TRADING OPTIONS ON FUTURES

MARKETS, METHODS, STRATEGIES, AND TACTICS

John W. Labuszewski
John E. Nyhoff

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WILEY

JOHN WILEY & SONS

New York • Chichester • Brisbane • Toronto • Singapore

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Library of Congress Cataloging in Publication Data:

Labuszewski, John.
Trading options on futures.

Bibliography: p.
Includes index.
1. Financial futures. 2. Put and call transactions.
I. Nyhoff, John E. II. Title.

HG6024.3.L33 1988 332.64′4 87-29656
ISBN 0-471-60676-6

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

Foreword

Fixed income, equity, and currency markets have experienced tremendous volatility in recent years. This volatility has arisen as the price inflation of the 1970s has been replaced by financial asset inflation in the 1980s.

The potentially deleterious effects of this volatility are magnified by the growth in the financial markets, raising the stakes in a macroeconomic sense. Further, it is clear that the capital markets now transcend political boundaries—the major economies are inextricably bound together.

For better or worse, risk management has become a 24 hour a day task, demanding quick responses to dynamic market conditions.

Financial futures and options were developed in response to these conditions. They provide perfectly suitable vehicles to transform the risk represented by marketplace volatility into a source of opportunity. Options can alter the risk/reward profile of a fixed income, equity, or currency portfolio to achieve the desired results—quickly, effectively, and efficiently.

TONE GRANT
President
Refco Group Ltd.

February 1988

Acknowledgments

The authors would like to express their sincere appreciation to our colleagues who made immeasurably valuable contributions to this effort. In particular: Takashi Aragane, Mutsuo Asaba, Suzanne Bishopric, Kyo Cho, Vincent Chung, Dennis Collins, Robert J. Dantone, Maryrose Dombrowski, H. Patrick Faust, Yusuke Ikeda, Dennis L. Heskel, Michael P. Kamradt, Yasuyuki Kato, James F. Meisner, Ikunori Morita, Marion Nyhoff, Horoiku Sago, Motoaki Sakaguchi, Yasuhiko Sawa, Diane E.G. Spikes, Yoshiki Suzuki, Keisuke Taguchi, Takeshi Sugihasi, Toshiki Tsunoda, Yasuto Tsuruta, and to the many others who supported this effort but whose contributions may have been inadvertently overlooked.

Special recognition must be extended to our employer, Refco Group Ltd.; its chairman, Thomas H. Dittmer; and its president, Tone Grant. Thank you for your generous support, infinite patience, and constant encouragement during the preparation of this publication.

John W. Labuszewski

John E. Nyhoff

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1

Introduction to Options

Options are an old business concept. However, this concept has enjoyed a renaissance of interest in recent years as evidenced by the trade of options on instruments as diverse as stock indexes, bonds, grain, and livestock. Many of these options are offered on an exchange-traded and over-the-counter (OTC) basis, domestically and in the international marketplace.

While options on many different instruments are actively traded, it was not too long ago that options enjoyed very limited interest. For many years, the trade of options for specified commodities was banned under the auspices of the Commodity Exchange Act (CEAct) enacted in 1936. This did not prevent the trade of options for individual equities in the over-the-counter market.

In 1973, the Chicago Board Options Exchange (CBOE) introduced exchange traded stock options. The success of this concept provided the impetus for the Commodity Futures Trading Commission (CFTC) to authorize the trade of commodity options on domestic commodity exchanges beginning in 1982. This development led to a new burst of interest in options both domestically and in international circles.

CONCEPTS AND TERMINOLOGY

This section is intended to introduce these markets, concepts and terminology associated with the markets, and a basic understanding about the mechanics of the markets.

Identifying Options

Options can be distinguished from one another on the basis of three criteria: *type, class,* and *series.*

The option type refers to whether an option is a *call* or a *put*.

