

ADMINISTRATION HISTORY APPENDIX  
CHAPTER THREE: IMPROVING FINANCIAL SERVICES, AND MARKETS AND THE  
FEDERAL GOVERNMENT'S FINANCIAL MANAGEMENT

# BUYBACKS



DEPARTMENT OF THE TREASURY  
WASHINGTON, D.C. 20220

December 10, 1999

**MEMORANDUM FOR SECRETARY SUMMERS  
DEPUTY SECRETARY EIZENSTAT**

**FROM:** Neal Comstock *nc*  
**SUBJECT:** Authority for Debt Buybacks

The purpose of this memorandum is to make you aware that early next week the Bureau of Public Debt (BPD) will publish a final regulation establishing its authority to conduct debt buyback operations. I believe you should be aware of the rule because there is considerable Congressional and media interest in debt buybacks.

The regulation establishes buyback authority and sets forth the broad procedures by which operations will be conducted. Should buybacks be undertaken, BPD will announce its intention to redeem a given amount of debt within a given maturity range. These details will be contained in an offering circular. Only primary dealers, as designated by the Federal Reserve Bank of New York (FRBNY), would be allowed to submit offers for themselves or their customers. This primary dealer restriction will enable BPD to use the FRBNY's electronic system for executing open market operations.

The regulation finalizes with minimal changes the proposal published in August. BPD received 13 comment letters on the proposed rule. Most concerned the timing of announcements and the appropriate maturity ranges to redeem -- issues that will be addressed in offering circulars.

Gary Gensler and Neal Wolin have reviewed the regulation, and no press release or announcement will accompany its publication.

cc: Sandberg  
Cohen  
Robertson  
Smith

TREASURY CLEARANCE SHEET

NO. \_\_\_\_\_  
Date \_\_\_\_\_

MEMORANDUM FOR:  SECRETARY  DEPUTY SECRETARY  EXECUTIVE SECRETARY  
 ACTION  BRIEFING  INFORMATION  LEGISLATION  
 PRESS RELEASE  PUBLICATION  REGULATION  SPEECH  
 TESTIMONY  OTHER \_\_\_\_\_

FROM: Van Zeck, Commissioner

THROUGH: Don Hammond, Fiscal Assistant Secretary

SUBJECT: Redemptions (Buy-Backs): New 31 CFR Part 375 (PDGSR99B2)

REVIEW OFFICES (Check when office clears)

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|--|--|---|
| <input type="checkbox"/> Under Secretary for Finance | <input type="checkbox"/> Enforcement       | <input type="checkbox"/> Policy Management      |
| <input type="checkbox"/> Domestic Finance            | <input type="checkbox"/> ATF               | <input type="checkbox"/> Scheduling             |
| <input type="checkbox"/> Economic Policy             | <input type="checkbox"/> Customs           | <input type="checkbox"/> Public Affairs/Liaison |
| <input type="checkbox"/> Fiscal                      | <input type="checkbox"/> FLETC             | <input type="checkbox"/> Tax Policy             |
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| <input type="checkbox"/> Public Debt                 | <input type="checkbox"/> General Counsel   | <input type="checkbox"/> E & P                  |
| <input type="checkbox"/> Unk                         | <input type="checkbox"/> Inspector General | <input type="checkbox"/> Mint                   |
| <input type="checkbox"/>                             |  | <input type="checkbox"/> Savings Bonds          |

*77-055-B*

*\**

NAME (Please Type)

*Lori Santa Moreno*

TEL. NO.

INITIATOR(S)

Lori Santamarena  
Van Zeck

*691-3757*

691-3632  
691-3600

REVIEWERS

Roberta McInerney  
Dave Lebryk  
Don Hammond  
Lee Sachs  
Gary Gensler  
Rick Carro  
Neal Wolin  
Neal Comstock

*pls call when etrad.  
Dec 13 Deadline.*

622-1988  
622-0176  
622-0560  
622-2245  
622-0865  
622-1146  
622-0287  
622-2735

*ll 12/6  
hw 12/9*

Associate General Counsel (GL)  
General Counsel (G)  
Executive Secretary (SE)

SPECIAL INSTRUCTIONS

Review Officer

Date

Executive Secretary

Date



DEPARTMENT OF THE TREASURY  
BUREAU OF THE PUBLIC DEBT  
WASHINGTON, DC 20239-0001

December 2, 1999

ACTION

MEMORANDUM FOR: NEAL COMSTOCK  
EXECUTIVE SECRETARY

THROUGH: GARY GENSLER  
UNDER SECRETARY (DOMESTIC FINANCE)

DON HAMMOND  
FISCAL ASSISTANT SECRETARY

LEE SACHS  
ASSISTANT SECRETARY (FINANCIAL MARKETS)

FROM: VAN ZECK  
COMMISSIONER

SUBJECT: Approval of Final Rule for Redemption Operations (Buybacks)

Attached for your review and approval for publication in the Federal Register is a final rule that sets out the terms and conditions by which Treasury could redeem (buy back) outstanding marketable Treasury securities. Although we have not decided to conduct redemption operations, the final rule establishes the mechanism by which Treasury would be able to conduct such redemption operations. This final rule, drafted using "plain language," establishes a new Part 375 in Title 31 of the Code of Federal Regulations.

The structure, terms and conditions for the buyback process are essentially unchanged from the proposed rule, which was published for comment on August 5. In developing the final rule, we considered 13 comment letters received in response to the proposed rule. The more significant comment letters, such as those from The Bond Market Association, the Treasury Advisory Committee, and various securities firms, primarily addressed issues such as the timing of announcements, redemption operations, and settlement, as well as which maturity ranges of securities to redeem and possible effects on the liquidity of securities not redeemed. These issues are not addressed in the final rule, which preserves Treasury flexibility to conduct redemptions operations to best meet its debt management goals and the public interest. Even though these and other issues remain to be decided, including whether to actually conduct redemption operations, it is important to issue the final rule to provide certainty to the market regarding the key terms and conditions of any redemption operations. The specifics of a redemption operation would be provided in the public announcement.

The key provisions of the final rule are as follows. We would first issue a public announcement of our intention to purchase Treasury securities, the approximate maximum total amount that we want to buy, and the deadlines for offers and settlement. Offers could be submitted only by entities that the Federal Reserve Bank of New York (FRBNY) has approved to transact open market operations (the primary dealers), although such submitters could place offers on behalf of their customers. By restricting direct offers to primary dealers, we can use the FRBNY's existing electronic system for executing open market operations, enabling us to execute buybacks in the most efficient, cost-effective manner. To expedite the process further, we would accept competitive offers only (i.e., no noncompetitive offers). Offers would be accepted on a multiple-price basis. There would be no limitation on the number of offers for each security or on the aggregate amount of offers for securities that we would accept from any one submitter. Redemption operation results would be announced in a results press release, with submitters also receiving individual results messages. Settlement would occur on the date specified in the redemption operation announcement. Participation in a Treasury redemption operation would be entirely voluntary.

The final rule is not a "significant regulatory action" under Executive Order 12866 or a "major rule" under the Small Business Regulatory Enforcement Fairness Act of 1996. Also, the notice and public procedures requirements of the Administrative Procedure Act do not apply. Accordingly, a regulatory flexibility analysis is not required. Finally, this final rule contains no new collection of information. Therefore, the Paperwork Reduction Act does not apply.

There has been media interest in Treasury's proposed buyback rule, and the House Ways and Means Committee has held hearings. While we do not anticipate significant controversy about the final rule, we do expect it to receive significant attention. We understand from the Under Secretary that extensive discussions on the proposed rule have already been held involving the Office of Management and Budget, the National Economic Council, the Council of Economic Advisors, and the Secretary. We recommend that the timing of the regulations be brought to the attention of the Secretary. In order to be published this year, the regulations must be at the Federal Register by December 13.

Recommendation: Approve for transmittal to the Federal Register.

NUC 12/10/99  
 Approve       Disapprove       Let's Discuss

Reviewer Comments:

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Attachment: Tab A - Final Rule (3 originals for signature)  
 Tab B - Proposed Rule



DEPARTMENT OF THE TREASURY  
BUREAU OF THE PUBLIC DEBT  
WASHINGTON, DC 20239-0001

**ACTION**

MEMORANDUM FOR: NEAL COMSTOCK  
EXECUTIVE SECRETARY

THROUGH: GARY GENSLER *GenSLER*  
UNDER SECRETARY (DOMESTIC FINANCE)

DON HAMMOND *DHammond*  
FISCAL ASSISTANT SECRETARY

LEE SACHS *LSachs*  
ASSISTANT SECRETARY (FINANCIAL MARKETS)

FROM: VAN ZECK *VanZeck*  
COMMISSIONER

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	INITIATOR	REVIEWER	REVIEWER	REVIEWER	REVIEWER	REVIEWER
OFFICE CODE SURNAME	PD-C: Andreatta PD-C: Santamora	PD-C: Locken PD-C: Eccard	PD-C: Meister GB: McInerney	UDG: Lebryk UDMF: Carleton	UDMF: Malvey	UDG: Sachs
INITIALS / DATE	<i>ex</i> 11/12/99 <i>LS</i> 11/24/99	<i>ML</i> 11/17/99 <i>CE</i> 11/17/99 <i>WDE</i> 11/16/99	<i>AM</i> 11/17/99 <i>MB</i> 11/17/99	<i>LL</i> 11/24/99 <i>LC</i> 11/24/99 <i>BN</i> 11/24/99 <i>DM</i> 11/24/99	11/23	<i>MS</i> 11/23 <i>W/Comments</i>

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Recommendation: Approve for transmittal to the Federal Register.

\_\_\_\_\_ Approve                      \_\_\_\_\_ Disapprove                      \_\_\_\_\_ Let's Discuss

Reviewer Comments:

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Attachment: Tab A - Final Rule (3 originals for signature)  
 Tab B - Proposed Rule

Billing Code 4810-39-P

**DEPARTMENT OF THE TREASURY**

**Fiscal Service**

**31 CFR Part 375**

**Marketable Treasury Securities Redemption Operations**

**AGENCY:** Bureau of the Public Debt, Fiscal Service, Department of the Treasury.

**ACTION:** Final rule.

**SUMMARY:** The Department of the Treasury ("Treasury," "We," or "Us") is issuing rules in final form setting out the terms and conditions by which we may redeem outstanding, unmatured marketable Treasury securities. Redemption operations ("buybacks") would help us better manage our financing needs, promote more efficient capital markets, and may lower financing costs for taxpayers.

While we have not yet decided to conduct redemption operations, issuing these rules will enable us to conduct these operations in a timely and efficient way should such a decision be made. We are establishing a new part in the Code of Federal Regulations for this purpose.

**EFFECTIVE DATE:** January 3, 2000.

**ADDRESSES:** You may download this final rule from the Bureau of the Public Debt's Internet site at the following address: [www.publicdebt.treas.gov](http://www.publicdebt.treas.gov). It is also available for public inspection and copying at the Treasury Department Library, Room 5030, Main Treasury Building, 1500 Pennsylvania Avenue, N.W., Washington, D.C. 20220. To visit the library, call (202) 622-0990 for an appointment.

**FOR FURTHER INFORMATION CONTACT:** Lori Santamorena (Executive Director) or Chuck Andreatta (Senior Financial Advisor), Bureau of the Public Debt, Government Securities Regulations Staff, (202) 691-3632.

**SUPPLEMENTARY INFORMATION:**

**I. Background**

The government's improved fiscal position has caused Treasury's borrowing needs to decline significantly, and we have been adjusting the government's borrowing program accordingly. Our adjustments to date have distributed the required cuts in market borrowing across all maturity areas. In this environment, we began examining the concept of purchasing outstanding Treasury securities in the market. No decisions have been made to use a debt buyback program, but having the infrastructure available to be able to use this tool would provide us additional flexibility.

Buybacks could provide us with greater flexibility to manage the government's debt and to respond to our improved fiscal condition. First, buybacks could enhance market liquidity by allowing us to maintain regular issuances of new benchmark securities across the maturity spectrum, in greater volume than would otherwise be possible. Over the long term, this enhanced liquidity could reduce the government's interest expense and promote more efficient capital markets.

Second, buybacks could enhance our ability to exert greater control over the maturity structure of the outstanding debt. Without a buyback program, further reductions in Treasury new issue sizes and frequencies could be necessary. A buyback

program, however, would provide us the option of managing the maturity structure of the debt by selectively targeting the maturities of debt to be repurchased.

Third, buybacks could be used as a cash management tool, absorbing excess cash in periods when tax revenues usually exceed immediate spending needs.

In addition, although not a primary reason for conducting buybacks, we may occasionally be able to reduce the government's interest expense by purchasing "off-the-run" debt and replacing it with lower-yield "on-the-run" debt.<sup>1</sup>

On August 5, 1999 (64 FR 42626), we published proposed rules for public comment that laid out the proposed terms and conditions by which we would conduct buybacks. The closing date for comments was October 4, 1999. As explained in more detail below, after considering the comments provided, we have decided to adopt the proposed methodology for conducting buybacks. The effective date of this final rule will be January 3, 2000.

## **II. Comments Received in Response to the Proposed Rule**

We received 13 comment letters on the proposed rule<sup>2</sup> -- five from securities firms, four from individuals, and one each from a major trade association, the Treasury advisory committee of a major trade association, a futures exchange, and a Federal

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<sup>1</sup> A Treasury security is "on-the-run" when it is the newest security issue of its maturity (e.g., in October the two-year note issued September 30 would be "on-the-run" while the two-year note issued August 31 would be "off-the-run"). An on-the-run security is normally the most liquid issue for that maturity.

<sup>2</sup> The comment letters are available for downloading on the Internet and for inspection and copying at the Treasury Department Library at the addresses provided earlier in this rule.

Reserve Bank. Overall these commenters were supportive of the proposal. No commenters opposed the proposal. As explained below, the comments raised a series of policy or technical issues related to implementation.

A. Debt Management Policy Issues

Two commenters expressed concern that the budget accounting treatment of any premiums that Treasury would pay to buy back Treasury securities could limit the size of the buyback program. Both commenters suggested a budget accounting policy change -- that these premiums be amortized over the remaining life of the security bought back.

We consider this issue to be outside the scope of these regulations, which set out the terms and conditions of redemption operations.

Several comment letters made recommendations on the scheduling of redemption operations. Two commenters wanted them to be held in conjunction with the regular Treasury quarterly refunding auctions in February, May, August, and November. Another commenter recommended that redemption operations be held close to auctions of Treasury securities of similar maturity, while another commenter suggested only a regular schedule of redemption operations. Two commenters preferred that redemption operations not be conducted near potential delivery dates for Treasury futures contracts.

Commenters recommended a variety of maturity ranges to buy back. For example, one commenter advocated that securities with 15 to 25 years remaining to maturity were the best candidates for the Treasury to purchase, while another commenter recommended that Treasury buy back debt within the two-year to five-year maturity range

to minimize any effects on the average length of the debt outstanding. Another commenter suggested that Treasury avoid buying back those securities that are the "cheapest-to-deliver" for Treasury futures contracts.

Two commenters expressed concern about the effect that redemption operations may have on the remaining liquidity of off-the-run issues. Both suggested limiting redemption operations for a particular security to 10 percent of its outstanding amount. One of these commenters also suggested that at least \$1 billion of a security always remain outstanding. On the other hand, one commenter advocated that "issues with less than \$2 billion outstanding should be removed from the market," while another commenter saw "no reason to state a limit on the specific amount of any given security that the Treasury can purchase."

The issues of the scheduling of redemption operations, the maturities to redeem, and the remaining supply of securities redeemed are not addressed in the final rule. If we decide to conduct redemption operations, for each operation we would first announce when the operation would occur and which maturity sector or sectors would be eligible for redemption. We would determine the amount of any particular security to redeem during the redemption operation consistent with our debt management goals.

#### B. Technical/Operational Issues

Two commenters recommended that we issue redemption operation announcements several days in advance of the redemption operations. They contended that a relatively long notice period would give securities dealers more time to prepare for

the redemption operation, to canvass their customers to determine their levels of interest, and that it would aid price discovery. One commenter, however, preferred "a relatively short lead time ... , not unlike the process for a Federal Reserve coupon pass."

We are not addressing the notice period in the final rule so that we can retain flexibility in the timing of announcements.

Opinion was fairly evenly divided on the issue of whether Treasury should announce the specific securities that are eligible for redemption or merely announce a particular range of maturities that will be purchased. Those who favored announcing specific issues primarily argued that this would help dealers add eligible securities to their inventories prior to the redemption operation. Commenters preferring announcing a range of securities contended that participants would have greater flexibility to decide which securities to offer, and Treasury would have greater flexibility to decide which securities to purchase. One commenter also predicted that announcing a maturity range would mitigate the "announcement effect" of the prices of specific issues increasing as a direct result of the announcement.

The announcement would provide the maturity sector or sectors that would be eligible for redemption. It would also provide descriptions of each security within those maturity sectors including the CUSIP number, interest rate, maturity date, and the amount outstanding.

One commenter recommended that we use a proprietary electronic system for processing offers different from the Federal Reserve Bank of New York's. We would use

the Federal Reserve Bank of New York's system; however, because it is already in place at the location where offers would be received and it would meet our processing needs.

Another commenter suggested that Treasury consider using a single-price rather than a multiple-price auction mechanism. This commenter suggested that submitters may make more aggressive offers in a single-price format.

Redemption operations would at least initially be a multiple-price process in which successful offerors would receive the price at which they offered securities. Multiple-price redemption operations would allow us to make immediate use of the Federal Reserve Bank of New York's electronic system for executing open market operations. At some future time, however, we might want to evaluate the potential merits of a single-price process.

One commenter noted that the proposed rule was silent on the length of time between the closing time for submission of offers and the time that confirmations would be provided to submitters. The commenter stressed that this time period should be as short as possible because of the submitting dealers' exposure to market risk during this timeframe.

We would provide confirmations (results messages) to submitters, and issue a redemption operations results press release, as quickly as possible following the deadline for submitting offers.

In the preamble to the proposed rule, we indicated that settlement would occur on the day after the redemption operation in conformance with the market's next-day

settlement convention for other Treasury securities transactions. We specifically requested comment, however, on settlement-related issues. Two commenters recommended that there be at least two days between a redemption operation and settlement, primarily to inform any customers that their offers had been accepted and to facilitate timely delivery of customer securities. Another commenter specifically urged a three-day settlement timeframe because that is the settlement standard for corporate debt.

We will initially provide a minimum of two days between a redemption operation and settlement. This timeframe, however, is not stated in the final rule. Rather, the redemption operation and settlement dates would be provided in the redemption operation announcement.

We also received a comment that the definition of "accrued interest" should be revised to clarify that the time period covered in the accrued interest calculation includes the settlement date. We agree with this recommendation.

One comment letter expressed confusion over whether participation in redemption operations would be voluntary and concern that the Treasury might purchase, or a securities dealer might offer to sell, a Treasury security without the permission of its owner.

In response, we want to emphasize that participation in a Treasury redemption operation would be entirely voluntary and that securities industry rules for dealing fairly with customers prohibit securities dealers from conducting unauthorized customer transactions.

Finally, one comment letter consisted of a series of questions regarding various aspects of the redemption program, but made no recommendations.

### **III. Changes from the Proposed Rule**

After taking the comments we received into consideration, we are adopting this final rule setting out the terms and conditions by which we may redeem outstanding, unmatured marketable Treasury securities. The final rule adopts the proposed rule without significant changes. The only changes that have been made are in the definitions of "Accrued interest", "Price", and "Privately held amount" (§375.2), and in the descriptions of the redemption operation announcement (§375.10), how to submit an offer (§375.12), and who is responsible for delivering securities (§375.15).

