

Margin Requirements on Equity Instruments¹

The stock market crash of October 1987 focused considerable attention on the adequacy and consistency of margin requirements on U.S. equity-related products. The analysis of these issues is difficult because of the complexity of U.S. margin rules. To help clarify the discussion, this article outlines the margin rules in the markets for stocks, stock index futures, stock options, stock index options, and stock index futures options.²

The general principle behind margin requirements is simple. Margin requirements oblige investors who undertake contractual obligations to deposit and maintain a minimum amount of cash or securities with their counterparties. Margin requirements in different markets serve several different goals,³ but in all cases margin deposits reduce counterparty losses whenever contractual obligations are not fulfilled: if the investor defaults, the counterparty at the very least retains the margin deposit.

This principle applies in all markets, even though the underlying contractual obligations that create the need for margin requirements may differ. These contractual obligations are outlined in Table 1. In practice, margin

requirements modify these obligations, since investors must satisfy the margin rules on a continuous basis.

As described in the table, the contractual obligations of short and long positions in the *stock index futures market* are to receive or make payments sometime in the future. Both long and short positions are required to put up and maintain minimum margin deposits with their counterparties. In *options markets*, the basic contractual obligation of the short position is to purchase or deliver the underlying security if and when the long position exercises the option. The short position is required to put up and maintain a minimum margin deposit with the counterparty. Finally, in the *stock market*, contractual obligations arise in two distinct transactions: buying stock on margin and selling stock short. Investors buying stock on margin take out a loan and use the proceeds together with their own funds to buy stock. The stock is then deposited as collateral with the lender. The basic contractual obligation of each investor is to repay the loan. Margin requirements oblige investors to deposit and maintain stock collateral at a specified minimum level above the face value of the loan. In short sales, investors sell borrowed stock, so their basic contractual obligation is to return the stock to the lender. Each short seller is required to put up a minimum deposit with the stock lender.

Describing the margin rules governing transactions in the U.S. financial markets is a difficult task. Different margin systems have developed for different markets and, even within individual markets, the rules may vary depending on the type of investor and transaction. The purpose of this article is to identify the appropriate margin-setting authorities, to sort out the rules apply-

¹This article is intended only to provide a brief overview of margin regulations and related topics. It is not designed to be used, and should not be used, as a substitute for the appropriate regulations and published interpretations thereof. Questions concerning margin regulations should be addressed to your legal counsel.

²A more detailed description of margin requirements can be found in George Sofianos, "Description of Margin Requirements," Federal Reserve Bank of New York, Unpublished research paper, September 1988.

³See the discussion in Arturo Estrella, "Consistent Margin Requirements: Are They Feasible?" in this issue of the *Quarterly Review*.

Table 1

Summary of Basic Contractual Obligations*

Stocks

Buying stock on margin Investors buying stock on margin take out a loan and use the proceeds together with their own funds to buy stock. The stock then serves as collateral for the loan. Such loans are known as margin loans. The basic contractual obligation of each investor is to repay the margin loan plus interest. In general, margin loans carry no stated maturity. The counterparty is the provider of the margin loan.

Selling stock short In short selling, investors sell borrowed stock. The basic contractual obligation of each short seller is to return the stock to the counterparty, the stock lender. Stock lending agreements are usually of indefinite duration, but they are subject to call by the lender.

Stock index futures

Long positions The contractual obligation of the long position is to receive on settlement date a multiple (usually \$500) times the underlying stock index minus the futures price. (Negative receivables denote a payment.)

Short positions The contractual obligation of the short position is to make a payment on settlement date equal to the multiple times the underlying stock index minus the futures price. (Negative payments denote receivables.)

Because all positions must be marked to market and losses and gains realized daily, the settlement date differs from other days only in that positions are marked to market for the last time and then closed.

The ultimate counterparty for both short and long positions is the clearinghouse associated with each exchange.

Stock options

Long positions The long position in an option contract has the right to exercise the option some time in the future and purchase (call option) or sell (put option) the underlying stock at the strike price fixed when the position is opened. Because the long position has a right but not an obligation, once the option premium is fully paid, no contractual obligations remain.

Short positions The contractual obligation of the short position is to sell (call option) or buy (put option) the underlying stock at the strike price if the long position exercises the option.

The ultimate counterparty in all stock option transactions is the Options Clearing Corporation (OCC).

Stock index options

The contractual obligations are the same as for stock options except that the underlying "security" is a multiple (usually \$500) times a stock index. The ultimate counterparty is the OCC.

Stock index futures options

The contractual obligations are the same as for stock options except that underlying a stock index futures option is a stock index futures contract. The ultimate counterparty is the clearinghouse associated with each exchange.

*This table summarizes the basic contractual obligations in the absence of margin requirements. The presence of margin requirements changes the contractual obligations of investors because the margin requirements must be satisfied on an ongoing basis. For example, when investors buy stock on margin from broker-dealers, they are required by the margin rules to maintain a specified level of equity in the margin account at all times.

ing to particular parties in particular situations, and to outline each set of rules briefly.

In describing the rules, the article focuses on five features that together determine the amount of protection provided to counterparties:

- **Initial margin requirements** set the minimum margin deposit with which a position can be opened.

- **Maintenance margin requirements** set a floor below which margin is not allowed to fall as long as the position remains open.

- **Variation margin** refers to the flow of payments from losers to gainers that results from the daily or intraday reevaluation of positions in futures markets.

- **Posting period** is the amount of time an investor is given to satisfy the initial, maintenance, and variation margin requirements. If the investor fails to satisfy the requirements within the allowable time, the counterparty can close the undermargined position. The length of the posting period is important because as it increases, counterparty losses may cumulate. In practice, posting periods range from as many as 15 days to a few hours.

- **Allowable form of margin** refers to the type of securities other than cash that can be used as margin. In some cases only cash is allowed as margin; in other cases securities and letters of credit can also be used. The form of margin influences the cost of maintaining a margined position and determines how easily the margin deposit can be converted into cash if needed.

The following sections examine the margin requirements in each market. Table 2 lists the markets that will be discussed, the main contracts, and the various margin-setting bodies. The table also identifies the clearinghouses that play an important role in the margin process for futures and option transactions.

Throughout, the article focuses on the margin requirements imposed by the regulatory bodies cited in the table. It is important to remember that these are minimum requirements. Counterparties, such as broker-dealers, often impose more stringent requirements.

