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Characteristics and Risks of Standardized Options

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CHAPTER I

Introduction

This document relates solely to options issued by The Options Clearing Corporation (OCC), and all references to "options" in this document are applicable only to such options. As of the date of this document, options are traded on the United States markets listed prior to the Table of Contents. In the future, options may be traded on other markets within or outside the United States. The markets on which options are traded at any given time are referred to in this document as the "options markets." Options described in this document are those approved for trading on the options markets but may not be actively trading at any given time.

OCC is a registered clearing agency, and each U.S. options market is a national securities exchange that is subject to regulation by the Securities and Exchange Commission (SEC) under the Securities Exchange Act of 1934.

What is an option? An **option** is the right to buy or sell a specified amount or value of a particular underlying interest at a fixed exercise price by exercising the option before its specified expiration date. An option that gives the right to **buy** is a **call** option, and an option that gives a right to **sell** is a **put** option. Calls and puts are distinct types of options, and buying or selling of one type does not involve the other. Certain special kinds of options may give a right to receive a cash payment if certain criteria are met.

EXAMPLE: *An option to **buy** 100 shares of common stock of the XYZ Corporation at a specified exercise price would be an XYZ **call** option. An option to **sell** 100 shares of common stock of the XYZ Corporation at a specified exercise price would be an XYZ **put** option.*

There are two different kinds of options—**physical delivery options** and **cash-settled options**. A **physical delivery option** gives its owner the right to receive physical delivery (if it is a call), or to make physical delivery (if it is a put), of the underlying interest when the option is exercised. A **cash-settled option** (other than a binary option or a range option) gives its owner the right to receive a cash payment based on the difference between a determined value of the underlying interest at the time the option is exercised and the fixed exercise price of the option. A **cash-settled call** conveys the right to receive a cash payment if the determined value of the underlying interest at exercise—this value is known as the **exercise settlement value**—exceeds the exercise price of the option, and a **cash-settled put** conveys the right to receive a cash payment if the exercise settlement value is less than the exercise price of the option. Binary options and range options are special kinds of cash-settled options described in Chapter II. The examples in this document generally refer to options other than binary options or range options except as otherwise stated.

Each options market selects the **underlying interests** on which options are traded on that market. Options are currently available covering four types of underlying interests: **equity securities** (which term includes "**fund shares**" described in Chapter III), **indexes** (including **stock**, **variability**, **strategy-based**, **dividend** and **relative performance indexes**), **debt securities** and **credit events**, and **foreign currencies**. Options on other types of underlying interests may become available in the future.

Most options have **standardized terms**—such as the nature and amount of the underlying interest, the expiration date, the exercise price, whether the option is a call or a put, whether the option is a physical delivery option or a cash-settled option, the manner in which the cash payment and the exercise settlement value of a cash-settled option are determined, the multiplier of a cash-settled option, the exercise price setting date and exercise price setting formula of a delayed start option, the style of the option, whether the option has automatic exercise provisions, and adjustment provisions. These standardized terms are generally described in Chapter II. Each U.S. options market publishes specification sheets setting forth the particular standardized terms of the options traded on that

options market. (The options markets may also provide for trading in options whose terms are not all fixed in advance. Rather, subject to certain limitations, the parties to transactions in these options may designate certain of the terms. These **flexibly structured options** are discussed in Chapter VII of this document.)

Options having the same standardized terms are identical and comprise an options **series**. The standardization of terms makes it more likely that there will be a secondary market on which holders and writers of options can close out their positions by offsetting sales and purchases. By selling an option of the same series as the one she bought, or buying an option of the same series as the one she wrote, an investor can close out her position in that option at any time there is a functioning secondary options market in options of that series.

In some instances, options of the same series may be traded on more than one options market at the same time. Options that are so traded are called **multiply-traded** options. Multiply-traded options can ordinarily be purchased and written, and positions in these options can ordinarily be liquidated in offsetting closing transactions, in any of the options markets in which the options are traded. However, because premiums are affected by market forces, the premiums for identical multiply-traded options may not be the same in all markets at any given time.

If an options market learns that a particular underlying interest no longer meets its requirements for options trading or is not eligible for trading in all U.S. jurisdictions, or if an options market decides to discontinue trading in a particular options series for another reason, the options market may stop introducing new options on that underlying interest and may in certain circumstances impose restrictions on transactions that open new positions in options series that have been previously introduced, although trading in the options series will ordinarily continue on at least one options market until its expiration.

Options generally are traded on U.S. options markets during normal day-time business hours of U.S. securities exchanges and for a short period afterward. However, trading in options may not be confined to those hours. Trading in evening and night trading sessions may occur in options on foreign currencies and may in the future occur in other types of options. Moreover, when there are unusual market conditions, an options market may authorize trading to continue for a substantially longer period than under normal conditions. Trading in an expiring option may close at an earlier time than trading in other options. Trading hours for options are also subject to change from time to time. Readers should ascertain the trading hours of the particular options they are interested in trading from the options markets where those options are traded. Readers should also be aware that trading in underlying interests is not confined to normal exchange trading hours. For example, underlying foreign currencies and debt securities are traded in international markets on virtually an around-the-clock basis, and underlying equity securities may be traded in foreign markets when U.S. markets are closed and in some U.S. markets after the close of their normal trading hours.

Readers should be aware that this document has been written to meet the requirements of an SEC rule that requires the U.S. options markets to prepare, and brokerage firms to distribute, a document that briefly and generally describes the characteristics of options and the risks to investors of maintaining positions in options. Options are versatile instruments that can be used in a wide variety of investment strategies. They give the investor the ability to create positions that reflect the investor's opinion of an underlying interest and to select investment strategies that reflect the investor's tolerance for risk. This document is not designed to describe the various potential benefits of options or how investors may use options to enhance their investment strategies or to reduce risk. Numerous other publications, including some prepared by the U.S. options markets that are available upon request, contain discussions of the uses and potential benefits of options and of the various trading and investment strategies that can be employed with options. Readers who wish to balance the general discussion of

risks that is contained in this document with a discussion of options uses, benefits and strategies should consult one or more of these other publications.

Readers should read and understand this document in its entirety, since a number of the separate chapters will be relevant to every reader interested in buying or writing options. For example, a reader who is interested in options on equity securities should fully read not only Chapter III, but also should read Chapters II, VIII and IX, as well as the discussion of risks in Chapter X. Readers should also be aware that, although this document seeks to describe the various characteristics of options and the risks that are unique to being an investor in options, there are many matters which are beyond the scope of this document that are not discussed. Chapter XI contains a discussion of the scope and limitations of this document.

CHAPTER II

Options Nomenclature

This chapter contains a description of the standardized terms, and of some of the special vocabulary, applicable to options. Most of the nomenclature is the same for options on the various types of underlying interests. Differences that are applicable to options on a particular underlying interest will be described in the chapter devoted to that underlying interest.

Certain terms—options, options markets, call options, put options, physical delivery options, cash-settled options, options series, and multiply-traded options—have been defined in Chapter I. Readers interested in those definitions should consult that chapter.

OPTION HOLDER; OPTION WRITER—The option **holder** is the person who buys the right conveyed by the option.

EXAMPLE: *The holder of a physical delivery XYZ **call** option has the right to **purchase** shares of XYZ Corporation stock at the specified exercise price upon exercise prior to the expiration of the option. The holder of a physical delivery XYZ **put** option has the right to **sell** shares of XYZ Corporation at the specified exercise price upon exercise prior to the expiration of the option. The holder of a cash-settled option has the right to receive an amount of cash equal to the **cash settlement amount** (described below) upon exercise prior to the expiration of the option.*

The option **writer** is obligated—if and when assigned an exercise—to perform according to the terms of the option. The option writer is sometimes referred to as the option **seller**. An option writer who has been assigned an exercise is known as an **assigned writer**.

EXAMPLE: *If a physical delivery XYZ call option is exercised by the holder of the option, the assigned writer must **deliver** the required number of shares of XYZ common stock. He will be paid for the shares at the specified exercise price regardless of their current market price.*

If a physical delivery put option is exercised, the assigned writer must **purchase** the required number of shares at the specified exercise price regardless of their current market price. If a cash-settled option is exercised, the assigned writer must pay the cash settlement amount.

No certificates are issued to evidence options. Investors look to the confirmations and statements that they receive from their brokerage firms to confirm their positions as option holders or writers. An option holder looks to the system created by OCC's rules, rather than to any particular option writer, for performance of the option he owns. Similarly, option writers must perform their obligations under the OCC system and are not obligated to any particular option holder. Since every options transaction involves both a holder and a writer, it follows that the aggregate rights of option holders under the system are matched by the aggregate obligations of option writers.

The OCC system is designed so that the performance of all options is between OCC and a group of firms called **Clearing Members** that carry the positions of all option holders and option writers in their accounts at OCC. To qualify as a Clearing Member, a firm must meet OCC's financial requirements. In addition, Clearing Members must provide OCC with collateral for the positions of option writers that they carry and must contribute to Clearing Funds that protect OCC against a Clearing Member's failure. The Clearing Members' guarantees of the performance of options writers' obligations, the financial strength of the Clearing Members, the collateral that they deposit, the obligations of correspondent clearing corporations, and the Clearing Funds together make up the OCC system backing the performance of options.

EXERCISE PRICE —In the case of a physical delivery option, the exercise price (which is sometimes called the "strike price") is the price at which the option holder has the right either to purchase or to sell the underlying interest.

EXAMPLE: *A physical delivery XYZ 40 call option gives the option holder the right to purchase 100 shares of XYZ stock at an* ***exercise price*** *of $40 a share. A physical delivery XYZ 40 put option gives the option holder the right to sell 100 shares of XYZ common stock at an exercise price of $40 a share.*

The exercise price of a cash-settled option (other than a binary option or a range option) is the base for the determination of the amount of cash, if any, that the option holder is entitled to receive upon exercise (see the discussion of "Cash Settlement Amount and Exercise Settlement Value" below). The exercise price of a binary option is the value or level of the underlying interest above, below, or, in some cases, at which the option will be in the money at expiration, thereby causing the fixed cash settlement amount to become payable (see the "Binary Option" definition below). In the case of a range option, the exercise price is the option's range length (see the "Range Option" definition below).

Exercise prices for each options series (except for series of delayed start options) are established by the options market on which that series is traded at the time trading in the series is introduced, and are generally set at levels above and below the then market value of the underlying interest. However, the options markets may use other methods to set exercise prices. Specific information regarding the setting of exercise prices may be obtained from the listing options market. The options markets generally have the authority to introduce additional series of options with different exercise prices based on changes in the value of the underlying interest, or in response to investor interest, or in unusual market conditions, or in other circumstances. For series of delayed start options, exercise price setting formulas—rather than exercise prices—are established by the options market on which each series is traded before the time trading commences in each such series. Those exercise price setting formulas provide that on the exercise price setting date the exercise price for the series will be fixed at the money, in the money by a certain amount, or out of the money by a certain amount.

EXPIRATION DATE —This is the date on which the option expires. **If an option has not been exercised prior to its expiration, it ceases to exist—that is, the option holder no longer has any rights, and the option no longer has any value.** The expiration dates for the various options series are fixed by the options market on which the series trades. Readers should learn the expiration date of each option they wish to buy or write.

STYLE OF OPTION —The **style** of an option refers to when that option is exercisable. At the date of this document there are three different styles of options—**American-style**, **European-style** and **capped**. **Subject to certain limitations prescribed in the rules of OCC or the options markets and subject to applicable law**, these three styles are exercisable at the following times:

Each **American-style option** other than a delayed start option may be exercised at any time prior to its expiration. An American-style delayed start option may be exercised at any time after its exercise price is set and before its expiration date.

A **European-style option** may be exercised only during a specified period before the option expires. Every European-style option being traded at the date of this document is exercisable only on its expiration date.

A **capped option** will be automatically exercised prior to expiration if the options market on which the option is trading determines that the value of the underlying interest at a specified time on a trading day "hits the cap price" for the option. Capped options may also be exercised, like European-style options, during a specified period before expiration. This period

is the expiration date for all capped options traded at the date of this document. The special terminology applicable to capped options is discussed at the end of this chapter.

European-style or capped options having an expiration period that is longer or shorter than their expiration date may be introduced for trading in the future.

BINARY OPTION—A binary option is a cash-settled option having only two possible payoff outcomes: either a fixed amount or nothing at all. Some binary options are referred to as "fixed return options." As of the date this product was approved for trading, the only binary options approved for trading (other than credit default options, as defined below) are binary stock options, which are binary options on individual equity securities, including fund shares; and binary index options, which are binary options on broad-based securities indexes (including volatility indexes). The binary options approved for trading are all subject to automatic exercise. The holder of a binary option other than a credit default option has the right to receive (and the writer of a binary option has the obligation to pay) the exercise settlement amount for the option if the value of the underlying interest as of the time specified by the applicable listing options market (*i.e.*, the exercise settlement value) meets the criteria for automatic exercise of the option, as specified in the rules of the listing options market. If those criteria are not met, the option will expire worthless. Credit default options are a specific kind of binary option discussed at the end of Chapter V. Except for credit default options, binary options are European-style options.

RANGE OPTION—A range option is a European-style, cash-settled option that has a payout if the value of the underlying interest falls within a specific range of values (the range length) at expiration. As the underlying interest value increases throughout the range length, the amount of the payout (*i.e.*, the cash settlement amount) of the range option increases linearly to a maximum value, remains constant at that value through the middle of the range length and then decreases linearly to zero as the value of the underlying continues to increase to the top of the range length. A more detailed description of this feature of range options is set forth below under the caption "Cash Settlement Amount and Exercise Settlement Value." Range options are of a single type rather than consisting of puts and calls.

UNIT OF TRADING; CONTRACT SIZE—The **unit of trading** (which is sometimes referred to as the **contract size**) of a physical delivery option is the amount of the underlying interest that is subject to being purchased or sold upon the exercise of a single option contract. For example, the unit of trading for most options on equity securities is 100 shares. Thus, a physical delivery XYZ 50 call will give its holder the right upon exercise to purchase 100 shares of XYZ at $50 per share. If the option is trading at a premium of, say, $4 per share, then the aggregate premium for a single option contract would be $400.

The **contract size** of a cash-settled option other than a binary option or a range option is determined by the **multiplier** that is fixed by the options market on which the options series is traded. The multiplier determines the aggregate value of each point of the difference between the exercise price of the option and the exercise settlement value of the underlying interest. For example, a multiplier of 100 means that for each point by which a cash-settled option is in the money upon exercise, there is a $100 increase in the cash settlement amount. Similarly, if an option with a multiplier of 100 is trading at a premium of, say, $4, then the aggregate premium for a single option contract would be $400. As another example, a multiplier of 1 means that for each point by which a cash-settled option is in the money upon exercise, there is a $1 increase in the cash settlement amount. Similarly, if an option with a multiplier of 1 is trading at a premium of, say, $4, then the aggregate premium for a single option contract would be $4. The contract size of a range option is determined by the option's multiplier and its maximum range exercise value. The contract size of a binary option is its cash settlement amount, which is fixed by the options market for any series of binary options at or before the opening of trading in that series. Some options markets define the cash settlement amount for binary options as being the multiplier times a fixed settlement value. Other options markets define the cash settlement amount for binary options without reference to a multiplier.

EXERCISE—If the holder of a physical delivery option wishes to buy (in the case of a call) or sell (in the case of a put) the underlying interest at the exercise price—or, in the case of a cash-settled option, to receive the cash settlement amount—his option must be exercised. **In order to exercise most options, option holders must give exercise instructions to their brokerage firm in accordance with the firm's procedures prior to the firm's exercise cut-off time. The exercise process is discussed in Chapter VIII. Every option holder should understand this process and should learn his brokerage firm's procedures concerning exercise, and its exercise cut-off time, for each option she may buy.**

Although an option holder must assure that action is taken to exercise most options, capped options and certain cash-settled options provide for automatic exercise in specified circumstances. Other options having automatic exercise provisions may be introduced for trading in the future.

The rules of the options markets generally limit the total number of puts or calls on the same underlying interest that a single investor or group of investors acting in concert may exercise during a specified time period. Information concerning the exercise limits for particular options is available from the options market on which those options are traded or from brokerage firms.

The right to exercise an option may be restricted in certain circumstances. This is discussed under "Risks of Option Holders" in Chapter X.

When an option has been exercised, OCC will **assign** the exercise in accordance with its rules to a Clearing Member whose account with OCC reflects the writing of an option of the same series. The Clearing Member may, in turn, assign this exercise to one of its customers who is a writer in accordance with the Clearing Member's procedures, and the assigned writer will then be obligated to perform the obligations of the option—that is, to sell (in the case of a physical delivery call) or buy (in the case of a physical delivery put) the underlying interest at the exercise price, or, in the case of a cash-settled option, to pay the cash settlement amount. The assignment process is discussed further in Chapter VIII.

CASH SETTLEMENT AMOUNT, SETTLEMENT CURRENCY and EXERCISE SETTLEMENT VALUE—The cash settlement amount is the amount of cash that the holder of a cash-settled option is entitled to receive upon exercise. In the case of a cash-settled option other than a binary option or a range option, it is the amount by which the **exercise settlement value** of the underlying interest of a cash-settled call exceeds the exercise price, or the amount by which the exercise price of a cash-settled put exceeds the **exercise settlement value** of the underlying interest, multiplied by the **multiplier** for the option.

EXAMPLE: *Assume that a holder of a cash-settled call on the XYZ index that has an exercise price of 80 exercises it when the exercise settlement value of the index is 85. If the multiplier for XYZ index options is 100, the assigned writer would be obligated to pay, and the exercising holder would be entitled to receive,* ***a cash settlement amount*** *of $500 ($85 minus $80 multiplied by 100 = $500).*

EXAMPLE: *Assume that a holder of a cash-settled call on the XYZ index that has an exercise price of 80 exercises it when the exercise settlement value of the index is 85. If the multiplier for XYZ index options is 1, the assigned writer would be obligated to pay, and the exercising holder would be entitled to receive, a cash settlement amount of $5 ($85 minus $80 multiplied by 1 = $5).*

In the case of a binary option, the cash settlement amount is determined by the relevant listing options market and, whether or not established through use of a multiplier, is fixed and does not vary (except in the case of certain adjustments described below) regardless of the amount by which the exercise settlement value exceeds (in the case of a binary call option) or is less than (in the case of a binary put option) the exercise price.

EXAMPLE: *An investor holds a binary call option on XYZ security that has an exercise price of $80 and a fixed cash settlement amount of $100. If the exercise settlement value of XYZ is $81 at expiration, the investor will receive $100. If the exercise settlement value is $90, the investor will still receive $100. If, on the other hand, the exercise settlement value of XYZ at expiration is below $80, the investor will receive nothing, and the option will expire worthless.*

It is very important to note that the conditions under which a binary option returns a cash settlement amount may vary depending upon the rules of the listing options market. Specifically, the listing options market may list binary options that return a cash settlement amount if: (1) the exercise settlement value of the underlying is *above* the exercise price (a binary call); or (2) the exercise settlement value of the underlying is *below* the exercise price (a binary put). In addition, certain binary call options return a cash settlement amount if the exercise settlement value of the underlying is exactly equal to the exercise price.

EXAMPLE: *Assume XYZ stock is the underlying security for a binary stock option with an exercise price of $80, and the exercise settlement value of XYZ at expiration is exactly $80. If the listing options market specified that the option would return a cash settlement amount if the exercise settlement value was* ***above*** *the exercise price, the option will expire unexercised. If, however, the listing options market specified that the option would return a cash settlement amount if the exercise settlement value was* ***at or above*** *the exercise price, the option would be automatically exercised at expiration.*

In the case of a range option, the cash settlement amount varies depending on where the exercise settlement value of the underlying index falls within the range length at expiration. At the time a series of range options is opened for trading, the listing options market will specify the range length as well as the range interval, which is a value equal to a certain number of index points that is used to divide the range length into three segments: the low range, the middle range and the high range. The low range begins at the low end of the range length and ends one range interval higher. The high range begins one range interval below the high end of the range length and ends at the high end of the range length. The high range and the low range are of equal length. The middle range is the segment of values between the end of the low range and the beginning of the high range. The listing options market will also set a maximum range exercise value and a multiplier, the product of which is the maximum cash settlement amount. This maximum cash settlement amount will be payable if the level of the underlying index falls anywhere in the middle range at expiration. Within the low range, the cash settlement amount increases from zero to the maximum cash settlement amount as the level of the underlying index increases. Within the high range, the cash settlement amount decreases from the maximum cash settlement amount to zero as the level of the underlying index continues to increase.

EXAMPLE: *Assume for a series of range index options that the listing options market has specified a range length from 1000 to 1100, a range interval of 10, a maximum range exercise value of 10 and a multiplier of $100. The series therefore has a maximum cash settlement amount of $1,000 (multiplier times the maximum range exercise value), a low range from 1000 to 1010, a middle range from 1010 to 1090 and a high range from 1090 to 1100. The table below summarizes the variations in cash settlement amount based on the foregoing assumptions:*

		Low Range					Middle Range	High Range					
Value of the Underlying Index	Below 1000	1000	1001	1002	…	1009	1010 -1090	1091	…	1098	1099	1100	Above 1100
Cash Settlement Amount ($)	0	0	100	200	…	900	1,000	900	…	200	100	0	0

The currency in which the cash settlement amount is payable is called the **settlement currency**. The settlement currency for all cash-settled options with standardized terms that are trading at the date of this document is U.S. dollars. It is possible that another currency will be the settlement currency for some options introduced in the future.

The manner of determining the **exercise settlement value** for a particular option series is fixed by the options market on which the series is traded. The exercise settlement values for options on a particular underlying interest traded in one options market will not necessarily be determined in the same manner as the exercise settlement values for options or futures on the same underlying interest that may be traded in other markets.

Options markets may change the method of determining exercise settlement values for particular options series on specified days or on all days. These changes may be made applicable to series outstanding at the time the changes become effective. Alternatively, an options market might phase in a change in the method of determining exercise settlement values by opening new series of options identical to outstanding series in all respects other than the method for calculating exercise settlement values. Such new series would trade alongside the old series until both series expire, but the two series would not be interchangeable. In the future, options markets may, subject to regulatory approval, introduce options whose exercise settlement values may not exceed a specified maximum amount.

ADJUSTMENT—**Adjustments** may be made to some of the standardized terms of outstanding options upon the occurrence of certain events related to the underlying security. Adjustments that may be made to a particular type of options are discussed in the chapter relating to that type.

The determination of whether to adjust outstanding options in response to a particular event, and, if so, what the adjustment should be, is made by OCC, taking into consideration policies established by a committee consisting of representatives of each of the U.S. options markets and a representative of OCC. OCC and the exchanges are free to discuss considerations pertaining to any adjustment decision or policy, but every adjustment determination is within OCC's sole discretion and is binding on all investors and OCC determines the value of distributed property involved in contract adjustments.

PREMIUM—The **premium** is the price that the holder of an option pays and the writer of an option **receives** for the rights conveyed by the option. It is the price set by the holder and writer, or their brokers, in a transaction in an options market where the option is traded. It is **not** a standardized term of the option. The premium does **not** constitute a "down-payment." It is simply and entirely

a nonrefundable payment in full—from the option holder to the option writer—for the rights conveyed by the option.

The premium is not fixed by the options markets or by OCC. Premiums are subject to continuous change in response to market and economic forces, including changes in the trading conditions on the markets where the particular options are traded. The factors which may generally affect the pricing of an option include such variables as the current value of the underlying interest and the relationship between that value and the exercise price, the current values of related interests (*e.g.*, futures on the underlying interest or other interests related to the underlying interest), the style of the option, the individual estimates of market participants of the future volatility of the underlying interest, the historical volatility of the underlying interest, the amount of time remaining until expiration, cash dividends payable on the underlying stock (in the case of stock and stock index options), current interest rates, current currency exchange rates (in the cases of foreign currency options and options whose premiums or cash settlement amounts are payable in a foreign currency), the depth of the market for the option, the effect of supply and demand in the options market as well as in the markets for the underlying interest and for related interests, the information then available about current prices and operations in the markets for the underlying interest and related interests, the individual estimates of market participants of future developments that might affect any of the foregoing, and other factors generally affecting the prices or volatility of options, underlying interests, related interests or securities generally. Also see the discussion below of "Intrinsic Value and Time Value." Readers should not assume that options premiums will necessarily conform or correlate with any theoretical options pricing formula, chart, last sale, or the prices of the underlying interest, related interests or other options at any particular time.

The currency in which the premium is payable is called the **premium currency**. The premium currency for most options is U.S. dollars. However, the premium currency for cross-rate foreign currency options, which are discussed in Chapter VI, is a foreign currency, and other options with premiums payable in a foreign currency may be introduced after the date of this document.

OPENING TRANSACTION—This is a purchase or sale transaction by which a person establishes or increases a position as either the holder or the writer of an option.

CLOSING TRANSACTION—This is a transaction in which, at some point prior to expiration, the option holder makes an offsetting **sale** of an identical option, or the option writer makes an offsetting **purchase** of an identical option. A closing transaction in an option reduces or cancels out an investor's previous position as the holder or the writer of that option.

EXAMPLE: *In June an investor buys a December XYZ 50 call at an aggregate premium of $500. By September the market price of the option has increased to $700. To seek to realize his $200 profit, the investor can direct his broker to sell an offsetting December XYZ 50 call in a* ***closing transaction****. On the other hand, if by September the market price of the option has decreased to $300, the investor might still decide to sell the option in a* ***closing transaction****, thereby limiting his loss to $200.*

Although holders of American-style options (other than delayed start options for which the exercise price has not yet been set) have the right to exercise at any time before expiration, holders frequently elect to realize their profits or losses by making closing transactions because the transaction costs of the closing transactions may be lower than the transaction costs associated with exercises, and because closing transactions may provide an opportunity for an option holder to realize the remaining time value (described below) of the option that would be lost in an exercise. The holder's only means of realizing profit or loss on a delayed start option before its exercise price has been set, or on a European-style or capped option when the option is not exercisable, is by selling the option in a closing transaction.

POSITION LIMITS—The rules of the options markets generally limit the maximum number of options on the same side of the market (*i.e.*, calls held plus puts written, or puts held plus calls written) with respect to a single underlying interest that may be carried in the accounts of a single investor or group of investors acting in concert. These limits—which are called **position limits**—differ for options on different underlying interests. Information concerning the position limits for particular options is available from the options market on which those options are traded or from brokerage firms.

COMBINATIONS; SPREADS and STRADDLES—**Combination** positions are positions in more than one option at the same time. **Spreads** and **straddles** are two types of combination positions. A **spread** involves being both the buyer and writer of the same type of option (puts or calls) on the same underlying interest, with the options having different exercise prices and/or expiration dates. A **straddle** consists of purchasing or writing both a put and a call on the same underlying interest, with the options having the same exercise price and expiration date.

LONG and SHORT—The word **long** refers to a person's position as the holder of an option, and the word **short** refers to a person's position as the writer of an option.

COVERED CALL WRITER—If the writer of a physical delivery call option owns or acquires the amount of the underlying interest that is deliverable upon exercise of the call, she is said to be a **covered** call writer.

EXAMPLE: *An individual owns 100 shares of XYZ common stock. If she writes one physical delivery XYZ call option—giving the call holder the right to purchase 100 shares of the stock at a specified exercise price—this would be a covered call. If she writes two such XYZ calls, one would be covered and one would be uncovered.*

The distinction between covered and uncovered call writing positions is important since uncovered call writing can involve substantially greater exposure to risk than covered call writing. A call option writer who is not a covered writer may hold another option in a **spread** position and thereby offsets some or all of the risk of the option he has written. However, the spread may not offset all of the risk of the uncovered writing position. For example, if the long portion of the spread has a higher exercise price than the exercise price of the short, or if the long has an earlier expiration date than the expiration date of the short, then the writer may still be exposed to significant risks from his uncovered writing position.

AT THE MONEY—This term means that the current market value of the underlying interest is the same as the exercise price of the option. A range option, which is of a single type rather than being categorized as a call or a put, is said to be at the money if the current level of the underlying index is at the top or bottom of the range length.

IN THE MONEY—A call option is said to be **in the money** if the current market value of the underlying interest is above the exercise price of the option. A put option is said to be **in the money** if the current market value of the underlying interest is below the exercise price of the option. A range option, which is of a single type rather than being categorized as a call or a put, is said to be in the money if the current level of the underlying index falls within its range length.

EXAMPLE: *If the current market price of XYZ stock is $43, an XYZ 40 call would be* ***in the money*** *by $3.*

EXAMPLE: *Assume a series of XYZ range options has a maximum cash settlement amount of $1,000, a low range from 1000 to 1010, a middle range from 1010 to 1090 and a high range from 1090 to 1100. If the current level of XYZ index is 1003, the option would be in the money by $300. If the current level of XYZ index is from 1010 to 1090, the option would be in the money by $1,000, the maximum cash settlement amount. If the current level of XYZ index is 1093, the option would be in the money by $700.*

OUT OF THE MONEY—If the exercise price of a call is above the current market value of the underlying interest, or if the exercise price of a put is below the current market value of the underlying interest, the call or put is said to be **out of the money**. A range option, which is of single type rather than being categorized as a call or a put, is said to be out of the money if the current level of the underlying index falls outside of its range length.

EXAMPLE: *With the current market price of XYZ stock at $40, a call with an exercise price of $45 would be* ***out of the money*** *by $5—as would a put with an exercise price of $35.*

EXAMPLE: *Assume a series of XYZ range options has a specified range length from 1000 to 1100. If the current level of XYZ index is either below 1000 or above 1100, the series of XYZ range options would be out of the money.*

INTRINSIC VALUE and TIME VALUE—It is sometimes useful to consider the premium of an option as consisting of two components: **intrinsic value** and **time value.**

In the case of an option other than a binary option, the **intrinsic value** reflects the amount, if any, by which the option is in the money. An option that is out of the money would have an intrinsic value of zero. Delayed start options, other than series whose exercise prices are to be set in the money, have no intrinsic value before the exercise price is set. Thereafter, as in the case of any other option, whether a delayed start option has intrinsic value depends on the level of the underlying index at the time. A binary option (other than a credit default option) that is in the money has an intrinsic value equal to the fixed cash settlement amount of the option. Where the listing exchange has specified that a binary call will return a cash settlement amount if the exercise settlement value of the underlying is exactly equal to the exercise price, the call will have an intrinsic value equal to the cash settlement amount if it is either in the money or at the money. As is further discussed under the heading "Credit Default Options and Credit Default Basket Options" in Chapter V, credit default options have no intrinsic value.