The description of the redemption operation announcement was revised to add the range of maturities of eligible securities as one of the details that we would provide.

The description of how to submit an offer was revised to provide us greater flexibility in which electronic system we will use for receiving offers. The proposed rule specified the Federal Reserve Bank of New York's Trading Room Automated Processing System (TRAPS) as the system through which submitters must submit offers. While TRAPS is the system through which submitters would submit offers, eliminating specific mention of this system in the final rule would allow for a different system to be used at some future date.

The description of who is responsible for delivering securities was revised to clarify that submitters are responsible for delivering all securities we accept in a redemption operation, including any securities for which they submitted offers on behalf of others.

In addition, we eliminated the paragraphs on the maximum amount offered (§375.13) and deliveries of definitive securities (§375.23). We removed the limit on the maximum amount of a particular security that a submitter may offer because it is not necessary operationally. The Federal Reserve Bank of New York's electronic system would accept the correct amount of an offer, even if the offer were to exceed the security's amount outstanding.

We eliminated the paragraph that would have permitted deliveries of definitive securities because developing a process for timely definitive deliveries would have been too complex operationally in relation to any participation we might expect from holders of definitive securities. Relatively few Treasury securities continue to be held in definitive form. Those still holding definitive securities can easily convert them to book-entry securities if they wish to participate in any future redemption operations.

A summary of the main features of the final rule that remain unchanged from the proposed rule are:

- (1) We would issue an announcement of an upcoming redemption operation, including the expected maximum amount of the operation;
- (2) Offers would be competitive, on the basis of price, to three decimals;

- (3) Redemption operations would be a multiple-price process in which successful offerors receive the price at which they offered securities;
- (4) Only primary dealers as designated by the Federal Reserve Bank of New York would be allowed to submit offers for themselves or others, enabling use of the Bank's existing electronic systems; and
- (5) There would be no limits on the number of offers per security or on the total number of offers from a particular submitter.

#### **IV. Procedural Requirements**

This final rule is not a "significant regulatory action" under Executive Order 12866. Although we issued this rule in proposed form to benefit from public comment, the notice and public procedures requirements of the Administrative Procedure Act do not apply, under 5 U.S.C. 553(a)(2).

Since no notice of proposed rulemaking was required, the provisions of the Regulatory Flexibility Act (5 U.S.C. 601 et seq.) do not apply.

#### **List of Subjects in 31 CFR Part 375**

Bonds, Federal Reserve System, Government securities, Securities.

For the reasons stated in the preamble, Part 375 is added as follows:

**PART 375 - MARKETABLE TREASURY SECURITIES  
REDEMPTION OPERATIONS**

**SUBPART A--GENERAL INFORMATION**

Sec.

375.0 What authority does the Treasury have to redeem its securities?

375.1 Where are the rules for the redemption operation located?

375.2 What special definitions apply to this rule?

375.3 What is the role of the Federal Reserve Bank of New York in this process?

**SUBPART B--OFFERING, CERTIFICATIONS, AND DELIVERY**

375.10 What is the purpose of the redemption operation announcement?

375.11 Who may participate in a redemption operation?

375.12 How do I submit an offer?

375.13 What requirements apply to offers?

375.14 Do I have to make any certifications?

375.15 Who is responsible for delivering securities?

**SUBPART C--DETERMINATION OF**

**REDEMPTION OPERATION RESULTS; SETTLEMENT**

375.20 When will the Treasury decide on which offers to accept?

375.21 When and how will the Treasury announce the redemption operation results?

375.22 Will I receive confirmations and, if I am submitting offers for others, do I have to provide confirmations?

375.23 How does the securities delivery process work?

#### SUBPART D--MISCELLANEOUS PROVISIONS

375.30 Does the Treasury have any discretion in this process?

375.31 What could happen if someone does not fully comply with the redemption operation rules or fails to deliver securities?

AUTHORITY: 5 U.S.C. 301; 31 U.S.C. 3111; 12 U.S.C. 391.

#### Subpart A--General Information

§ 375.0 What authority does the Treasury have to redeem its securities?

Section 3111 of Title 31 of the United States Code authorizes the Secretary of the Treasury to use money received from the sale of an obligation and other money in the general fund of the Treasury to buy, redeem, or refund, at or before maturity, outstanding bonds, notes, certificates of indebtedness, Treasury bills, or savings certificates of the United States Government. For the purposes of this part, we will refer to these outstanding obligations as "securities."

§ 375.1 Where are the rules for the redemption operation located?

The provisions in this part and the redemption operation announcement govern the redemption of marketable Treasury securities under 31 U.S.C. 3111. (See § 375.10.)

§ 375.2 What special definitions apply to this rule?

The definitions in 31 CFR Part 356 govern this part except as follows:

Accrued interest means an amount payable by the Treasury as part of the settlement amount for the interest income earned between the last interest payment date up to and including the settlement date.

Bank means the Federal Reserve Bank of New York.

Customer means a person or entity on whose behalf a submitter has been directed to submit an offer of a specified amount of securities in a specific redemption operation.

Minimum offer amount means the smallest par amount of a security that may be offered to the Treasury. We will state the minimum offer amount in the redemption operation announcement.

Multiple means the smallest additional par amount of a security that may be offered to the Treasury. We will state the multiple in the redemption operation announcement.

Offer means an offer to deliver for redemption a stated par amount of a specific security to the Treasury at a stated price.

Price means the dollar amount to be paid for a security expressed as a percent of its current par amount.

Privately held amount means the total amount outstanding of a security less holdings of the Federal Reserve System and Federal Government accounts.

Redemption amount means the maximum par amount of securities that we are planning to redeem through a redemption operation. We will state the redemption amount in the redemption operation announcement.

Redemption operation means a competitive process by which the Treasury accepts offers of marketable Treasury securities that by their terms are not immediately payable.

Security means an outstanding unmatured obligation of the United States Government that the Secretary is authorized to buy, redeem or refund under section 3111 of Title 31 of the United States Code.

Settlement means full and complete delivery of and payment for securities redeemed.

Settlement amount means the par amount of each security that we redeem, multiplied by the price we accept in a redemption operation, plus any accrued interest.

Settlement date means the date specified in the redemption operation announcement on which you must deliver a security to the Treasury for payment.

Submitter means an entity submitting offers directly to the Treasury for its own account, for the account of others, or both. (See § 375.11(a).)

Tender means a computer transmission or document submitted in a redemption operation that contains one or more offers.

We ("us") means the Secretary of the Treasury and his or her delegates, including the Treasury Department, the Bureau of the Public Debt, and their representatives. The term also includes the Federal Reserve Bank of New York, acting as fiscal agent of the United States.

You means a prospective submitter in a redemption operation.

§ 375.3 What is the role of the Federal Reserve Bank of New York in this process?

As fiscal agent of the United States, the Federal Reserve Bank of New York performs various activities necessary to conduct a redemption operation under this part.

These activities may include but are not limited to:

- (a) Accepting and reviewing tenders;
- (b) Calculating redemption operation results;
- (c) Issuing notices of redemptions;
- (d) Accepting deliveries of Treasury securities at settlement; and
- (e) Processing the Treasury payment for securities delivered at settlement.

Subpart B--Offering, Certifications, and Delivery

§ 375.10 What is the purpose of the redemption operation announcement?

We provide public notice that we are redeeming Treasury securities by issuing a redemption operation announcement. This announcement lists the details of each proposed redemption operation, including the maximum redemption amount, the range of maturities of eligible securities, descriptions of the securities that fall within that maturity range, and the redemption operation and settlement dates. The redemption operation announcement and this part specify the terms and conditions of a redemption operation. If anything in the redemption operation announcement differs from anything in this part, the redemption operation announcement will apply. Accordingly, you should read the applicable redemption operation announcement along with this part.

§ 375.11 Who may participate in a redemption operation?

(a) Submitters. To be a submitter, you must be an institution that the Federal Reserve Bank of New York has approved to conduct open market transactions with the Bank.

(b) Others. A person or entity other than a submitter may participate only if it arranges to have an offer or offers submitted on its behalf by a submitter.

§ 375.12 How do I submit an offer?

As a submitter, you must submit an offer in a tender to the Treasury via the Federal Reserve Bank of New York. You must submit any tenders in an approved format and the Bank must receive them prior to the closing time stated in the redemption operation announcement. If we do not receive your tenders timely, we will reject them.

Your tenders are binding on you after the closing time specified in the redemption operation announcement. You are responsible for ensuring that we receive your tenders on time. We will not be responsible in any way for any unauthorized tender submissions or for any delays, errors, or omissions in submitting tenders.

§ 375.13 What requirements apply to offers?

(a) General. You may only submit competitive offers (specifying a price). All offers must state the security description, par amount, and price of each security offered. All offers must equal or exceed the minimum offer amount, and be in the multiple, stated in the redemption operation announcement.

(b) Price format. You must express offered prices in terms of price per \$100 of par with three decimals, e.g., 102.172. The first two decimals represent fractional 32nds of a dollar. The third decimal represents eighths of a 32nd of a dollar, and must be a 0, 2, 4, or 6. For example, an offer of 102.172 means one hundred two and seventeen 32nds and two eighths of a 32nd, or in decimals, 102.5390625.

(c) Maximum number of offers. There is no limit on the number of offers you may make for each eligible security. There is also no limit on the number of eligible securities you may offer.

§ 375.14 Do I have to make any certifications?

By submitting a tender offering a security or securities for sale, you certify that you are in compliance with this part and the redemption operation announcement.

§ 375.15 Who is responsible for delivering securities?

As a submitter, you are responsible for delivering any securities we accept in the redemption operation, including any securities for which you submitted offers on behalf of others. (See § 375.23.) All securities you deliver must be free and clear of all liens, charges, claims, and any other restrictions.

Subpart C--Determination of  
Redemption Operation Results; Settlement

§ 375.20 When will the Treasury decide on which offers to accept?

We will determine which offers or portions of offers to accept after the closing time for receipt of tenders. All such determinations will be final.

§ 375.21 When and how will the Treasury announce the redemption operation results?

We will make an official announcement of the redemption operation results through a press release. For each security we redeem, the press release will include such information as the amounts offered and accepted, the highest price accepted, and the remaining privately held amount outstanding.

§ 375.22 Will I receive confirmations and, if I am submitting offers for others, do I have to provide confirmations?

(a) Confirmations to submitters. We will provide a confirmation of acceptance or rejection in the form of a results message to submitters of offers by the close of the business day of the redemption operation.

(b) Confirmation of customer offers. If you submit a successful offer for a customer, you are responsible for notifying that customer of the impending redemption.

§ 375.23 How does the securities delivery process work?

If any of the offers you submitted are accepted, you must transfer the correct book-entry Treasury securities in the correct par amount against the correct settlement amount on the settlement date. You must deliver the securities to the account specified in the redemption operation announcement.

Subpart D--Miscellaneous Provisions

§ 375.30 Does the Treasury have any discretion in this process?

(a) We have the discretion to:

(1) Accept or reject any offers or tenders submitted in a redemption operation;

- (2) Redeem less than the amount of securities specified in the redemption operation announcement;
- (3) Add to, change, or waive any provision of this part; or
- (4) Change the terms and conditions of a redemption operation.

(b) Our decisions under this part are final. We will provide a public notice if we change any redemption operation provision, term or condition.

§ 375.31 What could happen if someone does not fully comply with the redemption operation rules or fails to deliver securities?

(a) General. If a person or entity fails to comply with any of the redemption operation rules in this part, we will consider the circumstances and take what we deem to be appropriate action. This could include barring the person or entity from participating in future redemption operations under this part and future auctions under 31 CFR Part 356. We also may refer the matter to an appropriate regulatory agency.

(b) Liquidated damages. If you fail to deliver securities on time, we may require you to pay liquidated damages of up to 1% of your projected settlement amount.

Dated:

DONALD V. HAMMOND

Fiscal Assistant Secretary

2000-SE-001356



DEPARTMENT OF THE TREASURY  
Washington

Assistant Secretary  
(Financial Markets)

For Secretary Summers,

For your information.

Lee Sachs

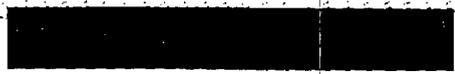


21 January 2000

Gerald Lucas  
Senior Government Strategist  
(1) 212 449-0251

Joseph Shatz  
Govt/FF&O Strategy  
(1) 212 449-9196

To: LHS office  
Fu: Ull



# Treasury Buybacks and the Debt Maturity

## Look for \$100B in T-bond Buybacks

United States

# Governmentments

### Highlights of This Issue

If not for the buybacks, the average maturity of the debt should soon extend past six years, due to the large amount of short-dated coupons maturing.

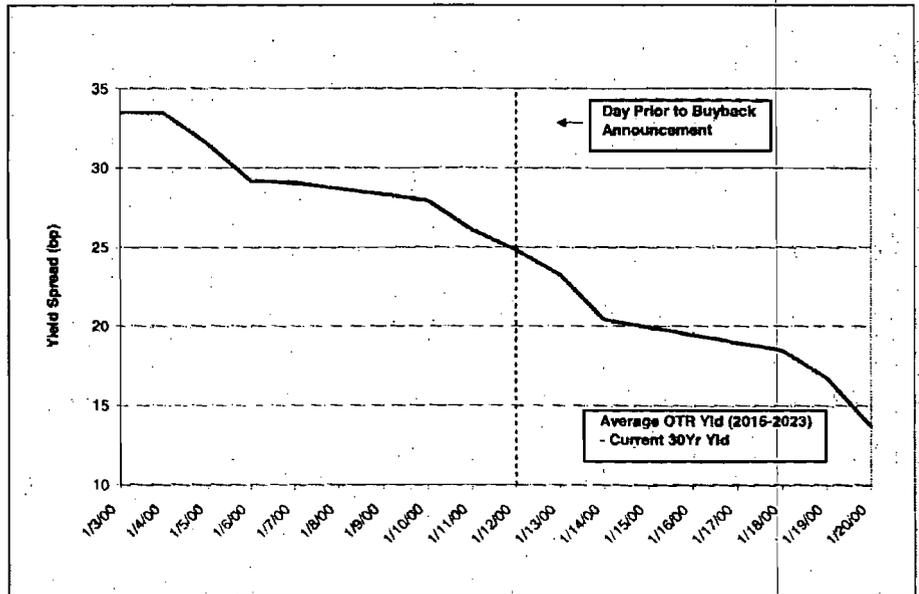
If the Treasury does not focus on repurchasing T-bonds, the debt maturity would soon bump up against the six-year "ceiling".

For the next three to four years, we believe that the Treasury may repurchase up to \$100 billion-\$120 billion in T-bonds before it makes the program maturity or curve neutral

After four years of buybacks (\$120 billion), the average debt maturity should be close to 5.4 years, a maturity the Treasury would be comfortable with.

The buyback program fully justifies the recent richening of OTR and 10/30 curve inversion. Look for these trends to continue.

Chart 1: OTR T-Bond Richening Prior/After Buyback Announcement



Since the Jan. 13 "buyback" announcement, off-the-run T-bonds (2015-2023 sector) have richened by about 11 bps versus the current long bond (see Chart 1), primarily because the buyback size was much larger than expected (\$30 billion vs. "Street" estimates of \$10 billion-\$15 billion). The questions now facing the market are 1) how much will the Treasury repurchase in the backend over the next few years; and 2) will these buybacks justify the recent richening of OTR T-bonds and inversion of the 10/30 curve? To answer these questions, we must examine the trends in average maturity of outstanding Treasury debt.

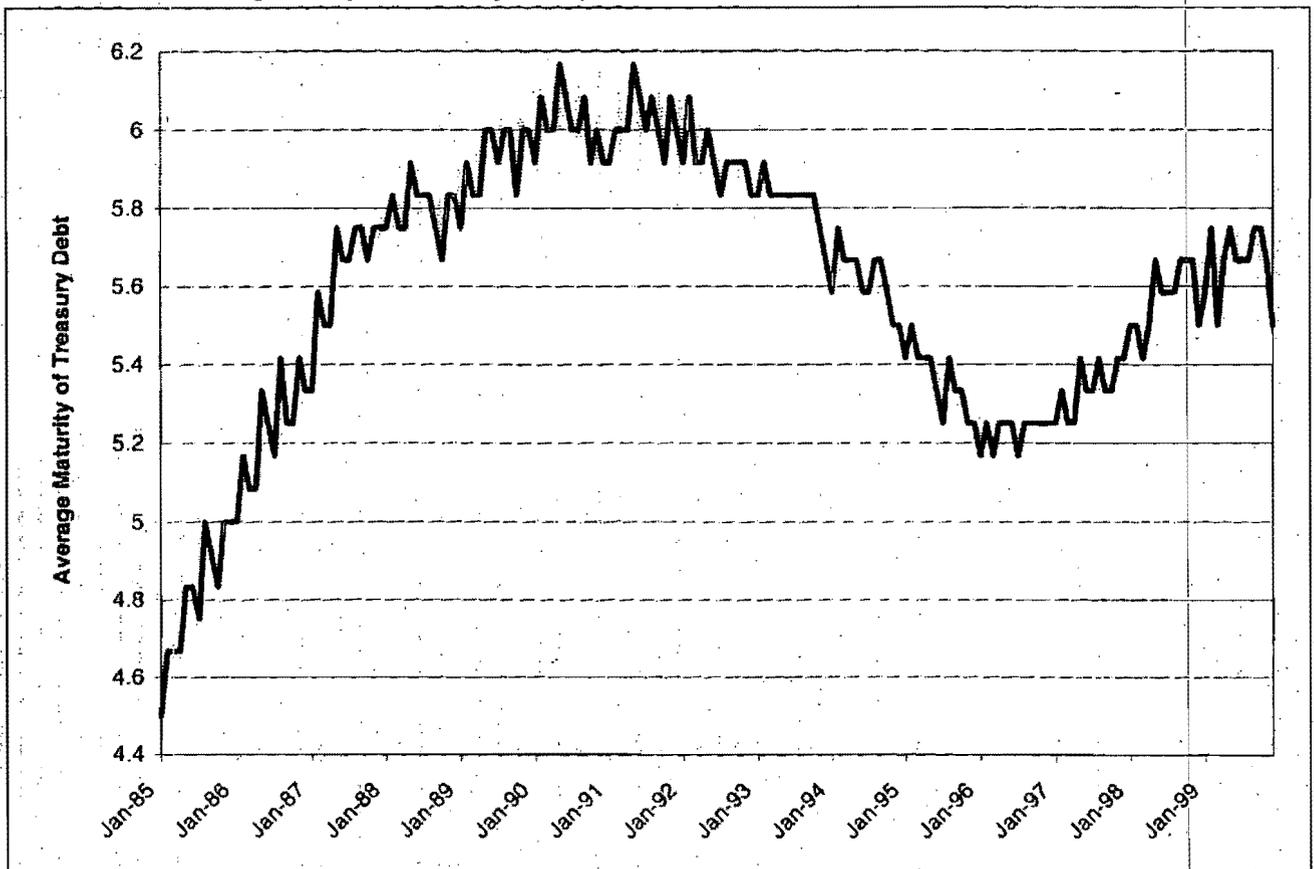
The primary purpose of the buyback program is to build deep liquid benchmark issues, which should both lower the Treasury's overall financing costs and maintain its access to the credit markets. A secondary purpose, but highly important, is to manage the overall maturity of the marketable Treasury debt. Since August 1985, the average maturity of the debt has ranged between five and

6.2 years (see Chart 2).<sup>1</sup> The Treasury wants to keep the average maturity of its debt below six years; we believe that it would prefer to keep it in the five to 5.5-year range. If not for the buybacks, the average maturity of the debt should soon extend past six years, due to the large amount of short-dated coupons maturing.