Stocks

The Federal Reserve Board divides stocks into margin and nonmargin groups. Margin stocks consist of all U.S. exchange-traded stocks and some but not all over-the-counter (OTC) stocks. Broker-dealers are not allowed to use nonmargin stock as collateral in making loans. By contrast, banks and other lenders can lend any amount they like on nonmargin stock. Both margin

and nonmargin stocks can be sold short.⁴ The following sections describe the rules established by the Board and the New York Stock Exchange (NYSE) for buying margin stock using a margin loan and for short selling.⁵

⁴It is likely that some thinly traded nonmargin stocks are not sold short because no stock is available to borrow, but the Board does not prohibit such a sale

⁵The margin rules of the various exchanges and the National Association of Securities Dealers (NASD) are similar. This is partly the result of a 1975 amendment of the Securities Exchange Act

Buying stock on margin

Margin requirements for buying margin stock using a margin loan differ depending on the source of the loan. Margin loan sources—the lenders—fall into three groups: broker-dealers, banks, and other lenders. Regulation T of the Federal Reserve Board determines the

Footnote 5 continued
of 1934, which prohibits the use of margin rules to get a competitive advantage. The rules of the various exchanges and the NASD apply to each organization's members

Table 2

Instruments, Markets, Clearing, and Margin Setting*

Stocks

Markets	Margin-setting Bodies
New York Stock Exchange Over-the-Counter Market American Stock Exchange Midwest Stock Exchange Pacific Stock Exchange Philadelphia Stock Exchange Boston Stock Exchange Cincinnati Stock Exchange	Federal Reserve Board, Regulations T, U, G, X (initial margin) [†] Exchanges and the National Association of Securities Dealers (NASD) (maintenance margins) The Securities and Exchange Commission (SEC) must approve exchange and NASD margins

Stock Index Futures

Main Contracts	Markets	Clearing	Margin-setting Bodies
S&P500 NYSE Composite Major Market Value Line	Chicago Mercantile Exchange (CME) New York Futures Exchange (NYFE) Chicago Board of Trade (CBOT) Kansas City Board of Trade (KCBOT)	CME Clearinghouse Intermarket Clearing Corp ‡ CBOT Clearing Corp KCBOT Clearing Corp	Exchanges and clearinghouses The Commodities Futures Trading Commission (CFTC) can impose emergency margins§

Stock Options

Main Markets	Clearing	Margin-setting Bodies
Chicago Board Options Exchange American Stock Exchange Philadelphia Stock Exchange Pacific Stock Exchange New York Stock Exchange	Options Clearing Corp (OCC)	Federal Reserve Board Exchanges and the OCC SEC must approve exchange and OCC margins

Stock Index Options

Main Contracts	Markets	Clearing	Margin-setting Bodies
S&P 100 Value Line Major Market S&P 500 NYSE Composite	Chicago Board Options Exchange Philadelphia Stock Exchange American Stock Exchange Chicago Board Options Exchange New York Stock Exchange	Options Clearing Corp	Same as for stock options

Stock Index Futures Options

Main Contracts	Markets	Clearing	Margin-setting Bodies
S&P500 NYSE Composite	Chicago Mercantile Exchange New York Futures Exchange	CME Clearinghouse Intermarket Clearing Corp	Same as for stock index futures

*For each instrument, markets are ranked according to average daily share or contract volume in March 1988 (greatest volume first)

†Although the Board has the authority to set maintenance margins, it has chosen not to exercise it

‡The Intermarket Clearing Corporation is a wholly owned subsidiary of the Options Clearing Corporation

§The exchanges and clearinghouses do not have to get CFTC approval for changes in the level of margin requirements. Major changes in margin systems, however, must be approved by the CFTC

||Since September 1985, the Board has allowed the exchanges to set their own margins. Nevertheless, the Board prohibits banks from making margin loans using options as collateral, only margin loans to specialists are exempted from this rule

initial margin requirements on margin loans provided by broker-dealers, and the NYSE determines the maintenance margin requirements on loans provided by its members. Margin loans from banks and other lenders are regulated exclusively by the Federal Reserve Board through Regulations U, G, and X.⁶

Margin requirements also differ depending on the destination of the loan. Margin loan destinations—the borrowers—fall into three groups: public customers, market makers, and broker-dealers other than market makers.⁷ Diagram 1 shows the nine resulting combinations of lenders and borrowers. Because the rules are the same for some combinations, only six distinct cases are discussed.

Margin loans from broker-dealers to public customers. A public customer wishing to borrow from a broker-dealer to buy margin stock must open a margin account with the broker-dealer. The account is debited with the face value of the margin loan and credited with the market value of the stock. The market value of the stock minus the face value of the loan is the net equity in the account. The initial margin requirement sets the minimum acceptable net equity level at the beginning of the transaction at 50 percent of the stock value.⁸ Equivalently, the investor cannot borrow more than 50 percent of the market value of the stock, that is, the loan value of the stock is 50 percent.⁹ To satisfy this requirement, the investor can make a cash down payment equal to 50 percent of the market value of the stock. For example, to buy a stock worth \$100, the investor can put up \$50 in cash and borrow \$50. The margin account will be credited with \$100 worth of stock and debited with the \$50 margin loan.¹⁰ Regula-

⁶ The Board regulations cover only those loans that are (a) extended for the purpose of purchasing, carrying, or maintaining margin stock ("purpose credit") and (b) secured by margin stock. A purpose loan secured with a bond or with a mortgage on the borrower's home is not covered. Also, a loan secured by margin stock that is used to buy a bond or a house ("nonpurpose credit") is not covered.

⁷ There are no margin requirements on loans to non-U.S. borrowers outside the United States. In many cases, however, U.S. citizens are covered by the margin regulations even if they borrow offshore.

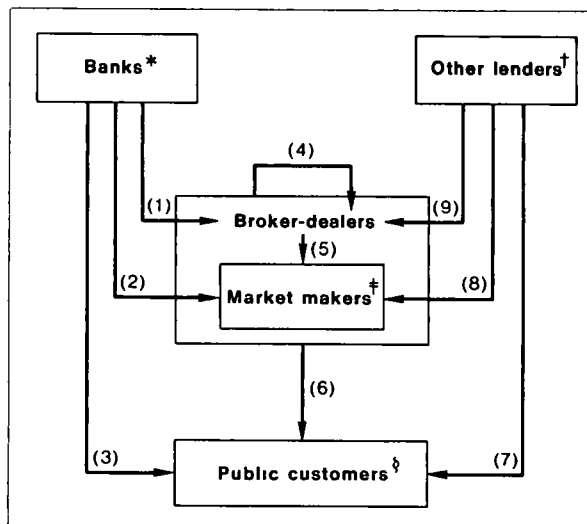
⁸ NYSE rules also require that a minimum net equity of \$2,000 be maintained in the account at all times.

⁹ In general, the loan value of a security equals one minus the margin requirement. For example, Treasury bills are subject to a 1 percent NYSE-determined initial margin requirement and consequently have a loan value of 99 percent. Nonmargin OTC stock has zero loan value at broker-dealers.