Time value is whatever the premium of the option is in addition to its intrinsic value. Time value is that part of the premium that reflects the time remaining before expiration. An American-style option may ordinarily be expected to trade for no less than its intrinsic value prior to its expiration, although occasionally an American-style option will trade at less than its intrinsic value. Because European-style options (including binary options and range options) and capped options are not exercisable at all times, they are more likely than American-style options to trade at less than their intrinsic value when they are not exercisable.

EXAMPLE OF A CALL WITH INTRINSIC VALUE: *At a time when the current market price of XYZ stock is $46 a share, an XYZ 40 call would have an* ***intrinsic value*** *of $6 a share. If the market price of the stock were to decline to $44, the intrinsic value of the call would be only $4. Should the price of the stock drop to $40 or below, the call would no longer have any intrinsic value.*

EXAMPLE OF A PUT WITH INTRINSIC VALUE: *At a time when the current market price of XYZ stock is $46 a share, an XYZ 50 put would have an* ***intrinsic value*** *of $4 a share. Were the market price of XYZ stock to increase to $50 or above, the put would no longer have any intrinsic value.*

EXAMPLE OF TIME VALUE: *At a time when the market price of XYZ stock is $40 a share, an XYZ 40 call may have a current market price of, say, $2 a share. This is entirely* ***time value****.*

An option with intrinsic value may often have some time value as well—that is, the market price of the option may be greater than its intrinsic value. This could occur with an option of any style.

EXAMPLE: *With the market price of XYZ stock at $45 a share, an XYZ 40 call may have a current market price of $6 a share, reflecting an intrinsic value of $5 a share and a time value of $1 a share.*

An option's time value is influenced by several factors (as discussed above under "Premium"), including the length of time remaining until expiration. An option is a "wasting" asset; if it is not sold or exercised prior to its expiration, it will become worthless. As a consequence, all else remaining the same, the time value of an option usually decreases as the option approaches expiration, and this decrease accelerates as the time to expiration shortens. However, there may be occasions when the market price of an option may be lower than the market price of another option that has less time remaining to expiration but that is similar in all other respects.

An American-style option's time value is also influenced by the amount the option is in the money or out of the money. An option normally has very little time value if it is substantially in the money. Although an option that is substantially out of the money has only time value, the amount of that time value is normally less than the time value of an option having the same underlying interest and expiration that is at the money.

Another factor influencing the time value of an option is the volatility of the underlying interest. All else being the same, options on more volatile interests command higher premiums than options on less volatile interests.

Time value is also influenced by the current cost of money. Increases in prevailing interest rates tend to cause higher premiums for calls and lower premiums for puts, and decreases in prevailing interest rates tend to cause lower premiums for calls and higher premiums for puts.

The following is a description of the terminology applicable to **capped options**:

CAP INTERVAL—The **cap interval** is a constant established by the options market on which a series of capped options is traded. The exercise price for a capped-style option plus the cap interval (in the case of a call), or minus the cap interval (in the case of a put), equals the **cap price** for the option. For example, if a capped call option with an exercise price of 360 has a **cap interval** of 30, then the **cap price** at which the option will be automatically exercised would be 390.

CAP PRICE—The **cap price** is the level that the automatic exercise value of a capped option must reach in order for the option to be automatically exercised. The **cap price** of a call option is above, and of a put option below, the exercise price of the option.

EXAMPLE: *A 360 ABC capped call index option has an exercise price of 360 and a cap interval of 30. The call option has a* ***cap price*** *of 390.*

EXAMPLE: *A 310 XYZ capped put index option has an exercise price of 310 and a cap interval of 20. The put option has a* ***cap price*** *of 290.*

AUTOMATIC EXERCISE VALUE—The **automatic exercise value** of a capped option is the price or level of the underlying interest determined in a manner fixed by the options market on which the option is traded for each trading day as of a specified time of that day.

EXAMPLE: *A 310 XYZ capped put index option has a cap interval of 20, and therefore has a cap price of 290. Assume that the options market on which the option is traded has specified the close of trading on each trading day as the time for determining the automatic exercise value on the XYZ index, and that the index level reaches a low of 289 during a particular trading day, but is at 291 at the close. The* ***automatic exercise value*** *has not reached the cap price, and the automatic exercise feature of the option is not triggered, because the index level was not at or below the cap price at the time of day specified by the options market for determining the automatic exercise value.*

CASH SETTLEMENT AMOUNT—This is the cash amount that the holder of a cash-settled capped option is entitled to receive upon the exercise of the option. In the case of a capped option that has been automatically exercised, the **cash settlement amount** is equal to the cap interval times the multiplier for the option, even if the automatic exercise value on the day that the automatic exercise feature is triggered exceeds (in the case of a call) or is less than (in the case of a put) the cap price. If the capped option is voluntarily exercised at expiration, the cash settlement amount is determined in the same manner as for other styles of cash-settled options.

EXAMPLE: *A 360 ABC capped call index option has a cap interval of 30 and a multiplier of 100. The automatic exercise value of the ABC index is 396 on a particular trading day. The call option is automatically exercised, and the* ***cash settlement amount*** *is $3000 (equal to the cap interval of 30 times the multiplier of 100).*

EXAMPLE: *A 360 ABC capped call index option has a cap interval of 30 and a multiplier of 100. The automatic exercise value of the ABC index never equals or exceeds the cap price of 390 during the life of the option, and the exercise settlement value of the option is 367 on the final trading day. Upon exercise of the option, the holder is entitled to receive a cash settlement amount of $700 (equal to the multiplier of 100 times the difference between the exercise settlement value of 367 and the exercise price of 360).*

A **delayed start option** is an option that does not have an exercise price when first introduced for trading but instead has an exercise price setting formula pursuant to which the exercise price will be fixed on a specified future date. The following is a description of the terminology applicable to delayed start options:

EXERCISE PRICE SETTING DATE—The exercise price setting date for a series of delayed start options is the date on which the options market on which the series is traded will set the exercise price for the series. The exercise price setting date is specified before the commencement of trading of each series of delayed start options. Specific information regarding exercise price setting dates may be obtained from the listing options market.

EXERCISE PRICE SETTING FORMULA—The exercise price setting formula for a series of delayed start options is the formula used by the options market on which the series is traded to set the exercise price for the series on the exercise price setting date. The exercise price setting formula is specified before the commencement of trading of each series of delayed start option. The formula for a particular series may provide that the exercise price will be at the money, in the money by a specified amount, or out of the money by a specified amount. Exercise prices may be rounded as specified by the listing options market.

EXAMPLE: *In January, an American-style delayed start option on the ABC index is opened for trading with an exercise price setting date of the third Friday in September and an exercise price setting formula specifying that the exercise price will be set at the closing value of the ABC index on the exercise price setting date, rounded to the nearest whole number. The option may not be exercised at all until after the third Friday in September because it will not have an exercise price until that time. At the close of trading on the third Friday in September, the options market on which the delayed start option is trading will determine the closing value of the ABC index and set the exercise price based on that value. For example, if the options market determines that the ABC index closed at 908.10 on the exercise price setting date, the options market would round that value to 908, and from that time until its expiration date the delayed start option would trade as a regular American-style option with an exercise price of 908.*

Options on Equity Securities

The term "stock options" is used broadly in this document to include not only options on common stocks but also options on all other types of equity securities, such as limited partnership interests, "American Depository Receipts" and "American Depository Shares" representing interests in foreign entities, preferred stocks, and fund shares. The term "fund shares" includes interests in exchange-traded funds and other entities holding or trading in one or more types of investments, and as used in this document the term "equity securities" includes fund shares.

Issuers of underlying equity securities do not participate in the selection of their securities for options trading (although some options markets may determine not to select an underlying security without the consent of the issuer of that security). Issuers of underlying equity securities have no responsibility regarding the issuance, the terms, or the performance of options, and option holders have no rights as security holders of such issuers.

The principal risks of holders and writers of stock options are discussed in Chapter X. Readers interested in buying or writing stock options should carefully read that chapter.

Features of Stock Options

The following discussion relates primarily to stock options other than binary options. A separate description of the features of binary stock options may be found at the end of this chapter.

As a general rule a single-stock option covers 100 shares of the underlying security, although in the case of options covering fund shares, options covering 100 or 1000 shares may be available. Other stock options departing from the general rule may be introduced in the future. The number of underlying shares covered by any stock option may be adjusted after the option is issued if certain events occur, as described below.

The **exercise prices** of the stock options that are traded at the date of this document are stated in U.S. dollars per share. The exercise price of an option must be multiplied by the number of shares underlying the option in order to determine the aggregate exercise price and aggregate premium of that option.

EXAMPLE: *An XYZ 40 call gives the buyer the right to purchase 100 shares of XYZ stock at a price of $40 per share, or a total price of $4,000.*

In the future, stock options may, with regulatory approval, be introduced that have exercise prices in a foreign currency.

Adjustments may be made to certain of the standardized terms of outstanding stock options when certain events occur, such as a stock dividend, stock distribution, stock split, reverse stock split, rights offering, distribution, reorganization, recapitalization, reclassification in respect of an underlying security, or a merger, consolidation, dissolution or liquidation of the issuer of the underlying security. **In the following discussion, there is a brief description of a number of general adjustment rules applicable to stock options that are in effect at the date of this document. Such rules may be changed from time to time with regulatory approval. OCC has the authority to make such exceptions as it determines to be appropriate to any of the general adjustment rules**.

As a general rule, no adjustment is made for ordinary cash dividends or cash distributions. A cash dividend or distribution will generally be considered "ordinary," regardless of size, if OCC believes

that it was declared pursuant to a policy or practice of paying such dividends or distributions on a quarterly or other regular basis. No adjustment will normally be made for any cash dividend or distribution that amounts to less than $0.125 per underlying share. For contracts originally listed with a unit of trading larger than 100 shares, no adjustment normally would be made for any cash dividends or distributions that amount to less than $12.50 per contract. As an exception to the general rule, options on fund shares will generally be adjusted for capital gains distributions even if made on a regular basis, and adjustments may be made for certain other distributions in respect of fund shares in special circumstances described in OCC's rules, provided in each case that the amount of the adjustment would be $0.125 or more per fund share. Determinations whether to adjust for cash dividends or distributions not covered by the preceding rules, or when other special circumstances apply, are made on a case-by-case basis.

Because stock options are not generally adjusted for ordinary cash dividends and distributions, covered writers of calls are entitled to retain dividends and distributions earned on the underlying securities during the time prior to exercise. However, a call holder becomes entitled to the dividend if he exercises the option prior to the ex-dividend date even though the assigned writer may not be notified that he was assigned an exercise until after the ex-date. **Because call holders may seek to "capture" an impending dividend by exercising, a call writer's chances of being assigned an exercise may increase as the ex-date for a dividend on the underlying security approaches**.

Stock dividends, stock distributions and stock splits may result in an adjustment of the number of options held or written or the number of underlying shares, and in some cases may also result in an adjustment of the exercise price.

When a stock distribution, stock split or stock dividend results in the issuance of one or more whole shares of stock for each outstanding share—such as a 2-for-1 or a 3-for-1 stock split—as a general rule the number of underlying shares will not be adjusted. Instead, the number of outstanding options will be proportionately increased and the exercise price will be proportionately decreased.

EXAMPLE: *Before a 2-for-1 stock split, an investor holds an option on 100 shares of XYZ stock with an exercise price of $60. After adjustment for the split, he will hold two XYZ options, each on 100 shares and each with an exercise price of $30.*

Other stock dividends, stock distributions and stock splits may result in an adjustment in the number of underlying shares and the exercise price.

EXAMPLE: *An investor bought an XYZ 50 option—either a call or a put—and XYZ Corporation subsequently effected a 3-for-2 stock distribution. Instead of covering 100 shares of stock at an exercise price of $50 a share, each outstanding option could be adjusted to cover 150 shares at an exercise price of $33.33 per share. The aggregate exercise price remains substantially the same before and after the adjustment ($50 x 100 = $5,000 and $33.33 x 150 = $4,999.50).*

As a general rule, adjustments in exercise prices are rounded to the nearest exercise price increment, and adjustments in the number of underlying shares are rounded down to eliminate fractional shares. In the latter case, the property deliverable upon exercise may be adjusted to include the value of the eliminated fractional share, as determined by OCC.

Note that in the preceding example where the exercise price of the adjusted XYZ option was rounded down, the exercising put holder or assigned call writer would lose $0.50 as a result of the rounding. Rounding up could result in losses to exercising call holders and assigned put writers.

A reverse stock split, combination of shares, or similar event will generally result in an adjustment in the number of shares deliverable upon exercise, while the aggregate exercise price remains unchanged.

EXAMPLE: *An investor holds a call option covering 100 shares of XYZ stock with an exercise price of 50 resulting in an aggregate exercise price for the contract of $5,000 ($50 x 100). After a 1-for-10 reverse split, the deliverable could be reduced to 10 shares while the nominal exercise price remained $50. In that case, upon exercise of the adjusted option, the investor would still pay $5,000 ($50 x 100, not $50 x 10), but would receive 10 shares of XYZ stock instead of 100.*

An adjustment that substitutes cash for all, such as in the case of a cash merger or other event whereby the underlying security is converted solely to cash, or part of the deliverable security will eliminate or reduce the time value of the option, and therefore the option may lose significant value, both immediately and at exercise, as a result of the adjustment.

EXAMPLE: *Because of an all cash merger involving XYZ Corporation, the stock held by XYZ's owners is extinguished in return for a payment of $50 in cash per XYZ share. In response to the corporate action on the underlying security, XYZ options generally will be adjusted to require the delivery of $50 per share upon exercise. As a result, an XYZ call option with an exercise price of $40 will lose all of its time value and the option's value will only reflect the intrinsic value of $10 ($50–$40 = $10). Additionally, an XYZ call option with an exercise price of $60 will become worthless because the exercise price exceeds the $50 cash settlement delivery amount.*

EXAMPLE: *An investor bought a $50 put option representing the obligation to deliver 100 shares of Company A stock upon exercise. Company A subsequently effected a 1-for-3 reverse stock split and the terms of the reverse split provided for payment of cash in lieu of fractional shares, using a value of $60 per share for this purpose. As a general rule, any adjustment in the number of underlying shares is rounded to eliminate fractional shares, so the number of shares to be delivered could be adjusted to 33 shares (100 x ⅓ = 33⅓, with the ⅓ fractional share rounded down as part of the adjustment to eliminate fractional shares) plus $20 cash in lieu of the ⅓ fractional share ($60 x ⅓) if cash is paid in lieu of such fractional share. Because this cash delivery obligation is generally fixed at the time of adjustment, the investor would lose the time value of the fractional share. This option may continue to trade until expiration, with the deliverable at exercise or expiration being 33 shares plus $20 cash.*

The obligation to make a fixed cash payment in lieu of a fractional share could result, depending on the relative size of the fixed cash obligation, in an immediate reduction in the value of the option and at exercise could result in the option being less valuable or worthless in comparison to the value it would have had in the absence of the adjustment. If a stock underlying the option undergoes multiple reverse splits prior to expiration, it will become increasingly likely that one of those reverse stock splits eventually will create a fractional share.

As a general rule, no adjustment is made for ordinary stock dividends or distributions. A stock dividend or distribution will generally be considered "ordinary" if (i) the number of shares distributed does not exceed 10% of the number of shares outstanding on the declaration date and (ii) it is declared pursuant to a policy or practice of paying such dividends or distributions on a quarterly basis.

Distributions of property other than the underlying security may result in the adjustment of outstanding options to include the distributed property.

EXAMPLE: *If XYZ "spins off" its subsidiary ABC by distributing to its stockholders 2.5 shares of ABC stock for each share of XYZ stock, outstanding XYZ options might be adjusted to require delivery of 100 shares of XYZ stock plus 250 shares of ABC stock.*

Alternatively, the exercise prices of outstanding options might be reduced by the value, on a per-share basis, of the distributed property, as determined by OCC.

Events other than distributions may also result in adjustments. If all of the outstanding shares of an underlying security are acquired in a merger or consolidation, outstanding options will as a general rule be adjusted to require delivery of the cash, securities, or other property payable to holders of the underlying security as a result of the acquisition.

EXAMPLE: *If XYZ is acquired by PQR in a merger where each holder of XYZ stock receives $50 plus 1/2 share of PQR stock for each share of XYZ stock held, XYZ options might be adjusted to call for the delivery of $5,000 in cash and 50 shares of PQR stock instead of 100 shares of XYZ stock.*

When an underlying security is wholly or partially converted into a debt security or a preferred stock, options that have been adjusted to call for delivery of the debt security or preferred stock may, as a general rule, be further adjusted to call for any securities distributed as interest or dividends on such debt security or preferred stock.

When an underlying security is converted into a right to receive a fixed amount of cash, options on that security will generally be adjusted to require the delivery upon exercise of a fixed amount of cash, and trading in the options will ordinarily cease when the conversion becomes effective. As a result, after such an adjustment is made all options on that security that are not in the money will become worthless and all that are in the money will have no time value, and the expiration date of the option will ordinarily be accelerated to fall on or shortly after the date on which the underlying security is converted to a right to receive cash occurs. Holders of an in-the-money option whose expiration date is accelerated must be prepared to exercise that option prior to the accelerated exercise cut off time in order to prevent the option from expiring unexercised. See the discussion in Chapter VIII under "How to Exercise." Writers of options whose expiration date is subject to being accelerated bear the risk that, in the event of such an acceleration, they may be assigned an exercise notice and be required to perform their obligations as writers prior to the original expiration date. When the expiration date of an option is accelerated, no adjustment will be made to compensate for the accelerated expiration date. There is no assurance that the exercise settlement date for an accelerated option will coincide with the date on which the cash payment to the holders of the underlying security becomes available from the issuer. Covered writers of an accelerated option may therefore be required to pay the cash amount in respect of the option before they receive the cash payment on the underlying security.

As a general rule, adjustments are not made for tender offers or exchange offers, whether by the issuer or a third party, and whether for cash, securities (including issuer securities), or other property. This presents a risk for writers of put options, because a successful tender offer or exchange offer (whether by the issuer or by a third party) may have a significant effect on the market value of the security that the put writers would be obligated to purchase if the put options are exercised after the expiration of the offer.

As a general rule, adjustments will not be made to reflect changes in the capital structure of the issuer where all of the underlying securities outstanding in the hands of the public (other than dissenters' shares) are not changed into another security, cash or other property.

As a general rule, an adjustment that is made in an option will become effective on the ex-date established by the primary market for trading in the underlying security.

The following is a description of certain special features of binary stock options:

As in the case of other stock options, the exercise price of a binary stock option is ordinarily stated as a price per share of the underlying security. Premium values may be stated in an amount that must be multiplied by a multiplier to obtain the premium price per option contract.

The listing exchange specifies the method for determining the exercise settlement value of the underlying stock for a binary stock option. This method may be based on a volume weighted average price for a specified time period preceding expiration, such as the last trading day before expiration. The exercise settlement value for a stock underlying a binary option is the value of the stock as reported by the reporting authority designated by the listing options market for that purpose. Unless OCC directs otherwise, the value as initially reported by the reporting authority is conclusively presumed to be accurate and deemed to be final for the purpose of determining whether the option is automatically exercised and returns a cash settlement amount. This is true even if the value is subsequently revised or determined to have been inaccurate.

Adjustments in the terms of binary stock options will be made to reflect some, but not all, of the same events that result in adjustments to other stock options, and any adjustment that is made will not necessarily be the same as the adjustment made to other options on the same underlying security. As in the case of other stock options, adjustments will not normally be made to the terms of binary stock options to account for ordinary dividends or distributions. The guidelines set forth above under the caption "Features of Stock Options" for determining when a distribution is considered "ordinary" will generally be applied to distributions with respect to securities underlying binary stock options.

Adjustments in the terms of binary stock options will ordinarily be made for stock dividends, stock distributions and stock splits, subject to the exception stated above where OCC determines to treat a stock distribution as ordinary.

If OCC determines to make an adjustment to binary stock options to reflect a stock dividend, stock distribution, or stock split, the exercise price of the option will ordinarily be proportionately reduced—regardless of whether a whole number of shares, or other than a whole number of shares, of the underlying security is issued. OCC has discretion to make exceptions to the general rules described above.

EXAMPLE: ***Before a 2-for-1 stock split, an investor holds one ABC binary stock option with an exercise price of $50 that pays a cash settlement amount of $100 if the exercise settlement value of ABC at expiration is above the exercise price. After adjustment for the split, the investor will still hold one ABC binary stock option that pays a cash settlement amount if the exercise settlement value of ABC at expiration is above the exercise price, but the exercise price will be $25 (i.e., $50 divided by two). Thus, if the exercise settlement value of ABC stock at expiration, on a post-split basis, is above $25, the investor will receive $100.***

An investor holds an XYZ binary stock option with an exercise price of $50 that pays a cash settlement amount of $100 if the exercise settlement value of XYZ stock is below the exercise price. XYZ announces a 2.5-for-1 stock split. The exercise price will be adjusted to equal $20 ($50 divided by 2.5). If the exercise settlement value of XYZ stock at expiration is below $20, the investor will receive $100. Exercise prices of binary stock options will generally be rounded to the nearest adjustment increment (or up in the event the adjusted price is equidistant between two adjustment increments).

Conversely, in the event of a reverse stock split or combination of shares, the exercise price will be proportionately increased.

Distributions of property other than the underlying security may result in adjustments to the terms of binary stock options. For example, the exercise settlement value might be adjusted to include the value of the distributed property.

EXAMPLE: ***XYZ "spins off" its subsidiary ABC by distributing to its stockholders two shares in ABC for each share of XYZ. The exercise settlement value of XYZ binary stock options may be adjusted to include the value of two shares of ABC as well as one share of XYZ.***

Alternatively, the option might be adjusted by reducing its exercise price by an amount equal to the value of the property distributed with respect to a single share of the underlying security (in the example above, the two shares of ABC).

As in the case of other stock options, adjustments to the terms of binary stock options may result from events other than dividends, distributions, and splits. If all outstanding shares of an underlying security are acquired in a merger or consolidation, binary stock options may be adjusted so that the cash, securities or other property received by stockholders with respect to a single share of that underlying security becomes the underlying interest. Alternatively, OCC may determine to fix a value for some or all of the non-cash property received. Where holders of an underlying security receive only cash or OCC determines to fix a cash value for all non-cash property received, the aggregate per share value received, as determined by OCC, will become the exercise settlement value, trading in the options will ordinarily cease, options that are out of the money will become worthless, the expiration date will ordinarily be accelerated, and options that are in the money will be automatically exercised. No adjustment in the fixed settlement amount will be made to reflect the accelerated expiration date.

As in the case of other stock options, any adjustment decision with respect to binary stock options will be made by OCC as described above. OCC has discretion to make exceptions to the general rules described above.

CHAPTER IV

Index Options

About Indexes

As referred to in this document, an index is a measure of the prices or other attributes of a group of securities* or other interests. Indexes have been developed to cover a variety of interests, such as stocks and other equity securities, debt securities and foreign currencies, and even to measure the cost of living. The following discussion relates to (i) indexes on equity securities (which are called **stock indexes** in this document), (ii) indexes intended to measure the implied volatility, or the realized variance or volatility, of specified stock indexes or specified securities (which are collectively called **variability indexes** in this document), (iii) **strategy-based indexes**, such as indexes measuring the return of a particular strategy involving the component securities of a stock index and options on that index, (iv) indexes intended to measure the stock price changes of the component securities of underlying indexes that result solely from the distribution of ordinary cash dividends, as calculated on their respective ex-dividend dates (which are called **dividend indexes** in this document), (v) **relative performance indexes**, which are a special type of strategy-based indexes that measure the relative performance over a given time period of one index component to another index component, (vi) indexes on foreign currencies (which are called **foreign currency indexes** in this document), and (vii) options on the above indexes (including binary index options and range options).

Stock indexes are compiled and published by various sources, including securities markets. A stock index may be designed to be representative of the stock market of a particular nation as a whole, of securities traded in a particular market, of a broad market sector (*e.g.*, industrials), or of a particular industry (*e.g.*, electronics). A stock index may be based on securities traded primarily in U.S. markets, securities traded primarily in a foreign market, or a combination of securities whose primary markets are in various countries. A stock index may be based on the prices of all, or only a sample, of the securities whose prices it is intended to represent. Like stock indexes, variability indexes, strategy-based indexes, dividend indexes and relative performance indexes are securities indexes. However, variability indexes may measure the implied volatility of an index, using the premiums for series of options on that index, or may measure the historical variance or volatility of the returns of an index using daily returns over a certain period assuming a mean daily return of zero. Strategy-based indexes measure the return of a particular strategy involving the component securities of an index and options on that index. Dividend indexes measure the stock price changes of the component securities of underlying indexes that result solely from the distribution of ordinary cash dividends, as calculated on their respective ex-dividend dates. Relative performance indexes measure the performance of two **index components** relative to one another over a period of time. While a foreign currency index is not an index of securities, options on foreign currency indexes trade on securities exchanges like options on securities indexes. The foreign currency indexes discussed in this document are designed to reflect the value of a single currency, often the U.S. dollar, against a basket of foreign currencies. In this document options on variability indexes are referred to generically as **variability options**, options on strategy-based indexes are referred to as **strategy-based index options**, options on dividend indexes are referred to as **dividend index options**, options on relative performance indexes are referred to as **relative performance options**, and options on foreign currency indexes are referred to as **foreign currency index options**.

Information relating specifically to the various types of indexes appears below under the captions "Stock Indexes," "Variability Indexes," "Strategy-based Indexes," "Dividend Indexes," "Relative Performance Indexes" and "Foreign Currency Indexes."

Stock Indexes

A stock index, like a cost of living index, is ordinarily expressed in relation to a "base" established when the index was originated.

* Some indexes reflect values of companies, rather than securities, by taking into account both the prices of component securities and the number of those securities outstanding.

EXAMPLE: *On the starting or "base" date for a new value-weighted index, the total market values of the component securities (market price times number of shares outstanding) is $50 billion. The publisher of the index will assign an arbitrary index level—say 100—to that base value. If the total market value of the component stocks increases by 2% the next day (i.e., to $51 billion), the index level would rise to 102 (102% of the base level of 100).*

The base may be adjusted from time to time to reflect such events as capitalization changes affecting the constituent securities of the index (*e.g.*, issuance of new shares) or to maintain continuity when securities are added to or dropped from the index. These adjustments are generally designed so that the index level will change only as a result of price changes of constituent securities during trading.

Securities may be dropped from an index because of events such as mergers and liquidations or because a particular security is no longer thought to be representative of the types of stocks constituting the index. Securities may also be added to an index from time to time. Adjustments in the base level of an index, additions and deletions of constituent securities, and similar changes are within the discretion of the publisher of the index and will not ordinarily cause any adjustment in the terms of outstanding index options. However, OCC has authority to make adjustments if the publisher of the underlying index makes a change in the index's composition or method of calculation that in OCC's determination, may cause significant discontinuity in the index level.

Different stock indexes are calculated in different ways. Accordingly, even where indexes are based on identical securities, they may measure the relevant market differently because of differences in methods of calculation. Often the market prices of the securities in the index group are "capitalization weighted." That is, in calculating the index value, the market price of each constituent security is multiplied by the number of shares outstanding. Because of this method of calculation, changes in the prices of the securities of larger corporations will generally have a greater influence on the level of a capitalization weighted index than price changes affecting smaller corporations.

Other methods may be used to calculate stock indexes. For example, in one method known as "equal-dollar weighting," the index is established by establishing an aggregate market value for every constituent security of the index and then determining the number of shares of each security by dividing such aggregate market value by the then current market price of the security. The base level of the index is established by dividing the total market value of all constituent securities by a fixed index divisor. Thereafter, the number of shares of the constituent securities and the index divisor are adjusted at periodic intervals in order to have each constituent security continue to represent an approximately equal dollar value in the index without distorting the level of the index.

Another method of calculation is simply to add up the prices of the securities in the index and divide by the number of securities in the index, disregarding numbers of shares outstanding. Another method measures daily percentage movements of prices by averaging the percentage price changes of all securities included in the index.

Investors should keep in mind that a stock index can respond only to reported price movements in its component securities. An index will therefore reflect the stock market as a whole, or particular market segments, only to the extent that the securities in the index are being traded, the prices of those trades are being promptly reported, and the market prices of those securities, as measured by the index, reflect price movements in the relevant markets. The index level will be affected by all of the factors that may at the time affect prices in the relevant markets for the constituent securities of the index, including, among other things, applicable laws, regulations and trading rules, the market-making and order processing systems of those markets, the liquidity and efficiency of those markets, and the prices and price behavior of futures contracts on that index or a related index.

Index options may be traded on underlying indexes designed to reflect the net asset values of selected mutual funds in specified categories. For example, an underlying index may be designed to reflect the net asset value of a selected group of growth funds, or a selected group of growth and income funds. These indexes are calculated and disseminated based on the reported net asset values of the mutual funds included in the index. Mutual funds typically report their net asset values only once per day following the close of trading in the primary markets for the securities held in the funds' investment portfolios. Mutual fund indexes are based on these closing values and are not updated during the trading day. Mutual fund indexes as reported during the trading day will thus be based on non-current information, not only because the funds' portfolios may have changed since the previous day's close, but also because the values of the funds' portfolio securities during the trading day may vary from their values at the previous day's close. Therefore, reported fund index values should not be relied upon as indicative of the current values of the mutual funds included in the indexes. In this respect, mutual fund indexes are comparable to other indexes that are not updated during the trading day, including certain foreign stock indexes. These other indexes are not updated because their component stocks may not be traded in their primary home country markets during all or part of the options trading day.

