that determines which coupon is most advantageous to deliver is relative carry profit. Of two coupons with the same equivalent 8s price, the coupon that could be carried at the highest profit (or least loss) would be the more advantageous one to deliver.
may be priced in terms of an issue that is not currently in existence or one that is not currently, but is expected to be, most advantageous to deliver. For example, if the current most advantageous deliverable issue were the highest outstanding GNMA coupon and the current production coupon, then an expectation of an FHA rate increase in the near-term might cause the futures to be priced in relation to the higher expected GNMA coupon. A change in expectations with regard to the coupon-yield relationship in the GNMA market could also affect the pricing of the futures contracts. For example, if this relationship is positive, i.e., yield increases with coupon, then the highest coupon GNMA is usually most advantageous to deliver. If this coupon-yield relationship were expected to invert, then the futures might begin to be priced in terms of lower coupon GNMA.

The fact that at different times different coupons will be most advantageous to deliver and, thus, will affect the pricing of GNMA futures complicates matters for the hedger in that he needs to be able to make reasonably accurate forecasts of the price relationship between the GNMA coupon he is hedging and the coupon that is or is expected to be most advantageous to deliver.

Certificate-Delivery GNMA Futures

In contrast to the CDR-delivery contract, the certificate-delivery GNMA futures contract calls for direct delivery of GNMA certificates (hence its name) and places restrictions on what coupons are acceptable for delivery. With regard to those coupon restrictions, CBOT Rule 4031(b) reads:
Coupons which may be delivered against a futures contract in a given delivery month shall be designated as follows:

(1) Any coupon at or below the current production rate is deliverable. If the current production rate is lower than the previous production rate, then the previous production rate is also deliverable through the next three months following the month in which the production rate was lowered.

(2) The above is subject to the provision that no substitution of coupon is made for any delivery date until forty-five (45) days have transpired after the effective date of the rate change. That is, if the current production rate is changed, certificates bearing the new coupon rate are not deliverable on the Board of Trade futures contract until 45 days after the new coupon rate is in effect. The one exception to this rule will be the delivery of a new issue dated and issued after the date of record of the rate change and bearing the new rate.

Futures prices of the certificate-delivery contract are currently quoted in terms of an 8 percent coupon but this coupon designation may be changed at the CBOT directors' discretion. GNMA's delivered with coupons other than 8 percent are adjusted in price so as to provide for firm yield maintenance in terms of the yield implied by the final settlement price of the expiring futures contract on the last day of trading. For example, if the settlement price of the futures contract were 91-25/32nds or $91,781.25 per contract, then the implied yield based on an 8 percent coupon is 9.139 percent. If GNMA 9s were delivered, the party taking delivery would be billed for $98,656.25, the price at which $100,000 principal value of GNMA 9s yield 9.139 percent (plus any accrued interest on the certificates).

One major advantage the certificate delivery GNMA futures contract has over the CDR-delivery contract is that the futures tend to be priced in
closer relation to the current GNMA production coupon when there is a positive relationship between coupon and yield. This cash-futures pricing relationship is especially beneficial for hedgers, such as GNMA originators, who are dealing predominantly in the current production coupon. However, if there is an inverse coupon-yield relationship, then the futures will be priced in accordance with a coupon lower than the current production coupon.

U.S. Treasury Bond Futures

The market basket approach to deliverable supply is also employed in connection with the U.S. Treasury bond futures contract in that any cash Treasury bond with at least 15 years to maturity (or first call, if callable) from the first day of the delivery month may be delivered. The basic trading unit of the contract is a Treasury bond(s) with a $100,000 face value at maturity and an 8 percent coupon. If bonds bearing a coupon rate other than 8 percent are delivered, then the party taking delivery is invoiced for an amount equal to the settlement price multiplied by a conversion factor (plus accrued interest on the delivered bonds). This conversion factor is the price at which a $1 face value bond of a coupon with a given maturity (or time to first call, if callable) measured in complete three-month increments (i.e., 15 years and 5 months becomes 15 years and 1 quarter) from the first day of the delivery month yields 8 percent. For example, on March 1, 1979, the 8-3/4 percent bonds of November 15, 2003-08 will be callable in 24 years, 7 months and 14 days, which, when rounded down to the nearest quarter, is 24 years and 2 complete quarters. An 8-3/4 percent coupon bond of this maturity
with a face value of $1 yields 8 percent at a price of 1.08. Thus 1.08 is the conversion factor for these bonds in conjunction with the March '79 Treasury bond future.