¹⁰ Alternatively, the investor can deposit in the margin account a fully owned security, borrow an amount equal to the loan value of the security, and use this amount as the cash down payment. For example, the investor can deposit \$100 in Treasury bills, borrow \$99,

Diagram 1

Sources and Destinations of Margin Loans



*Banks include member banks of the Federal Reserve System and nonmember banks that have signed a special agreement with the Federal Reserve Board.

†Other lenders include savings and loan associations, credit unions, finance companies, insurance companies, and foreign sources of margin loans.

‡Market makers consist of specialists, odd-lot dealers, OTC market makers, third market makers, and block positioners.

§Public customers include all investors except market makers and broker-dealers.

Distinct Cases for Margin Requirements

- (i) Loans from broker-dealers to public customers (arrow 6)
- (ii) Loans from banks and other lenders to public customers (arrows 3 and 7)
- (iii) Loans from banks and broker-dealers to market makers (arrows 2 and 5)
- (iv) Loans from banks to broker-dealers (arrow 1)
- (v) Loans from broker-dealers to other broker-dealers (arrow 4)
- (vi) Loans from other lenders to broker-dealers and market makers (arrows 8 and 9)

Footnote 10 continued

and use this dollar amount as the cash down payment together with a \$99 margin loan to buy \$198 worth of stock. The margin account will have \$298 in assets (bills and stock) and \$198 in liabilities. Because the account also includes Treasury bills, net equity is less than 50 percent.

tion T gives investors up to seven business days to make this down payment.¹¹

The initial margin requirement also determines the amount an investor can withdraw from the account. As the price of the margin stock increases, the maximum allowable margin loan (50 percent of the stock value) also increases. The difference between the outstanding margin loan and the maximum allowable loan is an unused credit line that the investor can draw down. In the example, if the stock rises to \$120, the maximum allowable margin loan is \$60, so with a \$50 margin loan outstanding, the investor can withdraw \$10.¹²

To satisfy the maintenance margin requirements, the equity in the account must not fall below 25 percent of the market value of the margin stock.¹³ If equity falls below 25 percent, the broker must make a margin call asking the investor to restore the account to at least the *maintenance* level. Margin calls must be met "as promptly as possible and in any event within 15 business days."¹⁴ If the margin call is not met, the broker must sell enough stock to restore the account to the maintenance level.

Margin loans from banks and other lenders to public customers. Loans in this category cannot exceed the maximum loan value of the margin stock securing the loan. This maximum loan value is set at 50 percent of the market value of the stock; consequently, it is equivalent to the initial margin requirements for broker-dealer loans. There is no explicit maintenance margin requirement. Margin loans to customers outside the United States, to other domestic and foreign banks, and to qualified employee stock ownership plans may be made on a good faith basis. The phrase "on a good faith basis" means that banks and other lenders, "exercising sound banking judgement," can lend any amount they like against margin stock.¹⁵

Margin loans from banks and broker-dealers to market makers. The Board allows banks and broker-dealers to make margin loans to market makers on a good faith basis. These loans can be made to registered exchange specialists, odd-lot dealers, and dealers certifying that they are qualified OTC-market makers, qualified third-market makers, or qualified block positioners as defined by the rules of the Securities and Exchange Commission (SEC).¹⁶ Market makers must certify that the loans will be used solely for financing their market-making activities.

*Margin loans from banks to broker-dealers other than market makers.*¹⁷ Loans in this category may be used for financing proprietary margin buying or for financing broker-dealer margin loans to customers. Regulation U treats bank loans to broker-dealers for financing proprietary margin buying the same way as bank loans to public customers: such loans cannot exceed the 50 percent loan value of margin stock. Several "special purpose loans," however, are exempted and can be made on a good faith basis. Special purpose loans include arbitrage loans, intraday loans, loans for securities in transit or transfer, temporary advances in payment-against-delivery transactions, and distribution loans.¹⁸

When bank loans are used to finance broker-dealer margin loans to customers, the broker-dealer acts as an intermediary between the banks providing the funds and the margin customers.¹⁹ Regulation U allows broker-dealers to borrow from banks up to the total indebtedness of their customers on a good faith basis, pledging customers' securities. For example, a broker-dealer that provided \$1 million in margin loans to its customers to buy \$2 million worth of stock could use this stock as collateral to borrow at most \$1 million on a good faith basis.²⁰

Margin loans from one broker-dealer to another. The

¹¹Broker-dealers often give investors less time to make the down payment

¹²In general, if on day one the initial margin requirement is just satisfied and on day two the stock price increases, the investor can withdraw half of the increase

¹³All exchanges and the NASD impose the same 25 percent maintenance margin requirement. Broker-dealers can impose higher maintenance margins on their customers, just as they can impose higher initial margins

¹⁴NYSE Rule 431(f)(6). Broker-dealers usually allow only one to two days for a call to be met. The Securities and Exchange Commission's capital rules require that broker-dealers take capital charges for any maintenance margin deficiencies (less than 25 percent equity) that persist for more than five days. Margin calls can be met by depositing cash or securities

¹⁵The quotation is from Regulation U. The good faith loan should not exceed 100 percent of the value of the collateral

¹⁶Only banks may provide good faith margin loans to block positioners

¹⁷Margin loans to broker-dealers are not the only loans made by banks to securities firms, only margin loans, however, are subject to the Board's margin requirements. Banks regularly provide securities firms with other types of loans, including unsecured loans and loans for financing activities unrelated to the broker-dealer function

¹⁸For a loan to qualify as a special purpose loan, the borrower must state in writing the purpose of the loan

¹⁹The broker-dealer is not a mere pass-through between the bank and the margin customers. If a customer defaults, the broker-dealer must use its own capital to repay the lending bank

²⁰Loans to broker-dealers secured by customer securities are called hypothecation loans. Written certification of their purpose is required. SEC rules stipulate that a broker-dealer cannot pledge more than its aggregate customer indebtedness but can pledge up to 140 percent of the debit balance in an individual margin account

Board does not allow margin loans from one broker-dealer to another for financing proprietary buying of stock. Certain other loans between broker-dealers can be made on a good faith basis. These include loans for the purchase of securities for customer accounts²¹ and loans by a broker-dealer to any of its partners or stockholders for the purchase of its own stock, the stock of an affiliated corporation, or the stock of another broker-dealer.

Margin loans from other lenders to broker-dealers. The Board does not allow margin loans from other lenders to broker-dealers, including market makers²² The only exceptions are emergency and capital contribution loans. Unsecured loans to broker-dealers are theoretically possible.²³

Selling stock short

In general, a short sale consists of two distinct transactions, each subject to different requirements. One transaction is between a customer and the customer's broker-dealer. In this transaction the broker-dealer provides the stock that the customer sells short. The stock comes from the broker-dealer's own inventory, from other customers of the broker-dealer, from other broker-dealers, or from other institutions.²⁴ If the stock does not come from the broker-dealer's own inventory, then there is a second transaction—in this case, between the broker-dealer and the stock lender.

