

PUBLIC

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Our Ref. No. 94-560-CC
Philadelphia Stock
Exchange, Inc.
File No. 132-3

RESPONSE OF THE OFFICE OF CHIEF COUNSEL
DIVISION OF INVESTMENT MANAGEMENT

Your letter of September 2, 1994 requests assurance that we would not recommend enforcement action to the Commission if, as more fully described in your letter, (1) certain commodity trading advisers ("CTAs") provide investment advice with respect to foreign currency options traded on the Philadelphia Stock Exchange ("PHLX Options") without registering as investment advisers under the Investment Advisers Act of 1940 ("Investment Advisers Act"), and (2) certain commodity pools invest in PHLX Options without registering as investment companies under the Investment Company Act of 1940 ("Investment Company Act").

Section 2(a)(36) of the Investment Company Act and section 202(a)(18) of the Investment Advisers Act each define the term "security" to include any put, call, straddle, option or privilege entered into on a national securities exchange relating to foreign currency. PHLX Options trade on a national securities exchange, and therefore meet the definition of "securities" under the Investment Company and Investment Advisers Acts. As a result, a CTA providing advice with respect to these options may be considered an investment adviser under the Investment Advisers Act¹ and a commodity pool investing in PHLX Options may be considered an investment company under the Investment Company Act².

You state that the option provision was added to the definition of security to clarify the regulatory jurisdiction between the Commission and the Commodities Futures Trading Commission ("CFTC") with respect to futures and option contracts on financial instruments.³ A similar instrument traded on a board of trade, rather than a national securities exchange, would be a commodity option subject to CFTC regulation.

¹ Section 202(a)(11) of the Investment Advisers Act generally defines an investment adviser as any person who, for compensation, engages in the business of advising others, either directly or through publications, as to the value of securities or as to the advisability of investing in, purchasing, or selling securities or who, for compensation and as part of a regular business, issues or promulgates analyses or reports concerning securities.

² Section 3(a) of the Investment Company Act generally defines an investment company to include any issuer which is or holds itself out as being engaged primarily, or proposes to engage primarily, in the business of investing, reinvesting, or trading in securities.

³ See H.R. REP. No. 626, 97th Cong., 2d Sess., pt. 2, at 10-16 (1982).

You state that PHLX Options and options on foreign currency futures contracts that trade on the Chicago Mercantile Exchange ("CME Options") are functionally and economically equivalent instruments. While there are minor differences in the units of trading, you state that the principal distinguishing feature between PHLX and CME Options is the underlying interest. In the case of the PHLX Option, the underlying interest is the currency itself, while the underlying interest of the CME Options is a currency futures contract. As the price of the underlying currency moves, there will be a corresponding movement in the price of the futures contract. Furthermore, with the exception of the European Currency Unit, the currencies traded on the Philadelphia Stock Exchange are the same as those traded on the Chicago Mercantile Exchange.

You represent that the requested relief will only apply to CTAs that are registered with the CFTC under the Commodity Exchange Act ("CEA") and to commodity pools that are operated by commodity pool operators registered as such with the CFTC. You further represent that all Philadelphia Stock Exchange requirements for trading and recommending transactions in PHLX Options would continue to apply.⁴

Based on the facts and representations in your letter, we will not recommend enforcement action to the Commission against (1) any CTA registered as such under the CEA for failure to register as an investment adviser based solely upon such CTA providing advice and/or exercising trading discretion with respect to PHLX Options,⁵ and (2) any commodity pool operated by a commodity pool operator registered as such under the CEA, or the principals of such pool, for failure to register the pool as an investment company under the Investment Company Act based solely upon the pool's owning, holding, trading, reinvesting, or investing in PHLX Options.⁶ Any different facts or representations may require a different

⁴ Telephone conversation between Richard A. Cangelosi and Felice R. Foundos (October 17, 1994).

⁵ We note that the antifraud provisions of the Investment Advisers Act will apply to CTAs that provide advice with respect to PHLX Options. See David G. Takata (pub. avail. Aug. 21, 1992). Further, we express no opinion as to the registration requirements of CTAs as broker-dealers under the Securities Exchange Act of 1934.