A *call* option grants the buyer the right, but not the obligation, to *buy* from the seller or writer the underlying instrument at a predetermined strike or exercise price on or before a predetermined date. The buyer pays a negotiated price or premium to the seller in return for the rights conveyed.

If a call is an option to buy, a *put* may be thought of as an option to sell.

A *put* option grants the buyer the right, but not the obligation, to *sell* to the seller or writer the underlying instrument at a predetermined strike or exercise price on or before a predetermined date. The buyer pays a negotiated price or premium to the seller in return for the rights conveyed.

The second criteria which identifies an option is referred to as the option class. All options which are of the same type, that is, put or call, and share a common expiration date are of the same class.

For example, all call options exercisable for gold futures contracts which expire in the month of November 1987 are of the same class. When an option expires, all rights held by the buyer become null and void. Thus the expiration date defines the effective life of an option.

The expiration date must be distinguished from the exercise date. The exercise date is the day upon which the option holder actually exercises his right to buy (in the case of a call) or to sell (in the case of a put). The expiration date is the last day upon which such purchase or sale may take place.

An "American-style" option permits exercise at any time on or before the expiration date. A "European-style" option permits exercise only upon the specified expiration date. A "modified European-style" option may permit exercise during a limited "window" or range of dates.

The third and final criteria which completely identifies a given option is the option series. All options of the same class which share a common strike or exercise price are of the same series.

The following chart illustrates the three criteria:

Identifying an Option

	Type	*Class*	*Series*
Put or call:	Call		
Expiration:		Dec. '87 Call	
Strike price:			86 Dec. '87 Call

For example, all call options on T-bond futures which expire in the month of March 1988 with an exercise price of 84 percent of par constitute an option series. Normally, exchanges establish a number of strike prices at regular intervals surrounding or "bracketing" the current underlying market price. If bond futures were trading at 88, for example, there may be options available "struck" at 82, 84, 86, 88, 90, 92. and 94.

Options on Futures versus Physicals

Implicit in our discussion thus far is that an option may be exercised for a particular underlying commodity; for example, gold, T-bonds, deutsche marks (DM), and so forth. But these commodities may be available in different forms.

For instance, an option may be available calling for the delivery of a T-bond futures contract or for an actual T-bond. For the most part, this discussion will focus on options exercisable for futures contracts; however, there are advantages and disadvantages associated with either concept.

Options on futures tend to enjoy greater liquidity and interest than options which call for the actual delivery of a cash instrument. This is most clearly exemplified when you consider the bond option competition which had existed between the Chicago Board of Trade (CBOT) and the CBOE.

In 1982 and 1983, respectively, CBOT and CBOE introduced options exercisable for T-bond futures and for actual cash T-bonds. The CBOE market has never enjoyed much interest while the CBOT market has become the second most active exchange traded option worldwide (second only to the CBOE's OEX stock index option discussed next).

CBOT locals were able to make a tighter market than were CBOE traders because they could readily hedge the risk to which they were exposed by taking an offsetting position in the highly active T-bond futures market trading in the adjacent pit. CBOE traders, however, did not have ready access to the cash bond market. Even if they did, spreads in the cash bond markets are not as tight as spreads in the bond futures market and you cannot readily short cash bonds. Finally, the amount of capital required to use the cash market as an offset vehicle may be prohibitive to many locals.

Secondly, to restate the obvious, CBOT bond futures do not call for an actual delivery of bonds. This may be important, for example, to a financial institution attempting to "cross-hedge." CBOE options call for the delivery of a recently issued 30-year bond. This may be an advantage for an institution trying to hedge a 30-year bond. But if an institution is trying to cross-hedge a nondeliverable bond by, for example, selling calls, it may have to swap out of the original bond and into a deliverable bond in order to satisfy an exercise.

By contrast, it is much simpler to be exercised into a short position in the bond futures contract and simply offset that position with a long transaction. This same rationale may be used to explain in part the Chicago Mercantile Exchange's (CME) success with options on foreign currency futures relative to the Philadelphia Stock Exchange's (PSE) options on actual foreign currency.