■ Estimated Size of Buyback Program

The buyback program easily allows the Treasury to manage and shorten its overall debt maturity. We believe the Treasury will primarily target T-bonds in the 2015-2025 sector. For the first few years, we do not believe that it will buy bonds in the 2026-2028 sector. The Treasury has said that another reason for the buybacks (albeit a minor one) is to save money by issuing rich currents and buying cheap OTR. Due to the inversion in the backend of the curve, bonds in the 2026-2028 sector trade some 8 bps-13 bps richer than the "hump" (2015-2019).

Chart 2: Historical Average Maturity of Outstanding Treasury Debt



For the next three to four years, we believe that the Treasury may repurchase up to \$100 billion-\$120 billion in T-bonds before it makes the program maturity or curve neutral (i.e., repurchasing securities along the whole curve with minimal net effect on the average debt maturity). The Treasury may occasionally repurchase shorter-maturity debt to preclude the back end from richening too much, but the quantity should be minor unless the yearly buybacks increase to more than \$30 billion per year. If the Treasury does not focus on repurchasing T-bonds, the debt maturity would soon bump up against the six-year "ceiling". The foundation for our buyback estimate is based upon the premise that the Treasury would prefer, at a minimum, to shorten the average debt maturity to less than 5.5 years.

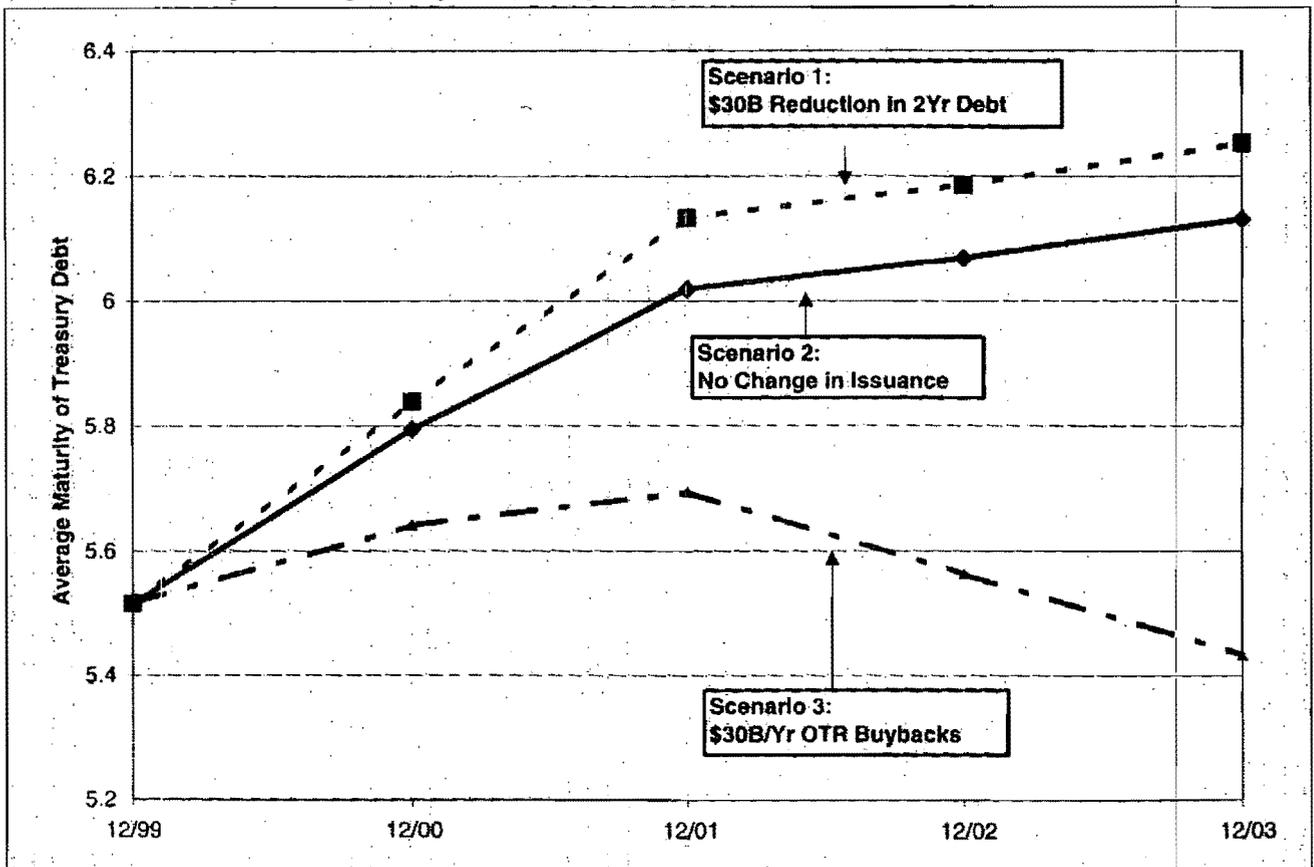
#### ■ Projections for Average Debt Maturity

As of Dec. 31, 1999, the average debt maturity equaled 5.5 years versus 5.75 years on Sept. 30. The heavy Y2K-related T-bill and CMB issuance accounted for this shortening.<sup>2</sup> As seen in Chart 3, we project our estimates for the average debt under three scenarios.

1. No buybacks. Treasury cuts the average size of the two-year to \$12.5 billion per month, thereby issuing \$30 billion less than in calendar year 1999.
2. No buybacks. Treasury maintains the 1999 issuance schedule in 2000 (T-bonds, T-Notes, and T-bills).
3. Treasury repurchases \$30 billion T-bonds per year, with average maturity of 20 years. The 2000 issuance schedule is the same as in 1999.

We believe the proper comparison is between Scenarios 1 and 3. If the Treasury does not conduct buybacks this year, it probably would probably have to reduce two-year issuance. We believe that the two-year and one-year T-bill securities are the most likely candidates to be cut. But reducing issuance of these short maturity securities only compounds the debt extension problem. Without buybacks, it is clearly evident the average debt maturity would surpass six years by December 2001 (No. 1). Conversely, by conducting buybacks (No. 3), the Treasury can both maintain the 1999 issuance schedule and keep the average debt maturity below 5.7 years. In 2002, the buybacks would begin to actually reduce the overall debt maturity. After four years of buybacks (\$120 billion), the average debt maturity should be close to 5.4 years, a maturity the Treasury would be comfortable with.

Chart 3: Scenario Analysis: Average Maturity of Outstanding Treasury Debt



## ■ Curve Inversion

This analysis shows that the Treasury will most likely concentrate its buybacks in the T-bond sector for the first two to three years. After that, it may gradually make the program more maturity neutral by repurchasing securities along the curve. **If the Treasury does repurchase \$120 billion in T-bonds in the 2015-2025 sector, the recent richening of OTR and 10/30 curve inversion should be fully justified. Look for these trends to continue.** Given that there are only \$369 billion face amount of T-bonds in the 2015-2025 sector, the Treasury would come close to repurchasing one-third of the outstanding face. The Treasury has other options for reducing its debt maturity, the most obvious being an increase in T-bill issuance. The buybacks allow the Treasury to increase T-bill issuance somewhat.

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**The anticipated large size for the buyback program in the backend (\$100 billion-\$120 billion) has important ramifications for the Treasury market and portfolio allocations. The 10/30 curve has already inverted and OTR T-bonds have richened by about 11 bps versus the current long bond. For investors making their portfolio and curve allocation decisions for the upcoming year, we recommend that they go long their benchmark in the Treasury curve. For the next few years, there will be zero or even negative net supply in the backend of the Treasury curve. This supply factor (or lack thereof) heavily favors long-maturity Treasuries over sister products.**

1. *TIPS are not included in calculating the average maturity of debt.*
2. *The average debt maturity at year-end 1999 was biased downward by about 0.1 years due to the large size of the 1/13/00 and 1/20/00 CMB and another 0.1 years due to the Y2K-related increase in T-hill issuance in the fourth quarter. In our maturity projections, we accounted for the CMBs by adjusting the maturity upward by 0.1 years.*

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ADMINISTRATION HISTORY APPENDIX

CHAPTER THREE: IMPROVING FINANCIAL SERVICES, AND MARKETS AND THE  
FEDERAL GOVERNMENT'S FINANCIAL MANAGEMENT

# CIRCUIT BREAKER

1998-SE-008226



DEPARTMENT OF THE TREASURY  
WASHINGTON, D.C. 20220

MUL 10 1998

ACTION

**MEMORANDUM FOR SECRETARY RUBIN**

**THROUGH:** UNDER SECRETARY HAWKE (Signed)  
ASSISTANT SECRETARY GENSLER (Signed),

**FROM:** Roger L. Anderson *RLA*  
Deputy Assistant Secretary  
(Federal Finance)

**SUBJECT:** Working Group Study of Circuit Breakers

**ACTION-FORCING EVENT:**

On October 29, 1997, Senators Gramm and Dodd wrote to you, as Chairman of the President's Working Group on Financial Markets, to request that the Working Group study how well the equity market circuit breakers worked on October 27, 1997.

**RECOMMENDATION:**

We recommend that you sign the enclosed letter transmitting the attached report.

\_\_\_\_\_ Approve \_\_\_\_\_ Disapprove \_\_\_\_\_ Discuss

**BACKGROUND:**

The SEC and CFTC amassed trading data from October 27, and all the Working Group agencies contributed to the analysis. The report concludes that the 7.18% decline in the Dow Jones Industrial Average on October 27 was not the type of extraordinary market decline that circuit breakers were meant to address. Under Secretary Hawke, along with Chairman Levitt, Chairperson Born and Governor Phillips, testified to that effect before Senator Gramm's subcommittee on January 29. Subsequently, the New York Stock Exchange revised its circuit breaker rules.

The report also includes as an appendix the May 7 letter from Treasury, the Fed, the SEC and the CFTC to the NYSE on the need to revise the collars and sidecar procedures.

Attachment

The Working Group on Financial Markets

Robert E. Rubin, Secretary  
Department of the Treasury

Brooksley Born, Chairperson  
Commodity Futures Trading Commission

Alan Greenspan, Chairman  
Board of Governors of the Federal Reserve System

Arthur Levitt, Chairman  
Securities and Exchange Commission

The Honorable Phil Gramm  
Chairman  
Subcommittee on Securities  
Committee on Banking, Housing, and Urban Affairs  
U.S. Senate

The Honorable Christopher J. Dodd  
Ranking Member  
Subcommittee on Securities  
Committee on Banking, Housing, and Urban Affairs  
U.S. Senate

Dear Senator Gramm and Senator Dodd:

In your letter of October 29, 1997, you asked the President's Working Group on Financial Markets (the "Working Group") to undertake a comprehensive study examining how well circuit breakers functioned on October 27, 1997, and whether the circuit breakers accomplished the goals for which they were created. We respectfully submit the attached report by the staff of the Working Group participants in response to your request.

The cross-market trading halt procedures were triggered for the first time at 2:36 p.m. on October 27, 1997, when the Dow Jones Industrial Average ("DJIA") declined 350 points (4.5%), thereby initiating a 30-minute trading halt in the stock, stock options, and stock index futures markets. After trading resumed at 3:06 p.m., prices declined rapidly to 554 points (7.2%) below the previous day's close, thereby

triggering the 550-point circuit breaker that would have halted trading for one hour. Because the DJIA reached the 550-point circuit breaker at 3:30 p.m., the circuit breaker closed the market for the remainder of the day, ending the trading session 30 minutes prior to the normal stock market close.

The events of October 27 focused considerable attention on circuit breakers. In November 1997, representatives from the SEC and the CFTC met with officials of the securities and futures markets to discuss possible changes to the circuit breaker procedures. Without reaching a consensus on the specifics of implementation, participants at the meeting agreed, in general, on the need to raise the thresholds for circuit breakers and to structure circuit breakers to permit the orderly establishment of daily closing prices.

On January 29, 1998, representatives of the Working Group agencies testified before the Senate Subcommittee on Securities. The Working Group representatives all generally expressed the view that markets function best when they are unencumbered by artificial constraints like circuit breakers. We also believe that markets should remain open as long as they are functioning efficiently. Circuit breakers were designed to halt trading only during market declines of historic proportions, and to substitute an orderly, pre-planned halt for the ad hoc trading halts that can occur during a dramatic and destabilizing market decline. The 7.2% DJIA decline on October 27 was not the type of extraordinary market decline that circuit breakers were meant to address. Due to the increase in information, trading, and settlement system capacity since the adoption of circuit breakers, the markets were operating efficiently on October 27, with no threat of an imminent breakdown. The need to halt trading on that day was not evident. Accordingly, we supported an increase in the circuit breaker trigger levels to ensure that they are activated only during extreme market declines. In addition, we indicated our belief that circuit breaker procedures should allow for an orderly close each day, and that they should be re-evaluated periodically.

In response to Congress's and the agencies' concerns, the securities and futures exchanges submitted proposals to revise their circuit breaker procedures. The SEC and CFTC approved the revised procedures in April 1998. The circuit breakers adopted by the securities exchanges establish trading halts following one-day DJIA declines of 10%, 20%, and 30%. The NYSE will calculate the trigger levels at the beginning of each calendar quarter, using the average closing value of the DJIA for the previous month to establish specific point values for the quarter. Under the securities exchanges' revised circuit breaker procedures, trading will halt for one hour if the DJIA declines 10% prior to 2:00 p.m., and for one-half hour if the DJIA declines 10% between 2:00 p.m. and 2:30 p.m. If the DJIA declines by 10% at or after 2:30 p.m., trading will not halt at the 10% level. If the DJIA declines 20% prior to 1:00 p.m., trading will halt for two hours; trading will halt for one hour if the DJIA declines 20% between 1:00 p.m. and 2:00 p.m.; and trading will halt for

The Honorable Phil Gramm  
The Honorable Christopher J. Dodd  
Page 3

the remainder of the day if a 20% decline occurs at or after 2:00 p.m. If the DJIA declines 30% at any time, trading will halt for the remainder of the day.

In our testimony before the Subcommittee, representatives of the Working Group agencies also testified that the NYSE's sidecar procedures and collar rule were probably outdated and should be eliminated or, in the alternative, that the trigger level in the collar rule should be raised substantially. The members of the Working Group submitted a letter to the NYSE, dated May 7, 1998, that addressed the need for further revisions to these rules, a copy of which is enclosed.

Although recent developments have reduced the need for an extensive study of circuit breakers by the Working Group, the Working Group nonetheless asked its staff to prepare a narrowly focused report analyzing the operation and effectiveness of circuit breakers on October 27. The attached report attempts to review the effects of both the cross market trading halts and the NYSE's sidecar and collar rules. We appreciate your interest and assistance in helping to ensure that circuit breakers and other regulatory measures designed to protect markets function to maintain the efficiency, liquidity, and integrity of our nation's capital markets.

Sincerely,

Robert E. Rubin, Secretary  
Department of the Treasury

Brooksley Born, Chairperson  
Commodity Futures Trading Commission

Alan Greenspan, Chairman  
Board of Governors of the Federal  
Reserve System

Arthur Levitt, Chairman  
Securities and Exchange Commission

Enclosures

## Working Group Staff Report on Circuit Breakers

### I. Introduction

In response to the events of October 19, 1987, when the Dow Jones Industrial Average ("DJIA") sustained a one-day decline of 508 points (22.6%), the nation's securities and futures markets in 1988 adopted rules that provide for coordinated, cross-market trading halts in all equity and equity-derivative markets following specified declines in the DJIA. These coordinated trading halts, or circuit breakers, were designed to operate only during significant market declines and to substitute orderly, pre-planned halts for the ad hoc and destabilizing halts which can occur when market liquidity is exhausted.<sup>1</sup> The circuit breakers also provide opportunities for markets and market participants to assess market conditions and potential systemic stress during a historic market decline.

The circuit breakers were activated for the first time on October 27, 1997, when the DJIA declined 554.26 points (7.18%) to close at 7161.15. The circuit breaker procedures in effect on October 27 called for a 30-minute trading halt in stocks, stock options, and stock index futures if the DJIA declined 350 points from its previous day's closing value, and for a one-hour trading halt if the DJIA declined 550 points from its previous day's closing value. As discussed more fully below, on October 27 the DJIA declined 350 points (4.54%) to trigger the first circuit breaker trading halt at 2:36 p.m. After trading resumed at 3:06 p.m., prices fell rapidly to reach the 550-point circuit breaker at 3:30 p.m. Because the 550-point circuit breaker called for a one-hour trading halt, the circuit breaker closed the market for the remainder of the day, ending the trading session 30 minutes prior to the normal stock market close.

On October 29, 1997, the Senate Subcommittee on Securities asked the President's Working Group on Financial Markets ("Working Group") to undertake a study examining how well circuit breakers functioned on October 27, and whether they accomplished the goals for which they were created.<sup>2</sup> Although it is difficult to draw general conclusions from an isolated event, and although the market decline on October 27 was not of a magnitude to demonstrate how circuit breakers might operate during more severe declines, our analysis of trading on October 27 provides insights into the operation of circuit breakers and into changes that may enhance the effectiveness of the markets' circuit breaker procedures. As discussed more fully below, the securities and

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<sup>1</sup> Liquidity is the ability to buy or sell an asset quickly and in large volume without substantially affecting the asset's price.

<sup>2</sup> See Letter from Phil Gramm, Chairman, Subcommittee on Securities, Committee on Banking, Housing, and Urban Affairs, U.S. Senate, and Christopher J. Dodd, Ranking Member, Subcommittee on Securities, Committee on Banking, Housing, and Urban Affairs, U.S. Senate, dated October 29, 1997.

futures markets revised their circuit breaker procedures in April 1998 in light of their experience with the trading halts triggered on October 27 and in response to concerns raised by regulators.<sup>3</sup> The revised circuit breaker procedures adopted by the securities and futures markets are consistent with the Working Group's recommendations based on our analysis of trading on October 27.

First, the October 1997 experience demonstrated that the securities and futures markets needed to increase the thresholds for circuit breaker halts to take into account current market levels and the increased capacity of the U.S. markets to handle volume and price corrections of the type that occurred on October 27. The 350-point decline that triggered the first circuit breaker on October 27 represented a decrease of only 4.54%; the DJIA has experienced such declines on 11 previous days since 1945. Moreover, there was little evidence on October 27 of the types of systemic stress that would have justified cross-market trading halts. There was no prudential need for circuit breakers to be triggered on October 27. Circuit breaker halts should be reserved only for a historic market decline of a magnitude that raises concerns that the exhaustion of market liquidity might result in uncoordinated, ad hoc market closures.

Second, the markets needed to modify circuit breaker procedures to permit trading to resume for orderly market closings whenever feasible. Our review indicates that investor concerns that the second circuit breaker would close the market for the remainder of the trading day may have accelerated the price declines in the last 25 minutes of trading on October 27.

In light of the above, regulators and officials of the securities and futures markets met to assess the operation of circuit breakers on October 27 and to consider possible modifications to the circuit breaker procedures. As a result of these discussions, the securities and futures markets revised their circuit breaker procedures in April 1998. As discussed more fully below, the revised circuit breaker procedures provide for trading halts following one-day DJIA declines of 10%, 20%, and 30%. The revised procedures also require quarterly recalculations of the circuit breaker trigger levels.