⁶ Our position does not alter the status of options relating to foreign currencies traded on a national securities exchange as securities subject to regulation under the federal securities laws.

conclusion. Moreover, this response expresses the Division's position on enforcement action only and does not express any legal conclusions on the issues presented.

A handwritten signature in cursive script that reads "Felice R. Foundos". The signature is written in dark ink and is positioned above the printed name and title.

Felice R. Foundos
Attorney

September 2, 1994

Office of the Chief Counsel
Division of Investment Management
Securities and Exchange Commission
450 Fifth Street, N.W.
Washington, DC 20549

ACT IAA-40
SECTION 203(a)
RULE _____
PUBLIC AVAILABILITY 10/18/94

Dear Chief Counsel,

On behalf of the Philadelphia Stock Exchange, Inc. (PHLX) enclosed is a proposal requesting that the Division of Investment Management provide that the staff will not recommend that the Commission take enforcement action under the Investment Advisors Act against registered commodity trading advisers ("CTA") which use PHLX foreign currency options or under the Investment Company Act against pools or their principals where such pools invest in PHLX foreign currency options.

If there are any questions please feel free to call William W. Uchimoto, General Counsel, at (215) 496-5208 or Richard A. Cangelosi, New Product Development, at (215) 496-5025.

Sincerely,



Richard A. Cangelosi
Director, New Product Development



William W. Uchimoto
General Counsel

September 2, 1994

Office of the Chief Counsel
Division of Investment Management
Securities and Exchange Commission
450 Fifth Street, N.W.
Washington, DC 20549

Dear Chief Counsel,

I am writing on behalf of the Philadelphia Stock Exchange, Inc. ("PHLX") to request that the Division of Investment Management ("Division") provide written assurance in the form of a "no action letter" that the staff will not recommend that the Commission take enforcement action (i) against any commodity trading adviser ("CTA") registered as such under the Commodity Exchange Act, as amended ("CEA") for failure to register as an investment adviser under the Investment Advisers Act of 1940, as amended ("IAA") based solely upon such CTA providing advice and/or exercising trading discretion with respect to currency options traded on a national securities exchange (hereafter "PHLX options"), and (ii) against any commodity pool or the principals of such pool for failure of the pool to register as an investment company under the Investment Company Act of 1940, as amended ("ICA") based solely upon the pool's owning, holding, trading, reinvesting, or investing in PHLX foreign currency options.

We believe that subjecting CTAs and commodity pools to duplicative federal regulation under the IAA and ICA, respectively, imposes unwarranted burdens which hamper legitimate hedging, trading and investment activities occurring under the purview of federal commodities laws and regulations and that the no-action relief requested will assist in making progress toward harmonizing the regulatory programs of the Commission and the Commodity Futures Trading Commission ("CFTC"). The current ambiguity regarding the use of PHLX foreign currency options by CFTC regulated entities places PHLX foreign currency options at a substantial competitive disadvantage to functionally equivalent products, such as options on foreign currency futures contracts, over-the-counter foreign currency options traded in the inter-bank market, and currency options which trade on a foreign exchange, all of which CFTC regulated entities freely trade. It has been our view, in which the Commission has concurred, that competing investment instruments should be tested in the marketplace on their merits, without regard to artificial advantages created by the presence or absence of a particular regulatory framework.

A. Proposals

1. CTAs

We request that the Division staff provide written assurance in the form of a "no action letter" that it will not recommend enforcement action to the Commission for a failure by any CTA which is registered with the CFTC as such to register as an investment adviser under the IAA where such CTA uses PHLX foreign currency options in its commodity trading strategies.

2. Commodity Pools

Similarly, we request that the Division provide written assurance in the form of a "no action letter" that it will not recommend enforcement action to the Commission against a commodity pool or its principals for failure to register the pool as an investment company under the ICA solely because of its investment in PHLX foreign currency options where such commodity pool is operated by a commodity pool operator ("CPO") registered as such with the CFTC.