Another instance to consider, however, is the relative success of the CBOE's option on the S&P 100—known by its ticker symbol of OEX. This option has attracted much more volume and activity than have competing products exercisable for futures, for example, the CME's option exercisable for S&P 500 futures.

Again, simplicity and ease of exit and entry appear to be factors. The OEX is a "cash-settlement" contract, that is, the contract is settled in cash upon exercise at the prevailing value of the index multiplied by $100. By contrast, a CME S&P 500 option is exercised into the S&P 500 futures contract. While S&P 500 futures are highly liquid and readily offsetable, it is still much easier to simply settle the contract in cash and not trade in futures.

Another factor is that the CBOE OEX contract is sized to be compatible to retail trading activity. The OEX is valued at $100 times the index—if the index is at 200.00, the contract represents a value of $20,000. The S&P 500 "futures-options" are valued at $500 times the index. Under similar circumstances, the CME's contract is valued at $100,000.

While bond options have attracted a largely institutional clientele, stock index options are largely retail. Of course, a number of over-the-counter products have appeared in recent years as well, exercisable for actual financial instruments. These products have enjoyed considerable market penetration although it is impossible to get a clear indication of their volume because trade of these products is fragmented over many different trading desks at different institutions worldwide.

Many of these products will continue to grow because the OTC market is capable of being more responsive to market demands than are the exchanges. As a result, OTC market participants are constantly developing new, innovative option products.

Profiting from Call Options

When a trader buys or sells futures, this implies a strongly bullish or bearish price expectation, respectively. Similarly, option strategies may be categorized as bullish or bearish, but options provide much more subtlety than do futures.

You can identify an option strategy which is strongly bullish or strongly bearish, mildly bullish or mildly bearish, or completely neutral,

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allowing you to capitalize on a flat market expectation. For example, you can buy (or hold or go long) a call option. This is a strongly bullish market position. Similarly, a long put may be described as a strongly bearish market position.

By contrast, if you sell (or write, grant, short—all of these terms being synonymous) a call, you have assumed a neutral to mildly bearish market position. A short put is a neutral to mildly bullish market position.

Once purchased, there are three ways in which an option may be disposed: (1) the option buyer may exercise the option; (2) the buyer may allow the option to expire unexercised or "abandon" the option; and (3) the option may be offset, that is, the buyer may subsequently sell the option, or the seller may subsequently buy the option back.

Let us illustrate a scenario where a call option is exercised or is permitted to expire unexercised.

Example: Assume that Eurodollar futures are trading at 92.50 and a trader expects a major bull move. He buys or goes long one call on Eurodollar futures struck at 92.50 for a 20 basis point premium (see Figure 1-1).

By expiration, our trader's expectations are realized: Eurodollars rally 50 basis points to 93.00. If our trader exercises this call option, he realizes a 50 basis

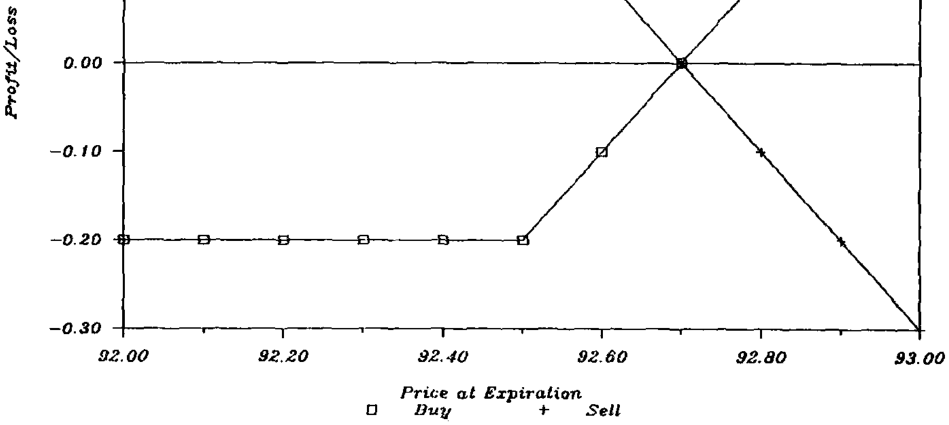

Figure 1-1 92.50 Eurodollar call.