In addition, in response to concerns raised by regulators<sup>4</sup> and the futures markets, the NYSE plans to review both NYSE Rule 80A(a) (the "sidecar" procedures) and NYSE Rule 80A(c) (the "collar rule"). In general, the NYSE's collar rule

<sup>3</sup> See Securities Exchange Act Release No. 39846 (April 9, 1998), 63 FR 18477 (April 15, 1998) (order approving proposals by the NYSE, AMEX, BSE, CHX, NASD, and PHLX) ("April 1998 Approval Order").

<sup>4</sup> See Letter from Robert E. Rubin, Secretary, Department of the Treasury, Brooksley Born, Chairperson, Commodity Futures Trading Commission ("CFTC"), Alan Greenspan, Chairman, Board of Governors of the Federal Reserve System, and Arthur Levitt, Chairman, Securities and Exchange Commission ("SEC"), to Richard A. Grasso, Chairman and Chief Executive Officer, NYSE, dated May 7, 1998.

establishes conditions for effecting index arbitrage transactions when the DJIA advances or declines 50 points or more from its closing value on the previous trading day. Specifically, when the DJIA declines by 50 points or more from its previous trading day's closing value, all index arbitrage orders to sell component stocks of the S&P 500 Index must be entered with the instruction "sell plus."<sup>5</sup> Conversely, when the DJIA advances by 50 points or more from its previous trading day's closing value, all index arbitrage orders to buy component stocks of the S&P 500 Index must be entered with the instruction "buy minus."<sup>6</sup> These provisions apply to all index arbitrage orders in component S&P 500 stocks traded on the NYSE, regardless of whether they are routed through the NYSE's Designated Order Turnaround ("DOT") system.

Under the NYSE's sidecar procedures, all automated program trading orders<sup>7</sup> for NYSE stocks in the S&P 500 Index are routed into a separate sidecar electronic file for five minutes if, prior to 3:25 p.m., the price of the primary S&P 500 futures contract declines 12 points from its previous settlement price.<sup>8</sup> In the sidecar files for each stock, program buy orders are matched with program sell orders, and NYSE specialists are notified of any order imbalances. If a stock has an order imbalance requiring significant price changes, the specialist must institute a trading halt in the stock and disseminate price indications for a set period prior to reopening the stock. Although sidecar procedures have been triggered numerous times since their adoption (37 times in 1997 alone), the orders in the sidecar files have never presented imbalances sufficient to warrant a halt in the trading of a stock.

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<sup>5</sup> "Sell plus" means that the order only can be executed on a plus or zero plus tick. A plus tick is a price above the price of the last preceding transaction. A zero plus tick is a price equal to the last preceding transaction if the most recent transaction at a different price was at a lower price.

<sup>6</sup> "Buy minus" means that the order only can be executed on a minus or zero minus tick. A minus tick is a price below the price of the last preceding transaction. A zero minus tick is a price equal to the last preceding transaction if the most recent transaction at a different price was at a higher price.

<sup>7</sup> For purposes of the sidecar procedures, program trading includes, but is not limited to, index arbitrage. Specifically, NYSE Rule 80A(e)(i) defines program trading for purposes of NYSE Rule 80A as "either (A) index arbitrage or (B) any trading strategy involving the related purchase or sale of a "basket" or group of 15 or more stocks having a total market value of \$1 million or more. Program trading includes the purchases or sales of stocks that are part of a coordinated trading strategy, even if the purchases or sales are neither entered or executed contemporaneously, nor part of a trading strategy involving options or futures contracts on an index stock group, options on any such futures contracts, or otherwise relating to a stock market index."

<sup>8</sup> The sidecar's trigger point of 12 points in the S&P 500 futures was established in October 1988, in coordination with the CME's 12-point initial intra-day price limit. Its approval was "conditioned on [the] approval of the CME's companion rule" and it was to apply "at the same trigger value." However, when the CME initial limit was expanded to 15 and then 25 points, the NYSE did not expand its NYSE Rule 80A(a) correspondingly.

## II. History and Overview of Circuit Breakers

### A. The October 1987 Market Break and the Adoption of Circuit Breakers

In October 1987, the U.S. securities markets experienced an extraordinary surge in price volatility and trading volumes. The DJIA declined 6% during the week of October 5, 1987, and an additional 9% during the week of October 12. On Monday, October 19, the DJIA experienced a record one-day percentage decline of 508 points (22.6%). By mid-day on October 20, the DJIA again declined sharply before share prices stabilized and rallied to close up 6% for the day. These historic price swings were accompanied by extraordinary increases in trading volumes, with the NYSE setting successive daily share volume records on Friday, October 16, Monday, October 19, and Tuesday, October 20.

The combination of historic price swings and unprecedented trading volumes during October 1987 overwhelmed the operational capacities and liquidity of the securities and futures markets. On October 19, there were frequent delays in reporting quotes and transactions, which contributed to the stress of a price decline of nearly 23%. By mid-day on October 20, heavy selling pressure had produced large order imbalances and numerous ad hoc trading halts in individual stocks. Liquidity and pricing difficulties also resulted in uncoordinated trading suspensions on major options exchanges and several large stock index futures exchanges. In addition, amid rumors that some clearinghouses and several major market participants were experiencing financial difficulties, a widespread credit breakdown appeared to be possible. While the subsequent rally in market prices in the afternoon averted more widespread financial problems, the near shutdown of the markets on October 20 became a central focus of several studies of the October 1987 market break that resulted in the adoption of circuit breaker procedures in 1988.

One of the studies, the report issued on January 8, 1988, by the Presidential Task Force on Market Mechanisms (the "Brady Report"),<sup>9</sup> recommended a number of initiatives to address future periods of extreme market volatility, including the implementation of circuit breaker mechanisms coordinated across the markets for stocks, stock options, and stock index futures. Noting that the market disorders of October 1987 "became, in effect, ad hoc circuit breakers," the Brady Report suggested that the markets design and implement coherent, coordinated circuit breaker mechanisms in advance rather than be left "at the mercy of the unavoidable circuit breakers of chaos and system failure."<sup>10</sup>

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<sup>9</sup> The report is named for the head of the task force, Nicholas Brady, who at the time was chairman of Dillon Read and later became Secretary of the Treasury.

<sup>10</sup> See Brady Report at 66.

The May 1988 Interim Report of the Working Group ("Interim Report") also contained a number of recommendations to assist the markets in coping with future periods of extraordinary price swings and volume surges. These initiatives included expansion of the operational capacity of the markets, streamlining of clearance and settlement operations, and the adoption of circuit breakers that would provide coordinated trading halts and reopenings for large, rapid market declines that threaten to create panic conditions. The Interim Report noted that circuit breakers were designed to substitute planned trading halts for ad hoc, destabilizing market closings, which were manifest during the October 1987 market break through systems breakdowns, reduced liquidity, and concerns over trading because of fears of counter-party and clearing corporation failure. The Working Group suggested that all U.S. markets for stocks, options, and futures halt trading for one hour if the DJIA declines 250 points from its previous day's closing level and provide for a second, two-hour trading halt if the DJIA declines 400 points from its previous day's closing level.<sup>11</sup> These levels represented approximately 12% and 20% of the value of the DJIA at that time. The Working Group anticipated quarterly reviews of the circuit breaker trigger levels to determine whether changes in index levels necessitated changes to the triggers in order to reflect percentage DJIA declines approximately equivalent to 12% and 20%.<sup>12</sup>

Both the Brady Report and the Working Group recommendations on circuit breakers must be viewed in the context of their times. The markets in October 1987 had experienced a one-day decline of historic proportions. A contributing factor to the chaos during that period was the inability of the markets to handle the surge in trading volume which overwhelmed the operational capacity of the markets. Since 1987, the markets have increased their systems capacity exponentially and can now handle substantially greater trading volume than that which swamped the markets in 1987. This was evident on October 27 and 28, 1997. In addition, a number of improvements in clearance and settlement operations since 1987 have improved the markets' ability to withstand future declines. Several initiatives have been adopted to reduce potential disruptions and settlement risks, including three-day settlements in stocks and same-day funds settlement, and cross-margining and cross-guarantee agreements among major securities and futures clearing agencies. In addition, clearing funds have been strengthened significantly since 1987 and systems have been established to allow clearing agencies to better monitor participants' risks and to share critical information with other securities and futures clearing organizations if problems are detected.

#### **B. Circuit Breakers Adopted in 1988**

The U.S. securities and futures exchanges adopted circuit breakers in October 1988 in response to their experiences during the historic market declines of October 1987 and pursuant to recommendations contained in subsequent studies of the 1987

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<sup>11</sup> See Interim Report at 4.

<sup>12</sup> See Interim Report at Appendix A.

**Market Break.** The circuit breakers were designed to substitute orderly, pre-planned halts for the ad hoc halts that can occur when market liquidity is exhausted. The circuit breakers also provide opportunities for markets and market participants to assess market conditions and potential systemic stress during a historic market decline.

The circuit breakers adopted by the securities and futures markets in 1988 provided for a one-hour cross-market trading halt if the DJIA declined 250 points from its previous day's closing level and for a subsequent two-hour trading halt if the DJIA declined 400 points from its previous day's close. In addition, the original circuit breaker procedures allowed the markets to use abbreviated reopening procedures either to permit trading to reopen before the scheduled closing or to establish closing prices if the DJIA reached the 250-point trigger during the last hour, but before the last half-hour of trading, or if the DJIA reached the 400-point trigger during the last two hours, but before the last hour, of trading.

In approving the original circuit breakers proposed by the securities markets, the SEC noted that the circuit breakers were not an attempt to prevent markets from reaching new price levels, but an effort by the securities and futures markets to arrive at a coordinated means to address potentially destabilizing market volatility of the severity of the October 1987 market break.<sup>13</sup> While concurring in the rationale of the Brady Report and the Interim Report regarding the purpose of circuit breakers, the SEC also believed that circuit breakers would help promote stability in the equity and equity-related markets by providing for increased information flows and enhanced opportunity to assess information during times of extreme market movements. The SEC believed that circuit breakers would provide market participants with an opportunity to re-establish an equilibrium between buying and selling interest and ensure that market participants had a reasonable opportunity to become aware of and respond to significant price movements.

### C. Modifications to the Circuit Breakers in 1996 and 1997

By 1995, the SEC and the CFTC had become concerned that the markets' circuit breaker procedures needed to be adjusted to take into account changing market conditions since 1988, and the agencies began working with the markets in early 1996 to review the existing circuit breaker procedures. In July 1996, the SEC and the CFTC approved the first significant modifications to the circuit breakers, which included: (1) a 50% reduction in the length of the trading halts; and (2) elimination of the provisions allowing for abbreviated reopening procedures.<sup>14</sup>

<sup>13</sup> See Securities Exchange Act Release No. 26198 (October 19, 1988), 53 FR 41637 (October 24, 1988) (CBOE, NASD, NYSE, and AMEX).

<sup>14</sup> See Securities Exchange Act Release Nos. 37457 (July 19, 1996), 61 FR 39176 (NYSE); 37458 (July 19, 1996), 61 FR 39167 (AMEX); and 37459 (July 19, 1996), 61 FR 39176 (BSE, CBOE, CHX, and PHLX). See also Letter from Norman E. Mains, Senior Vice President, Chief Economist and Director of Research, CME, to Jean A. Webb, Secretary, CFTC, dated July 5, 1996.

In approving the 1996 amendments, the agencies also urged the markets to consider increasing the existing 250-point and 400-point circuit breaker trigger levels, noting that when the circuit breakers were adopted in 1988, the 250-point threshold represented a DJIA decline of 12% and the 400-point threshold represented a decline of 19%. By July 1996, the 250-point and 400-point triggers represented DJIA declines of 4.5% and 7%, respectively. Accordingly, the agencies encouraged the markets to increase the circuit breaker trigger levels to reflect their original design.<sup>15</sup>

Subsequently, in approving a six-month extension of the circuit breakers in October 1996, the agencies again strongly urged the markets to reach a consensus on the size of increases in the trigger levels required to ensure that cross-market trading halts would be imposed only during market declines of historic proportions.<sup>16</sup>

In response to the agencies' recommendations, the markets submitted proposals to increase the circuit breaker triggers to the levels of 350 and 550 points in the DJIA. Although the 350/550 trigger levels represented a substantial improvement over the existing 250/400 trigger levels, the SEC maintained that trigger levels should be further amended to reflect an extraordinary decline. Hence, the SEC and CFTC approved the revised limits and indicated that they would work with the markets to develop procedures for reevaluating the circuit breaker triggers on an annual basis.<sup>17</sup>

### III. Operation and Effect of Circuit Breakers on October 27

On October 27 and 28, 1997, the nation's securities markets experienced significant price volatility on record trading volume. On October 27, 1997, the DJIA declined 554.26 points (7.18%) to close at 7161.15; the decline represents the tenth largest percentage DJIA decline in the index since 1915. The October 27 DJIA decline activated cross-market circuit breaker trading halts for the first time since the securities and futures markets adopted circuit breaker procedures in 1988. Specifically, on

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<sup>15</sup> Id.

<sup>16</sup> See Securities Exchange Act Release No. 37890 (October 29, 1996), 61 FR 56983 (AMEX, NYSE, and PHLX). The SEC approved the securities exchanges' rules for a temporary one-year program.

<sup>17</sup> See Securities Exchange Act Release No. 38221 (January 31, 1997), 62 FR 5872 (NYSE, AMEX, CBOE, CHX, BSE, and PHLX). See also Letter to Howard L. Kramer, Associate Director, Office of Market Supervision, Division of Market Regulation, SEC, from Stephen A. Sherrod, Chief, Financial Instruments Unit, CFTC, dated December 20, 1996; and Letters to Jean A. Webb, Secretary, CFTC, from Norman E. Mains, Senior Vice President, Chief Economist and Director of Research, CME, dated December 17, 1996; from Richard T. Pombonyo, Managing Director, New York Futures Exchange, Inc. ("NYFE"), dated December 16, 1996; and from Jeff C. Borchardt, Senior Vice President, Kansas City Board of Trade ("KCBT"), dated December 18, 1996.

October 27, the DJIA declined 350 points (4.54%) to trigger the first circuit breaker trading halt at 2:36 p.m. After trading resumed at 3:06 p.m., the DJIA declined rapidly to reach the 550-point circuit breaker at 3:30 p.m. Because the 550-point circuit breaker called for a one-hour trading halt, the circuit breaker closed the market for the remainder of the day, ending the trading session 30 minutes prior to the normal stock market close. On October 28, the DJIA initially declined 187.86 points (2.62%) by 10:06 a.m., before rallying to close up 337.17 points (4.71%) at 7498.32 on record share volumes of over a billion shares each on the NYSE and Nasdaq.

Subsequent to the triggering of the circuit breakers on October 27, the staff of the SEC and CFTC collected data to use in the Working Group report. The SEC collected data on the operation of the cross-market trading halts on October 27. That data and its analysis is contained in Appendix I. The CFTC reviewed data on the operation of the NYSE collar and sidecar rules from 1990 to the present. That data and its analysis is contained in Section VI of this report. From this data, discussions with market participants, and observations on the effect of cross-market trading halts, the staff of the Working Group was able to arrive at several conclusions regarding the operation of circuit breakers. These are presented below.

#### **A. The 30-Minute Trading Halt was Unnecessary**

As noted above, the U.S. markets were functioning relatively well on October 27, with no evidence of systemic stress. There was no dramatic reduction in market liquidity. Broker-dealers did not experience significant capital or cash flow difficulties, and there were no indications of systems backlogs or widespread panic selling. In addition, most firms experienced few delays or problems with order executions. Accordingly, most firms did not need to use the trading halt for systems checks, to assess market conditions or to respond to inquiries from institutional customers. Because none of the conditions justifying a cross-market halt was evident on October 27, the 30-minute circuit breaker halt was an unnecessary interruption to trading.

#### **B. No Clear "Magnet Effect" From the First Circuit Breaker**

Several factors mitigate against concluding that there was a magnet effect<sup>18</sup> from the first circuit breaker. First, the DJIA came within seven points of the 350-point trigger at 1:59 p.m., but prices stabilized and recovered approximately 70 points by 2:10 p.m. In addition, there is no clear pattern of an accelerating market decline from 2:10 p.m. to 2:36 p.m. Specifically, the largest one-minute percentage decline in the DJIA during this period occurred around 2:16 p.m. and the price decline abated for a few minutes shortly after 2:20 p.m. and again at 2:34 p.m. before the DJIA reached

<sup>18</sup> Commentators use the term "magnet effect" to describe the role circuit breakers may play in exacerbating a market decline. Specifically, the "magnet effect" refers to the idea that the approach of a circuit breaker may increase selling pressure during a market decline as market participants move to sell shares prior to a circuit breaker trading halt.

the 350-point threshold. Second, although the rate of the decline in S&P 500 stocks accelerated as the first circuit breaker approached, with S&P 500 stocks declining at a rate of .03% per minute between 1:03 p.m. and 2:35 p.m. (compared to .01% per minute between 9:30 a.m. and 1:03 p.m.), the increase in the rate of the decline is not as dramatic as the increase in the rate of the decline between 3:06 p.m. and 3:30 p.m., when S&P 500 stocks declined at a rate of .10% per minute. Third, there was no appreciable increase in trading volume on the NYSE in the period immediately prior to the first circuit breaker. Taken together, these factors suggest that there was no clear magnet effect from the first circuit breaker.

**C. The Market Reopenings at 3:06 p.m. Further Indicated the Unnecessary Nature of the First Halt**

The market reopenings at 3:06 p.m. generally appeared to be orderly, with few significant "gaps" between stock prices before and after the halt. Stocks reopened more quickly following the conclusion of the first circuit breaker trading halt on October 27 than at the morning opening on the control day of October 23.<sup>19</sup> Specifically, 50% of all S&P 500 stocks traded on the NYSE had opened two minutes after the trading halt ended on October 27, 75% were open after four minutes, and 90% were open after seven minutes. Within 23 minutes after the conclusion of the trading halt, all of the S&P 500 stocks had reopened. On October 23, 50% of all S&P 500 stocks traded on the NYSE were open six minutes after the start of trading, 75% were open ten minutes after the start of trading, and 90% were open 14 minutes after the start of trading. The last stock opened 41 minutes after the start of trading on October 23.<sup>20</sup>

During the trading halt, most traders simply waited for trading to resume. Staff conversations with market participants found that there was little need for the participants to assess market conditions and no need to check credit lines. There was no huge influx of orders during the break. Consequently, the NYSE disseminated pre-opening indications in only a few stocks because most stocks had no sizable order imbalances prior to the 3:06 p.m. reopening.

<sup>19</sup> In order to assess the impact of circuit breakers on October 27, the SEC compared trading on October 27 to trading on a control day, October 23. The SEC selected October 23 as the control day because October 23 was relatively close in time to October 27 and because trading on October 23 displayed price trends similar to those of October 27, though of a lesser magnitude. The use of October 23 as the control day minimized changes in the characteristics of the sample (e.g., stock prices, trading activity, and volatility) that affect liquidity measures.

<sup>20</sup> On October 28, the morning opening (which also was the effective reopening after the second circuit breaker) was slower than both the morning opening on October 23 and the reopening on October 27 following the first circuit breaker trading halt. Specifically, on October 28, 50% of the S&P 500 stocks traded on the NYSE were open after 11 minutes, 75% were open after 18 minutes, and 90% were open after 26 minutes. All of the S&P 500 stocks were open after 55 minutes.