Dividend Indexes

Dividend indexes measure the stock price changes of the component securities of underlying indexes that result solely from the distribution of ordinary cash dividends, as calculated on their respective ex-dividend dates. As of the date of this document, dividend indexes on which options are approved to be traded are based on the accumulated "ex-dividend amounts" reflecting ordinary cash dividends for the component securities over a specified accrual period. Investors should note that determinations by the reporting authority for a dividend index as to whether a cash dividend is "ordinary" and therefore reflected in the index may be made using rules other than those relating to adjustments of stock options and described in Chapter III under "Features of Stock Options." At the end of each accrual period, the value of a dividend index is reset to zero. The values of dividend indexes are typically published once per trading day, and these values could be affected by an issuer's determination to pay stock dividends in lieu of cash dividends or to forego payment of cash dividends. An "ex-dividend amount" is the amount by which the market price of a stock decreases on the ex-dividend date to reflect the dividend that will be received by holders of the stock immediately prior to the ex-dividend date. The "ex-dividend amount" is calculated by the reporting authority for the index, and information as to the method of calculation is available from the listing options market. Investors must understand the method used to calculate dividend indexes in order to understand the relationship between current dividend index values and the prices of dividend index options.

Variability Indexes

Variability indexes, and investment strategies involving the use of variability options, are inherently complex. You should be certain that you understand the method of calculation and significance of any variability index and the uses for which variability options based on that index are suited before buying or selling the options.

Economic, political, social and other events affecting the *level* of the reference index or the *price* of the reference security may also affect the *variability* of the reference index or reference security. Variability indexes based on equity securities have historically tended to move inversely to their reference indexes, since variability, whether in the form of variance or volatility, tends to be associated with turmoil in the stock markets and turmoil tends to be associated with downward moves in the stock market. But this relationship does not always hold true and, indeed, a variability index may be rising at a time when its reference index or the price of its reference security is also rising.

As with other index options, a call variability option will be in the money at exercise if the exercise settlement value of the underlying index is above the exercise price of the option, and a put variability option will be in the money at exercise if the exercise settlement value of the underlying index is below the exercise price of the option. Whether the variability option is in the money is determined in relation only to the value of the underlying variability index, and not in relation to the reference index or reference security.

The information set forth below under the caption "Features of Index Options" is generally applicable to variability options. However, **the method of determining the exercise settlement value for certain variability options may differ from those for other index options**, and you should read the information below relating to the particular types of variability options you wish to trade. **Note also that variability options may have expiration dates that are different from those of other index options**. You should be sure that you know the expiration date for each variability option you wish to buy or write.

As of the date of this document, options are approved for trading on three different types of variability indexes representing three different ways of measuring variability. A **realized variance index** represents the variability of returns of a specified **reference index** or reference security (in either case, a "**reference interest**") over a specified period of time relative to an average (mean) daily return of zero. The **realized volatility** of the same index over the same time period, also referred to as the standard deviation, is equal to the square root of the realized variance. Both of these measures are calculated from historical index values over the relevant period of time. An **implied volatility index** is a measure of the predicted future variability of the reference interest over a specified future time period. It measures the predicted standard deviation of the daily returns of the reference interest measured over the specified future time period. An implied volatility index reflects predictions about the future volatility of the reference interest as those predictions are implied by reported current premium values for options on the reference interest. The realized volatility of the reference interest may not conform to those predictions.

There are various methods of estimating implied volatility, and different methods may provide different estimates. Under the method that is used for volatility options that are traded at the date of this document, implied volatility index values are calculated using premium values of certain series of options on the reference interest in expiration months or weeks that are selected and weighted to yield a measure of the volatility of the reference interest over a specified future time period. For some volatility options, the premium values used in the calculation are for out-of-the-money options series; for other volatility options, they are for hypothetical at-the-money options series. For example, an implied volatility index that is calculated using one of these methods and that is designed to provide a prediction of volatility over 30 calendar days is based on premium values of at-the-money options series on the reference interest expiring in the two nearest months with at least 7 calendar days left to expiration. Implied volatility index values will be affected by any factor that affects the component options series of the index, including, among other things, applicable laws, regulations and trading rules, the market-making and order processing systems of the markets on which the options are traded, and the liquidity and efficiency of those markets.

Implied volatility options that are described in this document are European-style and "A.M.-settled," which means that the exercise settlement values are derived from opening values of the component put and call options or from the values of put and call options calculated during one or more periods of time at or near the opening of trading. For one type of implied volatility option, the exercise settlement value is calculated from actual opening premium prices of the relevant series of options on the reference interest or, if the option has no opening trades, the mid-point between the bid and offer premium quotations. For another type of implied volatility option, the exercise settlement value is calculated from the mid-point of the bid and offer premium quotations for the relevant series of options on the reference interest as determined at the opening of trading. For a third type of implied volatility option, the exercise settlement value is calculated from actual premium prices of the relevant series of options on the reference

interest during a specified period or periods of time commencing at or near the opening of trading or, if the option has no trades during the specified observation period or periods, from the mid-point of the bid and offer premium quotation during the particular observation period for that series. For all these types of implied volatility options, all other index values for each of these implied volatility indexes are calculated using the mid-points of the bid and offer premium quotations of and/or actual trade prices of the options series that comprise the index. (Where these index values are based on quotations and/or actual trade prices they are sometimes referred to as "indicative values.")

Because different values may be used in calculating the indicative values and exercise settlement values for implied volatility options, **there is a risk that there may be a divergence between the exercise settlement value for implied volatility options and an indicative value calculated at the opening on the date on which the exercise settlement value is being determined**. This risk is described further in Chapter X of this document, under the heading "Special Risks of Index Options." Additional information regarding the method used to calculate the values of a particular implied volatility index is available from the market on which options on that index are traded.

Investors should keep in mind that indicative values of an implied volatility index can reflect changes in the implied volatility of the reference interest only to the extent that quotations of the component options of the index are current. Indicative values for an implied volatility index may be disseminated, and implied volatility options may be traded, during times when the reference security or one or more component securities in the reference index are not trading, or when the quotations for the reference security or one or more of the options series comprising the implied volatility index are not current. Similarly, an exercise settlement value for an implied volatility index may be calculated even if one or more component securities in the reference index are not trading. In any of these cases, an indicative value or exercise settlement value will be based on non-current information. The quality of the information reflected in the values of an implied volatility index should be evaluated in light of the depth and liquidity of the markets for the securities in the reference index and the options that are the components of the index.

The realized variability indexes underlying variability options approved for trading as of the date of this document measure the actual volatility or variance, as the case may be, of the reference index for a fixed period ending on the last trading day before the expiration date for the variability option. As of December 2009, indicative values for a realized variability index are published once per trading day during the fixed period, but values published early in the period, which are based on a small number of observations, may vary substantially from the exercise settlement value. The exercise settlement amount for a realized variability option is equal to the difference between the exercise settlement value and the exercise price of the option, times a multiplier.

Realized variability options that are described in this document are European-style and "A.M.-settled." The initial and final values of a reference index for purposes of calculating the exercise settlement value for realized variability options described in this document are ordinarily calculated from the *actual opening prices* of the component securities of the reference index in their primary market. If a component security does not open for trading, the last reported price in the primary market may be used. OCC's rules provide for other methods of determining the exercise settlement value of a reference index in extraordinary circumstances. All other values for realized variability indexes are calculated from the published closing value of the reference index.

Strategy-Based Indexes

Strategy-based indexes are complex, and their calculations may involve the use of multiple variables, including the values of equity securities and options on those securities. Strategies based on options on these indexes, referred to as "strategy-based index options," are also complex. Investors should be certain that they understand the method of calculation and

significance of any strategy-based index and the uses for which strategy-based index options are suited before buying or selling the options.

Strategy-based indexes measure the returns from investment strategies involving the purchase and sale of various securities. All of the securities purchased and sold pursuant to the strategy are deemed to be the component securities of the strategy-based index. As of December 2009, the only strategy-based index on which options are approved to be traded is a buy-write index measuring the return on a hypothetical "buy-write" strategy involving the simultaneous writing of call options on a stock index and purchase of the component securities of that index. Under the hypothetical strategy, a succession of at the money index call options with one month to expiration are assumed to be written, and the proceeds (*i.e.*, the premiums received) from writing the options are assumed to be invested in a weighted basket of the component securities that mirrors the index. Dividends received from ownership of the component securities of the index are similarly assumed to be reinvested in the basket of securities. The options are deemed held until expiration, and new call options are assumed to be written on the business day immediately after the settlement value is determined. All options written under the buy-write strategy are deemed to have been assigned an exercise notice on the expiration date if in the money on that date, and to have expired without value if out of the money on the expiration date. The buy-write index measures the cumulative gross rate of return of the strategy since the inception of the index. The index will therefore rise during periods when the strategy is profitable and decline when it is unprofitable. The following example illustrates the calculation of the buy-write index.

EXAMPLE: *Assume that the buy-write index has a value of 800 on January 1. The return from the buy-write strategy, taking into account the returns of the component securities of the stock index and of the options assumed to be written on the index, is 0.5% and 1% on January 2 and 3, respectively. The index value at the end of a given trading day is equal to the previous closing value of the index multiplied by one plus the rate of return for that trading day. In this example, the value of the buy-write index at the close of trading on January 3 would be 812.04 (800 x 1.005 x 1.01). Assume that the return of the buy-write strategy on January 4, again taking into account the returns of the component securities of the stock index and of the options assumed written on that index, is a negative 0.7%. The value of the buy-write index at the close of trading on January 4 would be 806.36 (812.04 x .993).*

The calculation of the buy-write index, as in the case of any strategy-based index, requires the making of assumptions about, for example, the timing of transactions involved with a particular strategy and the prices received or paid for the securities traded (which are determined using market data for specified time periods). The index is calculated throughout the trading day using reported values for the reference index and reported premium values for the options as well as the value of any ordinary dividends payable on the component securities. The calculation of the index assumes that transactions can be continuously executed, *i.e.*, that there will be no market disruptions, and may use assumed prices equal to volume-weighted average prices, which may not be the same as the prices an investor employing the strategy would pay or receive. Detailed information regarding calculation of the buy-write index is available from the exchange on which the options are traded. A special opening value for the reference index is used in calculating the index on the date that a new option is written to replace an expiring option, which is known as a **roll date**, and special procedures are used on roll dates to reflect the hypothetical transactions that are assumed to take place on those dates.

Relative Performance Indexes

A relative performance index measures the relative performance—generally the relative total return—of two index components. As of January 2012, the only relative performance options approved for trading are options on indexes of which both index components are equity securities

(one or both of which could be non-leveraged fund shares). One of the components in each pair is referred to as the **target component** and the second is referred to as the **benchmark component**. The index is calculated by measuring the total return of the target component relative to the total return of the benchmark component. The index will rise as and to the extent that the target component outperforms the benchmark component, and will fall as and to the extent that the opposite occurs. The value of the relative performance index will be set to a base value, such as 100, initially. The following example illustrates the calculation of a relative performance index.

EXAMPLE: *Assume that a relative performance index has an initial base value of 100. If the total return of the target component in one day is 10% and the total return of the benchmark component in the one day period is 9%, the index value of the relative performance index at the end of the one day period would equal 100 x (1 + 10%) / (1 + 9%) = 100.92. If the total return of the target component in the one day period is 9% and the total return of the benchmark component in the one day period is 10%, the index value of the relative performance index at the end of the one day period would equal 100 x (1 + 9%) / (1 + 10%) = 99.09.*

The example above illustrates only a scenario where the total return assumed is for a one day period. Other periods would yield different results. Market participants should contact the exchange on which these options are traded for a more complete description of the index calculation methodology.

Investors should be certain that they understand the method of calculation of any relative performance index and the uses for which relative performance options are suited before buying or selling such options. Different relative performance indexes may measure relative performance in different ways. Investors should contact the listing options market for information on the method of calculation of a particular relative performance index.

In the event that one of the index components in an underlying relative performance index is eliminated as the result of a cash-out merger or other event, the reporting authority may cease to publish the value of the index. In that case, the exercise settlement value of the options would become fixed based upon the last published value for the index, and the market on which the options are traded may determine to accelerate the expiration date for the options (and, in the case of European-style options, their exercisability). The expiration date will ordinarily be accelerated to fall on the next standard expiration date for options as specified in OCC's rules or on such other date as OCC establishes in consultation with the market on which the options are traded. All options that are not in the money will become worthless and all that are in the money will have no time value. Holders of an in-the-money option whose expiration date is accelerated must be prepared to exercise that option prior to the accelerated exercise cut-off time in order to prevent the option from expiring unexercised. Writers of European-style options whose expiration date is subject to being accelerated bear the risk that, in the event of such an acceleration, they may be assigned an exercise notice and be required to perform their obligations as writers prior to the original expiration date. As with any other option for which the expiration date is accelerated, no adjustment would be made to compensate for the accelerated expiration date of a relative performance option.

Foreign Currency Indexes

Foreign currency indexes are designed to reflect the value of one currency, often the U.S. dollar, against a basket of foreign currencies. Foreign currency indexes are calculated using **exchange rates**, *i.e.*, the prices of currencies in terms of other currencies. An exchange rate is often expressed as a **currency pair** (*e.g.*, the price of euros in terms of U.S. dollars is expressed as EUR/USD). In a currency pair, the first currency is called the **base currency** and the second currency is called the **quote currency**. The exchange rate for a **currency pair** is how much of the **quote currency** is needed to purchase one unit of the base currency. Different foreign currency indexes are calculated in different

ways. Accordingly, there may be situations in which foreign currency indexes are based on the same component currency pairs but rely on different sources of exchange rate data or measure the relevant exchange rates differently because of differences in methods of calculation or weighting. A foreign currency index may be designed so that each component currency pair is weighted equally or weighted to conform to another static or dynamic benchmark as determined by the index provider. A foreign currency index, like a stock index, is ordinarily expressed in relation to a "base" established when the index was originated.

EXAMPLE: *On the starting or "base" date of a new foreign currency index representing a basket of four currency pairs measured against the U.S. dollar — e.g., the price of euros in terms of U.S. dollars is expressed as EUR/USD, the price of British Pounds in terms of U.S. dollars is expressed as GBP/USD, the price of U.S. dollars in terms of Japanese yen is expressed as USD/JPY and the price of Australian dollars in terms of U.S. dollars is expressed as AUD/USD — the index may be set to be equally weighted so that each component currency pair has equal influence on the overall index value. This may be accomplished by assuming a $10,000 position in each component currency pair. The index value would be calculated by multiplying (or dividing, in the case of a USD/JPY currency pair) each currency pair position by the spot exchange rate for the currency pair. The value, in dollars, of each foreign currency would be deducted from $20,000. This method is used in order to effectively invert the value of the currency pair, so that the index value will increase when the value of the U.S. dollar increases and decrease when the value of the U.S. dollar decreases. The sum of the resulting differences would be divided by the "divisor." The divisor is a number that is fixed on the base date — in this example, four — selected so that the index value on the base date equals 10,000. Accordingly, if the value of the U.S. dollar against the Euro increases by 2% the next day (i.e., the value of the EUR/USD position decreases to $9,800 from $10,000, which subtracted from $20,000 equals $10,200), while the GBP/USD, USD/JPY and AUD/USD exchange rates remained the same, the index level would rise to 10,050 ((10,200 + 10,000 + 10,000 + 10,000)/4).*

The base of the foreign currency index may be adjusted from time to time if certain "rebalancing events" occur, as determined by the index provider. An index might be structured so that it is not rebalanced unless the exchange rate for one of the component currency pairs drops by more than 90% from its original base or upon the occurrence of extraordinary events in the global currency markets. Adjustments in the base level of an index or other similar changes are within the discretion of the publisher of the index and will not ordinarily cause any adjustment in the terms of outstanding index options. However, OCC has authority to make adjustments if the publisher of the underlying index makes a change in the index's composition or method of calculation that, in OCC's determination, may cause significant discontinuity in the index level.

Information Concerning Underlying Indexes

Certain trading strategies involving purchases and sales of index options, index futures, options on index futures or portfolios of certain of the securities in an index can affect the value of the index, the prices of the index futures, and, therefore, the prices of index options. These transactions and the resulting impact may occur at any time — and may accompany significant changes in the prices or volatilities of the stock and derivative markets — including at or shortly before an expiration. For example, traders holding positions in expiring index options or futures contracts hedged by positions in securities included in the index may attempt to liquidate their securities positions at or near the time for determining the final exercise settlement value of the options or futures contracts. The resulting orders to liquidate these securities might result in significant changes in the level of the index. Index options investors should be aware of the potential impact that these trading strategies can have on index levels at or near expiration, and the possibility that the values of index option positions will be affected accordingly.

Readers who intend to trade index options should familiarize themselves with the basic features of the underlying indexes, including the general methods of calculation. Readers who are attempting to follow a precise and sophisticated strategy involving index options may wish to inform themselves about the exact method for calculating each index involved. Information regarding the method of calculation of any index on which options are traded, including information concerning the standards used in adjusting the index, adding or deleting securities, and making similar changes, is generally available from the options market where the options are traded.

The value level of every index underlying an option—including the exercise settlement value—is the value of the index as reported by the reporting authority designated by the options market where the option is traded as the official source for determining that index's value. Unless OCC directs otherwise, every value as initially reported by the reporting authority is conclusively presumed to be accurate and deemed to be final for the purpose of calculating the cash settlement amount, or, in the case of a binary index option, whether the option is automatically exercised and returns a cash settlement amount. This is true even if the value is subsequently revised or determined to have been inaccurate.

With some exceptions, such as those noted above with regard to mutual fund indexes, certain foreign stock indexes, realized variance and realized volatility indexes, and dividend indexes, the values of indexes are ordinarily updated throughout the trading day. Investors may determine current index levels from their brokerage firms. However, an index option may be traded in the options markets at a time when some, or even a substantial portion, of the components of the underlying index are not trading or when there is a lag in the reporting of prices in some or all of the components. Information regarding the method of calculation of any index on which options are traded, including information concerning the standards used in adjusting the index, adding or deleting components of the index, and making similar changes, and on any modification of the index in determining the underlying value for the options, is generally available from the options market where the options are traded.

Features of Index Options

All index options that are traded on the date of this document are **cash-settled**. Cash-settled index options do not relate to a particular number of shares. Rather, the "size" of a cash-settled index option is determined by the **multiplier** of the option. The "size" of a range option is determined by its multiplier and maximum range exercise value, and is equal to the maximum cash settlement amount (*i.e.*, the maximum range exercise value times the multiplier). In the case of a binary index option, the "size" of the contract is simply its fixed cash settlement amount, which for certain binary index options is defined as the product of a fixed settlement value times a multiplier.

The underlying interest for an index option may be a fraction or multiple of a particular index. An option on a fraction or multiple of a particular index is equivalent to an option on the full value of the index, but with a different contract size. Investors in index options should be aware that the underlying interest for an index option may not be the full value of a published index with which they are familiar.

The **exercise prices** and **premiums** of the index options that are traded at the date of this document are expressed in U.S. dollars. Subject to regulatory approval, trading in index options whose exercise prices or premiums are expressed in a foreign currency may be introduced in the future. The total premium and total exercise price for a single index option (other than a binary index option or a range option) are, respectively, the stated premium and exercise price multiplied by the multiplier.

EXAMPLE: *An investor purchases a December 100 index call at $2.15. The multiplier for that option is 100. The aggregate dollar amount of the premium is $215.00 ($2.15 times 100 = $215.00). Had the options market used a multiplier of 200, a premium of $2.15 would have meant an aggregate premium of $430.00. Had the options market used a multiplier of 1, a premium of $2.15 would have meant an aggregate premium of $2.15.*

The **exercise settlement values** of options on securities indexes are determined by their reporting authorities in a variety of ways. The exercise settlement values of some index options are based on the reported level of the underlying index derived from the last reported prices of the component securities of the index at the closing on the day of exercise. The exercise settlement values of other options are based on the reported level of the index derived from the opening prices of the component securities on the day of exercise. Other means for determining the exercise settlement values of some index options series have been, and may continue to be, established. For example, the exercise settlement values for options on an index of foreign securities may be fixed in relation to a value fixed by a foreign exchange. Additionally, some implied volatility options calculate the exercise settlement value by utilizing the mid-point of the bid and offering premium quotations at the opening of trading of the relevant series of the put and call options on the reference interest. If an option is exercised on a day that is not scheduled as a trading day for the component securities of the index, the exercise settlement value is based on the reported level of the index derived from the opening or closing prices (depending on the options series) of the component securities on the last prior day that is scheduled as a trading day. If a particular component security does not open for trading on the day the exercise settlement value is determined, a substitute value, such as the last reported price of that component security, is used.

Adjustment of Index Options

No adjustments will ordinarily be made in the terms of index option contracts in the event that index components are added to or deleted from the underlying index or reference index or when the relative weight of one or more such index components has changed. However, if OCC determines that any such addition, deletion, or change causes significant discontinuity in the level of the underlying index or reference index, OCC may adjust the terms of the affected index option contracts by adjusting the index multiplier and/or exercise price with respect to such contracts or by taking such other action as OCC deems fair to both the holders and writers of such contracts.

If the option market on which an option series is traded should increase or decrease the index multiplier for any index option contract, or the reporting authority should change the method of calculation of an underlying index or reference index so as to create a discontinuity or change in the level of the index that does not reflect a change in the prices or values of the index components, or a successor index (as defined in the paragraph below) should be substituted for an underlying index or reference index, OCC may make such adjustments in the number of outstanding affected options or the exercise prices of such options or such other adjustments, if any, as OCC deems fair to both the holders and the writers of such options.

OCC may substitute another index (a successor index) for an underlying index or reference index in the event OCC determines that: (i) publication of the underlying index or reference index has been discontinued; (ii) the underlying index or reference index has been replaced by another index; or (iii) the composition or method of calculation of an underlying index or reference index is so materially changed since its selection as an underlying index or reference index that it is deemed to be a different index. A successor index will be reasonably comparable to the original underlying index or reference index for which it substitutes. An index may be created specifically for the purpose of becoming a successor index.

OCC's determinations shall be conclusive, binding on all investors, and not subject to review.

Investors should be aware that the exercise settlement value of an option on a security index that is derived from the opening prices of the component securities of the index may not be reported for several hours following the opening of trading in those securities. A number of updated index levels may be reported at and after the opening before the exercise settlement value is reported, and there could be a substantial divergence between those reported index levels and the reported exercise settlement value.

The principal risks of holders and writers of index options are discussed in Chapter X. Readers interested in buying or writing index options should carefully read that chapter, particularly the discussions under the headings "Risks of Option Holders," "Risks of Option Writers," "Other Risks," and "Special Risks of Index Options." Readers interested in buying or writing options on foreign currency indexes should additionally read the discussion under the heading "Special Risks of Foreign Currency Options," which discusses the risks of foreign currency options, many of which are applicable to foreign currency index options.

CHAPTER V

Debt Options and Credit Default Options

Three kinds of debt options have been approved for trading as of May 2010. Two of these kinds are sometimes referred to as **price-based options**. Price-based options are options which give their holders the right either to purchase or sell a specified underlying debt security or to receive a cash settlement payment based on the value of an underlying debt security (depending on whether the options are physical delivery or cash-settled options). Options on securities issued by the U.S. Treasury are one kind of price-based debt options. Options on **index-linked securities** are a second kind of price-based debt options. An "index-linked security" is a debt security that trades on one or more exchanges similarly to an equity security, and that provides a cash return to its owner based on the performance of a "reference asset" which may, for example, consist of a securities or commodities index, a futures index, a physical commodity, a foreign currency, another debt security, or some combination of the above. The term "index" in the context of an index-linked security has a broader meaning than that set forth in Chapter IV since, in the context of an index-linked security, the term is a synonym for the term "reference asset" and is not limited to securities indexes.

A third kind of debt options, called **yield-based options**, are options that are cash-settled based on the difference between the exercise price and the value of an underlying yield. As of May 2010, all yield-based options that have been approved for trading are based on the yields of U.S. Treasury securities. The distinctions between price-based and yield-based options are fundamental and should be understood by readers interested in investing in debt options.

A fourth kind of options, called **credit default options**, are also described in this Chapter. Credit default options are cash-settled options that are related to the creditworthiness of issuers or guarantors of debt securities, and are exercised upon confirmation of a credit event affecting an underlying debt security or securities.

The principal risks of holders and writers of debt options and credit default options are discussed in Chapter X. Readers interested in buying or writing debt options or credit default options should not only read this chapter but should also carefully read Chapter X, particularly the discussions under the headings "Risks of Option Holders," "Risks of Option Writers," "Other Risks," "Special Risks of Debt Options," and "Special Risks of Credit Default Options."

Rates, Yields and Prices of Debt Securities

To understand debt options, an investor should understand the relationship between the **rates** or **yields**, which are different ways of expressing return on debt securities, and prices of debt securities. (Coupon interest **rates** of a debt security express return as a percentage of the principal amount (par value) of the security. **Yields** express return (or projected return) as a percentage of the amount invested.) This relationship, simply stated, is that prices of debt securities move **inversely** to changes in rates. Declining rates, whether on long-term bonds or money market instruments, will generally cause prices of outstanding debt securities to increase. Conversely, rising rates across a particular maturity spectrum will generally cause the prices of outstanding debt securities of that maturity to decline.

EXAMPLE: *A 30-year Treasury bond pays interest at a 12% coupon rate. The only time prior to maturity that investors will pay a price of 100 (that is, 100% of par value) for the bond is when the prevailing yield on such long-term Treasury bonds is exactly 12%. Should rates move higher to, say, 14% for such Treasury bonds, the price of an outstanding 12% bond would have to decline to about 86 in order for the bond to yield 14%. If rates on such bonds subsequently decline to 10%, the price of the 12% bond could be expected to rise substantially above par, since it would yield 10% at a price of 120.*

Price-based call options become more valuable as the prices of the underlying debt securities increase, and price-based puts become more valuable as the prices of the underlying debt securities decline. The relationship between interest rate changes, prices, and the value of price-based debt options can be expressed as follows:

Interest Rates (Yields) ↓	=	Prices ↑	=	Call ↑
				Put ↓
Interest Rates (Yields) ↑	=	Prices ↓	=	Call ↓
				Put ↑

In contrast, the exercise settlement value of a yield-based option is based on the difference between the value of an **underlying yield** and the exercise price of the option. Since the **underlying yields** of yield-based options will increase as interest rates increase, and vice-versa, it follows that **yield-based calls become more valuable as yields rise (*i.e.*, as the prices of the debt securities from which the underlying yield is derived decline), and puts become more valuable as yields decline (and prices of such securities increase)**. These relationships can be expressed as follows:

Interest Rates (Yields) ↓	=	Prices ↑	=	Call ↓
				Put ↑
Interest Rates (Yields) ↑	=	Prices ↓	=	Call ↑
				Put ↓

Treasury Securities

The underlying debt securities of one kind of price-based options that have been approved for trading as of May 2010, and the debt securities from which the underlying yields of yield-based options are derived, are Treasury securities—*e.g.*, 30-year Treasury bonds, 10-year Treasury notes, 5-year Treasury notes and Treasury bills.

Treasury bonds and notes are direct obligations of the United States that pay a fixed rate of interest semi-annually. Bonds are issued for maturities of more than ten years (although many issues are callable prior to maturity). Notes are issued for maturities of one to ten years, and are non-callable. New issues of bonds and notes are sold periodically by the Treasury, usually on an auction basis. The auction price is established by bidding and may be above or below par value. Occasionally the Treasury will "reopen" an outstanding issue by auctioning additional principal amounts. Government

securities dealers make secondary markets in virtually all outstanding issues, but market activity and liquidity tend to center on the most recently auctioned issues.

Unlike Treasury bonds and notes, Treasury bills do not pay interest. Instead, the Treasury sells bills at a discount from their principal amount (par value). The investment return consists of the difference between the discounted purchase price and the principal amount payable at maturity. Treasury bills are issued in maturities of 13, 26 or 52 weeks.

Return on Treasury bills is commonly expressed in terms of a discount rate which represents an annualization (based on a 360-day year) of the percentage discount at which the bills are sold.

EXAMPLE: *If a 13-week (91-day) Treasury bill with a principal amount of $1,000,000 is sold for $970,000, the actual discount would be $30,000 or 3% and the discount rate would be approximately 11.9% (360/91 times 3%).*

Bills are auctioned by the Treasury on a regular basis, typically at weekly intervals for 13-week and 26-week bills and every four weeks for 52-week bills. While dealers maintain secondary markets in all outstanding Treasury bills, activity tends to center in the most recently auctioned issues. These are commonly referred to as the "current" 13-week, 26-week, and "year" bills, respectively.

Yield-Based Options

The **underlying yield** of yield-based options is the annualized yield to maturity of the most recently issued Treasury security of a designated maturity—*e.g.*, 30-year, 10-year, 5-year—based upon quotations or prices determined in accordance with a method specified by the options market on which the option is traded. If such security is a Treasury bill, the underlying yield is the annualized discount of the Treasury bill. (A discount represents a percentage of principal amount, rather than a return on investment, and is therefore not a true yield.) Underlying yield is stated in terms of a **yield indicator**, which is the percentage yield multiplied by ten. For example, if the yield is based on a Treasury bill having an annualized discount of 8.715%, the **yield indicator** would be 87.15.

The designated maturity of the Treasury security from which the underlying yield may be determined is a standardized term of a yield-based option. The specific Treasury security having that maturity is not fixed; rather, the underlying yield is derived from the outstanding security of the designated maturity that has the longest remaining life. Newly-auctioned securities having the longest remaining life will replace old issues on the first trading day following their auction. Thus, the specific Treasury security from which the underlying yield is derived may change during the life of the option. Because yield-based options are European-style options, investors ordinarily will know prior to the time an option is exercisable the specific Treasury security from which its exercise settlement value will be determined. However, an option may often be traded for weeks or months before that specific security is auctioned by the Treasury. During that time, trading in the option will be based upon the yield for the Treasury security of the designated maturity that then has the longest remaining life.

EXAMPLE: *Yield-based options whose yield is based on 5-year Treasury notes expiring in December are opened for trading on the business day following the September auction of 5-year notes. Trading in the options will be based upon current yields for the September issue until the October auction of 5-year notes. Beginning on the trading day following the October auction, trading will be based upon current yields for the new 5-year notes. The same process will occur in November. If the options expire on or after the auction date for 5-year notes in December, their exercise settlement value will be based upon the then current yield for the December issue.*

Current bid and asked quotations for recently issued Treasury securities of particular maturities are available from normal market sources. Current yield indicator values based upon a sampling of bid and asked quotations from primary dealers are disseminated at frequent intervals during the trading day by an options reporting source. **Exercise settlement values** for yield-based options whose underlying yields are derived from Treasury securities are based upon the spot yield for the security at a designated time on the last trading day of the option, as announced by the Federal Reserve Bank of New York.