B. Justification of Proposal

We believe these proposals merit consideration for a number of compelling reasons. First, options traded on a national securities exchange and options traded on a board of trade or contract market are identical, functionally and economically equivalent instruments that have been separated legally only to impose a line of demarcation to clarify regulatory jurisdiction between agencies. Pursuant to Section 2(a)(36) of the ICA and Section 202(a)(18) of the IAA any "put, call, straddle, option or privilege entered into on a national securities exchange relating to foreign currency" is included in the definition of a security under those acts. This provision was added to those definitions as part of the legislation implementing the 1982 jurisdictional accord between the Commission and the CFTC regarding the scope of their respective jurisdictions with respect to futures and options contracts on financial instruments. Accordingly, PHLX foreign currency options are securities simply because they are traded on a national securities exchange. The identical instrument, traded on a board of trade (i.e., registered contract market) would be a commodity option subject to CFTC regulation.

Second, a significant number of PHLX foreign currency option customers reside in Europe. As of late, many of these customers are French individuals and institutions. In an effort to capture this "domestic" customer base, the Marche a Terme International de France ("MATIF"), the French derivatives exchange, in May 1994 commenced trading look-a-like contracts replicating certain PHLX foreign currency options contracts. Specifically, the MATIF has listed options on the U.S. dollar/Deutsche mark and on the U.S. Dollar/French franc. At the request of the MATIF and French financial regulators, the CFTC has issued an

order approving these particular MATIF contracts to be offered and sold to persons located in the United States, effective June 3, 1994. See 59 Fed. Reg. 22971 (May 4, 1994). Anomalously, therefore, CTAs and U.S. commodity pools currently may trade currency options offered by an off-shore exchange where they can not trade the same options contracts offered by a domestic U.S. exchange. Absent receipt of this no-action position, the PHLX is in the unenviable position of fighting to retain its European/French customer base from the direct, targeted MATIF attack, at a time that the MATIF has been accorded the opportunity to make substantial inroads to the domestic U.S. CTA/CPO business, an opportunity presently foreclosed to the PHLX.

— Third, PHLX Options specifically bear a substantially identical economic resemblance to options on foreign currency future contracts which trade on the Chicago Mercantile Exchange (hereafter "CME Options"). The CME, of course, is a CFTC regulated board of trade. In essence, foreign currency options whether options on the physical or on a futures contract, transfer the risk of an unfavorable shift in an exchange rate from the purchaser (or holder) of the option to the seller (or writer) of the options.

— While there are minor differences in the units of trading¹, the only distinguishing feature between PHLX and CME options is the underlying interest. In the case of the PHLX option, the underlying interest is the currency itself, while the underlying interest of the CME option is a currency futures contract². A currency future is a derivative of, and in terms of risk/reward, a surrogate for the currency. As the price of the underlying currency moves, there will be a corresponding movement in the price of the futures contract. (In some commodities the futures market price is used as a reference point for determining the cash market price.) In both trading the physical or a futures contract, the long incurs a profit from an increase in the price of the currency and the short incurs a loss. Conversely, the long incurs a loss if the currency's price falls, while the short incurs a profit. For a further discussion of the economic equivalence of PHLX and CME options, please see Addendum A attached.

Furthermore, with the exception of the European Currency Unit, the currencies traded on the PHLX are the same as those traded on the CME. In terms of clearing and settlement, the Options Clearing Corporation ("OCC"), the issuer and guarantor of all PHLX options, like the clearinghouses employed by the futures contract markets, interposes itself between the writer and purchaser of each foreign currency options contract it accepts for settlement. As a result, the participants of both markets look to their respective clearinghouses for performance of contract obligations owed to them, rather than to any individual counterparty, and do not concern themselves with the creditworthiness of their

¹With regard to Units of Trading, PHLX options are one-half the size of CME options.

²Presently, the CME only lists options on futures contracts, however, the CME is legally authorized to list options on the physical currency, which would then be identical to the underlying interest of the options now traded on the PHLX.

counterparties. Both PHLX and CME options are standardized with respect to material terms. Open interest in the respective markets is fungible with users having the right to offset their positions at any time by trading a countervailing contract.