point gain on expiration because he buys Eurodollar futures at the 92.50 strike when they are actually valued at 93.00. His net return equals the 50 basis points realized on exercise less the original 20 basis point premium for a net profit of 30 basis points or $750 ($25 per basis point).

Assume that Eurodollars fall to 92.00 instead of rising. It would be foolish to buy at 92.50 something valued at 92. Hence, the trader simply abandons the option by refusing to exercise it. Thus he limits his loss to the 20 basis point premium ($500).

What about the call writer's returns? The seller's returns are simply a mirror image of the returns which accrue to the option holder.

Example: In the foregoing example, the trader who had shorted the call would bring in 20 basis points to his account immediately upon sale. If the market rises to 93, the short is forced to sell at 92.50 something valued at 93.00. This implies a 50 basis point loss cushioned by the initial receipt of the 20 basis point premium for a net loss of 30 basis points ($750). If the market falls to 92.00, the option is abandoned, and the writer counts the entire 20 point premium ($500) as profit. Interestingly, if the market remains stable at the 92.50 strike price, the option is similarly abandoned, and the writer retains the full 20 basis point premium.

The Eurodollar futures price must appreciate noticeably before the option can be profitable for the holder. Specifically, Eurodollars must advance to a minimum price of 92.70 before the holder will realize any profit. Likewise, if Eurodollars stay under 92.70, the writer will realize a profit.

Why? Consider that if Eurodollars advance to 92.70, the holder can exercise by buying at 92.50 something valued at 92.70. This implies a 20 basis point profit. This profit is offset by the initial forfeiture of the 20 point premium for a net zero return. By the same reasoning, the call writer realizes a zero return at this level. This, therefore, is the call *breakeven point.*

> The *breakeven point* at which both the buyer and the seller of a call realize zero profit and zero loss (without considering transaction costs) equals the call strike price *plus* the premium paid up-front from long to short to secure the option.

Note that it is in the call holder's interest to exercise the option if it is about to expire even when the market is between the strike price and breakeven point even though a net loss results! For example, if the market rises to 92.65 the buyer may exercise for a gain of 15 basis points on exercise, reduced by the initial 20 point premium for a 5 point loss. But had the buyer refused to exercise, he would have suffered a loss of 20 basis points, equal to the entire option premium. Thus by exercising even when a net loss results, the buyer can limit his loss.

This example illustrates that the premium, once paid, does not enter into a decision of whether or not to exercise the option. The premium represents a "sunk cost" and is forfeit at the moment the holder buys the option.

Profiting from Put Options

If calls represent options to buy, puts represent options to sell. Thus where a long call position is essentially bullish, a long put position is essentially bearish; where a short call is mildly bearish to neutral, a short put is mildly bullish to neutral.

It is sometimes difficult to think of buying an essentially bearish market position. Nonetheless, one must think of the rights and obligations conveyed through the purchase and sale of a put, that is, the right to sell, the obligation to buy, rather than the overt market action which creates those rights and obligations.

Let us illustrate a scenario where a put option is exercised or is permitted to expire unexercised.

Example: Assume that Swiss franc futures are trading at 55.00 cents per franc and a trader expects a major bear move. He buys or goes long one put on Swiss franc futures struck at 55.00 for a 1.50 premium (see Figure 1–2).