The aggregate **cash settlement amount** that the assigned writer of a yield-based option is obligated to pay the exercising option holder is the difference between the exercise price of the option and the **exercise settlement value** of the underlying yield on the last trading day before expiration, as reported by a designated reporting authority, multiplied by the multiplier for the option. Different yield-based options may have different multipliers.

The **exercise prices** of yield-based options are expressed in terms of the yield indicator. For example, an exercise price of 82.50 would represent a yield of 8.25%.

Each point of **premium** will correspond to .1% in yield. The dollar value of the premium for a single yield-based option will equal the quoted premium multiplied by the dollar value of the option multiplier. Thus, a premium of 2½ would equal a premium of $250 for an option having a multiplier of 100, or $5000 for an option having a multiplier of 2000.

The premiums of yield-based options are affected by the factors discussed under "Premium" in Chapter II. Because yield-based options are European-style options and the underlying yield is determined from the most recently auctioned Treasury security with the longest remaining life, a major factor affecting the pricing of such options is likely to be the estimates of market participants of the anticipated yield at expiration, and current yield may be a less significant pricing factor.

Settlement of exercises of yield-based options takes place on the business day immediately following the day of exercise. Investors may determine from their brokerage firms when and how settlement amounts will be credited or debited to their brokerage accounts.

If the U.S. Department of the Treasury ceases to issue, or changes the terms or the schedule of issuance of, Treasury securities on which underlying yields are based, OCC has discretion to adjust the terms of the series by substituting other Treasury securities or to make such other adjustment as OCC may determine. If the options market on which a particular yield-based option is traded should increase or decrease the multiplier for the option, OCC has discretion to adjust outstanding options affected by the change by proportionately consolidating or subdividing them or by taking other action.

Rules of the options market on which yield-based options are traded may permit or require suspension of trading in the options if current quotations for the last-auctioned Treasury securities of the designated maturity become unavailable or unreliable. For a discussion of the risks involved in trading halts, see the discussion in Chapter X under "Other Risks."

Options on Conventional Index–Linked Securities

Index-linked securities are debt securities that trade on exchanges similarly to equity securities. Index-linked securities are issued by financial institutions such as banks and may take the form of trust certificates, units or some other interest. An index-linked security provides owners with a cash return based on the performance of a "reference asset" which may, for example, consist of a securities or commodities index, a futures index, a physical commodity, a foreign currency, another debt security, or some combination of the above. References in this document to "units" of underlying index-linked securities include these various forms of interests. The term "index" in the

context of an index-linked security has a broader meaning than that set forth in Chapter IV because, in the context of an index-linked security, the term is a synonym for the term "reference asset" and is not limited to securities indexes. As of May 2010, options are approved to be traded on conventional index-linked securities, but not on leveraged or inverse index-linked securities.

As a general rule, a single index-linked security option covers 100 units of the underlying security. However, it is possible that the number of underlying units covered by an index-linked security option would be adjusted after the option is issued if OCC determines, as described below, that it is appropriate to make such an adjustment.

The exercise prices of options on index-linked securities that are approved for trading as of May 2010 are stated in U.S. dollars per unit. As with a stock option, the exercise price of an index-linked security option must be multiplied by the number of units underlying the option in order to determine the aggregate exercise price and aggregate premium of the option.

Index-linked securities may be redeemable at certain intervals at the option of the holder through the issuer at a price related to the applicable underlying reference asset, subject to a minimum redemption increment and other conditions. Redemption of index-linked securities may affect the market for the securities by reducing the quantity of securities available for trading. Index-linked securities may return less than the principal originally invested, regardless of the solvency of the issuer of the securities.

An adjustment may be made to certain of the standardized terms of outstanding options on index-linked securities if a particular event occurs that is determined by OCC to warrant the adjustment. As is the case of other stock options, any adjustment decision with respect to options on index-linked securities will be made by OCC.

As a general rule, if the issuer of a particular index-linked security calls the entire issue of the security, the event will be treated like an event in which an underlying equity security is converted into the right to receive a fixed amount of cash. If an event is treated in this manner, when the issue of index-linked securities is called, outstanding options on that issue will be adjusted to require the delivery upon exercise of a fixed amount of cash, and trading in the options will ordinarily cease. As a result, after such an adjustment is made all options on that security that are not in the money will become worthless and all that are in the money will have no time value. The expiration date of the options will ordinarily be accelerated to fall on or shortly after the date on which the underlying security is called. Holders of an in-the-money option whose expiration date is accelerated must be prepared to exercise that option prior to the accelerated exercise cut-off time in order to prevent the option from expiring unexercised. See the discussion in Chapter VIII under "How to Exercise." Writers of options whose expiration date is subject to being accelerated bear the risk that, in the event of such an acceleration, they may be assigned an exercise notice and be required to perform their obligations as writers prior to the original expiration date. When the expiration date of an option is accelerated, no adjustment will be made to compensate for the accelerated expiration date. As with a stock option whose underlying security is converted into a right to receive a fixed amount of cash, there is no assurance that the exercise settlement date for an accelerated index-linked security option will coincide with the date on which the cash payment to the holders of the underlying security becomes available from the issuer. Covered writers of an accelerated option may therefore be required to pay the cash amount in respect of the option before they receive the cash payment on the underlying security.

In contrast to a situation in which the issuer calls an entire issue of index-linked securities, as a general rule no adjustment will be made to the terms of options on index-linked securities in the event of a call of less than an entire issue of the securities. In addition, as a general rule, no adjustment will be made to the terms of options on index-linked securities for any interest payment on the securities.

As is the case with equity options, OCC has discretion to make exceptions to the general rules described above with respect to options on index-linked securities.

Credit Default Options and Credit Default Basket Options

Credit default options are based on debt securities of one or more issuers or guarantors other than the U.S. Treasury. A significant difference between such debt securities and Treasury securities is the non-negligible risk that an issuer or guarantor of debt securities other than Treasury securities may default on its obligations. For example, the issuer might not pay the full interest and face amount of the securities when due or might file for bankruptcy, thereby making it nearly certain that it will not make timely payment of the full interest and face amount. Financial market participants call this **credit risk**. Credit risk is an important component of the value of most debt securities.

Credit default options relate to the credit risk presented by one or more specified debt securities, called **reference obligation(s)**, of one or more specified issuers or guarantors, each of which is called a **reference entity**. The reference obligation(s) and each reference entity for a class of credit default options are selected by the listing options market. When a credit default option is based on reference obligation(s) of more than one issuer or guarantor, it is referred to as a **credit default basket option**. There are further variations on credit default basket options as described below.

A credit default option is automatically exercised and pays a fixed **cash settlement amount** if a **credit event** is confirmed for one or more reference obligations of a reference entity prior to expiration of the option. The reference obligations of a reference entity may include all of the outstanding debt securities constituting general obligations of the reference entity or direct claims on the reference entities (excluding any non-recourse debt). A credit event may include a failure to make a payment on a reference obligation and/or any other event(s) that the listing options market may specify at the time a class of credit default options is listed. The specified credit event(s) will be defined in accordance with the terms of the reference obligation(s). However, not every event that might constitute an event of default by the reference entity under the terms of the reference obligations will necessarily be specified by the listing options market as a credit event. Investors should be certain that they understand the various possible events that will or will not constitute credit events. The determination of whether a particular event meets the criteria of a credit event, however defined, for a specific credit default option is within the sole discretion of the listing options market.

In order to result in automatic exercise of the option, a credit event must be confirmed to have occurred during the **covered period** (*i.e.*, the period between the initial listing of the series of options and the time specified by the options market as the last day of trading of the option series prior to the expiration date). An event that would otherwise be deemed a credit event will not result in an exercise of the option if it occurs either before or after this period. A series of credit default options ordinarily does not expire until a specified number of business days following the end of the covered period in order to provide the listing options market an opportunity to confirm whether or not a credit event occurred within the covered period. If an event otherwise meeting the definition of a credit event occurs after the end of the covered period but before the option expires, the option will not be exercised and will expire worthless.

If the listing options market determines that a credit event has occurred within the covered period for a class of credit default options, it will provide a **credit event confirmation** to OCC, and the options will be automatically exercised. Holders of the exercised options will receive, and writers will be obligated to pay, the fixed cash settlement amount. If OCC does not receive a credit event confirmation from the listing options market before expiration of a series of credit default options, the options will expire worthless.

Credit default options are **binary options** in that they have a specified, all-or-nothing cash settlement amount. Credit default options, however, have additional unique characteristics. For example,

credit default options have no **exercise price** and cannot be **in the money** and have no **intrinsic value**. The discussion of these terms in Chapter I and/or Chapter II of the document is therefore inapplicable to credit default options. In addition, a credit default option is automatically exercised whenever a credit event occurs within the covered period. Credit default options are thus a unique **style of options** and are neither American-style nor European-style.

A **credit default basket option** is similar to an aggregation of individual credit default options, each based on one or more reference obligations of a different **reference entity**. All of the outstanding debt securities constituting general obligations of each reference entity or direct claims on reference entities (excluding non-recourse debt) in the basket may be included in the **reference obligations**.

There are two different kinds of credit default basket options. A **single payout credit default basket option** is automatically exercised and pays a specified cash settlement amount upon the confirmation of the first credit event to occur with respect to a reference obligation of any one of the basket's reference entities. It is exercised only once. Once exercised, the expiration of the option will be accelerated to correspond to the exercise date. A **multiple payout credit default basket option** automatically pays a specified cash settlement amount each time a credit event is confirmed with respect to a reference obligation of any one of the reference entities during the covered period. In the case of either single payout or multiple payout credit default basket options, the listing options market may specify a different cash settlement amount for different reference entities or may specify the same cash settlement amount for each reference entity in the basket. The percentage of the total cash settlement amount that is attributable to any individual reference entity is referred to as its **weight** in the basket. Investors should note that the options markets on which credit default basket options trade may determine "weight" according to their own specified rules, and investors should contact the listing options market for information about how it determines weight. In the case of a multiple payout credit default basket option, a cash settlement amount will be paid only once with respect to any particular reference entity, after which time the affected reference entity will be removed from the credit default basket.

Premiums for both credit default options and credit default basket options are expressed in points and decimals. In order to obtain the aggregate premium for a single option, the quoted premium is multiplied by a premium multiplier specified by the listing options market.

Adjustment of Credit Default Options

Adjustments may be made to the standardized terms of outstanding credit default options when certain events occur, such as a **succession event** or a **redemption event**, both of which will be defined by the listing options market in accordance with the terms of the reference obligations. Adjustments of credit default options will be within the sole discretion of the listing options market. Investors should familiarize themselves with the listing options market's rules and procedures governing credit default option adjustments. The listing option market's rules governing adjustments of outstanding options may be changed with regulatory approval, and the listing options market may have authority to make such exceptions as it deems appropriate to its general adjustment rules.

Redemption Event Adjustments. A **redemption event** occurs when reference obligations of a reference entity are redeemed (or paid in full) by, or on behalf of, the issuer. In the case of all types of credit default options, if only some of the reference obligations are redeemed, the option is ordinarily adjusted such that the remaining reference obligations are the reference obligations for the option and no other adjustment will ordinarily be made. If all of the reference obligations of a reference entity are redeemed and there are other debt obligations of the reference entity that the listing options market deems appropriate to specify as successor reference obligations, then they will be substituted as the reference obligations. If, however, all of the reference obligations of a

reference entity are redeemed and there are no other debt obligations of the reference entity that the listing options market deems appropriate to specify as successor reference obligations for the reference entity (**a complete redemption**), then the adjustment will depend upon whether or not there are other reference entities for the options.

Adjustment of credit default options for a complete redemption. If there is a complete redemption affecting a credit default option, the option will cease trading on the date that the redemption event is confirmed by the listing options market. Expiration of the option will be accelerated to a specified number of days following the confirmation date of the redemption, and the option will expire unexercised if, prior to such expiration, no credit event is confirmed to have occurred prior to the effective date of the redemption event.

EXAMPLE: ***Company XYZ is the reference entity for a credit default option contract and its 8% May 15, 2022 bond issue is the only reference obligation. During the life of the option, Company XYZ redeems the 8% May 15, 2022 bond issue and there are no other obligations of Company XYZ that the listing options market deems to be suitable for specifying as successor reference obligations. The option will cease trading on the confirmation date, and its expiration date will be accelerated. If no credit event is confirmed to have occurred within the covered period, the option will expire worthless.***

Adjustment of credit default basket options for a complete redemption. In the case of a single or multiple payout credit default basket option, if a complete redemption event occurs with respect to one of the reference entities in the basket and no credit event is confirmed, pursuant to the rules of the listing options market, to have occurred prior to the effective date of such redemption event, the options will be adjusted by removing the affected reference entity from the basket of reference entities. **When a reference entity is deleted from the basket of reference entities because of a redemption event, the cash settlement amount of the option will be reduced by an amount reflecting the weight of the deleted reference entity in the basket**. The *relative* weights of the other components in the basket will remain unchanged, although each will represent a proportionally larger percentage of the adjusted cash settlement amount.

EXAMPLE: ***Company XYZ is one of ten reference entities for a class of multiple payout credit default option contracts and its 8% May 15, 2022 bond issue is specified as its only reference obligation. Company XYZ was assigned a weight of 15% when the credit default option was opened for trading. During the life of the option, Company XYZ redeems the 8% May 15, 2022 bond issue. No reference obligations remain and the listing options market determines that there are no other outstanding debt obligations of the issuer suitable for specification as reference obligations. The basket component will be removed from the credit default basket, and the cash settlement amount will be reduced by 15%.***

Succession Event Adjustments. A **succession event** occurs when one or more new entities assume one or more reference obligations of a reference entity or become the obligor with respect to any obligation that is substituted for the original reference obligations. This may occur, for example, when a reference entity is merged into a new entity or spins off a part of its business into a new entity. If, as the result of a succession event, more than one entity is the obligor of the original reference obligations, or obligations that were substituted for the original reference obligations, all of those obligors, including, as the case may be, the original reference entity, are referred to as **successor reference entities**.

Adjustment of credit default options after a succession event. Where a succession event results in assumption of all reference obligations by a single entity, the listing options market will ordinarily adjust the option by substituting the entity that assumes the reference obligation(s) as the

new reference entity. Where a succession event results in more than one successor reference entity, the credit default option may be adjusted by dividing it into two or more options.

EXAMPLE: ***Company XYZ is the reference entity for a credit default option contract, and its 8% May 15, 2022 bond issue is the only reference obligation. During the life of the option, Company XYZ spins off Company LMN. Company XYZ remains the obligor with respect to 70% of the principal amount of the original reference obligation. Company LMN becomes the obligor of a new reference obligation that is issued to holders of the remaining 30% of the original reference obligation. Company XYZ and LMN are identified by the listing options market as the successor entities. Following the succession event, the credit default option based on Company XYZ is adjusted into two separate credit default option contracts that specify Company XYZ and Company LMN as reference entities. The cash settlement amount of the original credit default option and the premium multiplier are allocated between the new credit default options in accordance with the 70/30 division of the reference obligation as specified by the listing options market.***

Adjustment of credit default basket options after a succession event. When a succession event occurs with respect to a reference entity that is included in a single payout or multiple payout credit default basket option, the listing options market will ordinarily adjust the option by replacing the affected reference entity with the successor entity or entities, and, if one or more new obligations are issued to replace some or all of the existing reference obligations, the new obligations will be substituted as the reference obligations. The listing options market will specify the weight of each new reference entity, and the sum of the weights will equal the weight of the original reference entity.

EXAMPLE: ***Company XYZ is one of ten equally weighted reference entities for a multiple payout default basket option and its 8% May 15, 2022 bond issue and its 8.5% September 1, 2030 bond issue are specified as its only reference obligations. During the life of the option, Company XYZ spins off Company LMN. Company XYZ remains the obligor for the 2022 bond issue and LMN becomes the obligor of a debt security issued to holder of the 2030 bond issue. The listing options market adjusts the option by specifying XYZ and LMN as the successor reference entities. The reference obligations are the original 2022 bond issue and the replacement for the 2030 bond issue. The listing options market determines the appropriate basket weight for the successor reference entities is 7.5% and 2.5%. The sum of the newly specified weights equals the 10% weight of the predecessor basket reference entity (Company XYZ) replaced by the successor reference entities (Company XYZ and Company LMN).***

CHAPTER VI

Foreign Currency Options

Foreign currency options—sometimes referred to simply as currency options—are options to purchase or sell one currency at a price denominated in another currency. The price of one currency in terms of another currency is known as an **exchange rate**. The exercise price of a currency option thus represents an exchange rate. The currency in which the premium and exercise price are denominated is referred to as the **trading currency**. The currency to be purchased or sold at the exercise price is the **underlying currency**.

Certain of the foreign currency options discussed in this chapter, which are referred to as **dollar-denominated foreign currency options**, are options to purchase or sell underlying foreign currencies for U.S. dollars, and their exercise prices represent the exchange rates of the underlying foreign currencies with respect to the U.S. dollar. Other options (which are referred to as cross-rate foreign currency options or cross-rate options) that are discussed below under "Cross-Rate Foreign Currency Options" are options to purchase or sell an underlying foreign currency at an exercise price that is denominated in another foreign currency. The exercise price of a cross-rate option therefore represents an exchange rate between two foreign currencies.

Although foreign currency options can be physical delivery options, they may also be cash-settled foreign currency options. These options are discussed below under "Cash-Settled Foreign Currency Options."

The principal risks of holders and writers of foreign currency options are discussed in Chapter X. Readers interested in buying or writing foreign currency options should not only read this chapter but should also carefully read Chapter X, particularly the discussions under the headings "Risks of Option Holders," "Risks of Option Writers," "Other Risks," and "Special Risks of Foreign Currency Options."

Market for Foreign Currencies

Understanding the risks inherent in foreign currency options requires familiarity with the characteristics of the markets for the underlying currencies. Readers will find extensive literature on the subject, and this chapter can do no more than briefly summarize the most fundamental characteristics of those markets as they pertain to foreign currency options.

Foreign exchange rates can be free floating or may be subject to a variety of formal or informal governmental exchange rate control mechanisms. Exchange rates of most Western nations are permitted to fluctuate in value relative to the U.S. dollar and to each other. It must be kept in mind, however, that sovereign governments rarely voluntarily allow their currencies to float freely in response to economic forces. To the contrary, sovereign governments use a variety of techniques, such as intervention by a country's central bank or imposition of regulatory controls, to affect the exchange rates of their currencies. Thus, a special risk in trading options on foreign currencies is that governmental actions might be instituted which could interfere with freely determined currency valuation or even with movement of currencies across borders. These risks are specifically addressed under "Special Risks of Foreign Currency Options" in Chapter X.

The market in foreign currencies exists in every large financial center in the world, and primarily consists of trading by the world's international banks. In contrast to the stock market, the market for foreign currencies is decentralized, essentially free from government regulation designed to protect investors (although, as noted above, governments may take various actions that affect their own currencies and the markets on which they are traded), and extremely large. Trading is generally conducted in units equivalent to $1 million to $5 million, and the market is not structured for trading or delivery of small amounts of currency. While a "retail market" for foreign currencies is available for tourists and others engaged in smaller transactions, the prices available in that market are only

generally related to prices in the "wholesale" interbank market, and it is unlikely that the prices in the retail market will be as favorable as the prices for transactions in large amounts of foreign currency.

Special Characteristics of Foreign Currency Options

Foreign currency options, like other options, provide opportunities for investment and pose risks to investors as a result of fluctuations in the value of the underlying interest. Just as certain options on equity securities are priced in relation to the price of the underlying security, dollar-denominated foreign currency option prices will generally depend in significant part on the U.S. dollar value of the underlying foreign currency. Similarly, the prices of cross-rate options will tend to depend on the relative values of the underlying currency and the trading currency.

The relationship between the value of an underlying foreign currency relative to the trading currency and the prices of options on that underlying foreign currency can be summarized as follows:

1. If the value of an underlying foreign currency rises in relation to the trading currency, call premiums will normally increase and put premiums decrease.

2. If the value of an underlying foreign currency decreases in relation to the trading currency, call premiums will normally decrease and put premiums increase.

EXAMPLE: *Assume a dollar-denominated call option gives its holder the right to purchase British pounds at $1.35 each. At expiration, that option will have intrinsic value if the price of the British pound is above $1.35. At the same time, it will have no intrinsic value if the price of the pound is equal to or below $1.35. The change in the price of British pounds may result from a change in the value of the U.S. dollar relative to all other currencies ("strong" dollar, "weak" dollar), from a change peculiar to the British pound ("strong" pound, "weak" pound), or from a combination of the two. In any case, the final measure of the intrinsic value of the option will be the value of the British pound relative to the U.S. dollar.*

EXAMPLE: *Assume a cross-rate call option gives its holder the right to purchase British pounds at 2.50 euros each. At expiration, that option will have intrinsic value if the price of the British pound in euros is above euros 2.50. It will have no intrinsic value if the price is equal to or below euros 2.50 at that time. Changes in the exchange rate between euros and British pounds may result from changes in the value of euros relative to other currencies generally, from changes in the value of the British pound, or from a combination of the two. In any case, the intrinsic value of the option will be determined by the value of the British pound relative to the euros, and not to the U.S. dollar or any other currency. However, as is noted in the following section, fluctuations in the value of the trading currency relative to other currencies may significantly affect investors who intend to convert their gains or losses into one of those other currencies.*

Readers should note that the various **expiration dates** for foreign currency options are different from the expiration dates for options on other underlying interests. Readers should determine the expiration date of each foreign currency option they wish to buy or write.

Special Features of Dollar-Denominated Foreign Currency Options

The amount of the foreign currency underlying each foreign currency option (*i.e.*, the **unit of trading**) is specified by the options market on which the option is traded.

Non-Rate-Modified Cash-Settled Foreign Currency Options

Exercise prices for currently available dollar-denominated options on foreign currencies (other than the rate-modified currency options, as described below) are stated in units of U.S. currency (*e.g.*, cents or hundredths of a cent) per unit of foreign currency. In order to determine the total exercise price per contract, it is necessary to know the unit of U.S. currency used for options on the particular foreign currency, and to multiply the stated exercise price by the unit of trading for such options. For example, dollar-denominated British pound options may be expressed in U.S. cents per unit, and dollar-denominated Japanese yen options may be expressed in hundredths of U.S. cents per unit.

EXAMPLE: *A dollar-denominated put covering 31,250 British pounds with an exercise price of 130 would entitle the holder to sell the underlying pounds for an aggregate exercise price of $40,625 ($1.30 multiplied by 31,250).*

EXAMPLE: *A dollar-denominated call covering 6,250,000 Japanese yen with an exercise price of 94 would entitle the holder to buy the underlying yen for an aggregate exercise price of $58,750 ($.0094 multiplied by 6,250,000).*

Readers should note, however, that certain exchanges may express exercise prices in other unconventional ways. For example, an exercise price stated as $100.50 may in reality mean $1.0050. Readers need to be sure they fully understand the various conventions used by the exchanges on which they trade in quoting exercise prices.

Because the issuer of a particular foreign currency may unilaterally issue a new currency to replace its existing currency or alter the exchange rate or exchange characteristics of its existing currency with respect to other currencies, OCC has the discretion to adjust the terms of the options on such foreign currency. Ordinarily, the terms of foreign currency options will not be adjusted to reflect a devaluation or revaluation of a currency.

Premiums for currently available dollar-denominated options on foreign currencies (other than rate-modified currency options, as described below) are expressed in units of U.S. currency per unit of foreign currency. In order to calculate the cost of the option, it is necessary to know the unit of U.S. currency used for options on the particular foreign currency.

EXAMPLE: *If a dollar-denominated option covering 62,500 Swiss francs is purchased at a premium of 0.81, the cost of the option will be $506.25 (0.81 cents, or $0.0081, times the unit of trading of 62,500).*

EXAMPLE: *If a dollar-denominated option covering 6,250,000 Japanese yen is purchased at a premium of 0.42, the cost of the option will be $262.50 (0.0042 cents, or $0.000042, times the unit of trading of 6,250,000).*

Readers should note, however, that certain exchanges may express premiums in other unconventional ways. Readers need to be sure they fully understand the various conventions used by the exchanges on which they trade in quoting premiums.

Settlement of exercises of physical delivery dollar-denominated and cross-rate options is significantly different from settlement of exercises of other types of options. The following is a description of the settlement procedures pertaining to such options.

Exercises are settled through the facilities of OCC. For this purpose, OCC may establish banking arrangements permitting it to receive and deliver each underlying foreign currency in the country of origin in satisfaction of option exercises. Clearing Members ordinarily deliver or receive foreign currency on the fourth business day after exercise that is also a banking day for OCC's correspondent bank in the country of origin. In the case of dollar-denominated options, cash settlement between OCC and Clearing Members (*i.e.*, payment or receipt of the net exercise price for each day's exercises) takes place in the United States or other locations approved by OCC.

For purposes of settlement between an investor and his brokerage firm, applicable rules require a holder exercising a physical delivery put option and an assigned writer of a physical delivery call option to arrange for the deposit of the requisite units of the underlying foreign currency into a designated bank account in the country issuing that currency no later than the time by which OCC requires delivery to it of foreign currency by its Clearing Members. Through this procedure, investors ordinarily rely upon their brokerage firms to make settlement with them. However, OCC has established procedures whereby Clearing Members may permit customers to make settlement directly with an OCC correspondent bank. (At the date of this document, such procedures are not yet available in the case of cross-rate options.) Investors should consult their brokerage firms with respect to these procedures.

OCC has exercise settlement procedures under which OCC's obligation to deliver or pay for underlying foreign currencies in satisfaction of option exercises may be discharged by transferring the foreign currency to be delivered, or the net exercise price for foreign currency to be received, to an OCC correspondent bank that is obligated to complete the settlement. Brokerage firms and their customers would then be relying on the correspondent bank to deliver or pay for the underlying foreign currency.

If OCC should determine that foreign governmental restrictions or taxes would prevent the orderly settlement of delivery foreign currency option exercises or would result in undue burdens on OCC or its Clearing Members, OCC has the authority to impose special exercise settlement procedures. These could range from technical changes in delivery procedures to the fixing of U.S. dollar settlement prices. If special exercise settlement procedures are imposed, investors may determine the nature of such procedures from their brokers.

Cross-Rate Foreign Currency Options

As noted at the beginning of this chapter, a cross-rate foreign currency option is an option to purchase or sell a foreign currency at an exercise price that is denominated in another foreign currency. An example of a cross-rate option is an option to purchase British pounds at an exercise price denominated in Japanese yen—that is, the trading currency would be the Japanese yen and the underlying currency would be the British pound. The exercise price would be expressed as a certain number of yen per pound. Premiums for cross-rate options are denominated in the trading currency. Thus, in the above example, premiums would be in yen.

The cross-rate options that have been approved for trading are physical delivery European-style options. It is possible that other kinds of cross-rate options will be traded in the future.

Investors in cross-rate options should bear in mind that the magnitude and direction of any change in the value of the underlying currency in relation to the trading currency may be quite different from the magnitude and direction of any contemporaneous change in the value of either of those currencies in relation to a third currency, such as the U.S. dollar. Thus, for example, the British pound

may appreciate in relation to the Japanese yen at the same time that the pound depreciates in relation to the U.S. dollar. As discussed in Chapter X under "Special Risks of Foreign Currency Options," this is of particular significance to investors who intend to convert their profits or losses on cross-rate options into U.S. dollars.

All of the previous discussion in this chapter relating to foreign currency options in general applies equally to cross-rate options except to the extent that it is specifically limited to dollar-denominated options. Certain special features of cross-rate options are discussed below.

Special Features of Cross-Rate Options

The amount of the foreign currency underlying each cross-rate option (*i.e.*, the **unit of trading**) is specified by the options market on which the option is traded.

The **exercise price** of a physical delivery cross-rate option is the price (denominated in the trading currency) at which the underlying currency may be purchased or sold upon exercise of the option. Exercise prices for cross-rate options are generally expressed in terms of units (or fractions of units) of the trading currency per unit of the underlying currency. Therefore, in order to determine the total exercise price per contract, it is necessary to multiply the stated exercise price by the unit of trading of the particular option.

EXAMPLE: *The exercise prices of yen-denominated options covering underlying euros are expressed in yen per euros. Therefore, a put covering 1,000,000 euros with an exercise price of 93 Japanese yen (JY) would entitle the holder to sell the underlying euros for an aggregate exercise price of JY93,000,000 (JY93 multiplied by 1,000,000).*

The discussion in this chapter of **adjustments** under the caption "Special Features of Dollar Denominated Foreign Currency Options" is applicable also to cross-rate options, except that adjustments in the terms of cross-rate options might be made to reflect events affecting the trading currency as well as events affecting the underlying currency.

Premiums for currently available cross-rate options are expressed in units and decimals of the trading currency per unit of the underlying currency.

EXAMPLE: *If a yen-denominated option covering 500,000 British pounds is purchased at a premium of 2.63, the cost of the option will be JY1,315,000 (JY2.63 times the unit of trading of 500,000).*

Premium settlements of cross-rate options are effected in a trading currency other than U.S. dollars. Similarly, in the event of exercise, the exercise price is paid in the trading currency. OCC has established banking arrangements permitting it to receive and pay foreign currencies in the country of origin for purposes of both premium and exercise settlement of cross-rate options between OCC and its Clearing Members. Customers ordinarily settle with their brokerage firms, although OCC may establish procedures whereby Clearing Members may permit customers to make exercise settlement directly with an OCC correspondent bank. Each customer should consult his brokerage firm to determine the procedures and time requirements for payment of foreign currencies on settlement of transactions in, and exercises of, cross-rate options.

If OCC should determine that foreign governmental restrictions or taxes or other events beyond the control of OCC would prevent the orderly settlement of exercises of, or premium payments with respect to transactions in, cross-rate options or would result in undue burdens on OCC or its

Clearing Members, OCC has the authority to impose special settlement procedures. These could range from technical changes in payment procedures for the trading currency or underlying foreign currency to the fixing of U.S. dollar settlement prices payable in lieu of either currency. OCC also has the authority to prohibit exercises of cross-rate options by holders who would be unable to meet the settlement obligations resulting from the exercise. The potential effects of such a prohibition are discussed in numbered section 5 under "Risks of Option Holders" in Chapter X. If special exercise settlement procedures are imposed, investors may determine the nature of such procedures from their brokerage firms.