In addition, bank regulators, including the Board of Governors of the Federal Reserve and the Comptroller of the Currency, have approved member banks and bank holding companies to operate affiliates at both the PHLX and CME in recognition of the closely related nature of both marketplaces' respective instruments³. In summary, PHLX and CME currency options economically function in an identical fashion. This conclusion is readily evidenced by the myriad of users who actively and freely engage in trading across both markets for arbitrage and hedge purposes.

Finally, in addition to the economic argument, CTAs and pools are already subject to substantial regulation under both the securities and commodities laws, with many regulations imposed upon CTAs and CPOs paralleling those under the IAA or the ICA.

CPOs of commodity pools must comply with numerous CFTC regulations that provide pool investors with substantial protection. CPOs are required to register with the CFTC and become a member of the National Futures Association. Publicly offered commodity pools must comply with the disclosure and registration requirements of both the Commission pursuant to the Securities Act of 1933, as amended, and the CFTC under the CEA. See Statement of the Commission Regarding Disclosure by Issuers of Interests in Publicly Offered Commodity Pools, 54 Fed. Reg. 5600 Feb. 6, 1989. Most privately offered commodity pools offered in the U.S. also must have a disclosure document filed by its CPO with the CFTC. See CFTC Rule 4.20. In addition, CPOs of pools are restricted in the manner in which they can deal with pool assets and are subject to book and record keeping requirements. See CFTC Rules 4.20 and 4.23. CPOs also must provide holders of pool interests with periodic reports and an audited annual report of financial condition. See CFTC Rule 4.22.

CTAs are also subject to substantial regulation by the CFTC. CTAs which direct trading in client accounts must deliver disclosure documents to such clients containing all material information about the CTA. See CFTC Rule 4.31. Absent an applicable exemption, a CTA must register with the CFTC and join the National Futures Association as a member. A CTA also must comply with book and record keeping requirements. See CFTC Rule 4.32

Accordingly, we believe that the proposed no-action relief requested herein would

³Standard and Chartered Banking Group, Ltd., 38 Fed. Reg. 27553. The Federal Reserve has, on several occasions, noted that options on certain financial physicals are functionally and operationally equivalent to futures and options on futures. See, e.g., Security Pacific, 70 Fed. Res. Bull. 53 (1984); The Long Term Credit Bank Credit Bank of Japan, Ltd., 74 Fed. Res. Bull. 573 (1988). The Federal Reserve has, in turn, noted the functional equivalence between the purchase and sale of these derivatives products and the foreign exchange activities in which banks have traditionally engaged. See, e.g., Fidelcor, Inc., 70 Fed. Res. Bull. 368 (1984).

further the coordination and harmonization of the regulatory structures of the Commission and the CFTC. The no-action relief requested would only apply to PHLX foreign currency options and only, in instances when the CTA and the CPO of the pool are subject to CFTC regulation.

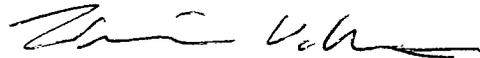
C. Conclusion

Providing the relief we have requested herein will promote financial innovation through enhanced competition by placing all similar products on a level playing field and eliminating the unfair disadvantage to which PHLX foreign currency options are currently subject. In this regard, presently well regulated commodity pools and CTAs should be able to decide which instruments to invest in based upon their merits, and not be prevented from investing in products which may pose potential regulatory burdens, but which are otherwise economically equivalent to instruments in which they presently trade.

For the reasons expressed above, we respectfully request that the Division provide written assurance in the form of a "no action letter" that it will not recommend enforcement action to the Commission under the IAA against registered CTAs which use PHLX foreign currency options or under the ICA against pools or their principals when such pools invest in PHLX foreign currency options.

If you have any questions regarding this request please call the undersigned at (215) 496-5208.