**D. The Second Circuit Breaker Appears to Have Had Some Magnet Effect**

During the period between the reopening of the markets at 3:06 p.m. and the triggering of the second circuit breaker at 3:30 p.m., the DJIA declined over 200 points.<sup>21</sup> The velocity of the price decline in S&P 500 stocks also increased significantly during that period, with S&P 500 stocks declining at a rate of .10% per minute (or 6% per hour) between 3:06 p.m. and 3:30 p.m., ten times more quickly than their decline at a rate of .01% per minute (or .6% per hour) between 9:30 a.m. and 1:03 p.m. The price decline during this interval also is more rapid than the decline between 1:03 p.m. and 2:35 p.m., when S&P 500 stocks declined at a rate of .03% per minute (or 1.8% per hour).<sup>22</sup>

The increase in quote spreads between 3:06 p.m. and 3:30 p.m. also suggests a possible magnet effect associated with the second circuit breaker. Between 3:06 p.m. and 3:30 p.m., mean relative spreads (the quoted dollar bid-ask spread divided by the spread mid-point) for S&P 500 stocks were approximately 46 basis points, a 50% increase over the mean relative spread of 30 basis points on October 23.<sup>23</sup>

Effective quote spreads (calculated by doubling the difference between the trade price and the midpoint of the bid-ask spread), which reflect the cost of trades executed inside the quoted spread, also increased throughout the day on October 27, but most significantly after the first circuit breaker. For S&P 500 stocks traded on the NYSE, the mean effective spread was 10.6 cents per share between 9:30 a.m. and 1:03 p.m., 12.9 cents per share between 1:03 p.m. and 2:35 p.m., and 18.1 cents per share between 3:06 p.m. and 3:30 p.m. Mean effective quote spreads for DJIA stocks also increased during these time periods, rising from 10.4 cents per share during the first period, to 14 cents per share during the second period, to 23.4 cents per share during the third period.<sup>24</sup>

<sup>21</sup> However, the DJIA did not accelerate in a clear pattern between 3:06 p.m. and 3:30 p.m. Specifically, the largest one-minute percentage declines between 3:06 p.m. and 3:30 p.m. occurred around 3:12 p.m. and 3:14 p.m. and again around 3:24 p.m. and 3:25 p.m., with the rate of the decline abating somewhat in the intervening period and again immediately prior to 3:30 p.m. The absence of a clear pattern in the price decline during this period is not entirely consistent with a magnet effect for the second circuit breaker.

<sup>22</sup> See Appendix I for a detailed discussion of trading on October 27.

<sup>23</sup> Id.

<sup>24</sup> Spreads typically exhibit an intra-day pattern characterized by wider spreads at the beginning and the end of the day and narrower spreads in the middle of the day. Spreads on the control day, October 23, follow this pattern. Specifically, on October 23, the mean effective quote spread for S&P 500 stocks was 11.5 cents per share from 9:30 a.m. to 1:03 p.m., 8.9 cents per share from 1:03 p.m. to 2:35 p.m., and 9.7 cents per share from 3:06 p.m. to 3:30 p.m. The

Finally, the ratio of bid depth to ask depth exhibited a similar pattern. The median bid depth to ask depth fell somewhat from the morning session to the first pre-halt period on October 27, then dropped substantially in the post halt period.<sup>25</sup>

Although the sharp increase in the rate of the S&P 500 stocks' decline between 3:06 p.m. and 3:30 p.m. is consistent with a magnet effect for the second circuit breaker, it is not possible to state definitively, on the basis of a single event, that the second circuit breaker produced a magnet effect. Given the increase in volatility prevailing at that time, it is impossible to place responsibility for the swiftness of the decline between 3:06 p.m. and 3:30 p.m. solely on the second circuit breaker.

#### **E. The 7% DJIA Decline on October 27 Should Not Have Closed the Markets Early**

Although quote spreads widened throughout the day on October 27, other measures of market quality suggest that, overall, the markets were functioning in an orderly manner with sufficient liquidity on October 27. Accordingly, the 7% DJIA decline on October 27 should not have closed the markets early.

For example, the number of transactions and shares traded at the bid before a downtick (*i.e.*, a change in price downward) reflect the amount of liquidity at a bid quote and the markets' ability to absorb selling pressure.

On October 27, data in both S&P 500 stocks and DJIA stocks reveal a fair amount of liquidity at each quote and suggest that the markets were able to function in an orderly manner. The data in Appendix I do not indicate that there was chaotic pricing or destabilizing price moves as the market declined in the late afternoon of October 27. Although certain measures, such as the ratio of bid depth<sup>26</sup> to ask depth,<sup>27</sup> quoted spreads, and acceleration of price declines, show a deterioration after the first circuit breaker, they clearly do not indicate an impending systemic breakdown or failure to maintain an orderly market. Indeed, the decline in market measures may have been due not only to the increase in volatility, but also in part to the uncertainty caused by the prospect of a premature close of trading from the approach of the second circuit breaker.

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mean effective quote spread for DJIA shares during these three periods was 9.8 cents per share, 8.3 cents per share, and 9.2 cents per share. See Appendix I.

<sup>25</sup> See Appendix I.

<sup>26</sup> Bid depth is the number of shares available for purchase at the bid quote.

<sup>27</sup> Ask depth is the number of shares available for sale at the offer quote.

## **F. An Early Close Could Have Resulted in Derivative-Related Losses**

Because October 27 was not an expiration day for most exchange-traded derivatives, most firms did not experience significant losses due to derivative positions that they could not properly hedge, adjust or unwind because of the early market closure at 3:30 p.m. However, firms could have experienced severe derivative-related losses if the circuit breaker had closed the market early on an expiration Friday or on a quarter-end when a significant number of exchange-traded and over-the-counter options expire.

## **IV. Regulatory Initiatives Since October 27, 1997**

Immediately following the events of October 27, 1997, the markets and regulators began considering further revisions to the circuit breaker procedures. The SEC hosted discussions with market officials and the CFTC staff on November 21, 1997, that considered whether the trigger levels for circuit breaker halts should be increased substantially and what measures could be taken to permit normal market closings if the DJIA reaches a circuit breaker threshold late in the trading session. Participants at the meeting generally supported initiatives to modify the circuit breaker thresholds to percentage DJIA declines of 10% and 20% and to reset the trigger levels at least annually. The participants agreed to give further consideration to possible modifications designed to permit a normal closing if the DJIA triggers the circuit breakers late in the trading session.

As an interim measure, the markets adopted modest changes designed to reduce the likelihood that the current 350/550-point trigger levels would preclude normal market closes. Specifically, the SEC and CFTC approved changes effective through April 30, 1998, which provided that the markets would not implement the 30-minute circuit breaker halt if the DJIA reached the 350-point trigger on or after 3:00 p.m., and would halt trading for only 30 minutes (rather than one hour) if the DJIA reached the 550-point trigger on or after 2:00 p.m. but before 3:00 p.m. If the DJIA reached the 550-point threshold on or after 3:00 p.m., the markets would continue to use their existing one-hour halt, which would end the trading session early.<sup>28</sup>

In ongoing discussions with the securities and stock index futures markets aimed at achieving a consensus on expanded circuit breaker levels, the SEC has indicated its firm belief that the 10% and 20% circuit breakers should not close the markets prematurely during the trading day. In addition, at U.S. Senate hearing on January 29, 1998, the Working Group agencies and most senators indicated a strong preference for the markets to remain open whenever possible and a disinclination for circuit breakers to close the markets for the day.

<sup>28</sup> See Securities Exchange Act Release No. 39582 (January 26, 1998), 63 FR 5408 (February 2, 1998) (order approving File Nos. SR-Amex-98-03; SR-BSE-98-01; SR-CHX-98-02; and SR-PHLX-98-02).

In response to Congress's and the agencies' concerns, the securities and futures exchanges submitted proposals to revise their circuit breaker procedures. The SEC and CFTC approved the revised procedures and they became effective on April 15, 1998.<sup>29</sup> The circuit breakers adopted by the securities exchanges establish trading halts following one-day DJIA declines of 10%, 20%, and 30%. The NYSE will calculate the trigger levels at the beginning of each calendar quarter, using the average closing value of the DJIA for the previous month to establish specific point values for the quarter. Under the securities exchanges' revised circuit breaker procedures, trading will halt for one hour if the DJIA declines 10% prior to 2:00 p.m., and for one-half hour if the DJIA declines 10% between 2:00 p.m. and 2:30 p.m. If the DJIA declines by 10% at or after 2:30 p.m., trading will not halt at the 10% level. If the DJIA declines 20% prior to 1:00 p.m., trading will halt for two hours; trading will halt for one hour if the DJIA declines 20% between 1:00 p.m. and 2:00 p.m., and trading will halt for the remainder of the day if a 20% decline occurs at or after 2:00 p.m. If the DJIA declines 30% at any time, trading will halt for the remainder of the day.

The futures exchanges trading stock index futures have adopted substantively identical circuit breaker procedures. However, the CME's revised daily price limit for S&P 500 futures will permit a maximum daily downward price movement of 20%, while the securities exchanges' circuit breaker procedures will permit trading in the range of 20% to 30% down prior to 2:00 p.m. In addition, the CME's variation margin settlement values will be based on the 20% limit price, rather than on a price derived from the closing index value. While noting the disparities in the markets' procedures and recommending that the CME reconsider its 20% cap on variation margin, the regulators, in approving the revised procedures, concluded that the markets' rules are substantively identical for purposes of the effectiveness of the circuit breaker rules.<sup>30</sup>

In approving the securities markets' revised circuit breaker procedures, the SEC noted that the amended trigger levels reflect the type of severe one-day market declines that circuit breakers were intended to address. The SEC concluded that the revised trigger levels are consistent with the intended design and function of circuit breakers, and that they should not cause premature or unnecessary trading halts. In addition, the SEC found that the revised circuit breaker procedures sufficiently address the need for the markets to remain open or to reopen during the trading day to permit an orderly market close.<sup>31</sup>

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<sup>29</sup> See April 1998 Approval Order, *supra* note 3; and Letters to Jean A. Webb, Secretary, CFTC, from Richard J. McDonald, Vice President, Research, CME, dated March 9, 1998; from Paul J. Draths, Vice President and Secretary, CBOT, dated March 13, 1998; from Jean Butler Furlan, Chief Economist, NYFE, dated March 12, 1998; and from Jeff C. Borchardt, Senior Vice President, KCBT, dated March 10, 1998.

<sup>30</sup> See April 1998 Approval Order, *supra* note 3.

<sup>31</sup> *Id.*

## V. Conclusion on Cross-Market Trading Halts

The nation's securities and futures markets should operate without unnecessary restraints. Accordingly, mechanisms like circuit breakers, which impact the natural functioning of markets, should be imposed only in the most extreme circumstances, when an abrupt market decline of historic proportions raises concerns that the exhaustion of market liquidity might result in uncoordinated, ad hoc market closures. In addition, circuit breaker procedures should be designed to halt trading in the U.S. financial markets only for the limited period necessary for regulators and market participants to assess market conditions and potential systemic stress.

The 4.5% and 7.18% market declines that triggered the circuit breaker trading halts on October 27 do not constitute the type of historic decline that circuit breakers were meant to address. Moreover, there was little evidence on October 27 of the types of systemic stress or exhaustion of market liquidity that would have justified cross-market trading halts. Broker-dealers did not experience significant capital or cash flow difficulties, and there were no indications of widespread panic selling. Although quote spreads widened during the afternoon of October 27, other measures of market quality indicate that the markets were functioning in an orderly manner and with sufficient liquidity and operational capacity. Because the circuit breakers were activated prematurely on October 27, when there were no signs of systemic stress or a potential breakdown of market mechanisms, the events of October 27 offer little evidence of how circuit breaker procedures might operate during a time of severe market stress. While the market decline on October 27 was not of a magnitude to offer a true test of how circuit breakers might function during severe declines, our review of trading on October 27 suggest that the following changes may enhance the effectiveness of circuit breaker procedures.

### A. Circuit Breaker Trigger Levels Needed to Be Raised

The events of October 27 clearly showed that the trigger points for circuit breaker halts needed to be raised significantly to take into account current market levels and the increased capacity of the U.S. markets to handle volume and price corrections of the type that occurred on October 27. On October 27, the 350-point trigger level represented a DJIA decline of only 4.54% and there was no evidence of the types of systemic stress that would have justified cross-market trading halts. The trigger levels for circuit breakers needed to be raised and maintained at levels that would minimize the likelihood that regulatory halts will needlessly interfere with the ability of investors to trade. This finding is consistent with the recent rule changes implemented by the securities and futures markets to increase the trigger levels to represent DJIA declines of 10%, 20%, and 30%, and to reset the trigger levels on a quarterly basis.

## **B. Circuit Breaker Procedures Should Permit an Orderly Market Close Each Day**

The trading dynamics on October 27 illustrate the need for circuit breakers to permit trading to resume at least for orderly market closings whenever feasible. The early market closing on October 27 was unnecessary, and investor concerns that the second circuit breaker would close the market may have accelerated the price declines in the last 25 minutes of trading on October 27. Moreover, normal business practices assume that trades at the close will be possible for managing market and credit risks and that these prices will be available for valuing portfolios. Some participants in the derivatives markets could be vulnerable to significant losses if an early market close leaves them unable to complete certain transactions and strategies (e.g., the unwinding of an arbitrage position). A normal close of the U.S. markets also lessens any disruptive impact on foreign markets. For these reasons, the securities and futures markets have revised their circuit breaker procedures to permit a conventional market close whenever possible.<sup>32</sup>

## **C. Circuit Breaker Procedures Must be Reviewed Periodically**

The recent changes to the circuit breaker procedures of the securities and futures markets reflect the need to revise circuit breakers periodically to ensure that trigger levels are maintained at levels that provide for cross-market trading halts only during market declines of historic proportions. In addition, markets and regulators should re-examine circuit breakers to make certain that they reflect technological advances that may enhance the capacities of financial markets and allow them to handle greater trading volumes while continuing to function in an orderly manner. As markets continue to grow and change, the regulatory agencies and the self-regulatory organizations must monitor and revise circuit breakers and other protective measures to ensure that they continue to function as intended and to achieve their goals with minimal market disruption.

## **VI. NYSE Rule 80A**

### **A. Overview**

#### **1. NYSE Rule 80A(c) Collar Provision**

NYSE Rule 80A(c), known as the "collar" provision, in its current form limits stock index arbitrage orders whenever the DJIA increases or decreases by 50 points from its previous close. Specifically, when the DJIA declines by 50 points or more from the previous trading day's closing value, all index arbitrage orders to sell must be entered with

<sup>32</sup>

We recognize that there might be extremely rare circumstances where the magnitude of a market decline is so overwhelming that the markets, as a practical matter, cannot continue to function. In this circumstance, the markets might effect a de facto halt for the day if a circuit breaker did not cause a close for the remainder of the day. For this reason, the securities markets have determined to close for the day if the DJIA declines 30% during the course of a trading day.

the instruction "sell plus." Conversely, when the DJIA advances by 50 points or more from its previous trading day's closing value, all index arbitrage orders to buy component stocks of the S&P 500 must be entered with the instruction "buy minus." The rule defines index arbitrage as "an arbitrage trading strategy involving the purchase or sale of a 'basket' or group of stocks in conjunction with the purchase or sale, or intended purchase or sale, of one or more cash-settled options or futures contracts on index stock groups, or options on any such futures contracts, in an attempt to profit from the price difference between the 'basket' or group of stocks and the derivative products."

Although Rule 80A(c) originally was intended to slow index arbitrage trading only on days of relatively large price movements, its trigger level has never been adjusted to reflect the threefold increase in the DJIA since 1988. Consequently, Rule 80A(c) is now triggered on average more than once per day.

## 2. NYSE Rule 80A(a) Sidecar Provision

In October 1988 the NYSE also implemented NYSE Rule 80A(a), known as the "sidecar" procedure. The sidecar procedure diverts program trading orders in S&P 500 stocks routed through the NYSE's Designated Order Turnaround ("DOT") system into a separate execution file for five minutes when the CME S&P 500 futures decline by 12 points. When Rule 80A(a) was implemented in 1988, the CME had an opening price limit of 5 points and an intra-day limit of 12 points.

Although Rule 80A(a) originally was intended to divert and temporarily delay program trading on days of relatively large price movements, its trigger level has never been adjusted. Although the CME has increased the first intra-day price limit from 12 points to 15 points as index values have increased, the NYSE has not modified Rule 80A(a). Consequently, Rule 80A(a) is now triggered more frequently as well.

### B. Background

Until 1988, no circuit breakers or price limits applied in U.S. equity markets. In response to the stock market volatility of October 1987, the NYSE on January 14, 1988, implemented a voluntary restriction against index arbitrage whereby member firms willingly refrained from executing index arbitrage transactions when the DJIA moved by 75 points.<sup>33</sup>

<sup>33</sup> Specifically, the NYSE asked its members to voluntarily refrain from using the NYSE's automated systems for index arbitrage on days when the DJIA moved 75 points or more. The NYSE changed the trigger to 50 DJIA points on February 4, 1988, in conjunction with its decision to file its initial Rule 80A proposal with the SEC. See Securities Exchange Act Release No. 25599 (April 19, 1988), 53 FR 13371 (April 22, 1988) (order approving File No. SR-NYSE-88-02).

On February 25, 1988, the NYSE submitted a proposed rule change to the SEC which formalized the voluntary restriction.<sup>34</sup>

In its initial filing, the NYSE proposed to prohibit members from entering into any NYSE automated order routing or trading system (such as the DOT system) any order or other trading interest involving index arbitrage once the DJIA reached a level 50 or more points above or below the previous day's close. When the NYSE filed its proposal with the SEC, the 50-point trigger represented a DJIA movement of approximately 2.5%. The NYSE's proposal contained provisions allowing the NYSE to adjust the trigger to maintain the 2.5% relationship.

The SEC approved NYSE Rule 80A, then known as the "DOT collar," in April 1988 on a six-month pilot basis. In approving the pilot program, the SEC stated that, in light of the need to increase investor confidence in the stability of the markets, it was appropriate for the self-regulatory organizations to implement measures intended to ameliorate extreme stock price volatility.

On February 9, 1990, the NYSE filed amendments with the SEC to modify the collar rule to require that all index arbitrage orders in component stocks of the S&P 500 be effected on stabilizing ticks when the DJIA moves 50 points or more from the previous day's closing value. The NYSE's proposal indicated that "program trading may create excess volatility" and that there was a need to "minimize excess market volatility and promote stabilization of the market" through provisions designed to "isolate one of the potential causes of market volatility, program trading."

On July 30, 1990, the SEC approved the rule amendments on a one-year pilot basis and Rule 80A(c) was put into effect.<sup>35</sup> In approving the pilot program, the SEC stated that it was concerned that the trigger level may have been too low. At that time, 50 points represented a 1.71% change in the DJIA.

On May 31, 1991, the NYSE provided the SEC with a report on the operation of Rule 80A(c), the "Rule 80A Arbitrage Tick Test." It stated that the rule had two purposes: "to prevent large price changes from gathering momentum by discouraging the submission of index arbitrage orders" and "to dampen large stock price swings." The NYSE concluded that Rule 80A(c) "dampened volatility," but did not eliminate it; slowed the execution of index arbitrage orders by increasing the execution risk; did not result in a "significant increase in mispricing" on "down days," but "increased significantly" the

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<sup>34</sup> See Securities Exchange Act Release No. 34-25400 (February 26, 1988), 53 FR 7273 (March 7, 1988) (notice of filing of File No. SR-NYSE-88-02).

<sup>35</sup> See Securities Exchange Act Release No. 28282 (July 30, 1990), 55 FR 31468 (August 2, 1990) (order approving File Nos. SR-NYSE-90-05 and SR-NYSE-90-11).

mispricing on "up days;"<sup>36</sup> appeared to curb price momentum during price declines, but failed to restrain momentum on upward moves; did not produce a magnet effect, although short-term volatility increased as the trigger point was approached; did not delink the futures and cash markets; and did not widen quotes or deter price continuity and depth.