Cash-Settled Foreign Currency Options

Some foreign currency options are dollar-denominated and cash-settled. The discussion above in this chapter relating to dollar-denominated foreign currency options generally applies to cash-settled foreign currency options except to the extent that such discussion specifically applies to physical delivery options.

The **contract size** of a cash-settled foreign currency option, like the size of other foreign currency options, is expressed in terms of the amount of the underlying currency covered by the option.

EXAMPLE: *If the exercise price of a cash-settled, dollar-denominated call option on euros is $1.2500 per euro, the exercise settlement value of the euro is determined to be $1.2607 and the option covers 10,000 euros, then the cash settlement amount for the option will be ($1.2607—$1.2500) x 10,000 = $107.00.*

Cash-settled foreign currency options may be **automatically exercised** on the expiration date if in the money or if in the money by a certain amount. See the discussion in Chapter VIII under "How to Exercise."

The exercise settlement value for cash-settled foreign currency options will be based on an exchange rate for the underlying foreign currency from a source selected by the market on which the options trade as set forth in exchange rules. In the case of rate-modified foreign currency options, the options market on which the options are traded would calculate and disseminate the underlying rate. In either case this rate may be based on a rate announced by the Federal Reserve Bank of New York, bid and offer quotations from a sampling of participants in the interbank spot market for the underlying foreign currency, the rate reported by a recognized pricing service, or some other widely-available rate. The time as of which the exercise settlement value is calculated and the method of calculation are determined by the options market on which the options are traded and may be changed by it at any time. Any such change may be made applicable to options outstanding at the time of the change.

If OCC determines that the exercise settlement value of the underlying foreign currency for any series of cash-settled foreign currency options is unreported, inaccurate, unreliable, unavailable, or inappropriate for purposes of calculating the cash settlement amount of such series, OCC has the authority to suspend the settlement obligations of the exercising and assigned Clearing Members of options of such series or to fix the cash settlement amount for exercised options of such series or to do both. In the event of such a suspension, OCC will fix a new settlement date after OCC determines that the exercise settlement value is available or after OCC fixes the cash settlement amount.

If OCC determines to fix the cash settlement amount, it will act through a panel, comprised of representatives from each exchange on which the series without an exercise settlement value trades, that will use its judgment as to what is appropriate for the protection of investors and the public interest. The panel may fix the cash settlement amount using the reported price or value of the underlying foreign currency at such time, or representing a combination or average of prices or values at such time or times, and reported in such manner, as the panel deems appropriate.

If a panel delays fixing a cash settlement amount for a series of cash-settled foreign currency options past the last trading day before expiration of that series, normal expiration exercise procedures will not apply to the affected series. Instead, exercise settlement will be postponed until the next business day following the day when the panel fixes the cash settlement amount, and each long position in the affected series will be treated as having been exercised if the cash settlement amount per contract for that series is $1.00 or more. If the cash settlement amount per contract is less than $1.00, the option will be treated as having expired unexercised. As a result of these procedures, holders of expiring cash-settled foreign currency options may not know whether their options have been exercised, and writers of such options may not know whether they have been assigned an exercise, until after the expiration date. A panel's determinations shall be conclusive, binding on all investors, and not subject to review.

Rate-Modified Cash-Settled Foreign Currency Options

A rate-modified currency option is a type of foreign currency option that may be thought of as an option on an underlying exchange rate between two currencies. The holder of a rate-modified currency option receives in U.S. dollars the difference between the modified rate and the exercise price multiplied by a multiplier (*e.g.*, USD $100). In this respect, rate-modified currency options resemble cash-settled index options where the index is an exchange rate between two currencies. Exchange rates in the spot market are expressed as the number of units of one currency (currency 1) required to purchase a single unit of a second currency (currency 2), and for each pairing of the world's major currencies, there is a convention as to which currency is currency 1 and which is currency 2. You should be aware that the exchange rates underlying rate-modified currency options may or may not be stated in the same way that they are conventionally quoted in the spot market. For example, exchange rates between the U.S. dollar and the euro are generally quoted as the number of dollars required to purchase a single euro; but the rate underlying a rate-modified currency option could be stated as the number of euros required to purchase a single dollar. You should therefore be certain that you understand the meaning of an underlying exchange rate.

In the case of rate-modified currency options, the underlying exchange rate may be multiplied by a "rate-modifier," such as 1, 10 or 100, to create an underlying value that more closely resembles a conventional index value. Exercise prices would, of course, also be expressed in terms of the rate-modified values.

EXAMPLE: *A rate-modifier of 100 may be applied to the exchange rate between U.S. dollars (USD) and Swiss francs (CHF) in order to obtain the underlying exchange rate for USD/CHF rate-modified currency options. If the current exchange rate in the USD/CHF spot market is 1.24 Swiss francs per dollar, the current rate-modified exchange rate would be stated as (1.24 x 100) = 124. For example, an exercise price of 1.25 Swiss francs per dollar would be expressed as 125.*

As in the case of an index option, the premiums and exercise settlement values of rate-modified currency options are determined using a multiplier, *e.g.*, USD $100.

EXAMPLE: *A rate-modified USD/CHF call option has an exercise price of 125. The USD/CHF exchange rate in the spot market at the time the exercise settlement value is fixed is 1.27 Swiss francs per dollar, meaning that the underlying rate-modified value is (1.27 x 100) = 127. The option is in the money. The exercise settlement value of the option is (127—125) x $100 = $200.*

Do not confuse the rate-modifier with the multiplier. They serve different purposes and may or may not have the same numeric value.

EXAMPLE: *Assume that the exchange rate underlying a rate-modified call option on the exchange rate between the U.S. dollar and the Mexican peso is stated as Mexican pesos per U.S. dollar (USD/MXN). The rate-modifier could be 10 and the multiplier could be $100. If the exercise price of the option is 11 Mexican pesos per U.S. dollar, it is stated as 11 x 10 = 110. If the underlying exchange rate is 11.2 at the time the option is exercised, the exercise settlement value is (112-110) x $100 = $200.*

Note that, as in the case of index options, the multiplier determines the cash value of an option that is in the money by a specified amount. Like index options, and unlike other cash-settled currency options, a rate-modified currency option has no unit of trading—it does not relate to a specified quantity of an underlying currency.

The multiplier is also used in determining the total premium for a rate-modified currency option. For example, if a premium is quoted as 0.50 and the multiplier is $100, the total premium for a single option is $50.

Flexibly Structured Options

Flexibly structured options, like the other options discussed in this document, are traded on the U.S. options markets and are issued by OCC. However, unlike other options, the terms of flexibly structured options are not all standardized. When a flexibly structured option is purchased and sold in an opening transaction, the parties to the transaction have the flexibility, within limitations set forth in the rules of the options market on which the transaction occurs, to fix certain of the option's terms. The terms of a flexibly structured option which may be fixed by the parties are called **variable terms**. The flexibility to fix these variable terms is what makes flexibly structured options different from other options.

The principal risks of holders and writers of flexibly structured options are discussed in Chapter X. Readers who are interested in buying or writing flexibly structured options should read not only this chapter but also all of Chapter X.

Because many of the terms of flexibly structured options are not standardized, it is less likely that there will be an active secondary market in which holders and writers of such options will be able to close out their positions by offsetting sales and purchases. See numbered section 1 under "Special Risks of Flexibly Structured Options' in Chapter X.

The trading procedures established by the options markets for transactions in flexibly structured options differ from the procedures for transactions in other options. Readers desiring information about the trading procedures of an options market for flexibly structured options may obtain that information from that market.

The options markets may fix minimum size or minimum monetary values for transactions in flexibly structured options. Flexibly structured options may be useful to sophisticated investors seeking to manage particular portfolio and trading risks. However, as a result of these minimums, as well as the special trading procedures and reduced likelihood of there being a secondary market, flexibly structured options transactions are not suitable for investors who are not financially able to bear the risks of maintaining such minimum positions in flexibly structured options.

Special Features of Flexibly Structured Options

DESIGNATION OF TERMS—The parties to an opening transaction in flexibly structured options may designate the option's variable terms in accordance with the rules of the options market where the transaction occurs. Included among the terms that an options market may identify as variable terms are the specification and amount of the underlying interest, whether the transaction involves a put, call or spread, the style of the option, the exercise price, the cap interval of a capped option, the expiration date, the method for determining the exercise settlement value of a cash-settled option that is exercised on the expiration date, the settlement currency of a cash-settled option, the premium currency, and the trading currency of a foreign currency option.

Only those terms identified as variable terms by the options market where the opening transaction occurs may be designated by the parties. All other terms are standardized in accordance with the rules of OCC and the options market. The rules of an options market may impose limitations on the variable terms which the parties may designate. For example, an options market may require that the expiration date of a flexibly structured option not fall within a specified period of time or that the life of the option not exceed a maximum permissible term. As another example, if the exercise settlement value of an index option is based on a specified average, an options market may require that the average conform with the averaging parameters established by the market. In addition, the underlying interest, the settlement currency, the premium currency and the trading currency, may be designated only from those available for flexibly structured options on the options market, and an options market may require that the premium currency be the same as the settlement currency.

MINIMUM SIZE REQUIREMENTS—Every transaction in flexibly structured options must satisfy the minimum size or monetary value requirements of the options market where the transaction occurs. The minimum requirements may be larger for an opening transaction in a series in which there is no open interest than for other transactions (whether opening or closing) in that series. An options market may also impose minimum size or monetary value requirements on exercises of flexibly structured options. Information as to such minimums may be obtained from the options market where the options are traded.

POSITION and EXERCISE LIMITS—The options markets may establish special position and exercise limits for flexibly structured options. Such limits may differ from the limits applicable to other options, although an options market may require that positions in certain flexibly structured options be aggregated with positions in certain other options. Information concerning position and exercise limits of particular flexibly structured options may be obtained from the options market where the options are traded or from brokerage firms.

TRADING PROCEDURES—The trading hours and trading procedures for flexibly structured options may differ from the trading hours and procedures for other options. These special procedures may mean that the market-making systems that are applicable to other options may not be applicable to flexibly structured options, that there may not be continuous quotations for flexibly structured options, and that quotations may be provided only in response to a specific request as the basis for trading with the party making the request.

EXERCISES and SETTLEMENTS—In general, the exercise, assignment and settlement of flexibly structured options occurs in the same manner as, and are subject to the same time frames and procedures that are applicable to, other options of the same style and having the same underlying interest. See Chapter VIII. However, unlike most other options, flexibly structured index options that are in the money on the expiration date may be exercised automatically. In the future it may be provided that flexibly structured index options will be exercised automatically only if they are in the money by a specified amount.

EXERCISE SETTLEMENT VALUE—The method of determining the exercise settlement value on the expiration date of a flexibly structured index option is a variable term that is fixed by the parties in their opening transaction. For example, the parties may specify that such exercise settlement value will be determined with reference to opening prices of the constituent securities of the index, their closing prices, an average of their high and low prices, an average of opening and closing prices, an average over a stated period of time, or another average that conforms with the parameters established by the options market. However, under the OCC rules in effect at the date of this document, the method of determining the exercise settlement value for an exercise that occurs on a day other than the expiration date is not a variable term. The exercise settlement value for such exercises of flexibly structured index options will be the value derived from the closing prices of the constituent securities on the day of exercise (as reported by the reporting authority), and the exercise settlement value of other flexibly structured options will be determined in the same manner as it is determined for other options on the same underlying interest that are traded on the options market where the opening transaction in the flexibly structured option occurred.

SETTLEMENT CURRENCY—The settlement currency may be a variable term to be fixed by the parties out of those currencies specified by the options market on which the transaction occurs as being available for flexibly structured options. The settlement currency may be the currency in which the premium is payable. In addition, brokerage firms may require their customers to make margin payments in the settlement currency.

If the settlement currency and premium currency are not U.S. dollars, settlement of premiums and exercises is generally made through the procedures and arrangements established by OCC for cross-rate foreign currency options. See “Special Features of Cross-Rate Options” in Chapter VI.

Exercise and Settlement

Although most option holders and writers close out their options positions by an offsetting closing transaction, investors should nonetheless be familiar with the rules and procedures applicable to exercise. Such an understanding can help an option holder determine whether exercise might be more advantageous than an offsetting sale of the option. An option writer needs to understand exercise procedures because of the possibility of being assigned an exercise. Once an exercise of an option has been assigned to an option writer—even though she may not yet have been notified of the assignment—the writer can no longer effect a closing transaction in that option but must instead purchase or sell the underlying interest for the exercise price (or, in the case of a cash-settled option, pay the cash settlement amount).

How to Exercise

The period during which an option is exercisable depends on the **style** of the option. This is discussed under "Style of Option" in Chapter II.

In order to exercise most options traded at the date of this document, action must be taken by the option holder prior to the expiration of the option. However, some options may be subject to automatic exercise. For example, capped options are subject to automatic exercise if the automatic exercise value of the underlying interest hits the cap price of the option, and certain other options (including binary options and flexibly structured index options) are subject to automatic exercise as well. Binary options are subject to automatic exercise if the exercise settlement value of the underlying interest at expiration meets the criteria for exercise specified by the listing options market. Credit default options are subject to automatic exercise whenever a credit event occurs in accordance with the description in Chapter V.

To exercise an option that is not subject to automatic exercise, the holder must direct his brokerage firm to give exercise instructions to OCC. In order to ensure that an option is exercised on a particular day, the holder must direct his brokerage firm to exercise before the firm's cut-off time for accepting exercise instructions for that day. Different firms may have different cut-off times for accepting exercise instructions from customers, and those cut-off times may be different for different options.

A brokerage firm's cut-off time for accepting exercise instructions becomes critical on the last trading day before an option expires. An option that expires unexercised becomes worthless. **An option holder who intends to exercise an option before expiration must give exercise instructions to his brokerage firm before the firm's cut-off time for accepting exercise instructions on the last trading day before expiration**. If the expiration date of an option falls on a day on which an options market is open for trading in that option, a brokerage firm's last cut-off time for accepting exercise instructions prior to the option's expiration may be on the expiration date. Investors should be aware of their brokerage firm's policies in this regard. Many brokerage firms accept standing instructions to exercise, or have procedures for the exercise of, every option which is in the money by a specified amount at expiration. These procedures often incorporate by reference OCC's administrative procedures that provide for the exercise of every option that is in the money by a specified amount at expiration unless the Clearing Firm carrying the option in its accounts instructs OCC not to exercise the option. Investors should determine from their brokerage firm the applicable cut-off times, the firm's procedures for submitting exercise instructions, and whether any of their options are subject to automatic exercise. Investors should also determine whether the exercise of their options is subject to standing instructions of their brokerage firm, and, if so, they should discuss with the firm the potential consequences of such instructions.

In highly unusual circumstances (*e.g.*, where a brokerage firm is unable to receive instructions from its customers), a firm may be authorized under applicable rules to make an exception to its regular

cut-off time. However, in order for an option to be exercised, the brokerage firm must in any event pass on its customer's exercise instructions to OCC before expiration. OCC may allow exercises for a limited time after expiration in the unlikely event that OCC is unable to follow its normal procedures for receiving exercise instructions from Clearing Members on the expiration date. Subject to that very limited exception, OCC has no authority to extend the expiration of any option.

Once an exercise instruction is given by a Clearing Member to OCC, it cannot ordinarily be revoked except to correct a bona fide error that is specified in a request filed by the Clearing Member prior to a deadline specified in OCC's rules.

Assignment

OCC follows established procedures for assigning exercises to Clearing Member accounts that contain short option positions identical to the exercised options. These procedures may be different for different classes of options. A description of OCC's assignment procedures and the options classes to which they apply is available on request from OCC at 125 S. Franklin, Ste 1200, Chicago, Illinois 60606.

Assignments are ordinarily made prior to the commencement of trading on the business day following receipt by OCC of the exercise instruction. In the case of options traded in evening sessions, exercise instructions received by OCC on a business day are ordinarily assigned prior to the opening of trading in that day's evening session.

Exercises may be assigned by OCC to a Clearing Member's customers' account. In that event, the Clearing Member must, in turn, assign those exercises to its customers maintaining positions as writers of the exercised options series. The rules of the options markets require their member firms to establish fixed procedures for allocating assignments to customers (*e.g.*, random selection or "first-in, first-out") and to inform their customers of the method used and how it works.

Regardless of the method used, an option writer is subject to the risk each day the option is exercisable that some or all of his short position may be assigned. (See the discussion in Chapter X under "Risks of Option Writers.") However, if less than all of the open interest in an options series is exercised, OCC's procedures for assigning exercises to Clearing Members and brokers' procedures for allocating assignments to customers may affect the likelihood that a customer's position will be assigned and the potential size of the assignment.

It is possible that an option writer will not receive notification from its brokerage firm that an exercise has been assigned to him until one or more days following the date of the initial assignment to the Clearing Member by OCC. This creates a special risk for uncovered writers of physical delivery call stock options. This is discussed in numbered section 8 under "Risks of Options Writers" in Chapter X and under "Settlement" in this chapter.

Settlement

Settlements between brokerage firms or their agents on virtually all exercised physical delivery stock options are routinely handled through a stock clearing corporation in much the same way as ordinary purchases and sales of the underlying equity security. Promptly after the exercise and assignment of a physical delivery stock option, OCC reports it to the designated stock clearing corporation of the Clearing Members representing the exercising holder and the assigned writer. If the stock clearing corporation does not reject the transaction by a time specified in its agreement with OCC, settlement is effected pursuant to the rules of the clearing corporation, and OCC has no further responsibility to either the exercising holder or the assigned writer.

In a few cases—which usually occur because an underlying equity security is no longer eligible for clearance through a stock clearing corporation—settlements calling for the delivery of that security are made directly between Clearing Members. OCC's rules provide **protect procedures** for exercise settlements made directly between Clearing Members that involve the delivery of securities which either have been called for redemption, are due to expire or with respect to which a call or expiration date is impending, or are subject to an offer which will expire, if the expiration time (as defined in OCC's rules) is on or after the exercise settlement date for the option. Under these protect procedures, the Clearing Member entitled to receive the securities may give a **liability notice** to the delivering Clearing Member by a specified cut-off time prior to the expiration time. If a liability notice is so given and the securities are not delivered sufficiently in advance of the expiration time to permit the receiving Clearing Member to obtain their benefit, the delivering Clearing Member will be liable for any resulting damages. If the failure to deliver was the fault of the Clearing Member's customer, the Clearing Member may (depending on its own procedures) pass that liability on to the customer. Investors should be aware that correspondent clearing corporations may have protect procedures in respect of the settlements made through them.

As of September 5, 2017, the regular exercise settlement date for physical delivery stock options is the second business day after exercise. The regular exercise settlement dates for all other types of physical delivery options traded at the date of this document are described in the separate chapters of the document discussing those options.

At the date of this document, settlements of exercises of cash-settled options and foreign currency options are effected by Clearing Members through OCC. Settlement of exercises of cash-settled options—through the payment in cash of the cash settlement amount—ordinarily takes place on the business day immediately following the day of exercise. However, cash-settled capped options that have been automatically exercised on any trading day other than the one immediately prior to expiration are settled on the second business day after the automatic exercise is triggered. The settlement of exercises of cash-settled options that have a settlement currency that is not U.S. dollars is discussed under "Settlement Currency" in Chapter VII.

OCC has authority to postpone settlement of any option on any type of underlying interest when OCC considers such action to be necessary in the public interest or to meet unusual conditions.

Each brokerage firm involved in an exercise or assignment settles with its own customer. Neither OCC nor any options market has any responsibility to customers with respect to funds or securities that have been received by brokerage firms for their customers. Investors may determine from their brokerage firms when and how settlement amounts will be credited or debited to their brokerage accounts.

In certain unusual circumstances, an event may threaten to reduce the available supply of an underlying security to a level insufficient to allow settlement if all of the outstanding option contracts for the affected security were exercised. This could happen, for example, in the event of a successful tender offer for all or substantially all of the outstanding shares of an underlying security or if trading in an underlying security were enjoined or suspended. If OCC in its discretion determines that a situation of that type exists, OCC may impose special exercise settlement procedures. These special procedures, applicable only when an assigned call writer or an exercising put holder is unable to obtain the underlying security, may involve the suspension of the settlement obligations of the holder and writer and/or the fixing of cash settlement prices in lieu of delivery of the underlying security. When special exercise settlement procedures are imposed, OCC will announce to its Clearing Members how settlements are to be handled. Investors may obtain that information from their brokerage firms.

Tax Considerations, Transaction Costs and Margin Requirements

Options investing, like other forms of investing, involves tax considerations, transaction costs and margin requirements that can significantly affect the profit or loss results of buying and writing options. These are only briefly mentioned in this chapter, but should be understood and taken into account by everyone considering transactions in options.

Notwithstanding the importance of tax considerations, transaction costs and margin requirements, for the sake of simplicity, the examples in this document do not take these matters into account. Nevertheless, it should be remembered that their impact may significantly reduce the opportunity for profit and the rate of return obtainable from particular options trading strategies; indeed, their effect may in some instances turn an apparent profit into a loss.

Tax Considerations

The tax consequences of an options transaction depend, in part, on the tax status of the investor and also may differ depending upon the type of underlying interest involved—since the tax rules are not the same for each type of underlying interest—and upon such factors as whether an option is exercised or is the subject of a closing transaction or is allowed to expire or whether an option that is written is covered or uncovered. Some options markets have publications that deal specifically with the tax treatment of various options transactions. These may be obtained from brokerage firms as well as the markets themselves. **Because of the importance of tax considerations to all options transactions, it cannot be emphasized too strongly that the reader considering options should consult with his tax adviser as to how taxes may affect the outcome of contemplated options transactions**.

Transaction Costs

The transaction costs of options investing consist primarily of commissions (which are imposed in opening, closing, exercise and assignment transactions), but may also include margin and interest costs in particular transactions. The impact of transaction costs on profitability is often greater for options transactions than for transactions in the underlying interests because these costs are often greater in relation to options premiums than in relation to the prices of underlying interests. Transaction costs are especially significant in option strategies calling for multiple purchases and sales of options, such as spreads and straddles. Readers should always discuss transaction costs with their brokerage firms before engaging in options transactions.

Margin Requirements

Writers of options, other than certain covered call option writers and certain writers of cash secured puts (discussed below), must comply with applicable margin requirements.

In the stock market, **margin** refers to buying stock or selling stock short on credit. Margin customers are required to keep securities on deposit with their brokerage firms as collateral for their borrowings. In the options market, margin means the cash or securities required to be deposited by an option writer with his brokerage firm as collateral for the writer's obligation to buy or sell the underlying interest, or in the case of cash-settled options to pay the cash settlement amount, if assigned an exercise. Minimum margin requirements are currently imposed by the Board of Governors of the

Federal Reserve System, the options markets and other self-regulatory organizations, and higher margin requirements may be imposed—either generally or in individual cases—by the various brokerage firms.

Uncovered writers may have to meet calls for substantial additional margin in the event of adverse market movements. Even if a writer has enough equity in his account to avoid a margin call, increased margin requirements on his option positions will make that equity unavailable for other purposes.

If a holder of a physical delivery call option exercises and wishes to purchase the underlying interest on credit, the holder may be required to deposit margin with the holder's brokerage firm. Holders of physical delivery options on a foreign currency should be aware that, at the date of this document, foreign currency has no value for margin purposes except to the extent that credit has been extended on the same foreign currency.

Margin requirements are complex and are not the same for writers of options on different types of underlying interests. Margin requirements are subject to change, and may vary from brokerage firm to brokerage firm. Consequently, the examples in this document do not take margin requirements into account. However, margin requirements can have an important effect on an option writer's risks and opportunities.

Persons considering writing options (whether alone or as part of options combinations, such as spreads or straddles) should determine the applicable margin requirements from their brokerage firms and be sure that they have sufficient liquid assets to meet those requirements in the event of adverse market movements.

CHAPTER X

Principal Risks of Options Positions

This chapter discusses the principal risks of holders and writers of options. The risks discussed are those that are unique to being an option holder or writer. Risks that relate to such matters as the trading of securities generally; the state of the economy; the supply and demand factors in the options markets and in other related markets; the factors affecting the values of the various underlying interests; the factors affecting the volatility, liquidity and efficiency of the options markets or of other markets or other factors that may affect the pricing of particular options; the quality or operations of the various options markets at any particular time; and the procedures of the various options markets and of brokers in transmitting orders and effecting executions are not within the scope of this document and are not discussed. (See the discussion in Chapter XI as to the scope and limitations of this document.)

It should also be noted that new types of options and new options strategies are constantly being developed and that some of the risks of new options products and new options strategies do not become apparent until there has been significant experience in trading and using the new options and strategies. Accordingly, readers should be aware that there is a risk in newness, particularly if the new option or strategy is complicated or complex, that cannot always be identified or described.

Readers should also be aware that not all options strategies will necessarily be suitable for them and that certain strategies may expose them to very significant potential losses. For example, the risks associated with the writing of puts or uncovered calls expose investors to such potential losses, and this type of strategy is therefore not suitable for all investors.

Many of the risks are the same for options on all types of underlying interests, although some special risks may apply only to options on particular types of underlying interests. The first three sections of this chapter describe risks that apply generally to options on all types of underlying interests. They are followed by sections discussing the special risks associated with options on the particular types of underlying interests.

Risks discussed in this chapter are applicable to binary options and range options as well as other options, except as otherwise noted. Certain risks discussed in the section entitled “Special Risks of Index Options’ are applicable to binary index options and range options as well. Special risks applicable to holders and writers of binary options are discussed in this chapter in the sections entitled “Special Risks of Binary Options (Other than Credit Default Options)” and “Special Risks of Credit Default Options.” Special risks applicable to holders and writers of range options are discussed in this chapter in the section entitled “Special Risks of Range Options.”

The value of an option is affected by the value of the underlying interest. It is beyond the scope of this document to discuss the characteristics or risks of underlying interests. If a description or risk factor is mentioned in this document with respect to a particular class of underlying interest, you should not assume that the same statements will be made with respect to all underlying interests discussed herein to which they may be applicable. You should look to disclosures made by issuers of underlying securities or information provided by publishers of underlying indexes and to information available from your broker or other sources to determine the nature and risks of the interests underlying the options that you trade. Some underlying interests may themselves involve a high degree of risk. Where the value of an underlying security is based in whole or in part on the performance of an index, information provided by the publisher of the referenced index, as well as financial and other disclosures made by the issuer of the underlying security regarding the issuer’s ability to perform its obligations, may be relevant.

Risks Of Option Holders

1. **An option holder runs the risk of losing the entire amount paid for the option in a relatively short period of time**. This risk reflects the nature of an option as a wasting asset which becomes worthless when it expires. An option holder who neither sells her option in the secondary market nor exercises it prior to its expiration will necessarily lose her entire investment in the option. (As noted in Chapter VIII, many brokerage firms have procedures for the exercise of options at expiration that are then in the money by a specified amount.)

The fact that options become valueless upon expiration means that an option holder must not only be right about the **direction** of an anticipated price change in the underlying interest, but she must also be right about **when** the price change will occur. If the price of the underlying interest does not change in the anticipated direction before the option expires to an extent sufficient to cover the cost of the option, the investor may lose all or a significant part of her investment in the option. This contrasts with an investor who purchases the underlying interest directly and may continue to hold her investment, notwithstanding its failure to change in price as anticipated, in the hope of waiting out an adverse price move and eventually realizing a profit.

The significance of this risk to an option holder depends in large part upon the extent to which she utilizes the leverage of options to control a larger quantity of the underlying interest than she could have purchased directly with the same investment amount. This is illustrated in the following example, which compares the consequences of three different approaches to investing the same amount of money in stock or options, with each approach involving a different degree of leverage.

EXAMPLE: *Assume that Investors A, B and C each have $5,000 to invest and that each anticipates an increase in the market price of XYZ stock, which is currently $50 a share. Investor A invests his $5,000 in 100 shares of XYZ. Investor B invests $500 in the purchase of an XYZ 50 call (covering 100 shares of XYZ at a premium of $5 a share) and invests the remaining $4,500 in a relatively risk-free investment such as Treasury bills. (For purposes of this example, it is assumed that all of the calls are purchased when they have six months remaining until expiration, and that the risk-free investment bears interest at an annual rate of, say, 3.25%—which means that a $4,500 investment will earn approximately $73 in interest over six months.) Investor C invests his entire $5,000 in 10 XYZ 50 calls.*

If each option is held for six months and, if it is profitable, is either sold or exercised immediately before it expires, the following table illustrates the dollar and percentage profit or loss that each investor would realize on his $5,000 investment, depending upon the price of XYZ stock when the option expires.

Price of XYZ stock at expiration of option	Investor A		Investor B		Investor C	
	Profit or Loss	% Return	Profit or Loss	% Return	Profit or Loss	% Return
62...	+ 1,200	+ 24%	+ 773	+ 15.5%	+ 7,000	+ 140%
58...	+ 800	+ 16%	+ 373	+ 7.5%	+ 3,000	+ 60%
54...	+ 400	+ 8%	-27	- 0.5%	- 1,000	- 20%
50...	0	0	-427	- 8.5%	- 5,000	- 100%
46...	- 400	-8%	-427	- 8.5%	- 5,000	- 100%
42...	- 800	- 16%	-427	- 8.5%	- 5,000	- 100%
38...	- 1,200	- 24%	-427	- 8.5%	- 5,000	- 100%

The table demonstrates how increased leverage results in greater profit potential on the upside and greater risk of loss on the downside. Investor C, as the most leveraged investor, would realize the highest percentage return if the price of XYZ increased to 62, but would incur a 20% loss even if the price of XYZ increased to 54 (assuming he did not sell his options while they had significant remaining time value), and would lose all of his investment if the price of XYZ stayed at or below 50.

Only the first two paragraphs of this numbered section 1 are applicable to binary options and range options. The amount by which a binary option is in the money does not affect the value of the option (and therefore the option holder's profit or loss) upon exercise. In the case of a range option, the value of the option is based on where the level of the underlying index falls within the range length at expiration, and not on the difference between the level of the underlying index and a discrete exercise price. Furthermore, as discussed below under the caption "Special Risks of Range Options," the value of a range option does not always move in the same direction as the underlying interest.