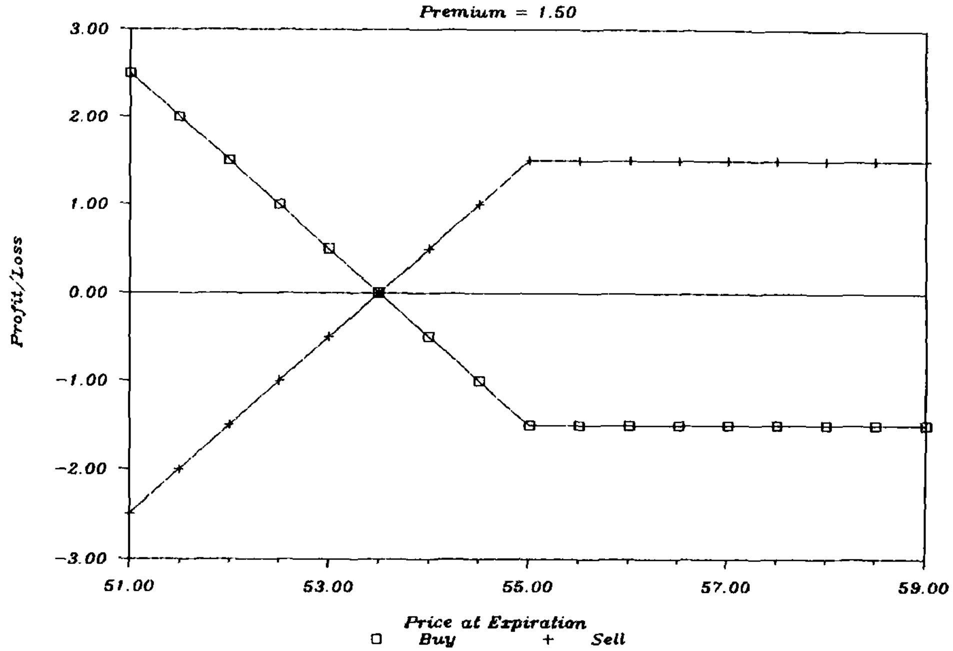

Figure 1–2 55.00 Swiss franc put.

By expiration, our trader's expectations are realized: francs fall to 52.20. If our trader exercises this put, he realizes a 2.80 gain on expiration because he sells "Swissie" futures at the 55.00 strike when they are actually valued at 52.20. His net return equals the 2.80 realized on exercise less the original 1.50 premium for a net profit of 1.30 or $1,625 ($12.50 per .01 cents).

Assume that francs rally to 57.80 instead of falling. It would be foolish to sell at 55.00 something valued at 57.80. Hence, the trader would simply abandon the option by refusing to exercise it, limiting his loss to the 1.50 premium ($1,875).

What about the put writer's returns? The seller's returns are simply a mirror image of the returns which accrue to the option holder.

Example: In the foregoing example, the trader who had shorted the put would bring in 1.50 cents per franc to his account immediately upon sale. If the market falls to 52.20, the short will be forced to buy at 55.00 something valued at 52.20. This implies a 2.80 loss cushioned by the initial receipt of the 1.50 premium for a net loss of 1.30 basis points ($1,625). If the market rises to 57.80, the put is abandoned, and the writer counts the entire 1.50 cent premium ($1,875) as profit. Note that if the market remains stable, the writer also counts the entire 1.50 cent premium as profit.

The Swiss franc futures contract must fall noticeably before the option can be profitable for the holder. Specifically, francs must fall to a maximum price of 53.50 before the holder will realize any profit. Likewise, if Swiss francs stay over 53.50, the writer will realize a profit.

The *breakeven point* at which both the buyer and the seller of a put realize zero profit and zero loss (without considering transaction costs) equals the put strike price *less* the premium paid up-front from long to short to secure the option.

	Call	*Put*
Long	Strongly Bullish	Strongly Bearish
Short	Mildly Bearish to Neutral	Mildly Bullish to Neutral

In-, At-, Out-of-the-Money

Because the question of whether or not an option may be expected to be exercised occurs frequently, the options trade has developed unique terminology to refer to options which are economical or uneconomical to exercise. When the market price exceeds the strike price for a call option, the holder may be expected to exercise. When the underlying market price is less than the call strike price, the option will be uneconomical to exercise.