Consider first the transaction between broker-dealer and stock lender. According to Regulation T, the broker-dealer must deposit with the stock lender cash or other acceptable collateral equal to 100 percent of the stock's current market value.²⁵ The broker must adjust or mark to market the amount of collateral daily so that it is at all times equal to 100 percent of the stock value at the close of the preceding business day. For example, if the stock closes \$10 higher than the

previous closing, the broker must deposit \$10 with the stock lender by the next day's opening.

Consider next the transaction between customer and broker-dealer. The short sale must take place through a margin account. The value of the stock sold short appears as a debit in the account. The proceeds from the short sale are retained by the broker-dealer and credited to the customer's margin account. According to Regulation T, the customer then has seven business days to deposit in the account an additional amount equal to 50 percent of the value of the stock. This additional deposit need not be in cash; securities can be used instead. Once this deposit is made, the account will show a credit equal to 150 percent of the stock value, a debit equal to the market value of the borrowed stock, and net equity equal to 50 percent of the stock value.

The account is marked to market daily so that a change in the value of the stock will lead to an equal and opposite change in the account's equity position, all else equal. For example, a \$10 increase in stock value will reduce the equity in the account by \$10. The customer need not deposit additional funds unless the account drops below the maintenance level. The NYSE requires customers to maintain net equity at a level equal to at least 30 percent of the market value of the borrowed stock.²⁶ The customer must restore an undermargined account to the required level promptly, and in no more than 15 days—the same requirement that applies to customers who buy stock on margin.

Finally, two special cases must be mentioned. First, for market-maker short sales that are related to market making, only good faith margin is required. Second, because proprietary broker-dealer short sales involve a single transaction—that between the broker-dealer and the stock lender—the broker-dealer is only subject to the requirements for this transaction: 100 percent collateral marked to market daily.²⁷

Stock index futures

In the stock index futures market, a clearinghouse interposes between customers with long and short positions. The clearinghouse is the ultimate counterparty in all trades and guarantees all transactions. Customer transactions entail an additional layer of intermediation: a clearing member comes between the customer and the clearinghouse. A clearing member is an exchange member firm that is also a member of the

²¹These loans are subject to the same rules as bank loans to broker-dealers used to purchase securities for customer accounts

²²Non-broker-dealer affiliates of securities firms are also not allowed to make margin loans to broker-dealers

²³Nevertheless, because virtually all of a broker-dealer's assets are securities, it is difficult to argue that any loan to a broker-dealer is not secured directly, or indirectly, by securities and hence exempt from the Board's lending restriction. One example of a permitted unsecured loan is subordinated debt that complies with SEC rules

²⁴To borrow stock from a customer, a broker-dealer must have the customer's written consent. The broker-dealer cannot borrow more than the debit in a customer's margin account

²⁵As usual, this is a minimum requirement, in practice more collateral may be put up. Acceptable collateral includes Treasury securities, negotiable bank certificates of deposit, banker acceptances, and irrevocable letters of credit

²⁶Maintenance margins for low-priced stocks are slightly higher

²⁷If the proprietary short sale has to be done through an account with another broker-dealer (because the short selling broker-dealer is not self-clearing), then it is subject to the 50 percent initial and 30 percent maintenance margin requirements

clearinghouse. Clearing members accept financial responsibility for the performance of their customers²⁸ Customers include public customers, nonclearing broker-dealers, and the floor traders or "locals" Only proprietary trades of clearing members clear directly through the clearinghouse²⁹

Customers deposit margin at clearing members, and clearing members deposit margin at the clearinghouse Each clearing member maintains two separately margined accounts with the clearinghouse a house account for proprietary trades and a customer account for the trades of its customers The exchanges determine the customer margin rules, and the clearinghouses determine the rules for the deposit of margin by the clearing members in their house and customer accounts³⁰

For both customers and clearing members, there are two distinct sets of margin flows those associated with the deposit of initial and maintenance margin and those associated with the payment of variation margin. The payment of variation margin is important because once such a payment has been made, future counterparty losses depend on the change in the value of the futures position till the next variation margin payment is due on the following day As a result, margin deposits are required to protect counterparties against the possible one-day loss in the value of futures positions

The next two sections examine the requirements for both types of margin flows, focusing on the rules of the Chicago Mercantile Exchange (CME) and its clearinghouse The most popular futures contract, the S&P 500, trades on this exchange

Initial and maintenance margin requirements Initial and maintenance margin requirements are specified in fixed dollar amounts to be deposited per contract As of August 22, 1988, customers are required to deposit with clearing members \$20,000 per S&P 500 contract if they are classified as speculators, and \$10,000 per contract if they are classified as hedgers³¹ These dol-

²⁸For example, if a customer defaults, then the clearing member must use its own capital to honor the defaulter's obligations to the clearinghouse

²⁹In practice, the structure of the market is more complicated Public customers and nonclearing broker-dealers (but not the locals) must trade through a futures commission merchant (FCM) Some FCMs are clearing members and some are not Moreover, not all clearing members are FCMs Nonclearing FCMs must clear both customer and proprietary trades through a clearing member—a requirement that adds an extra step in the whole process This extra step is ignored here For more details, see Sofianos, "Description of Margin Requirements"

³⁰The CME clearinghouse simply determines what portion of the initial margin deposit required by the exchange should be forwarded to the clearinghouse and when this must be done

³¹There are two other classifications *intramarket* spreaders take

lar figures translate to 15.6 percent and 7.8 percent, respectively, of the value of the contract on August 22, 1988 The maintenance margin is \$10,000 per contract for both speculators and hedgers To be classified as hedgers, customers must convince clearing members that they have a need to hedge For example, customers will qualify as hedgers if they hold diversified baskets of stock and take short futures positions (so-called bona fide hedging) Customers may also qualify as hedgers if they anticipate future capital flows and want to lock in prices (anticipatory hedging) In practice, the criteria used in making the classification vary from clearing member to clearing member; the majority of customers put up hedger margins Table 3 lists the current margin requirements for the main stock index futures contracts

The clearinghouse requires clearing members to pass the maintenance portion of customer initial margin on to their customer accounts with the clearinghouse For example, a speculator opening a single position will deposit at least \$20,000 with the clearing member The clearing member will then forward \$10,000 to the clearinghouse and retain the balance. For a hedger, the required initial and maintenance margins are the same, so unless the clearing member asks

Footnote 31 continued

opposite positions in contracts on the same index but with different settlement days, *intermarket* spreaders take opposite positions in contracts based on different stock indexes *Intramarket* spreaders have margin requirements as low as \$200 per contract

Table 3

Margin Requirements for Stock Index Futures
(As of August 22, 1988)