2. **The more an option is out of the money and the shorter the remaining time to expiration, the greater the risk that an option holder will lose all or part of his investment in the option.** The greater the price movement of the underlying interest necessary for the option to become profitable (that is, the more the option is out of the money when purchased and the greater the cost of the option) and the shorter the time within which this price movement must occur, the greater the likelihood that the option holder will realize a loss. This does not necessarily mean that an option must be worthwhile to exercise in order for a holder to realize a profit. Instead, it may be possible for the holder to realize a profit by selling an option prior to its expiration for more than its original cost even though the option never becomes worthwhile to exercise. (The shorter the time remaining until expiration the less likely it is that this will be possible.)

3. **Prior to the period when a European-style option (including a European-style delayed start option), a capped option, or an American-style delayed start option is exercisable, the only means through which the holder can realize value from the option (unless the capped option is automatically exercised) is to sell it at its then market price in an available secondary market.** If a secondary market for such an option is not available during the time the option is not exercisable, it will not be possible for its holder to realize any value from the option at that time.

4. **The exercise provisions of an option may create certain risks for the option holders**. If the option does not have an automatic feature, a holder who wishes to exercise must assure that action is taken in a timely manner. See the discussion of "How to Exercise" in Chapter VIII.

   On the other hand, if the option has an automatic exercise feature—such as one that will cause the option to be automatically exercised at the expiration if it is in the money by a specified amount—the option may be exercised at a price at which the holder would not voluntarily choose to exercise in view of the transactions costs of exercise or other factors. The transaction costs associated with the exercise could even exceed the cash settlement amount of the option, with the result that the holder would realize a net loss from the exercise. Conversely, an option that has a cash settlement amount that is less than the threshold amount cannot be exercised even though the option holder's transaction costs may be low enough to permit the option to be exercised profitably. In such a case, the option may expire unexercised.

   The automatic exercise feature of capped options imposes a maximum value that a holder of these options can receive. Even if the option holder expects the value of the underlying interest to continue to move in a favorable direction prior to its expiration, the automatic exercise feature will prevent the holder from realizing any gain from the option in excess of the cap interval times the multiplier for the option.

5. **The courts, the SEC, another regulatory agency, OCC or the options markets may impose exercise restrictions. OCC and the options markets have authority to restrict the exercise of options at certain times in specified circumstances.** The options markets often exercise such

authority with respect to an option in which trading has been halted. If a restriction on exercise is imposed at a time when trading in the option has also been halted, holders of that option will be locked into their positions until either the exercise restriction or the trading halt has been lifted.

Exercise restrictions imposed by OCC and the options markets affecting cash-settled options generally cannot be continued in effect beyond the opening of business on the last trading day before their expiration. Such exercise restrictions affecting physical delivery options generally cannot be continued beyond the opening of business on the tenth business day before their expiration.

It is also possible that a court, the SEC or another regulatory agency having jurisdiction would impose a restriction which would have the effect of restricting the exercise of an option. In such a case the option would not be exercisable until the restriction was terminated. In the remote possibility that the restriction were to remain in effect until the expiration of the option, the option would expire worthless, and the holder would lose the entire amount that he paid for the option.

Risks of Option Writers

The risks discussed in numbered sections 3, 4, 5 and 10 below apply to writers of non-binary and binary options, but the risks discussed in numbered sections 1, 2, 6, 7, 8, 9 and 11 are inapplicable to writers of binary options. Special risks of binary options are discussed below under the caption "Special Risks of Binary Options (Other Than Credit Default Options).'

The risks discussed in numbered sections 5, 9 and 10 below apply to writers of range options, but the risks discussed in numbered sections 1, 2, 6, 7, 8 and 11 do not. Although some of the risks discussed in numbered sections 3 and 4 apply to writers of range options, these risks are separately discussed below under the caption "Special Risks of Range Options" because range options are of a single type (rather than consisting of a put class and a call class) and have a unique payout structure.

1. **An option writer may be assigned an exercise at any time during the period the option is exercisable**. Starting with the day it is purchased (provided, in the case of a delayed start option, that its exercise price has been set), an American-style option is subject to being exercised by the option holder at any time until the option expires. This means that the option writer is subject to being assigned an exercise at any time after she has written the option until the option expires or until she has closed out her position in a closing transaction. By contrast, the writer of a European-style option (including a European-style delayed start option), a capped option, or an American-style delayed start option before its exercise price is set is subject to assignment only when the option becomes exercisable or, in the case of a capped option, when the automatic exercise value of the underlying interest hits the cap price.

   An assigned writer may not receive notice of the assignment until one or more days after the assignment has been made by OCC. Once an exercise has been assigned to a writer, the writer may no longer close out the assigned position in a closing purchase transaction, **whether or not she has received notice of the assignment**. In that circumstance, an attempted closing purchase would be treated as an opening purchase transaction.

   If an option that is exercisable is in the money, the option writer can anticipate that the option **will be exercised**, especially as expiration approaches. Once she is assigned an exercise, the assigned writer must deliver (in the case of a call) or purchase (in the case of a put) the underlying interest (or pay the cash settlement amount in the case of an in the money cash-settled option). The consequences of being assigned an exercise depend upon whether the writer of a call is covered or uncovered, as discussed below.

2. **The writer of a covered call forgoes the opportunity to benefit from an increase in the value of the underlying interest above the option price, but continues to bear the risk of a decline in the value of the underlying interest**. Unlike a holder of the underlying interest who has not written a call against it, the covered call writer has (in exchange for the premium) given up the opportunity to profit from an increase in the value of the underlying interest above the exercise price. If he is assigned an exercise, the net proceeds that he realizes from the sale of the underlying interest pursuant to the exercise could be substantially below its prevailing market price.

EXAMPLE: *When XYZ stock was $50, the investor collected a $4 a share premium by writing an XYZ 50 delivery call. As expiration approaches, the stock has risen to $58 and he is assigned an exercise. His total return, in addition to any dividends received, will be the $50 exercise price he is paid for the stock plus the $4 premium collected when the option was written—$4 a share less than the $58 he could have sold the stock for if he had* ***not*** *written the option.*

On the other hand, if the value of the underlying interest declines substantially below the exercise price, the call is not likely to be exercised and, depending upon the price paid for the underlying interest, the covered call writer could have an unrealized loss on the underlying interest. However, that loss will be wholly or partially offset by the premium he received when he wrote the option.

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3. **The writer of an uncovered call (other than a binary call) is in an extremely risky position and may incur large losses if the value of the underlying interest increases above the exercise price**. For the writer of an uncovered call (other than a binary call), the potential loss is unlimited. When a physical delivery call is assigned an exercise, the writer will have to purchase the underlying interest in order to satisfy his obligation on the call, and his loss will be the excess of the purchase price over the exercise price of the call reduced by the premium received for writing the call. In the case of a cash-settled call other than a binary call, the loss will be the cash settlement amount reduced by the premium. Anything that may cause the price of the underlying interest to rise dramatically, such as a strong market rally or the announcement of a tender offer for an underlying stock at a price that is substantially above the prevailing market price, can cause large losses for an uncovered call writer. For the writer of a binary call, the potential loss will be limited to the fixed cash settlement amount of the option minus the premium received for writing the call. The writer of a binary call will be obligated to pay the entire fixed cash settlement amount if the exercise settlement value is only slightly in the money or, for certain binary calls, even if the exercise settlement value is at the money.

EXAMPLE: *An investor receives a premium of $4 a share for writing an uncovered XYZ 50 call option and the stock price jumps to $69 as the option approaches expiration. If the investor liquidates his option position at, say, $19, in an offsetting closing purchase transaction, he will incur a loss of $1,500 (the $1,900 paid in the offsetting purchase transaction less the $400 option premium received when the option was written).*

EXAMPLE: *An investor receives a premium of $4 for writing a binary call option on XYZ security that has an exercise price of $80 and a fixed cash settlement amount of $100. If the exercise settlement value of XYZ is $81 at expiration, the investor will incur a loss of $96 (the $100 paid to the holder of the call option less the $4 premium received when the option was written).*

The writer of an uncovered call (other than a binary call) is in an extremely risky position and may incur large losses. Moreover, as discussed in Chapter IX, a writer of uncovered calls must meet applicable margin requirements (which, except in the case of binary calls, can rise substantially if the market moves adversely to the writer's position). Uncovered call writing is thus suitable only for the

knowledgeable investor who understands the risks, has sufficient liquid assets to meet applicable margin requirements, and, except in the case of binary options, where the potential loss is limited as described above, has the financial capacity and willingness to incur potentially **substantial** losses. A binary call writer may be required under exchange rules to deposit the full cash settlement amount at the time the option is written.

4. **As with writing uncovered calls, the risk of writing put options is substantial. The writer of a put option bears a risk of loss if the value of the underlying interest declines below the exercise price, and such loss could be substantial if the decline is significant**. The writer of a put bears the risk of a decline in the price of the underlying interest—potentially to zero in the case of a put other than a binary put. A writer of a physical delivery put who is assigned an exercise must purchase the underlying interest at the exercise price—which could be substantially greater than the current market price of the underlying interest—and a writer of a cash-settled put other than a binary put must pay a cash settlement amount which reflects the decline in the value of the underlying interest below the exercise price. For the writer of a binary put, the potential loss will be the fixed cash settlement amount of the option minus the premium received for writing the put. The writer of a binary put will be obligated to pay the entire fixed cash settlement amount even if the exercise settlement value of the option is only slightly in the money. Unless a put is a cash-secured put (discussed below), its writer is required to maintain margin with his brokerage firm. Moreover, the writer's purchase of the underlying interest upon being assigned an exercise of a physical delivery put may result in an additional margin call.

   Put writers must have an understanding of the risks, the financial capacity and willingness to incur potentially substantial losses, and the liquidity to meet margin requirements and to buy the underlying interest, or to pay the cash settlement amount, in the event the option is exercised. A writer of an American-style put other than a delayed-start option can be assigned an exercise at any time during the life of the option until such time as she enters into a closing transaction with respect to the option. A writer of an American-style delayed-start option can be assigned an exercise at any time after the option's exercise price is set until such time as she enters into a closing transaction with respect to the option. Since exercise will ordinarily occur only if the market price of the underlying interest is below the exercise price of the option, the writer of a physical delivery put option can expect to pay more for the underlying interest upon exercise than its then market value.

EXAMPLE: *At a time when XYZ stock is $50, an investor receives a $300 premium ($3 a share) by writing an XYZ 50 put. Subsequently the stock price declines to $40 and she is assigned an exercise. The investor must purchase the stock at $50. Even though the $3 a share premium reduces her effective cost to $47, that is still substantially higher than the $40 market price of the stock.*

EXAMPLE: *An investor receives a premium of $4 for writing a binary put option on XYZ security that has an exercise price of $80 and a fixed cash settlement amount of $100. If the exercise settlement value of XYZ is $79 at expiration, the investor will incur a loss of $96 (the $100 paid to the holder of the put option less the $4 premium received when the option was written).*

In the case of a put other than a binary put, the put writer's exposure to margin requirements can be eliminated if the put writer deposits cash equal to the option's exercise price with his brokerage firm. Under this strategy, known as cash-secured put writing, the put writer is not subject to any additional margin requirements regardless of what happens to the market value of the underlying interest. In the meantime, the put writer might earn interest by having the cash invested in a short-term debt instrument—for example, in a Treasury bill. However, a cash-secured put writer is still subject to a risk of loss if the value of the underlying interest declines. The risk of writers of binary puts is limited to the cash settlement amount of the option, and a binary put writer may be

required under exchange rules to deposit the full cash settlement amount at the time the option is written.

EXAMPLE: *An investor receives a $500 premium for writing an XYZ 50 put option with six months remaining until expiration and deposits with her broker $5,000 invested in Treasury bills which, over the six month option life, will earn interest of $250. If she has not been assigned an exercise by expiration, the investor will have a total return of $750 (option premium of $500 and interest of $250). On the other hand, if the price of XYZ stock were to fall below $42-1/2 and the investor is then assigned an exercise, she would have a net loss—that is, the market price of the XYZ stock she would be required to purchase would be below the exercise price by more than the combined premium income and interest earned.*

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5. The risk of being an option writer may be reduced by the purchase of other options on the same underlying interest—and thereby assuming a **spread** position—or by acquiring other types of hedging positions in the options markets or other markets. However, even where the writer has assumed a spread or other hedging position, the risks may still be significant. See numbered section 1 under "Other Risks." The risk profile of a spread where the long and short legs are options of different types is not the same as where both legs are options of the same type. For example, where the short leg is a conventional option, the risk-reducing characteristics of a long leg consisting of binary or range options are different than where the long leg is a conventional option because of the fixed cash settlement amount of binary options and the unique payout structure of range options.

6. **The obligation of a writer of an uncovered call or of a put that is not cash-secured to meet applicable margin requirements creates additional risks**. If the value of the underlying interest moves against the writer's position, or if there is a significant change in the volatility or liquidity of the underlying interest, related interests, or the option, or if the writer's brokerage firm otherwise requires, the firm may request significant additional margin payments. If those payments are not made, the firm may have the right to liquidate the options positions and other securities positions in the writer's account with little or no prior notice.

7. **Since the leverage inherent in an option can cause the impact of price changes in the underlying interest to be magnified in the price of the option, a writer of an option that is uncovered and unhedged may have a significantly greater risk than a short seller of the underlying interest**. This is illustrated by the table set forth in numbered section 1 under "Risks of Option Holders" above. If an investor had sold short 100 shares of XYZ to Investor A in that table in order to receive $5,000 in proceeds, the investor would have lost $1,200 if the market price of XYZ had increased to 62. On the other hand, if, in order to receive $5,000 in proceeds, the investor had written 10 XYZ 50 uncovered calls, she would have lost $7,000 if the market price of XYZ had increased to 62.

8. **The fact that an option writer may not receive immediate notification of an assignment creates a special risk for uncovered writers of physical delivery call stock options that are exercisable when the underlying security is the subject of a tender offer, exchange offer, or similar event**. A writer who fails to purchase the underlying security on or before the expiration date for the offer may learn after the expiration date that he has been assigned an exercise filed with OCC on or before that date. At that point, neither the purchase of the underlying security for regular settlement nor the exercise of another option (*e.g.*, the long leg of a spread) will enable the assigned writer to deliver the security on the settlement date for the option exercise (see "Settlement" in Chapter VIII). If the assigned writer fails to make timely settlement, he may be liable for, among other things, the value of the offer (because his non-delivery may have prevented the exercising holder from making timely delivery of the security to the offerer). This risk can be avoided only by purchasing the underlying security on or before the expiration date for the offer. Occasionally, an offer will require that tendered securities be delivered in less than the normal settlement time for exchange transactions after

the offer's expiration date. In those cases, call writers will need to purchase the underlying equity security at an earlier point—*i.e.*, at least the number of days equal to the normal settlement time before the offerer's delivery deadline—in order to protect themselves.

9. Although the rules of the options markets establish exercise cut-off times by which exercise instructions of expiring options must be received by brokerage firms from their customers, OCC must accept all exercises which it receives before expiration—even if those exercises are filed with OCC in violation of an options market's rules. **Accordingly, there is a risk that an option writer will be assigned an exercise that is made based on news that is published after the established exercise cut-off time and that the writer may not have an effective remedy to compensate for the violation of the options market's rules**.

10. **If a trading market in an option should become unavailable, or if the writers of the option are otherwise unable to engage in closing transactions, the writers of that option would remain obligated until expiration or assignment**. See the discussions in numbered sections 2 and 3 under "Other Risks' below.

11. **A sudden development may cause a sharp upward or downward spike in the value of the interest underlying a capped option**. Such a spike could cause the capped option to be automatically exercised, and writers of the option to become obligated to pay the cash settlement amount, even if the effect of the development on the value of the underlying interest completely disappears on the day after the automatic exercise is triggered.

Other Risks

1. **Transactions that involve buying and writing multiple options in combination, or buying or writing options in combination with buying or selling short the underlying interests, present additional risks to investors**. Combination transactions, such as option spreads, are more complex than buying or writing a single option. And it should be further noted that, as in any area of investing, **a complexity not well understood is, in itself, a risk factor**. While this is not to suggest that combination strategies should not be considered, it is advisable, as is the case with all investments in options, to consult with someone who is experienced and knowledgeable with respect to the risks and potential rewards of combination transactions under various market circumstances.

The investor considering strategies involving combination transactions should recognize several other risk-related considerations in addition to those already mentioned: the fact that it may at times be impossible simultaneously to execute transactions in all of the options involved in the combination, the difficulty that may be involved in attempting to execute simultaneously two or more buy or sell orders at the desired prices, the possibility that a loss could be incurred on both sides of a combination transaction, and the increased risk exposure that would result from the exercise or closing out of one side of the trade while the other side of the trade remains outstanding. Also, the transaction costs of combination transactions can be especially significant, since separate costs are incurred on each component of the combination. This can have the effect of requiring a substantial favorable price movement in the underlying interest before a profit can be realized.

Where a combination transaction involves the writing of an in the money American-style option, an investor must keep in mind the possibility of being assigned an exercise, which would eliminate that component of the transaction and could materially change the investor's risk position.

In the case of straddle writing, where the investor writes both a put and a call on the same underlying interest at the same exercise price in exchange for a combined premium on the two writing transactions, the potential risk is unlimited (except in the case of capped options or binary options). Except where a straddle consists of binary options, to the extent that the price of the underlying interest is either below the exercise price by more than the combined premium, or

above the exercise price by more than the combined premium, the writer of a straddle will incur a loss when one of the options is exercised. Indeed, if the writer is assigned an exercise on one option position in the straddle and fails to close out the other position, subsequent fluctuations in the price of the underlying interest could cause the other option to be exercised as well, causing a loss on both writing positions. An investor who writes a straddle using binary options will incur a loss when the combined premium is less than the fixed cash settlement amount of the option that is exercised.

Combinations involving different styles of options present added complexities. For example, the assigned writer of an American-style option would be unable to cover by exercising a European-style or capped-style option that he holds unless the assignment happened to occur during the exercise period of that option.

Combination transactions involving all cash-settled options also pose the same risks that are discussed for index options under "Special Risks of Index Options" below.

2. **If a trading market in particular options were to become unavailable, investors in those options could no longer engage in closing transactions. Moreover, even if the market were to remain available, there may be times when options prices will not maintain their customary or anticipated relationships to the prices of the underlying interests and related interests**. The options markets attempt to provide secondary markets in which holders and writers of options can close out their positions at any time prior to expiration — by making offsetting sales or purchases — but there is no guarantee that such a market will at all times exist for every option. Lack of investor interest, changes in volatility, or other factors or conditions might adversely affect the liquidity, efficiency, continuity or even the orderliness of the market for particular options. Or an options market might permanently discontinue trading of a particular option or of options generally (although it has ordinarily been the practice, when an options market decides to discontinue trading of options on a particular underlying interest, to do so only after all outstanding series of those options have expired if the options are not traded on another options market). A market could become temporarily unavailable if unusual events — such as volume in excess of trading or clearing capability, computer malfunction, fire or natural disaster — were to interrupt normal market operations. As discussed in numbered section 3, an options market may also become unavailable in the event trading in the underlying interest is formally suspended or halted. It is also possible that an options market will not open, or will delay opening, trading in certain options even though trading is taking place in the underlying security (or in the constituent securities of an underlying index).

   In addition, an options market may at times determine to impose restrictions on particular types of options transactions, such as opening transactions or uncovered writing transactions. For example, if an underlying interest ceases to meet qualifications imposed by the options market or OCC, new series of options on that interest may no longer be opened to replace expiring series, and opening transactions in existing series may be prohibited.

   The accounts of options market makers and specialists are carried and guaranteed by a relatively few firms. If one of these firms were to fail, be suspended by OCC, be restricted in its operations, determine or be required to discontinue or reduce its operations, or have a significant reduction in its capital, the markets for particular options, or even for all options, could be disrupted or possibly forced to discontinue trading. Similarly, in the event an options specialist or a significant group of options market makers should fail or have a significant reduction in capital, the markets in the particular options in which the specialist or market makers traded could be adversely affected. The suspension by OCC of any Clearing Member that maintains significant positions in a particular options series in its accounts could also disrupt the market for that options series.

   An options market could also become unavailable because of its own financial problems. For example, if an options market were to be declared bankrupt or if creditors were to take possession of its principal trading systems, it might be unable to continue to operate as an options market.

If a secondary market in a particular option were to become unavailable, a holder of that option would be able to realize his profits or limit his losses only by exercising at a time when the option is exercisable, and a writer of that option would remain subject to assignment until expiration. However, as noted in numbered section 5 under "Risks of Options Holders," an options market may also restrict exercises of that option.

3. **Disruptions in the markets for underlying interests could result in losses for options investors**. Each of the options markets has discretion to halt trading in an option in certain circumstances—such as when the market determines that the halt would be advisable in maintaining a fair and orderly market in the option. If trading is halted or suspended in one or more of the markets for an underlying interest, the trading of options on that interest may also be halted. Similarly, if dissemination of the current level of an underlying index is interrupted, or if trading is interrupted in stocks accounting for a substantial portion of the value of an index, the trading of options on that index may be halted. In addition, the rules of the options markets may require them to halt trading in particular types of options in certain circumstances. U.S. options markets are required to halt trading in all stock options and stock index options when trading in all stocks on the underlying exchange has been halted by the activation of "market-wide circuit breakers" by the underlying exchange. This requirement may be changed from time to time.

   When trading in an option is halted or suspended, holders and writers of that option will be unable to close out their positions until trading resumes, and they may be faced with substantial losses if the value of the underlying interest moves adversely during that time. For example, if a trading halt in an underlying stock is followed by the announcement of a tender offer at a substantial premium, and the stock reopens at a price reflecting the offer, uncovered call writers may sustain large losses.

   Even if options trading is halted, holders of American-style options, other than delayed start options for which an exercise price has not yet been set, would still be able to exercise unless exercises were restricted. (However, OCC or an options market may restrict the exercise of an option while trading in the option has been halted, and the restriction may remain in effect until shortly before expiration. See numbered section 5 under "Risks of Option Holders" above.) If the option is exercisable while trading has been halted in the underlying interest, option holders may have to decide whether to exercise without knowing the current market value of the underlying interest. This risk can become especially important if an option is close to expiration, and failure to exercise will mean that the option will expire worthless. If exercises do occur when trading of the underlying interest is halted, the party required to deliver the underlying interest may be unable to obtain it, which may necessitate a postponed settlement and/or the fixing of cash settlement prices (see Chapter VIII).

4. **All cash-settled options have certain special risks.** The special risks applicable to cash-settled index options are discussed under "Special Risks of Index Options" below. Special risks applicable to range options are discussed under "Special Risks of Range Options" and the special risks applicable to binary options are discussed under "Special Risks of Binary Options (Other than Credit Default Options)" and "Special Risks of Credit Default Options" below.

   If a cash-settled option has a settlement currency other than U.S. dollars, holders and writers will be subject to the same kinds of risks with respect to the foreign currency and the settlement of an exercise as are discussed in numbered sections 1 through 9 under "Special Risks of Foreign Currency Options" below.

5. **Holders and writers of a capped option bear the risk that an automatic exercise value will be reported erroneously by the official reporting source**. As a consequence of the error, the options market on which the option is traded may not determine on a timely basis that the automatic exercise feature has been triggered. In that event, the option will not be automatically exercised unless the options market determines on a subsequent trading day that the automatic exercise value for the option has hit the cap price. Alternatively, the options market may determine on the basis of an erroneous report that the automatic exercise feature has been triggered. If the options market

makes such a determination and does not correct it on a timely basis, the option will be automatically exercised and the short positions of all writers will be assigned based on the erroneous report.

6. **The insolvency of a brokerage firm could present risks for that firm's customers, whether they are investors in options or in other securities**. If a brokerage firm or the OCC Clearing Member that carries the firm's accounts at OCC were to become insolvent, the firm's customers could have some or all of their options positions closed out without their consent. Customers whose options positions were not closed out under these circumstances might experience delays or other difficulties in attempting to close out or exercise affected options positions. Similarly, the insolvency of an associate clearing house could present risks for the customers of brokerage firms whose accounts are carried through that associate clearing house.

7. Although OCC's rules and procedures have been designed for the purpose, among others, of facilitating the prompt settlement of options transactions and exercises, **there is a risk that OCC and its backup system will fail**. For example, if Clearing Member insolvencies are substantial or widespread, OCC's ability to honor all exercises could be impaired.

Special Risks of Index Options

The risks described in numbered sections 1 through 10 below relate primarily to options on stock indexes. The risks described in numbered sections 1, 2, 5, 8 and 10 also relate to options on foreign currency indexes, although in the case of options on foreign currency indexes the components of the index are foreign currencies rather than securities. The risks described in numbered section 11 relate to options on implied volatility indexes. The risks described in numbered sections 12 through 14 relate to options on variability indexes, strategy-based indexes or relative performance indexes. The risks described in numbered section 15 relate to delayed start options. The risk described in numbered section 16 relates to dividend index options, and the risks described in numbered section 17 relate to relative performance options.

The risks discussed in numbered sections 4, 5, 7, 8 and 10 below are generally applicable to writers of non-binary and binary index options, but the risks discussed in numbered sections 1 through 3, 6 and 9 are inapplicable to writers of binary index options. The risks discussed in numbered sections 4, 5, 7, 8 and 10 below apply to writers of range options on securities indexes, but the risks discussed in numbered sections 1 through 3, 6 and 9 do not. Special risks of range options are discussed below under the caption "Special Risks of Range Options." Additionally, certain risks factors applicable to options on foreign currency indexes are discussed below under the caption "Special Risks of Foreign Currency Options," which discusses the risks of foreign currency options, many of which are applicable to foreign currency index options.

1. **Writers of cash-settled index call options cannot provide in advance for their potential settlement obligations by acquiring and holding the underlying interest**. A call writer can offset some of the risk of his writing position by holding a diversified portfolio of securities similar to those on which the underlying index is based. However, except where the underlying index is a specialized one based on relatively few securities, most investors cannot, as a practical matter, acquire and hold a portfolio containing exactly the same securities in the same proportions as the underlying index. **Most writers of cash-settled index calls who also hold positions in securities will therefore bear the risk that the market prices of those securities will not increase as much as the index**.

2. **Even if the writer of a cash-settled index call option could assemble a securities portfolio that exactly reproduced the composition of the underlying index, the writer still would not be fully covered from a risk standpoint because of the "timing risk" inherent in writing cash-settled options**. When a cash-settled index option is exercised, the amount of cash that the holder is entitled to receive is determined by the difference between the exercise price and the exercise settlement value, which is based on the prices of the constituent securities at a particular time on or in relation

to the date on which the option is exercised. As with most other kinds of options, the writer may not learn that he has been assigned until the next business day, at the earliest. The time lag between exercise and notice of assignment poses no risk for the writer of a covered physical delivery call, because that writer's obligation is to deliver the underlying interest and not to pay its value as of a fixed time in the past. So long as the writer of a physical delivery call already owns the underlying interest, he can satisfy his settlement obligations simply by delivering it, and the risk that its value may decline after the exercise date is borne by the exercising holder. In contrast, even if the writer of a cash-settled index call holds securities that exactly match the composition of the underlying index, he will not be able to satisfy his assignment obligations by delivering those securities against payment of the exercise price. Instead, he will be required to pay cash in an amount based on the exercise settlement value on the exercise date, and by the time he learns that he has been assigned, the index may have declined, with a corresponding decline in the value of the securities portfolio. This "timing risk" is an inherent limitation on the ability of writers of cash settled calls to cover their risk exposure by holding positions in the underlying interest. This risk applies only to American-style options. The writer of a European-style capped call that is exercisable only on the expiration date runs the risk of assignment only with respect to exercises filed on that day. If the call is more than marginally in the money on the preceding trading day, the writer can ordinarily assume that it will be exercised and take market action to protect himself against a subsequent decline in the value of his position in the underlying interest.

3. **The timing risk discussed in the preceding paragraph makes spread positions and certain other multiple option strategies involving cash-settled American-style index options substantially riskier than similar strategies involving physical delivery options**. With physical delivery options, a person in a spread position can ordinarily satisfy his settlement obligations on the short leg of the spread merely by exercising the long leg if it is in the money. That is, the cash or underlying interest that she obtains by exercising the long leg will ordinarily be sufficient to enable her to meet her settlement obligations on the short leg. With cash-settled index options, however, an investor in a spread position runs the risk that by the time she receives notice of an exercise assignment on the option she has written, the index value will have changed such that exercising the long leg of the spread will not yield sufficient cash to satisfy her obligation on the exercise assignment. **Thus, an investor who holds a spread position in cash-settled index options and is assigned an exercise is at risk for any adverse movement in the prices of the constituent securities of the index after the time the exercise settlement value of the assigned short is determined unless the investor is able to exercise the long leg of the spread in time to receive that same exercise settlement value. Other multiple options strategies involving cash-settled options can present similar risks**.

4. **Readers intending to use index options to hedge against the market risk entailed in investing in individual securities should recognize the complexities of utilizing index options in this manner**. Market risk is the risk that factors affecting the stock market as a whole may have a similar effect on the price of a particular equity security. Historically, some securities have tended to be highly sensitive to factors influencing the market generally; others less so. As a result, different securities may be viewed as involving different levels of market risk. In addition, a security's sensitivity to broad market influences may change over time, so that the same security may involve different levels of market risk at different times.

   Investors using index options in this manner should also understand that they remain subject to company risk—that is, the risk that factors affecting a particular company, such as its market position or the quality of its management, may cause its securities to perform differently than the market as a whole.

   In addition, readers intending to utilize index options to hedge a diversified securities portfolio against market risk should understand that unless the securities in the portfolio exactly mirror the securities in an underlying index, the portfolio and the index may respond differently to a given market influence. For this reason, the use of index options for hedging purposes involves special risks that are not present with "true" hedges—*i.e.*, hedges composed of options on the specific securities in the hedged position. These risks are greatest when options on broad-based indexes are used to hedge a non-diversified

securities position. Except where the composition of the position to be hedged is very similar to that of an underlying index, index options may best be understood as a means of reducing some but not all of the risks of a securities portfolio position.

Readers should also be aware that it may not be possible to purchase or liquidate a portfolio of securities at prices that exactly converge with the prices used in determining the exercise settlement values of some index options. For example, if the underlying index is comprised in whole or part of securities whose primary market is the Nasdaq stock market, an investor cannot be certain that he will be able to effect transactions in those securities at the opening or closing prices (as the case may be) used in determining the exercise settlement value.