The former option is *in-the-money* while the latter option is *out-of-the-money*. Finally, you have the unique case where both market and strike prices are equal. This option is *at-the-money*.

Consider the case of the Eurodollar call discussed in the example above. Should the market be less than the 92.50 strike price, the holder cannot be expected to exercise—thus, an out-of-the-money option. It is only when the market price exceeds the 92.50 strike that the option is in-the-money.

A call is an option to buy; a put is an option to sell. Thus the definitions of in- and out-of-the-money are reversed in the context of a put.

It is profitable to sell when the market price is less than the exercise price, that is, when the put is in-the-money. It is unprofitable to sell when the market price is greater than the exercise price. This is an out-of-the-money put option.

In our Swiss franc example, the put is in-the-money when the market is less than the 55.00 strike. The put is out-of-the-money when the market is greater than the 55.00 strike.

In- and Out-of-the-Money

	Call	*Put*
In-the-Money	Market > Strike	Market < Strike
At-the-Money	Market = Strike	Market = Strike
Out-of-the-Money	Market < Strike	Market > Strike

Risk and Return

An option contract grants the holder the right, but not the obligation, to buy in the case of a call and sell in the case of a put. The writer takes on the obligation to sell in the case of a call and buy in the case of a put, but only upon demand of the option buyer!

Because the holder owns a right and not an obligation, he can limit losses to the premium paid upon purchase. (Clearly, a holder could not be expected to exercise an out-of-the-money option.) But an option holder is permitted to participate in favorable market movements, limited only by the fixed premium paid upon purchase. If the market moves considerably in his favor, considerable profits may ensue. Thus the option holder's losses are limited to the premium while his returns are "open-ended" and limited only by the extent to which the market may fluctuate.

An option writer's risks and returns are a mirror image of that of the holder. This means the writer's returns are strictly limited to the premium received upon purchase while the losses are open-ended. A basic asymmetry exists, therefore, between risk and reward inherent in the option buyer's and seller's positions.

Despite the open-ended risk, writing options retains certain advantages. For example, the option writer receives the premium in cash up front and enjoys use of those funds over the life of the option. Additionally, the holder must hope that the market moves sufficiently to permit a profitable exercise or a sale at a profit while the writer may profit even when the market remains stable—or even if it moves slightly in-the-money!

This asymmetry of risk and return distinguishes options from futures. Both buyer and seller of a futures contract experience similar risks and profit potential. A futures contract may be thought of as a *double-edged blade.* The market may move favorably or unfavorably resulting in profits or losses of potentially similar magnitude.

Options, by contrast, represent *single-edged blades.* If the market moves favorably for the holder, large returns ensue. If not, losses are *limited to the option premium.* Of course, the reverse reasoning applies to option writers.

Finally, it must be noted that the option premium is negotiated competitively in the market to balance this basic asymmetry between risk and reward inherent in the option buyer's and seller's positions.

PRICING FUNDAMENTALS

Option pricing can be one of the most complex, but perhaps the most significant, topic a prospective option trader must address. The importance of being able to identify the "fair-value" of an option is evident when you consider the meaning of the term fair-value in the context of this subject.

A fair-market value for an option is such that the buyer and seller expect to break even in a statistical sense, over a large number of trials (without considering the effect of transaction costs, commissions, etc.).

This means if a trader consistently buys overpriced or sells underpriced options, he can expect, over the long term, to incur a loss. By the same token, an astute trader who consistently buys underpriced and sells overpriced options might expect to realize a profit.

But how can a trader recognize overpriced or underpriced options? What variables impact upon this assessment? A number of mathematical models may be used to calculate these figures, most notably, the models introduced by Black-Scholes and Cox-Ross-Rubinstein. The purpose of this section, however, is not to describe these models, but to introduce some of the fundamental variables which impact upon an option premium and their effect.

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