Because Rule 80A(c) had been approved on a one-year pilot basis expiring July 31, 1991, the NYSE filed for permanent approval of Rule 80A(c) on June 10, 1991. The NYSE's proposal indicated that the NYSE thought that the rule had "been helpful in promoting market stability by minimizing excess volatility" and that "the 50 point level appears to be high enough that it is not triggered too frequently, yet low enough to act as a meaningful check on excess market volatility which might be associated with index arbitrage activity.... Since January 1, 1991, the rule has been applied to date eight times over five months. This latter pattern (about twice a month) appears to be representative of a more 'normal' instance of the rule's invocation."<sup>37</sup>

On July 19, 1991, the NYSE filed for accelerated approval of a rule to extend the pilot program until the earlier of November 1, 1991, or the date on which the SEC permanently approved Rule 80A.<sup>38</sup> Subsequently, the SEC approved the index arbitrage collar provisions on a permanent basis on October 24, 1991,<sup>39</sup> citing the need to "address excessive market volatility." In approving the index arbitrage collar provisions, the SEC stated again that the 50-point level was "high enough that it was not triggered too frequently" and the "frequency of triggerings ... about twice a month ... [did] not seem unreasonably intrusive to normal marketplace operations."

### C. Recent Experience with NYSE Rules 80A(a) and (c)

As the levels of equity indexes have increased over the past few years, NYSE Rule 80A has generated complaints. Some market participants argue that the absolute point limits have become too restrictive in relation to the escalation of the levels of stock indexes. These absolute point limits now represent a much smaller percentage move than they did when they were established. The following table shows over time the ranges of percentage moves in index value represented by absolute 50 point changes in the DJIA and 12 point

<sup>36</sup> The increase in mispricing on up days solely was attributed to January 17, 1991, when the DJIA rose 114 points during the Persian Gulf conflict.

<sup>37</sup> See Securities Exchange Act Release No. 29308 (June 14, 1991), 56 FR 28428 (June 20, 1991) (notice of filing of File No. SR-NYSE-91-21).

<sup>38</sup> See Securities Exchange Act Release No. 29498 (July 30, 1991), 56 FR 37377 (August 6, 1991) (order approving File No. SR-NYSE-91-24).

<sup>39</sup> See Securities Exchange Act Release No. 29854 (October 24, 1991), 56 FR 55963 (October 30, 1991) (order approving File No. SR-NYSE-91-21).

changes in CME S&P 500 futures, as well as the point moves corresponding to the 2.50% and 5.00% original standards for Rules 80A(c) and (a), respectively.

YEAR	RULE 80A(c) COLLAR				RULE 80A(a) SIDECAR			
	50 POINT MOVE		2.50 PERCENT		12 POINT MOVE		5.00 PERCENT	
1988	2.29%	2.70%	46	55	4.20%	5.01%	12	14
1989	1.79%	2.35%	53	70	3.29%	4.35%	14	18
1990	1.66%	2.12%	59	75	3.21%	4.06%	15	19
1991	1.57%	2.03%	61	80	2.86%	3.87%	15	21
1992	1.46%	1.62%	77	86	2.70%	3.08%	20	22
1993	1.32%	1.55%	81	95	2.54%	2.81%	21	24
1994	1.25%	1.41%	89	100	2.48%	2.76%	22	24
1995	0.95%	1.31%	95	131	1.92%	2.61%	23	31
1996	0.76%	1.00%	125	165	1.56%	2.01%	30	38
1997	0.60%	0.79%	159	207	1.21%	1.64%	37	50
1998 <sup>40</sup>	0.60%	0.67%	186	208	1.16%	1.31%	46	52

As is evident from the table, when the NYSE Rule 80A(c) collar was proposed in 1988, a 50-point move in the DJIA would have ranged from about 2.29% to 2.70%, using the high and low values for the year. Now it is less than one percent. If the original 2.50% standard were implemented, Rule 80A(c) would be triggered at levels ranging from 186 to 208 points. When the NYSE Rule 80A(a) sidecar was proposed in 1988, a 12 point move in the S&P 500 futures contract was 4.20% to 5.01%. Now it is a little more than one percent. If the original 5.00% level had been adhered to, Rule 80A(a) would be in effect at declines of 46 to 52 points in the S&P 500.

Rule 80A(c) has been activated with increasing frequency, particularly in 1996 and 1997, as shown in the following table of the annual history of Rule 80A(c) activation. In the earlier years, the collar was activated about once or twice a month. As the percentage change represented by a 50 point move declined markedly, activations increased to an average of more than once per trading session.

<sup>40</sup> Data through February 17, 1998.

YEAR	TOTAL 80 A(c) ACTIVATIONS	UPSIDE COLLARS	DOWNSIDE COLLARS
1990 <sup>41</sup>	23	7	16
1991	20	12	8
1992	16	8	8
1993	9	4	5
1994	30	9	21
1995	29	14	15
1996	119	56	63
1997	304	152	152
TOTALS	550	262	288

#### D. Studies of Rule 80A(c)

Four econometric studies that examined the impact of Rule 80A(c) on the stock and futures markets have failed to establish substantial empirical evidence justifying continuation of the rule in its current form.<sup>42</sup> The studies by Overdahl and McMillan and Goldstein et al., which use the most extensive data available, find only weak to moderate effects of Rule 80A(c) on price volatility. Among other things, Overdahl and McMillan conclude that: (1) Rule 80A(c) significantly curtails index arbitrage, reducing volume by as much as two-thirds; (2) the cash and futures markets nonetheless remain linked, although the price adjustment process between the two markets takes longer when Rule 80A(c) is in effect than when index arbitrage is unconstrained; and (3) trading costs, as measured primarily by bid-ask spreads for S&P 500 stocks, are not tangibly affected under Rule 80A(c), although cash index volatility (which they view as an underlying element of trading cost) declines after a triggering of the rule.

<sup>41</sup> NYSE Rule 80A(c) became effective in late July 1990.

<sup>42</sup> The studies are: M.A. Goldstein, J.E. Evans, & J.M. Mahoney, *Circuit Breakers, Volatility, and the U.S. Equity Markets: Evidence from NYSE Rule 80A* (January 1998) (unpublished working paper); G.J. Kuserk, P.R. Locke, and C.L. Sayers, *The Effects of Amendments to Rule 80A on Liquidity, Volatility, and Price Efficiency in the S&P 500 Futures*, 12 J. FUTURES MARKETS 383 (1992); J. Overdahl & H. McMillan, *Another Day, Another Collar: An Evaluation of the Effects of NYSE Rule 80A on Trading Costs and Intermarket Arbitrage*, Economics Working Paper 97-8 (Office of the Comptroller of the Currency, May 1997); and G.J. Santoni & T. Liu, *Circuit Breakers and Stock Market Volatility*, 13 J. FUTURES MARKETS 261 (1993).

Goldstein *et al.* found evidence that volatility was lower when Rule 80A(c) was in effect than when it was not in effect, and, in contrast to Overdahl and McMillan, found that Rule 80A(c)'s impact on lowering volatility was greater in rising markets than in falling markets. Goldstein *et al.* also found that volatility was lower than it would have been if Rule 80A(c) did not exist. Although their findings were statistically significant, the effects observed were small in magnitude.

The earlier studies, by Santoni and Liu and Kuserk *et al.*, suffer from problems associated with their small sample sizes. Santoni and Liu reached mixed conclusions but found, overall, that volatility on 50-point days was higher since the adoption of Rule 80A(c). Kuserk *et al.* concluded that Rule 80A(c) does not unduly constrain index arbitrage and slightly increases price volatility, although the authors suspect that their model overstates this effect.

Taken together, the studies do not offer strong justification for maintaining the 50-point collar employed by Rule 80A(c).

#### **E. Conclusion Regarding NYSE Rules 80A(a) and 80A(c)**

The Working Group staff believes that the data presented in Section VI.C demonstrate that Rules 80A(a) and 80A(c) have become outdated and no longer reflect their original purpose. Consequently, the NYSE should at the least significantly increase Rule 80A's trigger levels to reflect the increase in the equity prices since 1988. Indeed, there are reasons for eliminating Rule 80A entirely. The markets have changed significantly since 1988. For example, the NYSE has substantially increased its systems capacity so that it can handle five times the trading volumes experienced in October 1987. Moreover, the variety of derivative products have grown, as have the array of derivative related equity trading strategies. It may make little sense to single out index arbitrage, which ensures that markets are aligned economically, from all other types of derivative trading for restrictive treatment. Indeed, Rule 80A may tend artificially to disconnect the securities and futures markets and impose unnecessary costs on market participants. The NYSE should address this matter promptly. The members of the Working Group submitted a letter to the NYSE, dated May 7, 1998, that addressed the need for further revisions to these rules, a copy of which is provided as Appendix II.

## **Appendix I**

### **Analysis of Circuit Breaker Data**

#### **Introduction**

To analyze the performance of the two circuit breakers triggered on October 27, 1997, the SEC used audit trail data from the NYSE and Nasdaq and Securities Industry Automation Corporation ("SIAC") data from the regional stock exchanges. The attached charts present the data that was analyzed.

A caveat should be kept in mind in interpreting the following data tables. Care must be used in drawing direct causal inferences from the data compiled. For example, it may be tempting to conclude that the circuit breakers by themselves "caused" spreads to widen or "caused" prices to fall sharply after the first circuit breaker, but other factors, such as increased volatility and directional order flow, may have contributed to the change in market quality measures.

#### **Price Levels**

On October 27, the S&P 500 index lost 6.7% of its value. Circuit breakers, which are triggered by specified declines in the DJIA, halted NYSE trading twice during the trading day. The first halt occurred at 2:36 p.m. and lasted until 3:06 p.m. The second halt was triggered at 3:30 p.m. and, since this halt was to last for one hour, effectively discontinued trading for the rest of the day.

Exhibit 1 illustrates the decline of the stock market on October 27. The S&P 500 index began the day at 940.22. From the opening at 9:30 a.m. until 1:03 p.m., the index fell 20 points to 920.01. At that point the decline became more pronounced as the index fell by an additional 21 points over the subsequent hour and a half. The fall of the index was halted by the 2:36 p.m. circuit breaker at a level of 898.29, down approximately 4.5% from the opening. When trading resumed at 3:06 p.m., the decline in the market intensified. Over the ensuing 24 minutes, the S&P 500 index dropped another 22 points, or 2.2% as measured from the 9:30 a.m. opening index level. At 3:30 p.m., the second circuit breaker triggered, halting trading for the day.

Exhibit 3 documents the rates of change of the S&P index in three time intervals. The second column presents changes in the index measured in percent per minute. Between 9:30 a.m. and 1:03 p.m., this rate of change was -.01% per minute. The rate of change increased to -.03% per minute over the next interval (1:03 p.m. to 2:35 p.m.) and to -.10% per minute in the interval between the lifting of the first circuit breaker and the imposition of the second circuit breaker.

Because the second circuit breaker effectively ended trading on October 27, the SEC staff also reviewed the beginning of trading on October 28. Exhibit 2 shows that

the market initially fell and then rebounded dramatically. The low point of the market on October 28 occurred at 10:07 a.m., when the S&P 500 level hit 855.53. The percentage rate of change per minute in the index over the initial 37 minutes of trading was -0.5%. Over the following 38 minutes, the S&P 500 increased to 890.70, a percentage rate of change of +.11% per minute.

### Volume

Exhibit 4 presents volume of NYSE traded S&P 500 stocks in approximately 15-minute time intervals. No distinct pattern is evident. There does appear to be a significant increase in trading in the 15 minutes before the second circuit breaker was triggered. There is no increase in volume in the period immediately prior to the first breaker.

The average volume per minute between 9:30 a.m. and 1:00 p.m. was 1.84 million shares per minute. This average increased to 2.34 million shares per minute over the 1:00 p.m. to 3:30 p.m. period (excluding the half hour that the market was closed during the first circuit breaker). Excluding the final 15-minute period, this average was 2.10 million shares. For the final 15-minute period, the average was 3.6 million shares per minute, the highest for the day.

### Openings

One measure of the efficiency of circuit breaker implementation is how rapidly trading in stocks resumed after the halts were lifted. If the trading pause allows investors to place orders and establish equilibrium prices, then markets should open rapidly. Exhibit 5 shows the total number of NYSE traded S&P 500 index stocks that were open on a minute by minute basis for three time periods. The first is the opening of trading on October 23, our control period.<sup>43</sup> The second is the opening after the first circuit breaker on October 27. The third is the opening of trading on October 28, effectively the opening after the second circuit breaker.

On our control day, 50% of all S&P 500 NYSE stocks were open six minutes into the trading day. 75% were open 10 minutes into the day and 90% were open 14 minutes into the day. It took 41 minutes for the last stock to open.

During the first cross-market circuit breaker from 2:36 p.m. to 3:06 p.m. on October 27, trading in the markets for stocks, options, and stock index futures was

<sup>43</sup> As discussed above, the SEC selected October 23 as the control day because October 23 was relatively close in time to October 27 and because trading on October 23 displayed price trends similar to those of October 27, although of a lesser magnitude. The use of October 23 as the control day minimized changes in the characteristics of the sample (e.g., stock prices, trading activity, and volatility) that affect liquidity measures.

halted. During the halt, most traders in those markets simply waited for trading to resume. The NYSE disseminated pre-opening indications in only a few stocks because most stocks had no sizable order imbalances prior to the 3:06 p.m. reopening.

The opening of individual stocks after the first circuit breaker was lifted was more rapid than on the control day. Two minutes after the breaker was lifted 50% of the stocks had opened. After four minutes, 75% were open and after seven minutes 90% were open. Within 23 minutes, all S&P 500 stocks had reopened. Some market participants have suggested that the rapidity of the reopening after the first circuit breaker was due to the fact that the first circuit breaker was triggered when the market had declined only 4.5% and markets were still functioning in an orderly manner.

On the 28th, the opening was slower than on both our control day and the opening after the first circuit breaker. It took 11 minutes for 50% of S&P 500 stocks to open, 18 minutes to reach 75%, 26 minutes to reach 90% and 55 minutes to reach 100%. This opening was both the initial morning opening and effectively the reopening after the second circuit breaker.

Exhibit 6 shows the opening data in the same format for the DJIA Stocks.

### Quoted Spreads

Quoted spreads are one measure of trading costs. In general, narrower quoted spreads are suggestive of lower trading costs. The average spreads on the NYSE were higher on October 27 than on our control day. Mean relative spreads, defined as the quoted dollar bid-ask spread divided by the spread mid-point, on S&P 500 NYSE issues were approximately 30 basis points on October 23 and were close to 38 basis points on October 27. Exhibit 7 presents average raw and relative spreads for three time intervals during October 23 and 27. In the interval between 9:30 a.m. and 1:03 p.m., the spreads on October 27 were approximately 35 basis points, compared to 30 basis points for the same interval (and on average over the entire day) for October 23. Spreads increased on October 27 as the trading day wore on. Between 1:03 p.m. and 2:36 p.m., when the first circuit breaker was triggered, spreads averaged 39 basis points. In the 24 minute interval between the lifting of the first and triggering of the second circuit breaker, spreads widened to approximately 46 basis points.

At the close of trading on October 27, spreads were 50% higher than on a normal trading day. These higher spreads persisted on October 28. Over the first three and a half hours of trading, average relative spreads were approximately 48 basis points. These spreads decreased somewhat through the close of trading to approximately 42 basis points.

Exhibit 8 presents the spreads for Nasdaq issues. The same general pattern is evident with these stocks. Spreads began on October 27 somewhat higher than on October 23, and the spreads increased as the trading day wore on.

Although we see higher spreads around the circuit breakers than we do on our control day, it is not necessarily the case that the circuit breakers alone caused these higher spreads. Spreads in general will be higher when there is greater uncertainty about stock prices. We would therefore expect spreads to widen when volatility in prices is high, as was the case on October 27 and 28. Nevertheless, the possibility of a premature close on October 27 due to the second circuit breaker clearly contributed to the uncertainty about stock prices.

### **Effective Spreads**

The effective spread is calculated by doubling the difference between the trade price and the midpoint of the bid-ask spread. If all trades were executed on either the quoted bid or ask price, then the effective spread would precisely equal the quoted spread. But, in general, some fraction of trades occur at prices inside the quoted spread. The effective spread captures this effect. Effective spreads therefore are indicative of realized trading costs. Exhibit 9 reports the effective spread of trades executed in each of the three time periods.

Spreads typically exhibit an intra-day pattern characterized by wider spreads at the beginning and end of day and narrower spreads in the middle of the day. Indeed, in the control period effective spreads exhibit this U-shape intra-day pattern. However, on October 27 this particular pattern is not observed. Instead, effective spreads are narrowest in the 9:30 a.m. to 1:03 p.m. session and widen in afternoon sessions. For the NYSE S&P 500 issues the mean effective spread is 10.6 cents per share in the first session, rises to 12.9 cents in the 92 minutes prior to the first circuit breaker, and increases further to 18.1 cents per share in the post-halt session. Effective spreads of the DJIA stocks more than doubled, rising from an average of 10.4 cents per share in the morning session to 23.4 cents in 24 minutes of trading after the circuit breaker.

Although effective spreads widened around the circuit breakers, the circuit breakers alone may not have produced the increase in the effective spreads. Spreads typically widen when price volatility is high, as it was on October 27. Accordingly, it is not possible to conclude that circuit breakers alone caused the increase in effective spreads.

### **Bid Downtick Trades and Volume**

The number of transactions and shares traded at the bid before a downtick reflects the amount of liquidity at the bid quote and the markets' ability to absorb selling pressure. If prices fall rapidly through successive bid quotes with few trades occurring at the quotes, market depth and liquidity are poor. On the other hand, if a greater number of trades occur at the bid quotes before prices move down, market depth and liquidity are good.

In Exhibit 10, the first two columns present the mean and median number of trades executed on the bid downtick for October 23 and October 27. The final two columns present the mean and median volume of shares that traded on the bid downtick. Both sets of numbers indicate that more trading occurred on the bid downtick on October 27 than on October 23. However, more trading occurred overall on October 27.

### **Bid and Ask Depths**

Bid and ask depths indicate the number of shares available for purchase (ask depth) or sale (bid depth) at the prevailing quote. Depths are a measure of liquidity (the ability to buy or sell quickly and in large volume without substantially affecting price); greater depths in general indicate greater liquidity.

On October 27, shares available for sale at the inside ask (median ask depth) increased from earlier levels following the circuit breaker while shares available for purchase (median bid depth) declined slightly. This pattern is most evident for the DJIA stocks but also exists for the S&P 500 issues (see Exhibit 11). The median ask depth of DJIA stocks rose to 10,166 shares in the post-halt period from 5,294 shares in the 90-minute period prior to the halt, an increase of 92%. The median bid depth fell from 5,400 shares in the 90 minutes pre-halt session to 4,098 after the halt.

The ratio of the bid depth to the ask depth of DJIA stocks (median) fell from 0.97 in the morning session to 0.91 in the pre-halt session and declined further to 0.52 in the post-halt period. These ratios reflect the increase in selling interest as compared to buying interest which was evident throughout the day, and which accelerated after the first circuit breaker. These ratios are consistent with the downward direction of prices during these periods. (Values less than one indicate there is more selling interest than buying interest while values greater than 1 indicate more buying than selling interest.)