	Initial		Maintenance	
	In Dollars	In Percent	In Dollars	In Percent
Chicago Mercantile Exchange (S&P 500)				
Speculators	20,000	15.6	10,000	7.8
Hedgers	10,000	7.8	10,000	7.8
Chicago Board of Trade (Major Market)				
Speculators	15,000	15.5	10,000	10.3
Hedgers	10,000	10.3	10,000	10.3
New York Futures Exchange (NYSE Composite)				
Speculators	6,000	8.2	4,000	5.5
Hedgers	4,000	5.5	4,000	5.5
Kansas City Board of Trade (Value Line)				
Speculators	7,500	6.4	7,500	6.4
Hedgers	5,000	4.3	5,000	4.3

The percent requirements are the dollar requirements as a fraction of the appropriate multiple times the August 22, 1988 value of each index (500 × 257.0 for the S&P 500, 500 × 145.9 for the NYSE Composite, 500 × 234.1 for the Value Line, and 250 × 387.4 for the Major Market)

for more than the required \$10,000, the whole of the deposit must be forwarded to the clearinghouse. The total margin each clearing member must have on deposit in its customer account at the clearinghouse equals the total number of open positions it carries times the maintenance margin per position. The CME clearinghouse requires clearing members to make this deposit based on the gross positions of their customers. For example, a clearing member whose customers are long 100 positions and short 99 positions in the same S&P 500 contract must have at least \$1,990,000 in its customer account at the clearinghouse.³²

For proprietary positions, clearing members are subject only to the \$10,000 maintenance margin because they clear directly through the clearinghouse.³³ Clearing members must deposit this amount in their house account at the clearinghouse. Because the maintenance level is the same for hedgers and speculators, this distinction is irrelevant for clearing member proprietary positions.

The exchange requires clearing members to collect initial margin from customers in advance of opening a position. The clearinghouse has the following timetable for collecting margin from clearing members. Every day, after trading stops, it calculates the number of open positions in each clearing member's accounts, and early every morning it notifies members of their total margin requirements. If a clearing member has on deposit with the clearinghouse more margin than is required, it can withdraw the excess.³⁴ If the margin on deposit is not sufficient, then the system generates a cash margin call. For example, if open positions increase from 199 to 200 and only \$1,990,000 is on deposit, the clearing member will get a call for an extra \$10,000. By 7:00 a.m. a bank acting on behalf of the clearing member must confirm that it will meet the call within the same day.³⁵ In emergencies the clearinghouse may call for additional margin to be deposited, possibly within an hour.

Clearing members can accept as margin from customers cash, U.S. Treasury securities, letters of credit, and listed securities.³⁶ The clearinghouse, however, is more restrictive in what it accepts as margin from clearing members. The first \$25,000 of margin assets per member account must be in cash, after which Treasury securities are acceptable.³⁷ Letters of credit can be used after \$50,000 in cash and Treasury securities have been deposited. The letters of credit must be irrevocable and callable within 60 minutes. The clearinghouse does not accept listed securities.

Variation margin. After the end of the trading day, the clearinghouse marks to market each position in a member's house and customer accounts.³⁸ It then forwards this information to the clearing members ahead of the next day's opening. Variation margin flows between customers and clearing members and between clearing members and the clearinghouse.

Consider first the flows between customers and clearing members. Each clearing member typically has some customers that lose and some that gain on their S&P 500 futures positions. Using the information provided by the clearinghouse, each member credits the accounts of the gainers with the gain in their positions and debits the accounts of the losers with the loss. Customers whose accounts have been credited can withdraw any gains in excess of the initial margin. Customers whose accounts have been debited will get a margin call if the loss pushed the account balance below the maintenance level.³⁹ An investor who gets a margin call has to replenish the account, restoring it to the *initial* margin level. Consider the speculator who originally deposited \$20,000—\$10,000 with the clearinghouse and a \$10,000 buffer with a clearing member. A \$7,000 loss in the position may be met out of the buffer. No margin call has to be made, but the buffer will be reduced to \$3,000. A further loss of \$4,000 will leave the account undermarginated by \$1,000 and will lead to a margin call for \$11,000 to restore the account to the initial level. Clearing members determine the time allowed customers to meet a margin call. According to the CME rules, "if within a reasonable time the customer fails to comply with such demand (the clearing member may deem one hour to be a reasonable

³²The example assumes that the maintenance margin is \$10,000 for each of the 199 positions. The other three clearinghouses (see Table 2) require clearing members to forward maintenance margin based on the *net* positions of their customers. The netting is done not only for each customer (opposite positions in the same contract cancel each other out) but also across customers. In the example, clearing members would forward the maintenance margin on only one position.

³³The required margin is lower for intermarket or intramarket spreads.

³⁴An excess will occur if the clearing member experienced a net closing of positions.

³⁵Even though the bank makes a commitment at 7:00 a.m. to meet the margin call, the clearing member need not put up the cash till some time later in the day.

³⁶The securities must be listed on the NYSE or American Exchange and are accepted at 70 percent of market value.

³⁷Treasury notes and bonds are subject to at least a 5 percent haircut.

³⁸In marking to market, the clearinghouse uses closing settlement prices.

³⁹In practice investors whose accounts have been debited may get a margin call even if the account is above the maintenance level.

time), the clearing member may close out the customer's trades or sufficient contracts thereof to restore the customer's account to required margin status."⁴⁰

The clearinghouse calculates variation margin separately for each clearing member's customer account and house account. Customer account variation margin depends on the net gains or losses of each clearing member's customers. A member whose customers experienced more losses than gains will make a cash payment to its customer account at the clearinghouse equal to the net loss. For example, a member with 10 customers losing \$4,000 each and 5 customers gaining \$4,000 each must pay the clearinghouse \$20,000. A member that experienced net losses on its proprietary positions will have to make a payment to its house account at the clearinghouse. The clearinghouse will forward these payments to clearing members whose accounts are experiencing net gains.

Banks acting on behalf of clearing members must confirm by 7:00 a.m. that the variation margin will be posted with the clearinghouse sometime later the same day. Table 4 summarizes the timing of margin flows between clearing members and the clearinghouse. In times of extreme price volatility, the clearinghouse may ask clearing members to make intraday payments of variation margin, usually within an hour. The CME clearinghouse recently introduced a regular 2:00 p.m. intraday variation margin call.⁴¹

Stock options

The institutional arrangements for stock options are similar to those for futures. The ultimate counterparty in all stock option transactions is the Options Clearing Corporation (OCC). For customer transactions, a clearing member always interposes between the customer and the OCC. Only proprietary trades of clearing members clear directly through the OCC. Public customers, nonclearing broker-dealers, and market makers must clear through a clearing member.

The option exchanges determine the minimum margin to be deposited by customers to clearing members, and the OCC determines the minimum margin to be deposited by clearing members to the OCC.⁴² The OCC uses a margining system that differs from the one used

by the exchanges. The next two sections describe the NYSE rules for the deposit of margin by customers to clearing members⁴³ and the OCC rules for the deposit of margin by clearing members.