Sincerely,



William W. Uchimoto
General Counsel

ADDENDUM A

The Economic Equivalence of Currency Options on the Spot and Futures Markets

This Addendum addresses the economic equivalence of options on the actual currency (spot) and options on currency futures. Sections I and II discuss the fundamental economics of spot and futures options respectively. The instruments are then compared in Section III. The exercise convention of American-style options, that is, the ability to exercise an option contract at any point prior to expiration, and its implications are discussed in Section IV. Section V provides a summary and conclusion. In this paper the terms spot and cash are used interchangeably.

I. CURRENCY OPTIONS ON THE SPOT (CASH) MARKET

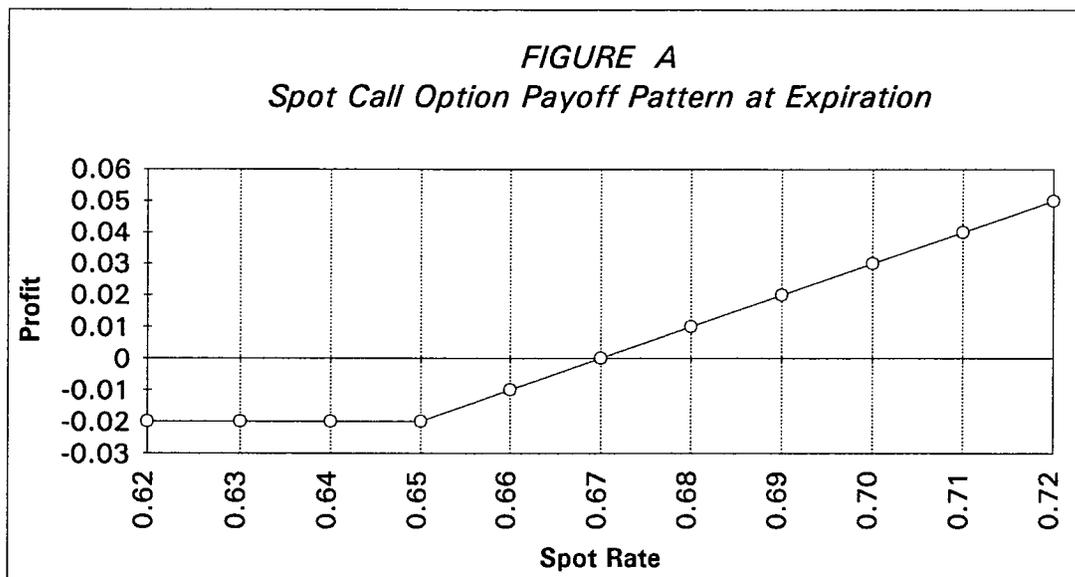
A currency call option contract conveys to the holder ("buyer") the right, but not the obligation, to purchase from a seller ("writer") a standardized amount of foreign currency at a specific, predetermined exchange rate ("strike price") within a specified period of time ("expiration date"). For this right, the buyer pays an amount called a premium to the writer. The buyer then has three choices: (1) exercise the option; (2) sell the option to someone else; (3) let the option expire unexercised. The Philadelphia Stock Exchange lists options on spot. Options on spot can have one of two styles of exercise. An American-style option allows the buyer to exercise (i.e., force the writer to deliver currency) at any time during the life of the option. A European-style option may only be exercised on the expiration date of the contract. The premium of a call option on the currency will vary according to:

1. the prevailing spot level relative to the strike price level. The higher the spot rate relative to the exercise price, the larger the option premium value.¹ The difference between foreign interest rates and domestic interest rates is a determinant of the spot price.
2. the time until the expiration of the option. The more time remaining before option expiration, the higher the probability of the spot rate rising above the strike price. Thus, there is a positive relationship between the option premium and the time to maturity of the option.

3. the volatility of the option. The greater the volatility of spot rates, the higher the probability that the spot rate will rise above the exercise price. Thus, there is a positive relationship between the option premium and volatility.²

The call option premium, as a result of the interaction of all of the above factors, must be at least equal to the difference between the existing spot rate and the exercise rate (i.e., the intrinsic value of the option premium). If this is not true, then riskless arbitrage opportunities will arise.