### **Specialist Participation**

Specialist sales as a percent of total sales fell dramatically after the circuit breaker was lifted at 3:06, while specialist purchases as a percent of total purchases was fairly stable throughout the day (see Exhibit 12). In DJIA stocks, NYSE specialists sales represented, on average, 16.3% of a stock's total sales in the 9:30 a.m. to 1:03 p.m. period, 17.5% of sales in the 1:03 p.m. to 2:35 p.m. session, and fell to 8.8% of total sales in the 24 minute session after the halt. The decline is attributable to the increase in directional order flow to the sell side after the first circuit breaker was lifted. The data show that specialists purchased, on average, 15.6%, 17.3%, and 16.7% of a stock's total purchases for the three time periods analyzed.

The median ratio of specialists' buy volume to sell volume also rose significantly in the period after the first circuit breaker as specialists purchased about

twice as much stock as they sold (median stock). The ratio for both the DJIA and S&P 500 stocks was approximately 1 in the time periods prior to the circuit breaker indicating specialists' purchases and sales were about equal on average.

### **Trading by Account Type**

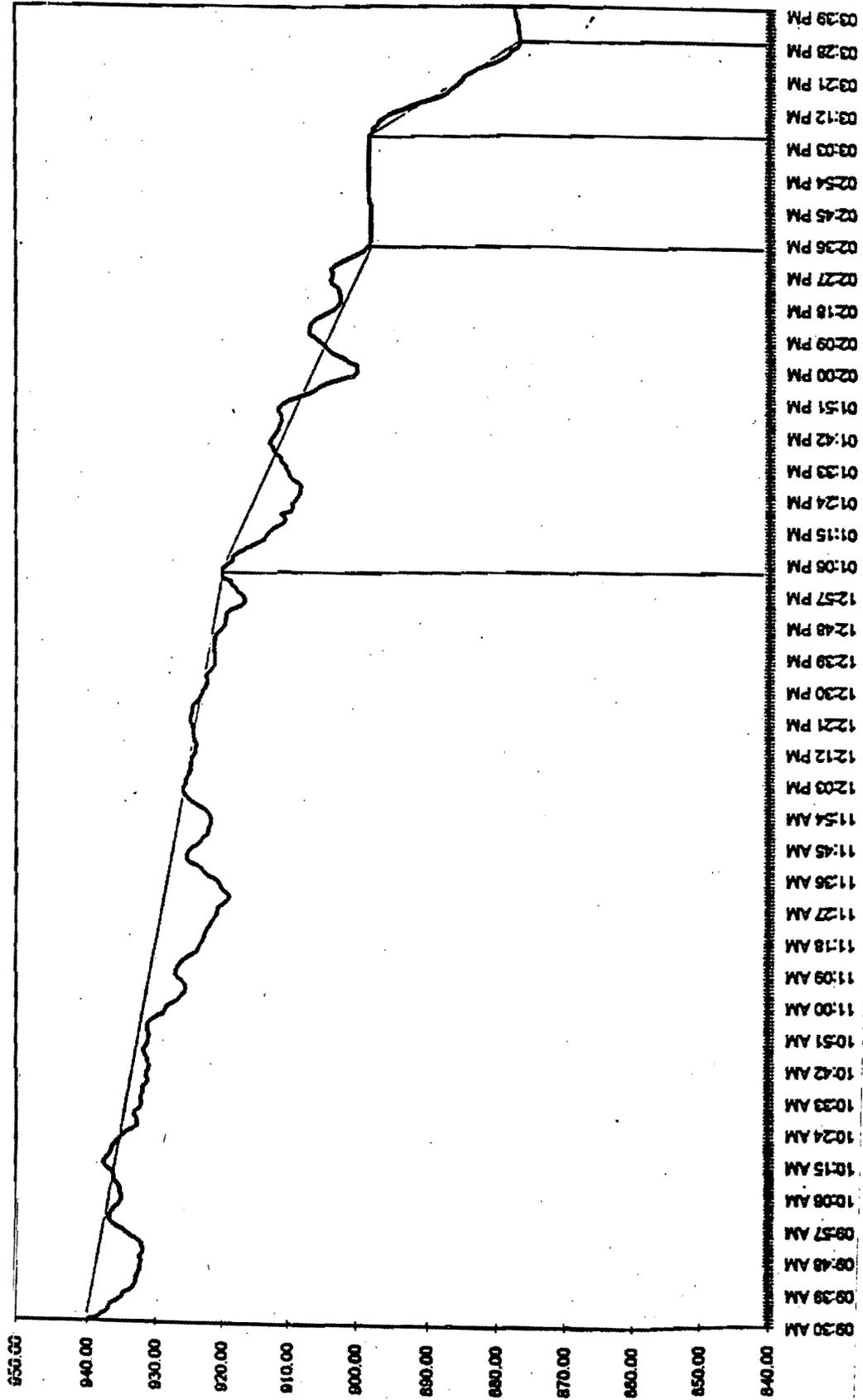
The NYSE data utilized for this analysis contains a data field that identifies the type of account for each buy and sell side of a trade. The account types are specialists, individual, proprietary, and agency, with further breakdowns into program trading, index arbitrage, and non-program trading for certain of the primary account types. An examination of changes in the buying or selling interest after the halt may indicate what if any effect the halt had on investors.

Exhibit 13 presents information on the number of trades and share volume by buy and sell side and by account type. The primary role of a specialist on the NYSE is to buy or sell stock when there is no counter party for someone wishing to trade. As a provider of liquidity, specialists' participation in the market is indicative of how often customer orders meet directly. Overall, sell interest increased somewhat after the halt, meaning that there were more non-specialist sell trades than there were non-specialist buy trades. However, the pattern varies widely according to account type. Program trading and index arbitrage accounts were net sellers after the halt, while individuals, proprietary and agency non-program accounts, and specialists were net buyers. Trading in the first half hour on October 28 generally continued in the same pattern but one exception was trading by individual investors. Individual accounts were net sellers of stock early on October 28 and sold stock almost twice the rate as they bought stock. As the market moved upward in mid-morning, individuals became net purchasers of stock.

**Index of Exhibits**

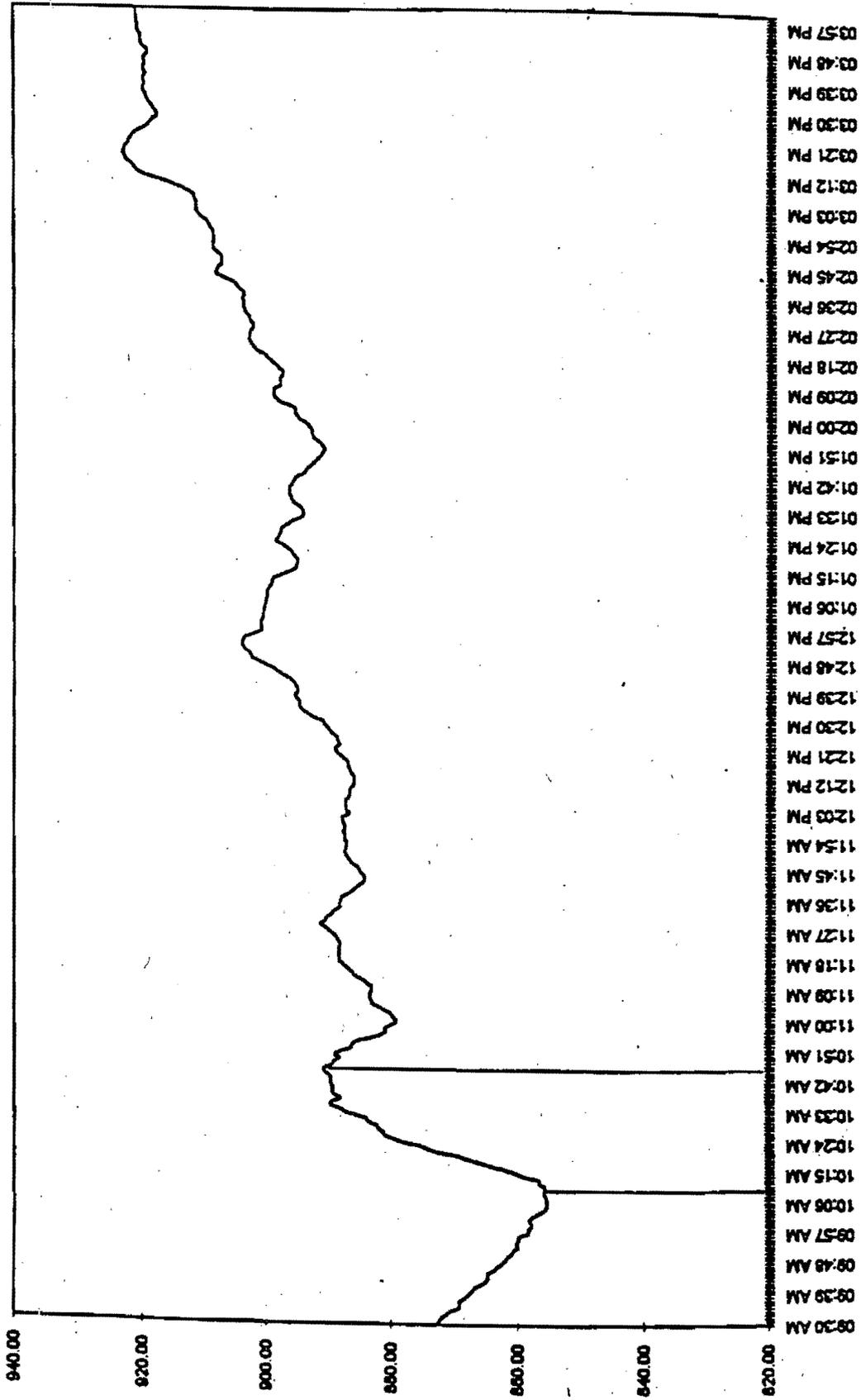
- Exhibit 1: S&P 500 Cash Index - October 27, 1997
- Exhibit 2: S&P 500 Cash Index - October 28, 1997
- Exhibit 3: Rate of Change of S&P 500 Index
- Exhibit 4: Millions of Share Traded Per Minute in S&P 500 - October 27 and October 28
- Exhibit 5: Opening S&P 500 NYSE Issues
- Exhibit 6: Opening of Dow Stocks
- Exhibit 7: Quoted and Percent Bid-Ask Spreads in NYSE Issues
- Exhibit 8: Quoted and Percent Bid-Ask Spread in NASDAQ Issues
- Exhibit 9: Effective Spreads of NYSE Issues
- Exhibit 10: Bid Down Tick Trades and Volume
- Exhibit 11: Statistics on Average Bid and Ask Depths in NYSE Issues
- Exhibit 12: Measures of Specialists Trading Activity
- Exhibit 13: Distribution of Share Volume by Account Type - S&P 500 NYSE Issues

Exhibit 1: S&P 500 Cash Index - October 27, 1997



Securities and Exchange Commission  
Office of Economic Analysis  
1/21/98

Exhibit 2: S&P 500 Cash Index - October 28, 1997



Securities and Exchange Commission  
Office of Economic Analysis  
1/22/88

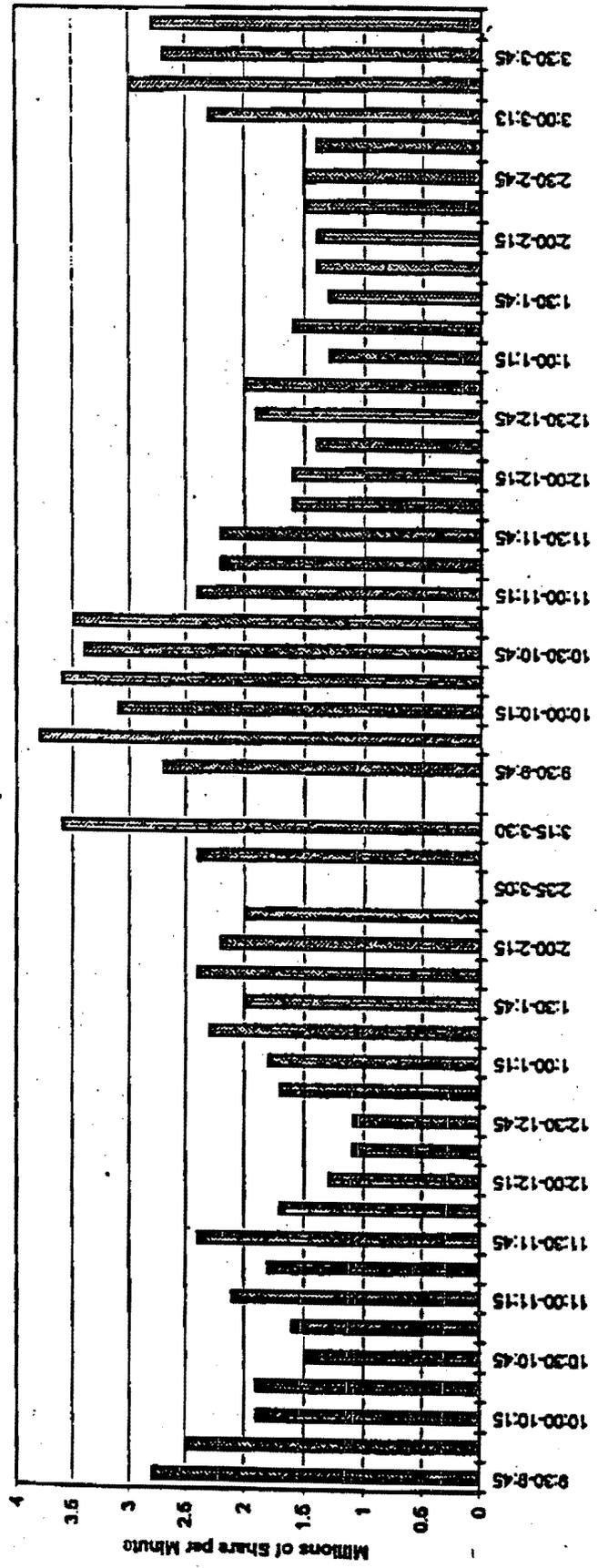
### Exhibit 3

#### Rates of Change of S&P 500 Index

Table shows the mean rate of change of the S&P 500 index in intervals on October 27 and October 28. Table presents changes in index points and percent.

Interval	Change per minute	
	Index points	Percent
27-Oct		
9:30-1:03	-0.095	-0.01
1:03-2:35	-0.24	-0.03
3:05-3:30	-0.89	-0.10
28-Oct		
9:30-10:07	-0.47	-0.05
10:07-10:45	0.93	0.11

**Exhibit 4**  
**Millions of Shares Traded per Minute in S&P 500 Issues**



October 27 and October 28

**Exhibit 5**  
**Opening of S&P 500 NYSE Issues**

This Exhibit tracks the opening of S&P 500 stocks which trade on the New York Stock Exchange. Opening is defined as the time at which the first trade occurs. Three periods are compared: the opening at 9:30 AM on October 23, the opening after the circuit breaker was lifted at 3:05 PM on October 27, and the opening at 9:30 AM on October 28. The exhibit documents the number of S&P 500 NYSE stocks open at each minute and the percentage this number represents of all S&P 500 NYSE stocks (there are 459 S&P 500 stocks traded on the NYSE).

10/23/97			10/27/97			10/28/97		
Time	Number of Stocks Open	Percent of Stocks Open	Time	Number of Stocks Open	Percent of Stocks Open	Time	Number of Stocks Open	Percent of Stocks Open
930	40	8.7%	1505	2	0.44%	930	22	4.8%
931	72	15.7%	1506	135	29.41%	931	45	9.8%
932	99	21.6%	1507	234	50.98%	932	60	13.1%
933	131	28.5%	1508	302	65.80%	933	81	17.6%
934	168	36.6%	1509	352	76.69%	934	107	23.3%
935	205	44.7%	1510	377	82.14%	935	127	27.7%
936	234	51.0%	1511	397	86.49%	936	147	32.0%
937	267	58.2%	1512	412	89.78%	937	163	35.5%
938	292	63.6%	1513	427	93.03%	938	177	38.6%
939	322	70.2%	1514	437	95.21%	939	183	40.0%
940	350	76.3%	1515	439	95.64%	940	213	46.4%
941	367	80.0%	1516	441	96.08%	941	235	51.2%
942	368	84.5%	1517	447	97.39%	942	258	56.2%
943	403	87.8%	1518	452	98.47%	943	280	61.0%
944	417	90.8%	1519	454	98.91%	944	296	64.5%
945	425	92.6%	1520	454	98.91%	945	314	68.4%
946	428	93.2%	1521	454	98.91%	946	321	69.9%
947	429	93.5%	1522	456	99.35%	947	336	73.2%
948	432	94.1%	1523	456	99.35%	948	350	76.3%
949	435	94.8%	1524	457	99.56%	949	358	78.0%
950	437	95.2%	1525	457	99.56%	950	371	80.8%
951	442	96.3%	1526	457	99.56%	951	378	82.4%
952	443	96.5%	1527	457	99.56%	952	382	83.2%
953	447	97.4%	1528	459	100.00%	953	393	85.6%
954	450	98.0%	1529	459	100.00%	954	401	87.4%
955	450	98.0%	1530	459	100.00%	955	405	88.2%
956	451	98.3%	.	.	.	956	417	90.8%
957	452	98.5%	.	.	.	957	419	91.3%
958	454	98.9%	.	.	.	958	422	91.9%
959	454	98.9%	.	.	.	959	429	93.5%
1000	454	98.9%	.	.	.	1000	434	94.6%
1001	455	99.1%	.	.	.	1001	436	95.0%
1002	457	99.6%	.	.	.	1002	438	95.4%
1003	457	99.6%	.	.	.	1003	439	95.6%
1004	458	99.8%	.	.	.	1004	440	95.9%
1005	458	99.8%	.	.	.	1005	442	96.3%
1006	458	99.8%	.	.	.	1006	443	96.5%
1007	458	99.8%	.	.	.	1007	444	96.7%
1008	458	99.8%	.	.	.	1008	445	96.9%
1009	458	99.8%	.	.	.	1009	448	97.2%
1010	458	99.8%	.	.	.	1010	448	97.6%
1011	459	100.0%	.	.	.	1011	448	97.6%
1012	459	100.0%	.	.	.	1012	449	97.8%
1013	459	100.0%	.	.	.	1013	449	97.8%
1014	459	100.0%	.	.	.	1014	448	97.8%
1015	459	100.0%	.	.	.	1015	450	98.0%
1016	459	100.0%	.	.	.	1016	450	98.0%
1017	459	100.0%	.	.	.	1017	451	98.3%
1018	459	100.0%	.	.	.	1018	453	98.7%
1019	459	100.0%	.	.	.	1019	454	98.9%
1020	459	100.0%	.	.	.	1020	455	99.1%
1021	459	100.0%	.	.	.	1021	457	99.6%
1022	459	100.0%	.	.	.	1022	458	99.8%
1023	459	100.0%	.	.	.	1023	458	99.8%
1024	459	100.0%	.	.	.	1024	458	99.8%
1025	459	100.0%	.	.	.	1025	459	100.0%

## Exhibit 6 Opening of Dow Stocks

This Exhibit tracks the opening of the 30 Dow Jones Industrials stocks. Opening is defined as the time at which the first trade occurs. Three periods are compared: the opening at 9:30 AM on October 23, the opening after the circuit breaker was lifted at 3:05 PM on October 27, and the opening at 9:30 AM on October 28. The exhibit documents the number of Dow 30 stocks open at each minute and the percentage this number represents of all Dow 30 stocks.