By dividing the market prices of the various deliverable cash Treasury bonds by their respective conversion factors, one can get a first approximation as to which issue will generally be most advantageous to deliver (ignoring differing carry profits) at a point in time. This exercise is carried out below using conversion factors for the March '79 future and cash Treasury bond prices (asked side) for January 30, 1979, as reported in the *Wall Street Journal*.

<table>
<thead>
<tr>
<th>Bond Issue</th>
<th>Yield (decimal equivalent)</th>
<th>Price</th>
<th>March '79 Conversion Factor</th>
<th>Converted Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3s of 2/15/95</td>
<td>5.19%</td>
<td>76.3125</td>
<td>.5566</td>
<td>137.10474</td>
</tr>
<tr>
<td>3-1/2s of 11/15/98</td>
<td>5.48%</td>
<td>76.1875</td>
<td>.5593</td>
<td>136.21938</td>
</tr>
<tr>
<td>8-1/2s of 5/15/94-99</td>
<td>8.84%</td>
<td>96.84375</td>
<td>1.0432</td>
<td>92.83335</td>
</tr>
<tr>
<td>7-7/8s of 8/15/95-00</td>
<td>8.85%</td>
<td>90.8125</td>
<td>.9887</td>
<td>91.85041</td>
</tr>
<tr>
<td>8-3/8s of 8/15/95-00</td>
<td>8.87%</td>
<td>95.28125</td>
<td>1.0036</td>
<td>92.18387</td>
</tr>
<tr>
<td>8s of 8/15/96-01</td>
<td>8.84%</td>
<td>91.8125</td>
<td>.9998</td>
<td>91.83087</td>
</tr>
<tr>
<td>8-1/4s of 5/15/00-05</td>
<td>8.81%</td>
<td>94.28125</td>
<td>1.0252</td>
<td>91.96376</td>
</tr>
<tr>
<td>7-5/8s of 2/15/02-07</td>
<td>8.78%</td>
<td>88.00000</td>
<td>.9608</td>
<td>91.59034</td>
</tr>
<tr>
<td>7-7/8s of 11/15/02-07</td>
<td>8.66%</td>
<td>91.75000</td>
<td>.9868</td>
<td>92.97730</td>
</tr>
<tr>
<td>8-3/4s of 8/15/03-08</td>
<td>8.82%</td>
<td>95.28125</td>
<td>1.0397</td>
<td>91.64302</td>
</tr>
<tr>
<td>8-3/4s of 11/15/03-08</td>
<td>8.84%</td>
<td>99.06250</td>
<td>1.0800</td>
<td>91.72454</td>
</tr>
</tbody>
</table>
On strictly a converted-price basis, the 7-5/8s of 2002-07 would be the most advantageous bonds to deliver against the March '79 Treasury bond future.

Due to the variety of issues that can be delivered and the possibility of changes among these issues as to which one is most advantageous to deliver, the hedger in Treasury bond futures faces similar problems to his counterpart in GNMA futures, especially CDR-delivery GNMA's. The bond hedger would like to be able to forecast the price relationship between the bond that is being hedged and the bond that is currently most advantageous or is expected to be most advantageous to deliver. For interest rate futures using the market-basket approach to deliverable supply, the more volatile the yield relationship among the deliverable issues, the greater is the probability of changes in the issue most advantageous to deliver and, thus, the more difficult is the task for the hedger.

Exchange Insurance of Performance on Futures Contracts

Clearing house guarantees of performance on futures contracts are not against customer defaults to member firms -- these are the responsibility of the individual firms -- but instead against losses to customers in the event of the default of a member firm. No formal program involving third-party insurance exists at the CBOT or CME. Instead, the clearing houses of both exchanges maintain reserves to meet member firm defaults.

The first resources available to the clearing houses in the event of a member firm default are the margins posted by the member firms. In addition to those funds, the clearinghouses may draw upon the reserves from the
stock subscription which are mandatory for firms becoming clearing members. The CME further assesses members a security deposit which is retained and may be used to cover a default. Revenues of the clearing houses from fees levied on each futures transaction, while used for clearing house operations, are also available in the event of a default. Finally, if the above resources were to prove insufficient, the members of the CMEs clearing house could be assessed a special charge based on their working capital and trading volume.