Consider the following example. Given a certain level of volatility and time to maturity, assume that a Deutsche mark call option on spot is available with an exercise price of \$0.65 and a call premium of \$0.02. The profits to be earned are dependent upon the movement of the spot rate of the Deutsche mark. Figure A represents the payoff pattern at expiration created to measure the profit or loss per unit. Notice that if the spot rate is \$0.65 or less, the net loss per unit is (\$0.02). This represents the loss of premium paid per unit for the option. At \$0.66, \$0.01 would be earned from exercising the option, but considering the \$0.02 premium paid, the net result is a loss of (\$0.01). At \$0.67, \$0.02 per unit would be earned from exercising the option with a net result of no profit or loss. Any spot level above \$0.67 results in a economic gain for the option holder.



It is obvious from the above example that the value of the option, and thus the profit from exercising the option critically depends upon the movement of the spot rate.

II. OPTIONS ON CURRENCY FUTURES

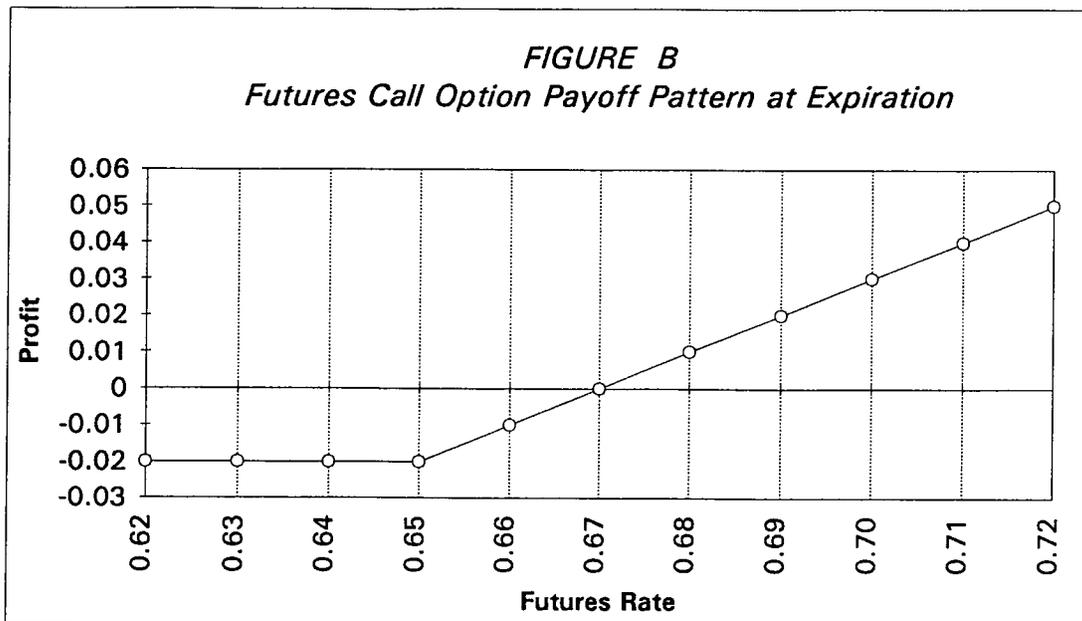
A currency call option contract conveys to the holder ("buyer") the right, but not the obligation, to purchase from a seller ("writer") a standardized currency futures contract at a

specific predetermined exchange rate ("strike price") within a specified period of time ("expiration date"). The buyer pays an amount to the writer called a premium. The buyer then has three choices: (1) exercise the option; (2) sell the option to someone else; (3) let the option expire unexercised. The Chicago Mercantile Exchange lists options on currency futures. Options on futures can have one of two styles of exercise.³ An American-style option allows the buyer to exercise (i.e., force the writer to deliver a currency futures contract) at any time during the life of the option. A European-style option may only be exercised on the expiration date of the contract. The premium of a call option on currency futures will vary according to:

1. the prevailing currency futures price level relative to the strike price level. The higher the futures rate relative to the exercise price, the larger the option premium value.⁴ The difference between foreign interest rates and domestic interest rates is a determinant of the futures price.
2. the time until the expiration of the option. The more time remaining before option expiration, the higher the probability of the futures price rising above the strike price. Thus, there is a positive relationship between the option premium and the time to maturity of the option.
3. the volatility of the option. The greater the volatility of currency futures prices, the higher the probability that the futures price will rise above the exercise price. Thus, there is a positive relationship between the option premium and volatility.⁵

The call option premium is determined as a result of the interaction of the above stated factors, and is at least equal to the difference between the existing futures exchange rate and the exercise rate. If the option premium is less than the stated difference, then riskless arbitrage opportunities will arise.