Deposit of margin by customers to clearing members.⁴⁴

Option buyers—that is, the long positions—must pay the full premium in cash; they are not allowed to buy options on margin.⁴⁵ Once the premium is paid, the

⁴³The margin rules of the option exchanges are very similar. This similarity enabled the NYSE to specify a uniform set of option rules for all its members, irrespective of where options are listed. The NYSE rules cover most of the market participants.

⁴⁴Option transactions usually, but not necessarily, take place through a margin account. Options may be both held and written in a cash account. This section describes the requirements for margin account option transactions. Writing options through a cash account is subject to a variety of restrictions. Most important, the account must hold either (a) the underlying stock in the case of a call option, or (b) cash or money market instruments in the amount of the exercise price in the case of a put option.

⁴⁵Equivalently, the loan value of options is zero. This restriction applies only to borrowing for the purpose of buying options (or stock). It is possible to use the value of long option positions as collateral to borrow for other purposes.

Table 4

Timing of Margin Flows between Clearing Members and Clearinghouse (Chicago Mercantile Exchange, S&P 500 Futures Contract)

Chicago Time	
3 15 p m	Trading ends
9 00 p m	The clearinghouse begins final trade reconciliation. After it is completed, the clearinghouse calculates two sets of margin flows: <ul style="list-style-type: none"> (a) the amount of margin each member should deposit or can withdraw to keep total margin in its customer and house accounts at the required level (number of open positions times maintenance margin), (b) the amount of variation margin each member should pay or receive (the net loss or gain in each account).
Early morning	The clearinghouse informs clearing members of the two sets of margin flows.
7 00 a m	The clearinghouse receives irrevocable commitments from banks acting on behalf of the clearing members that both sets of margin payments will be made within the day. The timing of the actual cash flows between clearing members and their banks and between the banks and the clearinghouse varies from case to case.
8 30 a m	Trading in the S&P 500 futures contract begins.

Source: Chicago Mercantile Exchange, Clearing Division, "Clearing House Banking Interface," White Paper Series, December 1987.

⁴⁰CME rulebook, chap. 8, section 827(D). The clearing member may also lend the required margin to the customer.

⁴¹The CBOT Clearing Corporation has had a regular 2:00 p.m. intraday variation margin call since before the October 19 stock market crash.

⁴²The Board has the authority to set option margin requirements. Since September 1985 the Board has allowed individual exchanges to determine the margin requirements on the options that they list. Nevertheless, the Board's Regulation U prohibits banks from making margin loans against options.

option buyer has no remaining contractual obligations and so is not required to put up and maintain a margin deposit

Margin requirements on option issuers—the short positions—consist of a set of basic requirements for naked (uncovered) positions. These requirements are reduced for covered positions. Table 5 summarizes the requirements.⁴⁶ For a naked position, the issuer must deposit as margin all the proceeds from the sale of the option. If the option is in the money, the issuer must also deposit extra margin equal to 20 percent of the underlying stock price. If the option is out of the money, the extra margin required is 20 percent of the stock price minus the out-of-the-money amount but no less than 10 percent of the stock price.

There are three types of covered short positions: hedges, spreads, and combinations. To hedge a short call (put), the issuer has to be long (short) in the underlying stock.⁴⁷ No margin is required for the hedged short option.⁴⁸ Spreads combine short with long positions in a given call or put option. The positions can have different expiration dates, different exercise prices, or both. Combinations consist of short puts and short calls on the same underlying stock, possibly with different expiration and exercise prices. The rules for spreads and combinations are summarized in Table 5.

Maintenance margin requirements on short options are the initial requirements marked to market daily. If stock and option prices move favorably, funds will be freed to support other investments. For unfavorable moves, additional funds will be required to support option positions. For example, if the underlying stock price increases by \$5 and the premium of an in-the-money naked short call option increases by \$1, the margin requirement will increase by \$2.

With options, as with stock margin transactions, initial margin must be deposited within seven business days from the trade date, and margin calls must be met promptly.⁴⁹ Margin stock and U.S. government securities, valued at their loan value, can be used to satisfy

option margin requirements.

The only groups exempted from the customer margin rules are stock specialists, option specialists,⁵⁰ and other registered market makers. The NYSE allows its members to carry long and short option positions of these groups on "a margin basis satisfactory to the concerned parties."⁵¹ In the case of option market makers, this special treatment applies only to positions in the options in which they are making markets. In the case of stock market makers, the special treatment applies only to positions in options overlying the stock in which they are making markets. When market-maker positions in other options are allowed, they are subject

⁵⁰In addition to the option specialists, competitive option traders who qualify as specialists under SEC rules are also exempted.

⁵¹NYSE Rule 431 (f)(2)(J). Moreover, the Board's Regulation U allows banks to lend against long option positions to stock and option specialists on a good faith basis. Such loans must be used to finance narrowly defined "permitted offset positions."

Table 5

Customer Margin Requirements on Stock Options

(As of July 11, 1988)

Long options	Premium must be paid in full
Naked short options	
In-the-money	$\pi + (0.20 \times S)$
Out-of-the-money	$\pi + \text{MAX}\{(0.20 \times S) - T, 0\} \times S$
Hedges	
Short call, long stock	0 for call 0.50 × S for stock
Short put, short stock	0 for put 1.50 × S for stock
Spreads	
Long expires before short	Premium must be paid in full for long Short treated as naked
Long does not expire before short	
Call spreads	Premium must be paid in full for long $\text{MAX}[E(\text{long}) - E(\text{short}), 0]$ for short
Put spreads	Premium must be paid in full for long $\text{MAX}[E(\text{short}) - E(\text{long}), 0]$ for short
Short combinations	The greater of the naked short put or the naked short call requirement plus π for the option with the lower requirement

Explanations

π	Option premium
S	Value of underlying stock
E	Exercise price of option
T	Out-of-the-money amount = $\text{MAX}[E - S, 0]$ for a call = $\text{MAX}[S - E, 0]$ for a put

⁴⁶Table 5 shows the minimum amounts that must be in deposit at clearing members for each customer short position. In all cases the out-of-pocket payment of an option issuer is the required deposit minus the proceeds from issuing the option.

⁴⁷For example, issuers of IBM calls must hold the underlying IBM stock so that their ability to deliver the stock, whenever the calls are exercised, is assured.

⁴⁸If the stock hedging a short call is not owned outright, it is subject to the usual stock initial and maintenance margin requirements. The same applies for stock sold short to hedge a put.

⁴⁹As in the case of stocks, the NYSE permits members to give customers as many as 15 business days to meet a call. In practice, broker-dealers usually give much less time.

to the customer margin rules⁵²

Proprietary positions of broker-dealers that are neither market makers nor clearing members of the OCC are treated like those of any other customer. The proprietary positions of OCC clearing members are only subject to the OCC requirements

The deposit of margin by clearing members to the OCC. Each clearing member must maintain separate customer, house, and market-maker accounts with the OCC. These accounts are margined separately. Total margin for the customer account is calculated differently from total margin for the house and market-maker accounts.