5. **Holders and writers of index options generally bear the risk that the reported current index level may be in error**. Persons who exercise cash-settled index options or are assigned exercises based on erroneously reported index levels will ordinarily be required to make settlement based on the exercise settlement value as initially reported by the official source of the index, even if a corrected value is subsequently announced. In the case of binary index options, while the exercise settlement amount is fixed, the exercise settlement value of the underlying index will determine whether the option is automatically exercised and returns a cash settlement amount or expires worthless. References herein to index values "as initially reported" refer to the values initially reported by the source of the index as definitive, and not to any tentative or preliminary values that may be announced at an earlier time subject to adjustment. In extraordinary circumstances (*e.g.*, where an exercise settlement value as initially reported is obviously wrong and inconsistent with values previously reported, and a corrected value is promptly announced), OCC has discretion to direct that exercise settlements be based on a corrected exercise settlement value. Ordinarily, however, the exercise settlement value as initially reported by the official source of the index will be conclusive for exercise settlement purposes.

6. **A holder of a cash-settled index option who exercises it before the exercise settlement value of the index for that day is available runs the risk that the level of the underlying index may subsequently change**. If such a change causes the exercised option to fall out of the money, the exercising holder will be required **to pay** the difference between the exercise settlement value and the exercise price of the option (times the applicable multiplier) to the assigned writer.

EXAMPLE: *A holder of an index put option that settles based on the closing prices of the constituent securities and that has an exercise price of 30 directs his broker to exercise at 10:00 A.M., when the level of the underlying index is 28. If the underlying index stays at that level until the close of trading that day, the holder will be entitled to receive $200 in settlement (assuming a multiplier of 100). If, however, the index level rises to 32 based on the closing prices of the constituent securities, the holder will be required to* ***pay*** *$200 to the assigned writer, thereby sustaining a $200 loss on the exercise.*

EXAMPLE: *A holder of an index put option that settles based on the closing prices of the constituent securities and that has an exercise price of 30 directs his broker to exercise at 10:00 A.M., when the level of the underlying index is 28. If the underlying index stays at that level until the close of trading that day, the holder will be entitled to receive $2 in settlement (assuming a multiplier of 1). If, however, the index level rises to 32 based on the closing prices of the constituent securities, the holder will be required to pay $2 to the assigned writer, thereby sustaining a $2 loss on the exercise.*

A holder who plans to exercise a cash-settled index option that settles based on closing prices can minimize this risk by withholding exercise instructions until just before the daily exercise cut-off time fixed by his brokerage firm. However, he may not be able to eliminate it entirely. Daily exercise cut-off times for index options may be earlier than those fixed for other types of options and may

occur before definitive exercise settlement values have been determined. In the case of the exercise of a cash-settled index option that settles based on opening prices of the constituent securities, this risk applies if the holder submits exercise instructions before the definitive exercise settlement index value has been announced, which may be different from index levels that are initially disseminated at the time of the opening and which may not be available in some cases until several hours after the opening.

7. **Cash-settled index options whose exercise settlement values are based on the opening prices of the constituent securities are not traded on the last scheduled trading day for those securities prior to the option expiration date.** An option holder will be able to realize value from his option on that day only if the option is in the money and is exercised. A writer of this type of option who has not previously closed out his position will be unable to do so on that last trading day for the constituent securities and will be at risk of being assigned an exercise.

8. **Current index levels will ordinarily continue to be reported even when trading is delayed or interrupted in some or all of the constituent securities of the index or when the reporting of transactions in those securities has been delayed**. In that event, the reported index levels will be based on the most recent reported prices of the constituent securities—whether or not those securities are being currently traded. As a result, reported index levels may at times be based on non-current price information with respect to some or even all of the constituent securities of an index. If this condition existed at the time of determining the exercise settlement value of an exercised option, that exercise would be settled on the basis of an index level that might not reflect current price information with respect to constituent securities accounting for a significant portion of the value of the index. (Indeed, as noted in Chapter IV, an exercise settlement value that is based on the opening prices of the constituent securities may not coincide with, and may diverge substantially from, the index values that are reported at the time of the opening.) Moreover, if the index underlay a capped index option or a binary index option, that option would or would not be automatically exercised based on an index level that might not reflect the true state of the market at the time.

   If OCC determines that the primary market(s) for one or more component securities of an underlying index did not open or remain open for trading, or that the component security or securities did not open or remain open for trading on the primary market(s), on a trading day at or before the time when the exercised settlement value for that trading day would ordinarily be determined, or that a current index value or other price or value needed to calculate the exercise settlement value for an index option is otherwise unreported, inaccurate, unreliable, unavailable or inappropriate for purposes of calculating the cash settlement amount, then OCC may suspend settlement obligations for exercised and assigned contracts of the affected series. In the event of such a suspension, OCC will fix a new settlement date after OCC determines that the exercise settlement value is available or after OCC fixes the exercise settlement value.

   If OCC determines to fix the exercise settlement value, it will act through a panel comprised of representatives from each exchange on which the series without an exercise settlement values trades, that will use its judgment as to what is appropriate for the protection of investors and the public interest. The panel may fix the exercise settlement value using the reported price or value of the relevant security or securities or index (i) at the close of regular trading hours (as determined by OCC) on the last preceding trading day for which a price or value was reported by the reporting authority, or (ii) at the opening of regular trading hours (as determined by OCC) on the next trading day for which a price or value was reported by the reporting authority. Alternatively, the panel may fix the exercise settlement value using a price or value for the relevant security or securities or index, or using a combination or average of such prices or values, at or during such time or times that the panel sees fit.

   If a panel delays fixing an exercise settlement value for a series of index options past the last trading day before expiration of that series, normal expiration exercise procedures will not apply to the affected series. Instead, exercise settlement will be postponed until the next business day

following the day when the panel fixes the exercise settlement value, and each long position in the affected series will be treated as having been exercised if the exercise settlement amount per contract is equal to or greater than the exercise threshold amount used in normal expiration exercise procedures. For example, for an index option with a multiplier of 100, each long position in the affected series will be treated as having been exercised if the exercise settlement amount per contract for that series is $1.00 or more, and if the exercise settlement amount per contract is less than $1.00, the option will be treated as having expired unexercised. Similarly, for an index option with a multiplier of 1, each long position in the affected series will be treated as having been exercised if the exercise settlement amount per contract is $0.01 or more, and if the cash settlement amount per contract is less than $0.01, the option will be treated as having expired unexercised. As a result of these procedures, holders of expiring index options may not know whether their options have been exercised, and writers of such options may not know whether they have been assigned an exercise notice, until after the expiration date. Investors should contact the listings options market to obtain the exercise threshold amount of the options they trade. A panel's determinations shall be conclusive, binding on all investors, and not subject to review.

9. OCC has no authority, and the options markets on which capped index options are traded do not intend as of the date of this document, to restrict the automatic exercise of capped index options. It is therefore possible that automatic exercise of a capped index option could occur on a day when OCC or an options market has imposed restrictions on the exercise of other styles of options on the same underlying index. It is also possible that automatic exercise of a capped index option could occur on a day when the options market has suspended trading in the option. Either of these possibilities could limit the ability of a writer to take action to limit the cost of being assigned an automatic exercise.

10. The purchase and sale of index options in foreign markets at times when U.S. markets are closed may present special risks. Although an underlying index may be based on securities primarily traded in U.S. markets, the index levels reported in foreign options markets at such times may be based on the trading of some or all of the constituent securities in foreign markets, and, in any case, option premiums in the foreign market will not reflect current prices of the constituent securities in U.S. markets. In addition, if a cash-settled index option (other than a binary index option) is exercised through the foreign office of a brokerage firm on a day when U.S. markets are closed, the exercise settlement value of the option will not be known until the time fixed for determining exercise settlement values on the next day on which U.S. markets are open. The corresponding risks would apply to the trading in U.S. markets of options based on indexes of securities primarily traded in foreign markets.

11. Because different values may be used in calculating indicative values and exercise settlement values of the volatility indexes underlying implied volatility options, **there is a risk that there may be a divergence between the exercise settlement value and an indicative value calculated at the opening on the date on which the exercise settlement value is being determined**. (Please refer to the discussion in Chapter IV under the heading "Variability Indexes" for the definition of the term **indicative value** and a description of the method that is used to calculate an exercise settlement value for implied volatility options.) For those implied volatility options that calculate the exercise settlement value by utilizing the actual opening prices of the relevant series of the index's component put and call options on the reference index (rather than using the mid-point between opening bid and ask quotations), it is to be expected that there may will be at least some divergence between the exercise settlement value for such expiring implied volatility options and the indicative value calculated at the opening on the same date. Such divergence may occur if the indicative value is based on either the actual bid quotation or the actual ask quotation, depending on the forces of supply and demand, rather than the actual opening price for each of the options series that is used to calculate the exercise settlement value. This divergence may represent a significant percentage of the indicative value for the implied volatility index if the forces of supply and demand cause all or most of the series to open on the same side of the market. There may also be variability in the exercise settlement value for those implied volatility indexes that calculate the exercise settlement value by utilizing the mid-point of the bid and offering premium quotations at the opening of trading

of the relevant series of the put options on the reference interest. Readers should recognize and understand the risks associated with the different methods of determining the exercise settlement values of the implied volatility options they intend to trade.

12. **Strategies involving the purchase and sale of options on a variability index, strategy-based index or relative performance index are inherently complex and require a thorough understanding of the concepts that are measured by these indexes**. **Investors must understand the method used to calculate the index in order to understand how conditions in the market for the component securities used to calculate its value may affect the value of the index.** Investors may fail to realize their investment objective even if they have correctly predicted certain events if they do not understand how those events may or may not affect the level of the index. The component securities of an implied volatility index are put and call options (not stocks, which are the component securities of stock indexes). A realized variability index, on the other hand, measures the actual volatility of an index and is calculated directly from the values of the reference index. There is no assurance that predicted volatility as measured by a particular implied volatility index will correspond to the actual volatility of the reference interest or to measures of predicted volatility calculated using other methods. A strategy-based index may be calculated from the prices of multiple component securities of different types, such as in the case of a buy-write index measuring the return of a strategy that involves transactions in stocks and options. The return from a particular strategy as measured by a strategy-based index may differ from the actual returns that an investor following that strategy achieves, because of assumptions regarding transactions and the failure to take into account significant factors such as taxes and transaction costs. Different relative performance indexes may measure relative performance in different ways. Investors should contact the listing options market for information on the method of calculation of a particular variability index, strategy-based index or relative performance index.

13. **Persons who exercise variability options, strategy-based index options or relative performance options or are assigned exercises based on an erroneous index level will ordinarily be required to make settlement based on the exercise settlement value as initially reported by the designated reporting authority for the index, even if a corrected value is subsequently announced**. In extraordinary circumstances (*e.g.*, where an exercise settlement value as initially reported is obviously wrong, and a corrected value is promptly announced), OCC has discretion to direct that exercise settlements be based on a corrected exercise settlement value. Ordinarily, however, the exercise settlement value as initially reported by the designated reporting authority for the underlying variability index will be conclusive for exercise settlement purposes. As described in numbered section 8 with respect to other indexes, reported levels of a variability index, strategy-based index or relative performance index may be based on non-current information. This may occur as a result of delays or interruptions in the market for the reference security or the component securities of the underlying index or the reference index (which are the same in the case of realized variability indexes).

14. **As in the case of writers of other index options, writers of variability options, strategy-based index options or relative performance options cannot provide in advance for their potential settlement obligations by acquiring the underlying interest**. Offsetting the risk of writing a variability option, strategy-based index option or relative performance option may be even more difficult than offsetting the risk of writing other index options. Even where some offsetting of risk is possible, there are timing risks and other risks analogous to those discussed in numbered sections 3 and 4 above whenever an investor attempts to employ strategies involving transactions in variability options, strategy-based index options or relative performance options and transactions in stocks or in options, futures contracts or other investments related to stocks.

15. **Holders and writers of delayed start options bear the risk that the index level used to calculate the exercise price on the exercise price setting date may be unavailable or incorrect or that the options market may incorrectly calculate the exercise price.** Numbered section 5 of this section discusses some of the risks of an erroneously reported index level to a person buying,

selling, or exercising an option, or who is assigned an option exercise, based on the erroneous index level. Similarly, persons who are holders or writers of delayed start options on the exercise price setting date bear the risk that an erroneously reported index level will be used to set the exercise price. There is the additional risk that a correct index level will be used, but the options market will calculate the exercise price incorrectly. Once a series of delayed start options is opened for trading on the day after the exercise price setting date, even if a corrected index level is later reported, or if it is later discovered that an exercise price was set incorrectly, the exercise price will not be corrected to account for such errors.

16. The reported values of dividend indexes may be affected by factors other than the financial ability of the issuers of the component securities of a dividend index to pay cash dividends. For example, an issuer's determination to pay stock dividends in lieu of cash dividends or to forego payment of cash dividends notwithstanding its ability to do so may affect the level of a dividend index.

17. **In the event that one of the index components of a relative performance index is eliminated as a result of a cash-out merger or other event, the reporting authority may cease to publish the value of the relative performance index and the market on which options on that relative performance index are traded may determine to accelerate the expiration date of the options (and, in the case of European-style options, their exercisability**). In that case, the exercise settlement value of the options would become fixed based upon the last published value for the underlying relative performance index. As a result, all such options that are not in the money will become worthless and all that are in the money will have no time value. Holders of an in-the-money option whose expiration date is accelerated must be prepared to exercise that option prior to the accelerated exercise cut-off time in order to prevent the option from expiring unexercised. Writers of a European-style option whose expiration date is subject to being accelerated bear the risk that, in the event of such an acceleration, they may be assigned an exercise notice and be required to perform their obligations as writers prior to the original expiration date. As with any other option for which the expiration date is accelerated, no adjustment would be made to compensate for the accelerated expiration date of a relative performance option.

Special Risks of Debt Options

The risks described in numbered sections 1 through 9 of this section relate to debt options other than options on index-linked securities. The risks described in numbered sections 10 and 11 relate exclusively to options on index-linked securities.

1. Many of the special risks associated with debt options result from the character of the markets in which the underlying debt securities are issued and traded and the distinctive characteristics of debt securities. The vast majority of the trading activity in bonds and money market instruments takes place in a dealer market. Dealers typically maintain markets in all outstanding issues of Treasury securities, but most of the activity tends to center on recently issued securities. Liquidity is generally greater and quotations are generally tighter on recent issues than on older issues.

There are numerous dealers in all of the Treasury securities from which the yield on the options now traded is determined, but at the date of this document there is no comprehensive consolidation of bids and offers or public reporting of transaction prices in those securities such as exists in the markets for stocks. While there is some dissemination of representative bids and offers, at the date of this document anyone interested in buying or selling a Treasury security usually must have his brokerage firm or bank contact one or more dealers individually to learn their current quotations.

The absence of last sale information and the limited availability of quotations for debt instruments can make it difficult for many investors to obtain timely, accurate data about the state of the market for the underlying debt securities. At the same time, dealers in the underlying securities have access to private quotation networks that give actual current bids and offers of other

dealers. This information may not be available to investors. As a result, these dealers may have a significant advantage over other participants in the debt options markets.

2. Another important difference between the stock market and the market for Treasury securities is that stock quotations are generally keyed to a 100-share round lot while the basic unit of trading in the debt securities market typically involves much larger dollar amounts. A round lot for most dealers in Treasury securities is, at a minimum, $1,000,000 of principal amount; and on Treasury bills it can be larger. Most dealers are oriented toward doing business with large institutional customers or other dealers. As a result, investors buying or selling debt securities in amounts smaller than round lots can expect to pay more and receive less than dealer quotations for round lot transactions.

   The unit of trading for price-based debt options is likely to involve larger dollar amounts of the underlying debt security than is the case with stock options. In general, this means that: (a) premiums for such an option will tend to be higher than for a stock option, and (b) the increase or decrease in the price of an option that is associated with any given change in the price of the underlying security will tend to be larger for many such debt options.

   If the unit of trading for a physical delivery price-based debt option is smaller than $1,000,000, investors who buy or write options covering principal amounts other than a multiple of $1,000,000 may be disadvantaged by having to deal in an odd-lot market for the underlying debt security at prices that are less favorable than for round lots.

3. **In the event of a shortage of the underlying debt security deliverable on exercise of a physical delivery price-based debt option, OCC has the authority to permit other generally comparable securities to be delivered in fulfillment of the delivery obligation**. If OCC exercises its authority to allow such other securities to be delivered, it may also adjust the exercise prices of the affected options by setting different prices at which otherwise non-eligible securities may be delivered. As an alternative to permitting such substitute deliveries, OCC may impose special exercise settlement procedures similar to those applicable to stock options, including the fixing of a cash settlement price payable by writers who would otherwise be unable to meet their delivery obligations (see "Settlement" in Chapter VIII), and/or prohibit the exercise of puts by holders who would be unable to meet the resulting settlement obligations (see numbered section 5 under "Risks of Option Holders" above).

4. **The hours of trading for debt options may not conform to the hours during which the debt securities are traded. To the extent that the options markets close before the markets for the underlying or other related instruments, significant price and rate; movements can take place in the underlying markets that may not be reflected in the options markets**. The possibility of such movements should be taken into account in relating closing prices in the options markets to those in the underlying markets. In addition, there is a risk that debt options may be exercised on the basis of price movements in the underlying security after the close of trading in the options markets when writers are no longer able to close out their short positions.

5. **Because exercises of yield-based options are settled in cash, option writers cannot fully provide in advance for their potential settlement obligations by acquiring and holding the Treasury security from which the underlying yield is determined**. A writer of a yield-based option can theoretically offset most of the risk of his writing position by acquiring Treasury securities of the designated maturity period on which the underlying yield is based. Offsetting risk in this way may be difficult to do in practice, however. While it is possible at any given time to calculate the principal amount of Treasury securities needed to assure that the risk of the option position is offset, such calculations are based upon complex mathematical relationships. Moreover, the principal amount of Treasury securities needed to assure that the risk of an options position is fully offset will generally not remain constant throughout the life of the option, but instead will fluctuate as a result of changes in yields and remaining time to maturity.

For a given percentage change in yield, this fluctuation will be greater for securities of longer maturity periods than for securities of shorter maturity periods. Furthermore, there can be no assurance that an option writer will be able to sell the Treasury securities that she holds at the option's expiration at the same average yield that is used in calculating the exercise settlement value of the option. Prices, and therefore yields, could differ from dealer to dealer. Moreover, when dealer quotations are averaged in obtaining a yield, they may result in a value which varies from the value that would be obtained by averaging yields representing actual transactions for the same securities during the same time period.

6. **Investors in yield-based debt options run the risk that reported yields may be in error**. The values disseminated by the designated reporting authority of the options markets during trading and for exercise settlement purposes will ordinarily be averages or medians of dealer quotations or prices, and it is possible that errors could be made in the gathering or averaging of these values. A person who buys or sells an option at a premium based on an erroneous reported yield value is bound by the trade and has no remedy under the rules of the options markets. Similarly, persons who exercise options or are assigned exercises based on erroneous reported yields will ordinarily be required to make settlement based on the value as initially reported by the reporting authority, even if a corrected value is subsequently announced. In extraordinary circumstances (*e.g.*, where a value as initially reported is obviously wrong and inconsistent with values previously reported, and a corrected value is promptly announced), OCC may direct that exercise settlements be based on a corrected value. Ordinarily, however, the value as initially reported by the official source will be conclusive for exercise settlement purposes.

7. **A holder of a yield-based option who exercises it before the exercise settlement value of the underlying yield is available runs the risk that the level of the underlying yield may subsequently change**. If such a change causes the exercised option to fall out of the money, the exercising holder will be required to pay the difference between the exercise settlement value and the exercise price of the option (times the applicable multiplier) to the assigned writer. A holder who plans to exercise an option may be able to minimize this risk by withholding exercise instructions until just before the exercise cut-off time fixed by his brokerage firm. However, he may not be able to eliminate the risk entirely. Exercise cut-off times for yield-based options may occur before definitive exercise settlement values are announced. Because exercise cut-off times may vary from brokerage firm to brokerage firm, and there may be different exercise cut-off times for different yield-based options, option holders who anticipate exercising should determine the applicable cut-off times from their brokers.

8. If for any reason there are no quotations available for the Treasury security from which underlying yields of a yield-based option are determined, trading in the option may be halted. If trading is not halted, reported yields may be based on non-current price information for the Treasury security.

9. If OCC determines that the exercise settlement value of the underlying yield for any series of yield-based options is unreported, inaccurate, unreliable, unavailable, or inappropriate for purposes of calculating the cash-settlement amount of such series, OCC has the authority to suspend the settlement obligations of the exercising and assigned Clearing Members of options of such series or to fix the cash settlement amount for exercised options of such series or to do both. In the event of such a suspension, OCC will fix a new settlement date after OCC determines that the exercise settlement value is available or after OCC fixes the cash settlement amount.

   If OCC determines to fix the cash settlement amount, it will act through a panel, comprised of representatives from each exchange on which the series without an exercise settlement value trades, that will use its judgment as to what is appropriate for the protection of investors and the public interest. The panel may fix the cash settlement amount using the reported value of the underlying yield (i) at the close of regular trading hours (as determined by OCC) on the last preceding trading day for which such a value was reported by the reporting authority or (ii) at the opening of regular trading hours (as determined by OCC) on the next trading day for which such

a value was reported by the reporting authority. Alternatively, the panel may fix the cash settlement amount using the value for the underlying yield, or using a combination or average of such values, at or during such time or times that the panel sees fit.

If a panel delays fixing a cash settlement amount for a series of yield-based options past the last trading day before expiration of that series, normal expiration exercise procedures will not apply to the affected series. Instead, exercise settlement will be postponed until the next business day following the day when the panel fixes the cash settlement amount, and each long position in the affected series will be treated as having been exercised if the cash settlement amount per contract for that series is $1.00 or more. If the cash settlement amount per contract is less than $1.00, the option will be treated as having expired unexercised. As a result of these procedures, holders of expiring yield based options may not know whether their options have been exercised, and writers of such options may not know whether they have been assigned an exercise notice, until after the expiration date. A panel's determinations shall be conclusive, binding on all investors, and not subject to review.

10. In the event of a shortage of index-linked securities that are deliverable on exercise of a physical delivery option, OCC may impose special exercise settlement procedures similar to those applicable to stock options, including the fixing of a cash settlement price payable by writers who would otherwise be unable to meet their delivery obligations (see the discussion in Chapter VIII under "Settlement"), and/or prohibit the exercise of puts by holders who would be unable to meet the resulting settlement obligations (see numbered section 5 under "Risks of Option Holders").

11. In the event that an issuer of an index-linked security calls the entire issue of the security, outstanding options on that issue will be adjusted to require delivery upon exercise of a fixed amount of cash. After such an adjustment, all options on that security that are not in the money will become worthless, and all that are in the money will have no time value. Holders must be prepared to exercise the option to prevent the option from expiring unexercised, and writers must be prepared to perform their obligations prior to the accelerated exercise cut-off date. There is no assurance that the exercise settlement date for an index-linked security option will coincide with the date on which the cash payment to the holders of the underlying security becomes available from the issuer, and covered writers of an accelerated option therefore may be required to pay the cash amount in respect of the option before they receive cash payment on the underlying security.

Special Risks of Foreign Currency Options

1. The value of any currency, including U.S. dollars as well as foreign currencies, may be affected by complex political and economic factors applicable to the country issuing that currency. The price of a foreign currency option is dependent upon the value of the underlying foreign currency relative to the trading currency as well as the value of both currencies relative to other currencies generally. Fluctuations in the value of the trading currency—whether it is the U.S. dollar (in the case of a dollar-denominated option) or a foreign currency (in the case of a cross-rate option)—will affect exchange rates and the prices of foreign currency options, even in the case of an otherwise stable underlying foreign currency. Conversely, fluctuations in the value of an underlying foreign currency will affect exchange rates and the prices of foreign currency options even if the value of the trading currency remains relatively constant. Investors should consider factors affecting the economies and currency values of both the country of origin for the trading currency and the country of origin for the underlying currency. Although these same considerations apply to dollar-denominated options and cross-rate options, cross-rate options involve factors affecting the economies of at least two foreign countries and may involve consideration by U.S. investors of factors affecting the U.S. economy as well. Accordingly, a U.S. investor in cross-rate options may need to consider a broader range of economic developments than a U.S. investor in dollar-denominated foreign currency options.

2. Even though the intrinsic value of an option is determined by the value of the underlying currency relative to the trading currency, investors who intend to convert gains or losses into U.S. dollars or other currencies may be particularly affected by changes in the exchange rates between their "home" currency and either the trading or the underlying currency.

EXAMPLE: *Assume that an investor purchases a yen-denominated, at-the-money call option on British pounds by converting U.S. dollars to Japanese yen. The British pound then appreciates relative to the yen, and at expiration the exercise price is more favorable than the then current exchange rate between yen and pounds. The investor could realize a gain in yen by converting dollars to yen in order to purchase pounds at the exercise price and then reselling the pounds for yen at the current exchange rate. If the amount of that gain exceeds the premium that the investor paid for the option, the investor will realize a gain in yen on his investment in the option. However, if the yen has depreciated relative to the dollar since the investor purchased the option, the gain may be reduced or even converted to a loss when the yen are converted back to dollars. This is so because, although the yen received upon the sale of the pounds may exceed the exercise price plus the premium paid in yen, there is no guarantee that, when the yen are converted back to dollars at the current rate, the dollars received will exceed the exercise price plus the premium paid in dollars. If the investor converts the pounds directly into dollars rather than to yen and then to dollars, the result would be the same since the amount of the dollars received would be expected to be approximately the same, ignoring any difference in transaction costs and any timing differences in the two-step process.*

Similar considerations will apply if the investor liquidates his investment in a cross-rate option by selling it rather than by exercising it.

EXAMPLE: *Assume in the previous example that the premium value of the call option has increased permitting the investor to liquidate his investment in the option by selling it for more yen than he paid for it. If the exchange rate between the U.S. dollar and the Japanese yen has not changed, the investor should be able to convert the yen received on the sale of the option to a U.S. dollar amount greater than his original investment. If, on the other hand, the yen has declined in value relative to the U.S. dollar, the investor's gain in yen may be reduced or converted to a loss when the premium received on the sale of the option is converted to dollars.*

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3. The exchange rates of foreign currencies (and therefore the prices of foreign currency options) could be significantly affected, fixed or supported directly or indirectly by government actions. Government actions could increase risks to investors in both dollar-denominated and cross-rate options if exchange rates were not free to fluctuate in response to other market forces.

4. Because foreign currency transactions occurring in the interbank market involve substantially larger amounts than those likely to be involved in the exercise of individual foreign currency option contracts, investors who buy or write foreign currency options may be disadvantaged by having to deal in an odd lot market for the underlying foreign currencies at prices that are less favorable than for round lots. Because this price differential may be considerable, it should be taken into account when assessing the profitability of a foreign currency option transaction that will involve the exchange of one currency for another.

5. There is no systematic reporting of last sale information for foreign currencies. There is reasonably current, representative bid and offer information available on any market where foreign currency options are traded, in certain brokers' offices, in bank foreign currency trading offices, and to others who wish to subscribe for this information. There is, however, no regulatory requirement that those quotations be firm or be revised on a timely basis. The absence of last sale information and the limited availability of quotations to individual investors may make it difficult for many investors to

obtain timely, accurate data about the state of the underlying market. In addition, the quotation information that is available is representative of very large round lot transactions in the interbank market and does not reflect exchange rates for smaller odd lot transactions. Since the relatively small amount of currency underlying a single foreign currency option would be treated as an odd lot in the interbank market, available pricing information from that market may not necessarily reflect prices pertinent to a single foreign currency option contract.

The quotation information available to investors may be from sources that are different from those used to calculate the exercise settlement value of cash-settled foreign currency options. An investor who attempts to realize the intrinsic value of such an option through an exercise rather than by selling the option in a closing transaction runs the risk that the exercise settlement value may be less than appears from the information then available to him.

6. Foreign governmental restrictions or taxes could result in adverse changes in the cost of acquiring or disposing of foreign currencies. If OCC determines that such restrictions or taxes would prevent the orderly settlement of delivery foreign currency option exercises or would impose undue burdens on parties to exercise settlements, it has authority to impose special exercise settlement procedures, which could adversely affect some investors.

7. The interbank market in foreign currencies is a global, around-the-clock market. Therefore, the hours of trading for foreign currency options do not conform to the hours during which the underlying currencies are traded. To the extent that the options markets are closed while the market for the underlying currencies remains open, significant price and rate movements may take place in the underlying markets that cannot be reflected in the options markets. The possibility of such movements should be taken into account in relating closing prices in the options markets to those in the underlying markets. In addition, this creates a risk that foreign currency options may be exercised on the basis of price movements in the underlying currency after the close of trading in the options markets, when writers are no longer able to close out their short positions.

8. Since exercise settlement of physical delivery foreign currency options—whether they are dollar-denominated or cross-rate options—occurs within the country issuing the underlying foreign currency, investors must accept or make delivery of the trading and underlying foreign currencies through their brokerage firms in conformity with any U.S. or foreign restrictions or regulations regarding the maintenance of foreign banking arrangements by U.S. residents, and may be required to pay any fees, taxes or charges associated with such deliveries.

9. Exercise settlement of physical delivery foreign currency options—whether they are dollar-denominated or cross-rate options—is made through OCC's correspondent banks in the country of origin. Investors may be exposed to losses in the event that a correspondent bank should fail during the settlement process.

10. As in the case of other cash-settled options, writers of cash-settled foreign currency call options cannot fully provide in advance for their potential settlement obligations by acquiring and holding the underlying interest. Although a call writer may hold the quantity of the currency underlying the option, there is no assurance that if she is assigned an exercise she will be able to sell such currency at the exercise settlement value.

11. If a cash-settled foreign currency option is exercised based upon a reported exercise settlement value that is in error, the holder and the writer will ordinarily be obligated to make settlement based on the exercise settlement value as originally reported, even if the value is subsequently revised or determined to have been inaccurate. In extraordinary circumstances (*e.g.*, where the value as initially reported is obviously wrong and inconsistent with other available price information and a corrected value is promptly announced), OCC has discretion to direct that the exercise settlement be based on the corrected value.