Consider the following example. Assume that a Deutsche mark call option on the futures contract is available with an exercise price of \$0.65 and a call premium of \$0.02. Given a certain level of volatility and time to maturity, the profits to be earned are dependent upon the movement of the futures rate of the Deutsche mark. Figure B represents the payoff pattern at expiration created to measure the profit or loss per unit. Notice that if the futures rate is \$0.65 or less, the net loss per unit is (\$0.02). This represents the loss of premium paid per unit for the option. At \$0.66, \$0.01 would be earned from exercising the option, but considering the \$0.02 premium paid, the net result is a loss of (\$0.01). At \$0.67, \$0.02 per unit would be earned from exercising the option, with a net result of no profit or loss. Any futures level above \$0.67 results in an economic gain for the option holder.



It is obvious from the above example that the value of the option and thus the profit from exercising the option critically depends upon the movement of the futures rate.

III. A COMPARISON OF SPOT AND FUTURES OPTIONS ON CURRENCY

The above discussion clearly demonstrates that the variation in the option premium on a spot option contract depends upon the variation in the existing level of the spot exchange rate relative to the exercise price. Similarly, the variation in the option premium on a futures contract depends on the existing level of the futures exchange rate relative to the exercise price. Thus, both contracts are identical in terms of the underlying fundamental economic operations. Both contracts rise (or fall) in terms of the option premium if the underlying interest rises (or falls).

Additionally, the price of a futures contract changes over time in accordance with movements in the spot rate. For example, if the spot rate increased substantially over a one month period, the futures price, which is highly correlated to the spot rate, would increase by about the same amount. (See Madura 1992). Thus, the source of differential premium, if any, for two otherwise identical contracts is the difference in the exchange rate for spot versus the futures exchange rate. This difference is known as the basis. The higher the basis, the higher the relative valuation, the lower the basis, the lower the relative valuation. If the basis is zero, the relative valuation of spot and futures options are equal. It should be pointed out that the basis converges to zero as the futures contract approaches maturity.

Now, the critical question becomes, what determines the differential between the spot rate versus the futures exchange rates and how does it affect the economic equivalency

of currency spot options and currency futures options. According to the Interest Rate Parity Theorem, the following conditions hold:

1. The futures exchange rate will be equal to the spot rate if the foreign interest rate (i_f) is equal to the domestic interest rate (i_d). Given this condition, the value of a spot call option will be equal to the value of a futures call option for contracts that are otherwise identical. This is true in the case of put options as well. This condition is called equilibrium parity.
2. The foreign currency will be at a futures premium, that is, the futures rate will be greater than the spot rate if i_f is less than i_d . Given this condition, the value of a spot call option will be less than the value of a call option on futures. The opposite relationship is true for put options. The value of the spot put option will be greater than the value of an option on futures.
3. The foreign currency will be at a futures discount, that is, the futures will be less than the spot rate if i_f is greater than i_d . Given this condition, the value of a spot call option will be greater than the value of a call option on the futures contract. Conversely, the value of the spot put option will be less than the value of the option on futures.

Given the above, let us first consider a European-style exercise option. Recall that, by definition, a European currency futures option and a European spot option can be exercised only on option expiration day. The value of a European option on the physical currency *will always be equal* to the value of a European option written on the futures contract based on that physical currency, provided that the two otherwise identical options and the futures contract have the same maturity date. Under the conditions assumed this must be true because the stream of cash flows to be received at maturity for both options are *identical*, since neither option can be exercised before that date and the spot rate equals the futures rate on that date. (See DeRosa 1992). For American-style options on futures, it is not possible to make such a clear comparison to options on spot. The relative valuation depends on whether the currency is at a futures premium or discount. This is discussed in Section IV below.