The rules for the house and market-maker accounts are examined first. Within each account, the OCC pairs all long positions in an option class with short positions in the same option class.⁵³ Each option class now consists of some paired long and some paired short positions, and in most cases, either some unpaired long or some unpaired short positions.⁵⁴ Concentrating on the paired positions, the OCC subtracts the aggregate value of the paired long options from the aggregate value of the paired short options.⁵⁵ A positive balance is called excess short value and a negative balance is called excess long value. There are now four possibilities for each option class:

- Excess short value, unpaired short positions. Total margin is 130 percent of the excess short value plus 130 percent of the value of the unpaired short positions.⁵⁶
- Excess short value, unpaired long positions. Total

⁵²Market makers' allowable option transactions are narrowly defined. Stock specialists can only hold options overlying their specialty stock, any option position established must be on the opposite side of the market from the stock position, and the range of permissible hedge ratios is limited

⁵³An option class consists of either puts or calls on the same stock, possibly with different expiration dates and strike prices. The pairing is done as follows: positions in the same option series are paired first, then the highest priced longs are matched with the highest priced shorts, and so on till either the long or the short positions run out

⁵⁴For example, if an option class consists of two long and three short positions, there will be two paired long, two paired short, and one unpaired short position

⁵⁵Values are based on the option premium at the close of trading

⁵⁶Consider an option class consisting of two long options—one \$5 and the other \$6—and three short options—one \$5, one \$7, and one \$8. The \$5 long will be paired with the \$5 short (same option series) and the \$6 long will be paired with the \$8 short, leaving the \$7 short unpaired. Subtracting the paired longs from the paired shorts will give \$2 excess short value $((\$5 + \$8) - (\$5 + \$6))$. Total margin will be \$2.60 (130 percent of the excess short value) plus \$9.10 (130 percent of the unpaired short)

margin is 130 percent of the excess short value minus 70 percent of the value of the unpaired long positions.

- Excess long value, unpaired short positions. Total margin is minus 70 percent of the excess long value plus 130 percent of the value of the unpaired short positions.

- Excess long value, unpaired long positions. Total margin is minus 70 percent of the excess long value minus 70 percent of the value of the unpaired long positions.

If an option class ends with a margin credit, 50 percent of this credit can be applied against the margin required in other option classes within the same account.

Margin for the customer account is calculated more conservatively. All long positions in an option class are classified as unsegregated or segregated. Unsegregated positions form the long leg of an identified spread in the account of an individual customer. The OCC then follows the same procedure used for the house account, but with two differences: only the unsegregated long positions are paired with short positions,⁵⁷ and segregated long positions and excess long values are set to zero.⁵⁸ The end result is that clearing members must deposit 130 percent of the aggregate value of customer short positions, with some short positions offset by the value of unsegregated longs. Option classes never end with a margin credit in the customer's account.

The calculations described above are repeated every day after trading stops. By 7:00 a.m. every morning, clearing members get a report stating the aggregate required margin on short positions that must be in deposit with the OCC by 9:00 a.m. Margin must be deposited in the form of cash, U.S. government securities, bank letters of credit, or margin stock at 50 percent of market value. For short calls, the clearing member can deposit the underlying security rather than deposit the margin. The OCC has the authority to change margin requirements at short notice if market conditions make this necessary.

Stock index options

The same institutional arrangements are used for stock index options as for stock options: the OCC is the ultra-

⁵⁷Moreover, unsegregated longs cannot be paired with shorts with longer expirations

⁵⁸Segregated long positions are set to zero because if one customer defaults, the OCC cannot seize the long positions of another customer. The customer account of a clearing member at the OCC consists of the positions of the clearing member's many customers. Even though the clearing member has a lien on the positions of each of its customers, the OCC does not have an indiscriminate lien on all the positions in the customer account

mate counterparty but clearing members interpose between customers and the OCC. The rules for the deposit of margin by customers to clearing members are almost identical to the corresponding rules for stock options: long options cannot be bought on margin, and the margin deposit on naked short positions is calculated in the same way. For naked short positions in broad-based index options, however, the investor is required to deposit extra margin equal to 15 percent—instead of 20 percent—of the underlying index.⁵⁹ Spreads and combinations are given the same treatment as in stock options, but hedged index option positions are treated the same as naked positions. Posting periods are the same as for stock options.

The rules governing the deposit of margin by clearing members in their customer, house, and market-maker accounts at the OCC are different from the corresponding stock option rules.⁶⁰ The most interesting feature of these rules is the use of an option-pricing model to estimate the net cost (or value) of liquidating all positions in an account that belong to the same option group.⁶¹ For each option group, the OCC has specified a range, known as the margin interval, that

⁵⁹Broad-based index options include those on the S&P 500, S&P 100, Major Market, Value Line, and NYSE Composite indexes

⁶⁰The OCC margins all nonequity options (for example, options on government securities or foreign currencies) in the same way as index options

⁶¹An option group consists of all positions (long or short, put or call, at any strike price and any expiration date) on the same underlying index. Long positions give rise to liquidation value while short positions represent a liquidation cost

Table 6

OCC Stock Index Option Margin Intervals

(As of July 11, 1988)

Option	Margin Interval		
	In Points	In Dollars	Percent of Index
S&P 100	16 00	1,600	6 19
S&P 500	16 00	1,600	5 91
AMEX Major Market	24 00	2,400	5 86
NYSE Composite	8 00	800	5 23
AMEX Institutional	16 00	1,600	5 99
PSE FNN Composite	10 00	1,000	5 34
PHLX National OTC	15 00	1,500	5 77
Value Line Composite	12 00	1,200	4 89
AMEX Computer Tech	6 00	600	5 16
PHLX Gold and Silver	11 00	1,100	10 48
AMEX Oil	8 00	800	4 54
PHLX Utility Index	7 00	700	3 80

Source: OCC Information Memo, April 11, 1988, updated. Index percentages are based on the closing values of the underlying indexes on July 11, 1988.

reflects the likely one-day change in the underlying index. Table 6 lists the current margin intervals for all stock index options. For example, the margin interval for the S&P 100 index is 16 points. Every day, after trading stops, the OCC calculates the current liquidation cost using the closing option premia and estimates the liquidation cost under the assumption that the current closing index value increases and decreases by the full margin interval. If the closing value of the S&P 100 is 250, the OCC will estimate the liquidation cost at 234 and 266.⁶² The required margin is equal to the maximum of the estimated and current liquidation costs.⁶³ With stock index options, as with stock options, the OCC calculates margin for customer accounts more conservatively than for house accounts. The main difference is that the OCC assigns zero value to segregated long positions in a customer account. Posting periods for house, market-maker, and customer accounts are the same as for stock options.