12. If OCC determines that the exercise settlement value for any cash-settled foreign currency option is unavailable for purposes of calculating the cash settlement amount, OCC has the authority to suspend the settlement obligations of the exercising holder and assigned writer of such option or to fix the cash settlement amount based on the best information available to OCC, or to do both. Accordingly, there is a risk to both holders and writers that the settlement of exercised cash-settled foreign currency options may be postponed and may be based on a determination by OCC rather than by the procedures specified by the options market on which the options are traded.

13. In addition to foreign currency options, options on foreign currency indexes also may be traded. As discussed above under the heading "Special Risks of Index Options," many of the special risks applicable to options on stock indexes also apply to options on foreign currency indexes. In addition, the risks applicable to foreign currency options described in numbered sections 1 through 3, 5, 7, and 10 through 12 above generally apply to options on foreign currency indexes.

Special Risks of Flexibly Structured Options

In addition to the risks discussed above, the following special risks are applicable to flexibly structured options.

1. Because flexibly structured options have variable terms that are fixed by the parties, there are no pre-established series of flexibly structured options. Rather, many different series of flexibly structured options may be created and outstanding at any given time as a result of the various designations of variable terms that are made in different transactions. Secondary trading interest in flexibly structured options may therefore be spread over a larger number of series than the trading interest in other options, the trading interest in any particular series of flexibly structured options may be very limited, the secondary markets in flexibly structured options may be less deep, liquid and continuous than the markets in other options on the same underlying interests, and the premiums for flexibly structured options may not correlate with premiums for such other options.

2. OCC may base its calculations of the margin requirements of OCC's Clearing Members for positions in a series of flexibly structured options on an estimate derived from data and factors OCC deems pertinent in respect of quotations and transactions in that options series and in other options series. Alternatively, OCC may fix such margin requirements at a level it deems necessary to protect the respective interests of OCC, the Clearing Members and the public. As a result, the Clearing Member's margin requirements for positions in flexibly structured options may differ from—and may be significantly greater than—the margin requirements applicable to similar positions in other options on the same underlying interest. Such differences may cause Clearing Members to require customers that maintain positions in flexibly structured options to deposit more margin for flexibly structured options positions than for positions in other options. To the extent OCC's estimate of the current value of a flexibly structured option is used in the determinations of the margin requirements of the Board of Governors of the Federal Reserve System, the options markets and other self-regulatory organizations, it may also cause such margin requirements to be greater than they would be for other options.

Special Risks of Credit Default Options

1. Pricing of credit default options is complex. As stated elsewhere in this document, complexity not well understood is, in itself, a risk factor. In order to price these options, investors must estimate the probability of default from available security or other prices, primarily bond and credit default swap (CDS) prices. Models typically used by market professionals to infer the probability of default from prices may be more complex than the average investor is used to.

2. The sources of price information used to price credit default options are subject to a lack of transparency and, at times, illiquid markets. This is attributable to, among other things: (1) the absence of last sale information and the limited availability of quotations for the reference obligation(s), (2) lack of ready availability of information on related products traded primarily in the over-the-counter market, and (3) the fact that related over-the-counter market credit derivative transactions are privately negotiated and may not be made public in a timely fashion or at all.

3. Dealers in the underlying debt securities and in the over-the-counter credit derivatives markets have access to private quotation networks that give actual current bids and offers of other dealers. This information is not available to most investors. As a result, these dealers may have an advantage over participants with regard to credit default options.

4. If the listing options market determines that a credit default option is subject to a redemption event (*i.e.*, the issuer or guarantor pays off the reference obligation), the option will expire worthless unless a credit event has been confirmed to have occurred prior to the effective date of the redemption event. As a result, purchasers of such options will lose their premium since there is no chance of occurrence of a credit event for the reference entity. On the other hand, if a redemption event occurs but a credit event is confirmed to have occurred prior to the effective date of the redemption event, a seller would be obligated to pay the cash settlement amount even though a holder of the reference obligation may not incur a loss.

5. Since succession events are determined by the listing options market, credit default options may be modified to specify a different reference entity or several different reference entities. As a result, there may be new reference obligations that have higher or lower credit quality than the original reference obligation. In addition, other factors may exist that could affect the likelihood of the occurrence of a credit event. As a result, the occurrence of a succession event could affect the price of these options. Moreover, since the listing options market determines whether a succession event occurred and the adjustment resulting from such an event, the adjustment made to these options may be at variance with the treatment given to the same succession event with respect to related credit derivative products.

6. The occurrence of a credit event must be confirmed by the listing options market. This means that there will be a lag time between the actual occurrence of a credit event and the listing options market's confirmation of the credit event. Rules of the options market may provide a specified time period (*e.g.*, four business days) between the end of the **covered period** and the expiration date for a series of credit default options to allow the options market to confirm whether a credit event occurred during the covered period. There is a risk, however, that the sources used to monitor a credit event may not identify and report a credit event in a timely fashion. For example, it is possible that a credit event could occur on the last day of trading, but the sources which report the occurrence of a credit event do not make this information publicly available until after the expiration date. In this case, the cash settlement value of a credit default option would be zero. There is also a risk that the listing options market may determine that a credit event has occurred based on information available to it when in fact no credit event has occurred. This could happen, for example, if the sources used to confirm the credit event are erroneous. The rules of OCC and/or the listing options market may provide that a confirmation of a credit event or other contract adjustment may be revoked up to a specified time prior to exercise settlement. Settlements based on a listing options market's confirmation of a credit event are irrevocable even if no credit event has occurred.

7. Every determination by the listing options market of a redemption event, succession event or credit event will be within the listing options market's sole discretion and will be conclusive and binding on all holders and sellers and not subject to review. OCC shall have no authority to make such determinations and shall have no responsibility therefor.

8. Prior to the period when a credit default option has been automatically exercised, the only means through which the holder can realize value from the option is to sell it at its then market price in an

available secondary market. If a secondary market for such an option is not available, it will not be possible for its holder to realize any value from the option at that time.

9. There is no underlying interest for credit default options that is quoted in the marketplace. Because of this, there are no underlying interest prices to provide a reference to investors for pricing credit default options.

10. As discussed above under the caption "Other Risks," options markets have discretion to halt trading in an option in certain circumstances—such as when the market determines that the halt would be advisable in maintaining a fair and orderly market in the option. In the case of credit default options, options markets may take into consideration, among other factors, that current quotes for debt securities or other securities of the reference entity are unavailable or have become unreliable.

11. The risk that a trading market for particular options may become unavailable and the potential consequences are also discussed above under the caption "Other Risks." The SEC has approved certain credit default options for listing and trading on a national securities exchange as securities. OCC filed its rules for clearing credit default options with the CFTC, and the CFTC issued an exemption permitting OCC to clear such options when traded on a national securities exchange whether or not they are within the CFTC's jurisdiction. By its terms, the exemption is revocable, and its revocation would be one of the events that could lead to the unavailability of a trading market for credit default options.

Special Risks of Binary Options (Other Than Credit Default Options)

1. **Risks of holders of binary options are similar to the risks described above applicable to holders of other cash-settled, European-style options, but the holder of a binary option will not receive any gain in excess of the fixed settlement amount of the option**. Non-binary options, in contrast, may provide greater return to the holder as the difference between the exercise price and the exercise settlement value of the underlying interest increases. A binary option is like a capped option in the sense that its maximum return is limited. Unlike a capped option, however, the payout on a binary option is all or nothing. Accordingly, with respect to a binary option, the holder may experience a relatively greater gain than the holder of a non-binary option when the option is in the money by a small amount but a relatively smaller gain when the option is in the money by a greater amount.

2. **Binary options may be more difficult to hedge, or to use as hedges, than non-binary options**. Because of the fixed settlement amount to be realized from a binary option, an investor who wishes to hedge the risk of an increase in the price of a specified quantity of a stock, for example, cannot create a perfect hedge by buying a specified quantity of at-the-money binary options that return a cash settlement amount if the exercise settlement value of the underlying security is above the current price of the stock. If the stock price at expiration of the option has risen only slightly above the exercise price, the option payout may exceed the aggregate increase in the value of the stock. If the stock price has risen substantially over the exercise price, the payout from the option may not be sufficient to cover the excess. Similarly, an investor who writes a binary option on an individual stock and wishes to hedge the obligation through ownership of the shares of the underlying stock would not be able to do so precisely through the ownership of any specific number of shares.

3. **Holders and writers of binary options may bear a heightened risk that they will be adversely affected by manipulative behavior in the markets**. Because a binary option that is in the money by even the smallest amount (or, in the case of certain binary options, at the money) will pay the full fixed settlement amount, there may be an incentive for holders or writers of options that are at or near the money at expiration to attempt to influence the exercise settlement value in order to cause a series of options to expire either in or out of the money. Although opportunities for manipulation

may be greater when the underlying interest is an individual security than when it is an index, volume weighted average pricing is used to determine the exercise settlement value of binary stock options in order to reduce the likelihood of such manipulation. While market manipulation is unlawful under the federal securities laws and SEC regulations, there can be no assurance that manipulation affecting binary options will not occur. If manipulation does occur, exercise settlement values may be based on the manipulated price and there may be no adequate remedy available to investors.

4. A writer of a binary option has risks similar to those of writers of other cash-settled, European-style options except that the amount that the writer will be required to pay if assigned an exercise notice is limited to the fixed settlement amount. Even though the potential loss is limited, writers of binary options must have sufficient liquid assets to pay the fixed cash settlement amount and the financial capacity to bear that potential loss.

5. **A writer of a binary option will be obligated to pay the entire fixed cash settlement amount, even if the exercise settlement value is only slightly in the money or, in the case of certain binary options, at the money**. Investors should be aware of the criteria for automatic exercise of the binary options that they purchase or write. Binary stock options may be different in this regard from binary index options, and binary options traded on one options market may have different terms from those traded in other options markets.

6. A binary option that has an exercise price at or near the current price or level of the underlying as the expiration date approaches may be more volatile and therefore involve more risk than a non-binary option.

Special Risks of Range Options

1. Range options have a unique payout structure. Whereas other cash-settled options (other than binary options) provide an increasingly greater return to the option holder as the difference between the exercise price and the level of the underlying interest increases, a range option's potential payout increases through the lower range until it reaches the maximum cash settlement amount, remains at the maximum cash settlement amount through the entire middle range, and then decreases to zero as the level of the underlying interest moves through the high range. Therefore, a range option holder must not only be right about the timing of an anticipated change in the level of the underlying index, but she must also be right about the degree of the change because the option will have a reduced payout or drop out of the money altogether if the underlying index moves too far in either direction. In that case, a range option holder may lose all or a significant part of her investment in the option. On the other hand, the direction in which the underlying index moves will not affect the payout for a range option as long as it stays within the middle range.

2. **The writer of a range option, like writers of other cash-settled options, runs the risk that the option will expire in the money and he will be required to pay the cash settlement amount**. The writer's potential loss is limited to the maximum cash settlement amount of the option minus the premium received. Actual loss will depend on where the level of the underlying index falls within the range length.

EXAMPLE: *An investor receives a premium of $10 for writing a range option on XYZ index that has a maximum cash settlement amount of $100. Assume that the option has a low range from 90 to 100, middle range from 100 to 110, and a high range from 110 to 120. If the level of the XYZ index at expiration is 100 (i.e., falls in the middle range), the investor will incur a loss of $90 (the $100 paid to the holder of the option less the $10 premium received when the option was written). If the level of the XYZ index at expiration is in the low range or the high range, the profit or loss incurred by the investor will depend on where along the low range or high range the index level falls at expiration.*

3. Range options may be more difficult to hedge, or to use as a hedge, than other types of options because of range options' unique payout structure. A range option would be a perfect hedge only for a risk exposure to the underlying interest that varies with the level of the underlying interest in the same unique way as the payout structure of the range option. In addition, as in the case of a binary option, it is not possible to precisely offset the risk of writing a range option through ownership of the underlying interest.

Scope and Limitations of This Document

Readers should be aware of the scope and limitations of this document set forth below:

1. This document has been prepared by the U.S. options markets for distribution pursuant to the requirements of SEC Rule 9b-1 under the Securities Exchange Act of 1934 and the rules of the U.S. options markets. **This document is not intended to meet other requirements which may be in effect in any jurisdiction and should not be relied upon for that purpose**.

   The options discussed in this document are exempt from the registration requirements of the Securities Act of 1933, as amended, and this document is not a prospectus. Nothing in this document should be construed as furnishing investment advice or as being a recommendation, solicitation or offer to buy or sell any option or any other security.

2. **Only the U.S. options markets on which an option is authorized to be traded are responsible for the statements in this document concerning that option**.

3. **The options markets do not intend this document to be incorporated by reference into any publication** that may be prepared or distributed by OCC, an options market or any other person (other than a document that has been specifically designated to be a supplement to this document and that has been filed with the SEC pursuant to Rule 9b-l). The fact that another document states that this document is available, or states from whom this document may be obtained, or recommends that this document be read and understood, does not mean that this document has been incorporated by reference into that other document.

4. **No other publication is incorporated by reference into this document**. The fact that this document refers to information that may be available in other publications does not mean that any of those other publications has been incorporated into this document.

5. **This document does not attempt to present a complete description of all of the provisions governing options**. These are set forth in applicable laws, in the rules and regulations of the SEC and other regulatory agencies, and in the rules, interpretations, policies and procedures (collectively called "rules") of OCC, the options markets and the foreign clearing houses that act as "associate clearing houses" of OCC that may be in force from time to time.

   This document also does not attempt to describe either the rules that govern the structure or conduct of options trading or the forms and procedures for trading in the various options markets. These matters differ from one options market to another, and they may change from time to time. As examples, the various options markets may utilize different market-making systems (with some markets using a specialist system, others a competing market-maker system, and others a combination of the two), order routing systems, and automatic order execution systems. Moreover, as advances are made in computer technology, the trading and market-making systems and the other trading procedures of the options markets are likely to evolve and change—or even be radically different from what they now are.

   At particular times—such as when unusual conditions or circumstances exist, which for example may occur on and after days on which there have been substantial or volatile price movements in the securities markets generally or in the markets for underlying or related interests—the options markets may have authority under their rules to modify the application of some or all of their trading rules and procedures or to take such actions as they may deem appropriate in the circumstances. Such actions could include, among other things, changing the manner in which trading in particular

options is conducted, extending trading hours for particular options, halting trading in particular options, restricting the types of orders that may be employed, and modifying or eliminating the bid/asked differential at which market-makers or specialists may quote. The taking of such actions by an options market often is promptly disclosed to the trading crowd in that options market, to representatives of brokerage firms that are members of the options market, and/or to price vendors, but the actions may be taken without public notice, and there can be no assurance that disclosure will be made in a manner that will permit investors to learn of the actions in a timely way.

OCC and the options markets have broad discretion under their rules to take a variety of actions in particular circumstances, and readers should not assume that any organization will exercise its discretion in a particular way in any particular circumstance. A statement in this document to the effect that OCC or an options market has authority or discretion to take a particular action does not mean that it will necessarily take that action. To the contrary, it should be understood from such a statement that the organization also has authority not to take that action. Moreover, it should be understood that OCC and the options markets have broad discretion in the manner in which they interpret their own rules.

OCC and the options markets have no duty to enforce, or to oversee the enforcement of, each other's rules. OCC and each U.S. options market has a general statutory obligation to enforce compliance with its own rules by its own members. However, there can be no assurance that all such rules will always be complied with by members, since frequently the only means of enforcing compliance with rules is to impose disciplinary sanctions after the fact on those who have violated them.

Readers desiring information concerning the rules of OCC or any of the options markets as to the terms of options, the manner in which options are traded or in which a market functions, the trading hours of a particular options market, or other related matters, or information concerning any of the other matters referred to herein, may obtain the information from the relevant organization.

6. The U.S. options markets have rules applicable to the handling of customer accounts and the execution of buy and sell orders that impose special requirements with respect to approval of customer accounts for options trading and recommendations of particular option transactions. This document does not attempt to describe those requirements, the laws and rules governing brokerage firms and other securities professionals, or the agreements, procedures and internal rules of brokerage firms that are applicable to the approval and opening of customer accounts, the handling and execution of orders, the transmission to brokerage firms of instructions to exercise or not to exercise options, the manner or time in which writers of options are notified by their brokerage firms that options have been assigned an exercise, the handling of customers' funds, securities and accounts, the safeguarding of customers' positions in options, or other matters relating to the handling of options transactions by brokerage firms. Readers should consult with their own brokerage firms for information concerning such matters.

7. This document does not attempt to describe the risks to investors that may be associated with the way trading is conducted in any particular options market or in any market for an underlying or related interest. The reader should not assume that either the options markets or the markets for underlying or related interests will be efficient, liquid, continuous and orderly in all circumstances or that they will be or remain open at all times. Even on relatively normal days, there will be variances in the market-making performance of specialists and market makers in the various markets which derive primarily from differences in individual skills, capital, willingness to accept risk, ability to hedge risk, trading strategies, and market-making obligations, and these variances are likely to be exacerbated during times of greatly increased volume or volatility. Although specialists and market makers in some markets have certain obligations to assist in the maintenance, so far as is practicable, of a fair and orderly market, traditional indicators of orderliness are difficult to apply to the trading of derivative products such as options and there is a risk that the market-making system of a particular market will not operate effectively, efficiently or in an orderly manner at particular times. The nature and scope of that risk are not among the types of risk discussed further in this document.

It is also possible that the systems of an options market, or of a market for an underlying or related interest, may fail or may not work effectively or efficiently at times. Historically, for example, the operations of various U.S. markets have been disrupted by earthquake, flood, fire, electricity outages, and computer failure. Moreover, no system can be expected to work perfectly at all times. The options markets may rely on manual methods to record trade information, and errors or omissions can occur in their reports of price, volume and other information, and these can be expected to be exacerbated on days of significant volume or volatility.

It is also beyond the scope of this document to discuss the risks that may result to investors from the use by market participants of options pricing theories. There are a number of publications that are commercially available which discuss such theories.

8. **This document does not attempt to describe risks that may be inherent in an investment in the underlying interest**. It is obvious that the investment potential of an option can be dependent on the performance of the underlying interest and that investors in options are therefore subject to the risks that may affect the value of that interest. For example, one of the risks undertaken by a purchaser of a call option (or a writer of a put option) on XYZ stock is that XYZ may decline in price during the life of the option. The risk of this decline is dependent on the risks that may affect the economy or the stock market generally or XYZ specifically. Similarly, the holder of a dollar-denominated option on a foreign currency is subject to the risk factors affecting the relative values of the U.S. dollar and the foreign currency. A discussion of these types of risks is beyond the scope of this document.

9. **This document does not attempt to describe systemic risks that could affect the options markets and the investors in those markets**. The options markets, like all securities markets, are interrelated with, and frequently interdependent upon, other aspects of national and international financial and capital systems and upon the national and world economy. Any disturbance or crisis of one part of these interrelated systems could severely disrupt or even threaten the performance of the options markets or of OCC. Bank failures, payments breakdowns, large and sudden economic shocks, the failure of a large securities firm, market or clearing organization, or other such events could cause other failures on a widespread basis and could affect the liquidity and solvency of the participants in the options markets. The specific causes of systemic failure or disruption are not easy to predict, and a discussion of them is beyond the scope of this document.

10. **All examples in this document are based on hypothetical values that are not necessarily indicative of the prices in an actual transaction**. Readers should not assume that options will necessarily be priced in accordance with any example in this document or in accordance with any pricing formula or model. As noted in the discussion of "Premium" in Chapter II, option premiums are not fixed by OCC or any of the options markets.

11. **The examples in this document do not include tax consequences, commissions or other transaction costs, nor do they include the impact of applicable margin requirements**. As discussed in Chapter IX, these items can be very significant and should be taken into account by all investors.

Notice of Current Amendment

(March 2022)

This document may be amended from time to time, resulting in the addition, deletion, or modification of content. Each time this document is amended, changes to the content will be incorporated into the document and provided in this chapter.

This chapter will provide details on the changes made to the document with underlined text indicating new text added and ~~strikethrough~~ text indicating text deleted. The substantive changes made to the prior version of this document are below and provide additional language highlighting that index products may have a multiplier other than 100 as established by the listing exchange by providing examples of index options with a one dollar multiplier. Additionally, this chapter includes administrative corrections to chapter subtitles found in the original text of the ODD and updated references to sections in the document.

The following changes are made to accommodate the trading of certain index and index flex options with a one dollar multiplier.

The last full paragraph on page 8 is amended as indicated below.

The contract size of a cash-settled option other than a binary option or a range option is determined by the multiplier that is fixed by the options market on which the options series is traded. The multiplier determines the aggregate value of each point of the difference between the exercise price of the option and the exercise settlement value of the underlying interest. For example, a multiplier of 100 means that for each point by which a cash-settled option is in the money upon exercise, there is a $100 increase in the cash settlement amount. Similarly, if an option with a multiplier of 100 is trading at a premium of, say, $4, then the aggregate premium for a single option contract would be $400. As another example, a multiplier of 1 means that for each point by which a cash-settled option is in the money upon exercise, there is a $1 increase in the cash settlement amount. Similarly, if an option with a multiplier of 1 is trading at a premium of, say, $4, then the aggregate premium for a single option contract would be $4. The contract size of a range option is determined by the option's multiplier and its maximum range exercise value. The contract size of a binary option is its cash settlement amount, which is fixed by the options market for any series of binary options at or before the opening of trading in that series. Some options markets define the cash settlement amount for binary options as being the multiplier times a fixed settlement value. Other options markets define the cash settlement amount for binary options without reference to a multiplier.

The following example is added after the first example on page 9.

EXAMPLE: Assume that a holder of a cash-settled call on the XYZ index that has an exercise price of 80 exercises it when the exercise settlement value of the index is 85. If the multiplier for XYZ index options is 1, the assigned writer would be obligated to pay, and the exercising holder would be entitled to receive, a cash settlement amount of $5 ($85 minus $80 multiplied by 1 = $5).

The Example on page 33 is amended as indicated below.

EXAMPLE: An investor purchases a December 100 index call at $2.15. The multiplier for that option is 100. The aggregate dollar amount of the premium is $215.00 ($2.15 times 100 = $215.00). Had the options market used a multiplier of 200, a premium of $2.15 would have meant an aggregate premium of $430.00. Had the options market used a multiplier of 1, a premium of $2.15 would have meant an aggregate premium of $2.15.

The following example is added after the Example of page 71.

EXAMPLE: A holder of an index put option that settles based on the closing prices of the constituent securities and that has an exercise price of 30 directs his broker to exercise at 10:00 A.M., when the level of the underlying index is 28. If the underlying index stays at that level until the close of trading that day, the holder will be entitled to receive $2 in settlement (assuming a multiplier of 1). If, however, the index level rises to 32 based on the closing prices of the constituent securities, the holder will be required to pay $2 to the assigned writer, thereby sustaining a $2 loss on the exercise.

The last paragraph beginning on page 72 is amended as indicated below.

If a panel delays fixing an exercise settlement value for a series of index options past the last trading day before expiration of that series, normal expiration exercise procedures will not apply to the affected series. Instead, exercise settlement will be postponed until the next business day following the day when the panel fixes the exercise settlement value, and each long position in the affected series will be treated as having been exercised if the exercise settlement amount per contract is equal to or greater than the exercise threshold amount used in normal expiration exercise procedures. For example, for an index option with a multiplier of 100, each long position in the affected series will be treated as having been exercised if the exercise settlement amount per contract for that series is $1.00 or more, and i. ~~I~~f the exercise settlement amount per contract is less than $1.00, the option will be treated as having expired unexercised. Similarly, for an index option with a multiplier of 1, each long position in the affected series will be treated as having been exercised if the exercise settlement amount per contract is $0.01 or more, and if the cash settlement amount per contract is less than $0.01, the option will be treated as having expired unexercised. As a result of these procedures, holders of expiring index options may not know whether their options have been exercised, and writers of such options may not know whether they have been assigned an exercise notice, until after the expiration date. Investors should contact the listings options market to obtain the exercise threshold amount of the options they trade. A panel's determinations shall be conclusive, binding on all investors, and not subject to review.

The following are administrative changes to correct certain references to chapter subtitles contained in the original ODD text and to update sections or references to sections in the document.

References to "paragraph" and "paragraphs" that are numbered are changed to "numbered section" and "numbered sections" throughout the document.

The following sub-header is deleted from the bottom of page 19.

~~All Stock Options~~

The following change is made to the fourth paragraph on page 44 of the document.

The principal risks of holders and writers of foreign currency options are discussed in Chapter X. Readers interested in buying or writing foreign currency options should not only read this chapter but should also carefully read Chapter X, particularly the discussions under the headings "Risks of Option Holders," "Risks of Option ~~Buyers~~ Writers," "Other Risks," and "Special Risks of Foreign Currency Options."

The following change is made to the last paragraph on beginning on page 47 of the document.

Investors in cross-rate options should bear in mind that the magnitude and direction of any change in the value of the underlying currency in relation to the trading currency may be quite different from the magnitude and direction of any contemporaneous change in the value of either of those currencies in relation to a third currency, such as the U.S. dollar. Thus, for example, the British pound may appreciate in relation to the Japanese yen at the same time that the pound depreciates in relation to the U.S. dollar. As discussed in Chapter X under "Special Risks of Foreign Currency ~~Cross-Rate~~ Options," this is of particular significance to investors who intend to convert their profits or losses on cross-rate options into U.S. dollars.

The following change is made to the first paragraph after the first Example on page 48 of the document.

The discussion in this chapter of adjustments under the caption "Special Features of Dollar Denominated Foreign Currency Options" is applicable also to cross-rate options, except that adjustments in the terms of cross-rate options might be made to reflect events affecting the trading currency as well as events affecting the underlying currency.

The following change is made to the numbered section 7 on page 65 of the document.

7. Since the leverage inherent in an option can cause the impact of price changes in the underlying interest to be magnified in the price of the option, a writer of an option that is uncovered and unhedged may have a significantly greater risk than a short seller of the underlying interest. This is illustrated by the table set forth in ~~paragraph 2~~ numbered section 1 under "Risks of Option Holders" above. If an investor had sold short 100 shares of XYZ to Investor A in that table in order to receive $5,000 in proceeds, the investor would have lost $1,200 if the market price of XYZ had increased to 62. On the other hand, if, in order to receive $5,000 in proceeds, the investor had written 10 XYZ 50 uncovered calls, she would have lost $7,000 if the market price of XYZ had increased to 62.

List of Supplements

The list below provides prior supplements incorporated into the 1994 version of *Characteristics and Risks of Standardized Options* (also known as the "Options Disclosure Document" or "ODD"). A summary of each supplement is included, along with a description of the October 2021 version of the ODD.

December 1997—Supplement accommodated cash settled options on indexes of mutual funds.

March 2000—Supplement permitted (i) the acceleration of exercise of options when the underlying security has been converted into the right to receive a fixed amount of cash; and (ii) the automatic exercise of in-the-money flexibly structured index options on the expiration date.

January 2004—Supplement (i) permitted greater flexibility in the methods used for assigning options exercises; and (ii) addressed special considerations with respect to deadlines for the exercise of certain options that expire on a day on which an options market is open for trading.

April 2007—Supplement accommodated non-rate modified cash-settled foreign currency options and rate-modified cash-settled foreign currency options.

May 2007—Supplement (i) reflected modifications made to the definition of "ordinary cash dividend or distribution; (ii) reflected changes made to eliminate the need to round adjusted exercise prices in certain circumstances and to provide more precise compensation for fractional shares eliminated by rounding; (iii) accommodated options on interests in investment companies and similar entities; (iv) addressed special exercise settlement procedures or restrictions that may be imposed upon the occurrence of certain extraordinary events; (v) disclosed that a registration statement and prospectus for the options covered by the ODD are no longer available; (vi) explained OCC's authority to adjust the multiplier for yield-based treasury options and to fix a cash settlement amount for such options in certain circumstances; (vii) addressed the adoption of rules by certain options markets that permit, in very limited circumstances, the cancellation or adjustment of a transaction entered into at a premium based on an erroneously reported value for the underlying interest; and (viii) addressed acceleration of the expiration date of options on equity securities in certain circumstances.

June 2007—Supplement accommodated credit default options. This supplement was amended and restated in its entirety by the January 2011 Supplement.

June 2008—Supplement accommodated delayed start options, binary stock options, binary index options and range options.

December 2009—Supplement (i) accommodated options on variability indexes, strategy-based indexes and dividend indexes; and (ii) addressed adjustment of stock option contracts to reflect cash dividends or distributions on the underlying securities.

May 2010—Supplement accommodated options on index-linked securities.

January 2011—Supplement accommodated credit default options.

March 2011—Supplement accommodated options on any single security volatility index and options on relative performance indexes.

January 2012—Supplement accommodated options on relative performance indexes of which the index components are equity securities (including fund shares).

November 2012—Supplement accommodated the introduction of options originally listed to overlie less than 100 shares.

April 2015—Supplement accommodated the introduction of options on foreign currency indexes and the introduction of implied volatility options whose exercise settlement value is calculated differently than that of existing implied volatility options. This supplement was amended and restated in its entirety by the October 2018 Supplement.

October 2018—Supplement (i) accommodated the introduction of options on foreign currency indexes and the introduction of implied volatility options whose exercise settlement value is calculated differently from other existing implied volatility options, (ii) addressed certain aspects of contract adjustments related to the OCC's authority to determine contract adjustments and how certain adjustments may affect an option's value, and (iii) addressed the change in the regular settlement for option exercises to the second business date following exercise.

October 2021 (ODD Restatement and Supplement)—The October 2021 version of the ODD incorporates all prior supplements into the 1994 version of the document. It also (i) updates exchange information, (ii) removes references to options trading on foreign markets, (iii) adds language indicating not all products described in the ODD may trade at any given time, (iv) modifies or removed obsolete language such as references to currencies that no longer exist, methods of obtaining index closing prices and private quotations, market wide trading halts and the prohibition of buying options on credit, (v) removes all references to an OCC Prospectus, (vi) removes the contract methodology was only in effective for special dividends announced before February 1, 2009, and (vii) removes all references to fractional strike prices. This consolidated version of the ODD also includes supplemental material to accommodate the introduction of a third type of implied volatility option with an exercise settlement value that is calculated differently from other existing implied volatility options.

March 2022—The March 2022 version (i) adds language highlighting that index products may have a multiplier other than 100 as established by the listing exchange by providing examples of index options with a one dollar multiplier and (ii) includes 2022 ODD administrative corrections to chapter subtitles found in the original text of the ODD.