10/23/97			10/27/97			10/28/97		
Time	Number of Stocks Open	Percent of Stocks Open	Time	Number of Stocks Open	Percent of Stocks Open	Time	Number of Stocks Open	Percent of Stocks Open
930	2	6.7%	1505	0	0.0%	930	1	3.3%
931	2	6.7%	1506	14	46.7%	931	1	3.3%
932	3	10.0%	1507	17	56.7%	932	1	3.3%
933	5	16.7%	1508	22	73.3%	933	3	10.0%
934	5	16.7%	1509	27	90.0%	934	4	13.3%
935	8	26.7%	1510	28	93.3%	935	5	16.7%
936	11	36.7%	1511	28	93.3%	936	5	16.7%
937	12	40.0%	1512	29	96.7%	937	8	26.7%
938	14	46.7%	1513	29	96.7%	938	9	30.0%
939	15	50.0%	1514	29	96.7%	939	11	36.7%
940	23	76.7%	1515	29	96.7%	940	11	36.7%
941	24	80.0%	1516	29	96.7%	941	12	40.0%
942	25	83.3%	1517	30	100.0%	942	14	46.7%
943	25	83.3%	1518	30	100.0%	943	17	56.7%
944	27	90.0%	1519	30	100.0%	944	17	56.7%
945	27	90.0%	1520	30	100.0%	945	20	66.7%
946	27	90.0%	1521	30	100.0%	946	22	73.3%
947	27	90.0%	1522	30	100.0%	947	23	76.7%
948	27	90.0%	1523	30	100.0%	948	23	76.7%
949	27	90.0%	1524	30	100.0%	949	24	80.0%
950	27	90.0%	1525	30	100.0%	950	26	86.7%
951	27	90.0%	1526	30	100.0%	951	26	86.7%
952	27	90.0%	1527	30	100.0%	952	26	86.7%
953	28	93.3%	1528	30	100.0%	953	26	86.7%
954	29	96.7%	1529	30	100.0%	954	27	90.0%
955	29	96.7%	1530	30	100.0%	955	27	90.0%
956	29	86.7%	.	.	.	956	27	90.0%
957	30	100.0%	.	.	.	957	27	90.0%
958	30	100.0%	.	.	.	958	27	90.0%
959	30	100.0%	.	.	.	959	27	90.0%
1000	30	100.0%	.	.	.	1000	28	93.3%
1001	30	100.0%	.	.	.	1001	28	93.3%
1002	30	100.0%	.	.	.	1002	28	93.3%
1003	30	100.0%	.	.	.	1003	29	96.7%
1004	30	100.0%	.	.	.	1004	29	96.7%
1005	30	100.0%	.	.	.	1005	29	96.7%
1006	30	100.0%	.	.	.	1006	30	100.0%

## Exhibit 7

### Quoted and Percent Bid-Ask Spreads in NYSE Issues

Quoted spreads are calculated as (ask quote - bid quote) and are expressed as dollars per share. Percent spreads are calculated as (ask quote - bid quote)/(midpoint between the bid and ask quotes). First, mean spreads are calculated on a stock-by-stock basis, weighted by the length of time the quote remained in effect. The overall mean and median spreads in the table are then generated from the stock-by-stock mean spreads, equally weighted over all stocks. Spreads are shown for October 23 and October 27. Three time intervals are shown for each day.

#### S&P 500 Issues

Time	Quoted Spread		% Spread	
	Oct. 23	Oct. 27	Oct. 23	Oct. 27
9:30 to 1:03				
Mean	0.133	0.152	0.301%	0.349%
Median	0.125	0.148	0.276%	0.320%
1:03 to 2:35				
Mean	0.128	0.166	0.292%	0.391%
Median	0.124	0.161	0.257%	0.359%
3:05 to 3:30				
Mean	0.138	0.191	0.310%	0.457%
Median	0.129	0.171	0.278%	0.396%

#### Dow Issues

Time	Quoted Spread		% Spread	
	Oct. 23	Oct. 27	Oct. 23	Oct. 27
9:30 to 1:03				
Mean	0.116	0.134	0.183%	0.219%
Median	0.120	0.133	0.177%	0.200%
1:03 to 2:35				
Mean	0.113	0.166	0.178%	0.275%
Median	0.107	0.162	0.165%	0.270%
3:05 to 3:30				
Mean	0.120	0.209	0.187%	0.356%
Median	0.113	0.208	0.180%	0.370%

#### Non S&P Issues

Time	Quoted Spread		% Spread	
	Oct. 23	Oct. 27	Oct. 23	Oct. 27
9:30 to 1:03				
Mean	0.280	0.277	1.300%	1.351%
Median	0.178	0.176	0.784%	0.796%
1:03 to 2:35				
Mean	0.261	0.28	1.220%	1.385%
Median	0.157	0.176	0.725%	0.807%
3:05 to 3:30				
Mean	0.258	0.299	1.198%	1.447%
Median	0.151	0.189	0.715%	0.870%

## Exhibit 8

### Quoted Spreads and Percent Spreads in Nasdaq Issues

Quoted spreads are calculated as (ask quote - bid quote) and are expressed as dollars per share. Percent spreads are calculated as (ask quote - bid quote)/(midpoint between the bid and ask quotes). First, mean spreads are calculated on a stock-by-stock basis, weighted by the length of time the quote remained in effect. The overall mean and median spreads in the table are then generated from the stock-by-stock mean spreads, equally weighted over all stocks. Spreads are shown for October 23 and October 27. Three time intervals are shown for each day.

Top 50 Stocks		Quoted Spread		Percent Spread	
		Oct. 23	Oct. 27	Oct. 23	Oct. 27
<u>Before Halt</u>	9:30 to 1:03				
	Mean	0.121	0.148	0.46%	0.55%
	Median	0.104	0.117	0.34%	0.40%
	1:03 to 2:35				
	Mean	0.115	0.141	0.43%	0.58%
	Median	0.100	0.107	0.35%	0.41%
<u>After Halt</u>	3:05 to 3:30				
	Mean	0.114	0.162	0.42%	0.68%
	Median	0.094	0.128	0.29%	0.52%

Top 51-100 Stocks		Quoted Spread		Percent Spread	
		Oct. 23	Oct. 27	Oct. 23	Oct. 27
<u>Before Halt</u>	9:30 to 1:03				
	Mean	0.164	0.183	1.41%	1.54%
	Median	0.156	0.162	0.60%	0.76%
	1:03 to 2:35				
	Mean	0.163	0.191	1.39%	1.59%
	Median	0.139	0.176	0.56%	0.76%
<u>After Halt</u>	3:05 to 3:30				
	Mean	0.177	0.230	1.49%	1.80%
	Median	0.169	0.195	0.65%	0.86%

Top 101-500 Stocks		Quoted Spread		Percent Spread	
		Oct. 23	Oct. 27	Oct. 23	Oct. 27
<u>Before Halt</u>	9:30 to 1:03				
	Mean	0.230	0.226	1.29%	1.54%
	Median	0.195	0.229	1.00%	1.22%
	1:03 to 2:35				
	Mean	0.218	0.257	1.22%	1.59%
	Median	0.177	0.219	0.93%	1.24%
<u>After Halt</u>	3:05 to 3:30				
	Mean	0.213	0.286	1.21%	1.80%
	Median	0.171	0.250	0.87%	1.32%

501 & Below Stocks		Quoted Spread		Percent Spread	
		Oct. 23	Oct. 27	Oct. 23	Oct. 27
<u>Before Halt</u>	9:30 to 1:03				
	Mean	0.442	0.484	3.64%	3.90%
	Median	0.319	0.339	2.65%	2.65%
	1:03 to 2:35				
	Mean	0.424	0.454	3.50%	3.89%
	Median	0.290	0.335	2.48%	2.91%
<u>After Halt</u>	3:05 to 3:30				
	Mean	0.422	0.488	3.51%	4.28%
	Median	0.279	0.366	2.46%	3.14%

**Exhibit 9**  
**Effective Bid-Ask Spreads in NYSE Issues**

Table presents effective bid ask spreads and spreads for buy side and sell side. Buy side bid-ask spread is calculated as (trade price - quoted spread midpoint)\*2; sell side bid-ask spread is calculated as (quoted spread midpoint - trade price)\*2; effective spread is calculated |(trade price - quoted spread midpoint)|\*2. Mean effective spreads are equal-weighted across stocks. All spreads are presented in dollars per share.

**S&P 500 Issues**

Time	Oct. 23			Oct. 27		
	Buy Side	Sell Side	Effective	Buy Side	Sell Side	Effective
9:30 to 1:03						
Mean	0.020	-0.020	0.115	-0.009	0.009	0.106
Median	0.008	-0.008	0.096	-0.009	0.009	0.100
1:03 to 2:35						
Mean	0.001	-0.001	0.089	-0.015	0.015	0.129
Median	0.001	-0.001	0.083	-0.013	0.013	0.121
3:05 to 3:30						
Mean	0.020	-0.020	0.097	-0.029	0.029	0.181
Median	0.018	-0.018	0.087	-0.025	0.025	0.156

**Dow Issues**

Time	Oct. 23			Oct. 27		
	Buy Side	Sell Side	Effective	Buy Side	Sell Side	Effective
9:30 to 1:03						
Mean	0.006	-0.006	0.098	-0.012	0.012	0.104
Median	0.010	-0.010	0.096	-0.011	0.011	0.101
1:03 to 2:35						
Mean	0.010	-0.010	0.083	-0.004	0.004	0.140
Median	0.013	-0.013	0.079	-0.003	0.003	0.135
3:05 to 3:30						
Mean	0.019	-0.019	0.092	0.040	-0.040	0.234
Median	0.024	-0.024	0.085	0.024	-0.024	0.207

**Non S&P Issues**

Time	Oct. 23			Oct. 27		
	Buy Side	Sell Side	Effective	Buy Side	Sell Side	Effective
9:30 to 1:03						
Mean	-0.030	0.030	0.167	-0.060	0.060	0.168
Median	-0.008	0.008	0.125	-0.035	0.035	0.122
1:03 to 2:35						
Mean	-0.023	0.023	0.131	-0.069	0.069	0.172
Median	-0.014	0.014	0.096	-0.047	0.047	0.125
3:05 to 3:30						
Mean	0.001	-0.001	0.126	-0.062	0.062	0.194
Median	0.007	-0.007	0.094	-0.047	0.047	0.125

**Exhibit 12**  
**Measures of Specialists Trading Activity**

Table shows specialist volume as a percent of total volume on buy side and sell side for three time intervals on October 23 and October 27. The final two columns show the ratio of specialists buy to sell volume for each interval in each day. A ratio greater than one indicates specialists were net purchasers. A ratio less than one indicates that specialists were net sellers. Statistics are calculated on a stock-by-stock basis and the medians are presented.

**Dow Stocks**

	Oct. 23		Oct. 27		Oct. 23	Oct. 27
	Specialist Buy Volume as % of Tot Buy	Specialist Sell Volume as % of Tot Sell	Specialist Buy Volume as % of Tot Buy	Specialist Sell Volume as % of Tot Sell	Ratio of Specialist Buy Volume/Sell Volume	
9:30 - 1:03	17.2	15.7	15.6	16.3	0.93	0.97
1:03 - 2:35	13.9	13.4	17.3	17.5	0.95	1.07
3:05-3:30	11.4	13.6	16.7	8.8	0.89	2.06
Entire Day	15.5	14.7	16.2	15.3	0.94	1.06

**S&P 500 Stocks**

	Oct. 23		Oct. 27		Oct. 23	Oct. 27
	Specialist Buy Volume as % of Tot Buy	Specialist Sell Volume as % of Tot Sell	Specialist Buy Volume as % of Tot Buy	Specialist Sell Volume as % of Tot Sell	Ratio of Specialist Buy Volume/Sell Volume	
9:30 - 1:03	16.5	15	17.3	15.7	1.04	1.08
1:03 - 2:35	14.9	13.7	18.3	15.6	1.04	1.13
3:05-3:30	13.6	13.5	18.5	7.6	1.0	2.0
Entire Day	16.2	15	18.5	15.5	1.01	1.1

### Exhibit 13

#### Distribution of Share Volume by Account Type - S&P 500 NYSE Issues

The first two panels show the percentage of trade volume attributed to several account types within several time intervals on October 27 and 28. The third panel shows the net percentage purchase or sale of the market by account type. The fourth panel shows the ratio of purchases to sales by account type and time period. Proprietary trades are for clearing firm and affiliated member accounts. Agency trades are for institutional, money managed and discretionary accounts.

**Percent of Total Buy Volume by Time Period Across Account Types**

	Proprietary		Agency		Proprietary non- program	Agency Non- Program	Individual non- program	Specialist	Other	Total Percent
	non-index arbitrage program	non-index arbitrage program	Proprietary index arbitrage	Agency Index arbitrage						
<b>Oct. 27</b>										
9:30-1:03	1.5	6.3	3.1	1.9	6.4	57.0	4.2	16.4	3.2	100.0
1:03-2:35	1.5	4.6	1.9	1.2	6.2	58.2	5.1	17.4	3.9	100.0
3:05-3:30	0.1	3.9	0.0	0.0	4.1	62.3	8.8	17.7	3.1	100.0
<b>Oct. 28</b>										
9:30-10:00	0.6	1.9	0.0	1.0	6.3	62.6	8.8	16.1	2.7	100.0
10:00-10:30	1.0	2.7	0.1	0.4	4.9	66.2	8.7	13.6	2.4	100.0
10:30 & later	3.1	8.2	0.2	0.1	4.1	57.5	7.1	16.8	2.9	100.0

**Percent of Total Sell Volume by Time Period Across Account Types**

	Proprietary		Agency		Proprietary non- program	Agency Non- Program	Individual non- program	Specialist	Other	Total Percent
	non-index arbitrage program	non-index arbitrage program	Proprietary index arbitrage	Agency Index arbitrage						
<b>Oct. 27</b>										
9:30-1:03	2.3	6.1	0.7	0.3	4.8	61.0	5.9	15.4	3.5	100.0
1:03-2:35	9.1	8.7	0.4	0.4	4.4	53.0	5.3	15.9	2.8	100.0
3:05-3:30	9.8	13.2	2.9	1.0	3.0	48.1	7.5	12.0	2.5	100.0
<b>Oct. 28</b>										
9:30-10:00	2.4	6.7	1.8	0.7	2.1	55.8	15.5	10.7	4.3	100.0
10:00-10:30	3.0	5.8	2.9	1.3	3.4	52.3	5.6	23.3	2.4	100.0
10:30 & later	2.1	5.3	6.0	2.1	4.5	56.1	3.5	18.8	1.6	100.0

(Exhibit 13 continued)

Net % Purchase of Market Volume by Account Type and Time Period  
(% Purchases - % Sales)

	Proprietary non-index		Agency non-index		Proprietary non-		Agency Non-		Individual non-	
	arbitrage program	arbitrage program	Proprietary index arbitrage	Agency Index arbitrage	Proprietary program	Agency Program	Individual program	Specialist	Other	
<b>Oct. 27</b>										
9:30-1:03	-0.8	0.2	2.4	1.6	1.6	-4.0	-1.7	1.0	-0.3	
1:03-2:35	-7.6	-4.1	1.5	0.8	1.8	5.2	-0.2	1.5	1.1	
3:05-3:30	-9.7	-9.3	-2.9	-1.0	1.1	14.2	1.3	5.7	0.6	
<b>Oct. 28</b>										
9:30-10:00	-1.8	-4.8	-1.8	0.3	4.2	6.8	-6.7	5.4	-1.6	
10:00-10:30	-2.0	-3.1	-2.8	-0.9	1.5	13.9	3.1	-9.7	0.0	
10:30 & later	1.0	2.9	-5.8	-2.0	-0.4	1.4	3.6	-2.0	1.3	

Ratio of Purchases to Sales by Account Type and Time Period

	Proprietary non-index		Agency non-index		Proprietary non-		Agency Non-		Individual non-	
	arbitrage program	arbitrage program	Proprietary index arbitrage	Agency Index arbitrage	Proprietary program	Agency Program	Individual program	Specialist	Other	
<b>Oct. 27</b>										
9:30-1:03	0.7	1.0	.*	6.3	1.3	0.9	0.7	1.1	0.9	
1:03-2:35	0.2	0.5	.*	3.0	1.4	1.1	1.0	1.1	1.4	
3:05-3:30	0.0	0.3	.*	0.0	1.4	1.3	1.2	1.5	1.2	
<b>Oct. 28</b>										
9:30-10:00	0.3	0.3	0.0	1.4	3.0	1.1	0.6	1.5	0.6	
10:00-10:30	0.3	0.5	0.0	.*	1.4	1.3	1.6	0.6	1.0	
10:30 & later	1.5	1.5	0.0	0.0	0.9	1.0	2.0	0.9	1.8	

.\* less than 0.01%

The Working Group on Financial Markets

Robert E. Rubin, Secretary  
Department of the Treasury

Brooksley Born, Chairperson  
Commodity Futures Trading Commission

Alan Greenspan, Chairman  
Board of Governors of the Federal Reserve System

Arthur Levitt, Chairman  
Securities and Exchange Commission

May 7, 1998

Richard A. Grasso  
Chairman and Chief Executive Officer  
New York Stock Exchange  
11 Wall Street  
New York, NY 10005

Dear Mr. Grasso:

The members of the President's Working Group on Financial Markets are writing to express our views concerning the NYSE's collar rule (NYSE Rule 80A(c)) and sidecar procedure (NYSE Rule 80A(a)). We understand that the NYSE has undertaken a reexamination of the continuing necessity of these rules, as well as the appropriateness of their trigger levels. As a result, you recently indicated that the NYSE would be willing to eliminate its sidecar procedure and to change the trigger level for the collar rule from a 50-point move in the Dow Jones Industrial Average ("DJIA") to a 1% move in the DJIA.

We appreciate the NYSE's willingness to revisit these rules. Members of the Working Group testified before Congress earlier this year that these rules were probably outdated and should be eliminated. Alternatively, we testified that the triggers should be substantially raised to reflect increased market levels since these rules' adoption. While we are pleased by the NYSE's decision to eliminate the sidecar procedure, we urge you to re-evaluate the usefulness of the collar rule. In this regard, the NYSE's systems capacity has increased severalfold since the collar's inception. The NYSE can handle volumes of index arbitrage trading far greater than 10 years ago. Moreover, index arbitrage ensures that the securities and futures markets are aligned

Mr. Richard A. Grasso

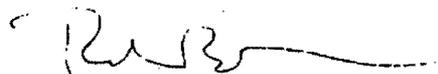
Page 2

economically. Accordingly, we question the continuing need for restrictive treatment of index arbitrage trading.

If you determine a continuing need for the collar, at a minimum, we believe that the NYSE should consider a substantially greater percentage increase in the collar rule's trigger level. We note that, even with a 1% trigger level, the collar would have been activated over 130 times during the previous 12 months. We also note that the original level was set at 2 1/2%.

Again, we would like to thank you for considering ways to respond to the Working Group's concerns about both the collar rule and the sidecar procedure. We believe that further consideration of the collar rule will help ensure that the NYSE's rules continue to enhance the efficiency, liquidity, and integrity of our nation's capital markets.

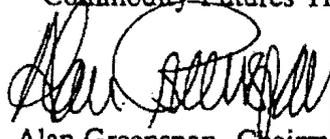
Sincerely,



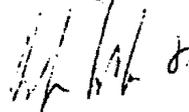
Robert E. Rubin, Secretary  
Department of the Treasury



Brooksley Born, Chairperson  
Commodity Futures Trading Commission



Alan Greenspan, Chairman  
Board of Governors of the Federal  
Reserve System



Arthur Levitt, Chairman  
Securities and Exchange Commission