IV. THE ECONOMICS OF EARLY EXERCISE

American-style exercise options can be exercised at the discretion of the holder at any time prior to expiration. Early exercise is often optimal when the following conditions exist: (1) the option is in-the-money, that is, the spot or futures rate exceeds the strike or exercise price; and (2) there is low volatility. A sufficient condition for early exercise of an American-style option is that the option premium trade for less than its intrinsic value.

For example, consider an in-the-money U.S. dollar/Deutsche mark call option. The holder pays a premium in U.S. dollars for the right to buy a fixed quantity of Deutsche

marks at the strike or exercise price at a future date. Point (1) is necessary, as no one would choose to exercise an option if it was possible to purchase the underlying interest cheaper in the market. Point (2) states that due to low volatility, the probability of spot (or the futures) rate falling below the exercise price is low thus providing an opportunity to an investor to buy the foreign currency cheaper at a future date.

Given the above conditions and assuming i_f is greater than i_d , the foreign currency is at a futures discount (i.e., the futures rate is less than the spot rate), the holder of a call option on spot faces a trade-off between the interest opportunity cost of not exercising the option and the probability of the spot rate declining below the exercise price. If the interest opportunity cost is higher than the probability of spot declining below the exercise price, than the option will be exercised early. Notice that given the low volatility conditions, the probability of spot declining below the exercise price is low. Therefore, the motivations for early exercise is high. Under the same conditions, the motivation to exercise the option on futures is low. This is due to the simple fact that the foreign currency is at a futures discount and thus the two contracts, though otherwise identical, have different value since the value of a call on futures is less than the call on spot. For a currency at a futures premium (the futures rate is higher than the spot rate as a consequence of i_f less than i_d), the reverse is true; the relative value of the call on futures is greater than the value of a call on spot and the put option on futures is less than the put on spot.

V. SUMMARY AND CONCLUSIONS

Options on spot and options on futures contracts are identical in terms of their underlying fundamental economic operations. Both contracts rise (or fall) in terms of the option premium if the underlying interest rises (or falls). The underlying interest for one contract is the physical currency (spot) and for the other it is the futures contract. The difference between the futures rate and the spot rate is known as the basis. The basis will converge to zero, that is, the futures rate will equal the spot rate at the maturity date of the futures contract. Additionally, the futures rate and the spot rate move in tandem with each other. In the case of European-style exercise contracts, the value of the options are always equal for otherwise identical contracts with the same maturity date as the futures contract. In the case of American-style calls, the relative values of puts and calls differ in relation to the basis, however, the fundamental economic reasons for early exercise are the same.

ENDNOTES

1. This is defined as the intrinsic value component of the spot option premium. In the case of a call, it is the greater of: zero, or the spot rate minus the exercise (strike) rate. For the put, it is the greater of: zero, or the exercise (strike) rate minus the spot rate.

2. The factors influencing call option premiums on spot also influence put option premiums. The lower the spot rate relative to the exercise rate, the higher the option premium since it reflects both a larger intrinsic value and a higher probability that the put option will be exercised. This is the opposite relationship held for the call. The time to maturity and variability of the underlying spot rate equally apply to the put and the call option.
3. The Chicago Mercantile Exchange currently lists American-style exercise options.
4. This is defined as the intrinsic value component of the futures option premium. In the case of a futures call, it is the greater of: zero, or the futures rate minus the exercise (strike) rate. For the put, it is the greater of: zero, or the exercise (strike) rate minus the futures rate.
5. The factors influencing call option premiums on futures also influence put option premiums. The lower the futures rate relative to the exercise rate, the higher the option premium since it reflects both a larger intrinsic value and a higher probability that the put option will be exercised. This is the opposite relationship held for the call. The time to maturity and variability of the underlying futures rate equally apply to the put and the call option.

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