Stock index futures options

Stock index futures options trade on futures exchanges and clear in the same way as futures. The most popular contract is the S&P 500 futures option. Like its underlying futures contract, this option contract trades on the CME and clears through the CME clearinghouse.⁶⁴ This section describes the rules of the CME and its clearinghouse.

The rules for the deposit of margin by customers to clearing members are similar to the corresponding stock option rules: both sets of rules are strategy-based. A set of basic requirements applies to naked short positions; these requirements are reduced for hedges, spreads, and combinations. To calculate margin, clearing members use the margin requirements for stock index futures, so the classification of customers as speculators or hedgers carries over to stock index futures options. Table 7 lists customer margin requirements for a sample of positions in the S&P 500 futures option. For example, a customer with a naked long position must pay the premium in full. A customer with a naked in-the-money short position must deposit the premium plus the margin for the underlying futures contract (either \$20,000 or \$10,000). If the position is

⁶²The OCC also estimates the liquidation cost at all strike prices between these two extremes

⁶³This is a simplified representation of the rules. For more details, see Sofianos, "Description of Margin Requirements." Another interesting feature of these rules is that options based on broad-based indexes form a single "product group" and are margined as an integrated portfolio

⁶⁴One advantage of this arrangement is that it facilitates the cross-margining of S&P 500 futures option positions and S&P 500 futures positions

out of the money, less margin is required. Customers can deposit securities and letters of credit as margin instead of cash—the same alternatives open to futures customers. Positions are marked to market daily. Customers must pay any additional required margin in cash, daily, and no later than 10 minutes before the market opens.

The clearinghouse uses a delta-based margin system to calculate the margin to be deposited by clearing members. Everyday it estimates the delta for each option position.⁶⁵ The daily margin requirement for each

⁶⁵The option delta is the rate at which the option premium changes as the underlying futures price changes. Deltas range from -1 to +1

Table 7

Customer Margin Requirements on S&P 500 Futures Options

(Selected Positions, As of September 1, 1988)

Long options	Premium must be paid in full
Naked short options	
In-the-money	$\pi + M$
Out-of-the-money	$\pi + \text{MAX}[M - (0.5 \times T), 2,250]$
Option-futures spreads (hedges)	
Short call/long futures	} $\pi + \text{MAX}[m - (0.5 \times N), 2,250]$ on combined position
Short put/short futures	
Long call/short futures	} $\text{MAX}[m - \pi, 0]$ for futures Premium must be paid in full for long options
Long put/long futures	
Option-option spreads	
Horizontal*	
Long expires before short	$\mu + \text{MAX}[\pi(\text{short}) - \pi(\text{long}), 0]$ for short Premium must be paid in full for long
Short expires before long	0 for short Premium must be paid in full for long
Short combinations	
Straddles†	$\pi(\text{put}) + \pi(\text{call}) + m$

Explanations

- π Option premium
- M Margin on S&P 500 futures contract (20,000 or 10,000)
- m Hedge margin on S&P 500 futures contract (10,000)
- μ Spread margin on S&P 500 futures contract (400)
- S Value of underlying index
- E Exercise price of option
- T Out-of-the-money amount = $\text{MAX}[E - S, 0]$ for a call
= $\text{MAX}[S - E, 0]$ for a put
- N In-the-money amount = $\text{MAX}[S - E, 0]$ for a call
= $\text{MAX}[E - S, 0]$ for a put

*Horizontal spreads one short plus one long, call or put, same exercise price, different expiration date

†Short straddles one short put plus one short call, same exercise price, same expiration date

short position is the current option premium plus the \$10,000 maintenance margin requirement for the underlying S&P 500 futures contract multiplied by the relevant delta. There is a minimum margin charge of \$475 per naked short option. As in the case of futures positions, clearing members can deposit Treasury securities and letters of credit as margin. Because both the option premium and the delta can vary from day to day, the total margin that must be on deposit with the clearinghouse will change daily even if the number of open positions does not change.⁶⁶ The clearinghouse uses the same timetable for calculating and collecting margin on options that it uses for futures.

The CME is currently replacing both its strategy-based and its delta-based margin systems with a new system called Dollars-at-Risk.⁶⁷ It will use the new system to calculate the margin that must be deposited both by customers to clearing members and by clearing members to the clearinghouse. The new system is similar to the OCC margin system for stock index options. Under the new system, the CME will be using an option-pricing model to obtain daily estimates of the liquidation cost of a portfolio of positions on the S&P 500 index under a variety of assumptions about the underlying futures price and its volatility. It will set margin to cover the maximum estimated liquidation cost. The portfolio may consist of positions on S&P 500 futures and options on these futures, so that estimated gains (losses) on the futures can offset (augment) estimated losses on the options. The CME will impose additional margin charges for spread positions with different settlement dates, and there will be a minimum margin charge for short options.⁶⁸

Summary

The differences in margin requirements examined in this article can be summarized briefly. The margin rules on U.S. equity-related products differ depending on the product and the identity of the parties in the transaction. Often, for a given product and investor, the requirements will also depend on the investor's combination of positions. Differences in margin requirements go beyond simple variations in margin levels; there are differences in the way margin is calculated, the length of the posting period, and the form margin can take.

Investors buying stock on margin face different

⁶⁶For stock index futures contracts, the total margin that must be on deposit with the clearinghouse changes only if the number of open positions changes

⁶⁷The new system will be used for S&P 500 futures options and all other CME options on futures

⁶⁸A more detailed description of the new Dollars-at-Risk system can be found in Sofianos, "Description of Margin Requirements"

requirements depending on whether the source of the margin loan is a broker-dealer, a bank, or some other lender. The requirements also depend on whether the margin borrower is a public customer, a market maker, or a broker-dealer. For short sales, the identity of the short seller is important: the short seller may be a public customer, a market maker, or a broker-dealer, and the requirements vary in each case.

In the stock index futures market, one set of rules governs the deposit of initial, maintenance, and variation margin by customers to clearing members. Initial margin is higher if the customer is classified as a speculator rather than a hedger. Another set of rules governs the deposit of margin by clearing members to the clearinghouse. Each clearing member maintains one customer account and one house account with the clearinghouse, and the two accounts are margined separately.

For options, there are again two sets of rules: one for the deposit of margin by customers to clearing members and another for the deposit of margin by clearing members to the clearinghouse. For stock options, stock index options, and stock index futures options, customer margins are strategy-based: in all cases margins vary depending on whether short positions are naked, or whether they are hedges, spreads, or part of some other combination. For each of these three types of options, a completely different margining system is used to calculate clearing member margins. In all cases, clearing members maintain separate customer and house accounts with the clearinghouse. The two accounts are margined separately using different rules.

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