

CURRENCY DERIVATIVES  
AND  
THEIR APPLICATIONS IN TURKEY

MBA THESIS

By

A. Yekta NAZLI

Ankara, June-1997

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A THESIS

SUBMITTED TO THE DEPARTMENT OF MANAGEMENT  
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By

A. Yekta NAZLI

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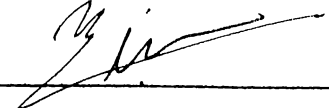
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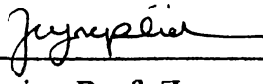
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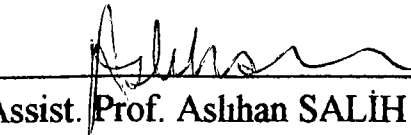
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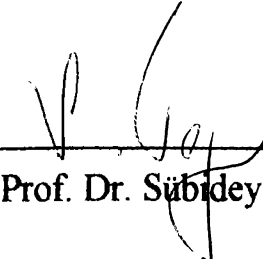
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ABSTRACT

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AND  
THEIR APPLICATIONS IN TURKEY

BY

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As a result of increased volatility in freely floating exchange rates, corporations and individuals were faced with currency risks after the 1970s. In order to manage these risks, new financial instruments -called derivatives- started to be used worldwide. They are currently used in a limited manner in Turkey. The main purpose of this thesis is to present the applications of over-the-counter currency derivatives in Turkey. Throughout the thesis, the reasons for lagging behind in the use of derivative instruments will be presented. Finally, policy recommendations will be made for the development of efficient currency derivatives markets.

Key Words: Currency derivatives, over-the-counter (OTC), exchange rate risk, forwards, futures, options, dual currency loans, swaps, exotic options, DKEM, Margin Trading, PSM, MLD

## ÖZET

# DÖVİZ TÜREV ÜRÜNLERİ VE TÜRKİYE'DEKİ UYGULAMALARI

A. YEKTA NAZLI

YÜKSEK LİSANS TEZİ, İŞLETME FAKÜLTESİ

TEZ DANIŞMANI: DR. YEŞİM ÇİLESİZ

HAZİRAN, 1997

1970 sonrasında, deęişken kur sistemindeki artan volatiliteden dolayı, kurumlar ve bireyler döviz riskiyle karşılaştılar. Bu riski yönetmek amacıyla dünyada yeni finansal enstrümanlar -türev ürünler- kullanılmaya başlarken, bu enstrümanların Türkiye'deki uygulamaları kısıtlı kaldı. Bu tezin ana amacı, Türkiye'deki tezgah-üstü döviz türev uygulamalarını sunmaktır. Tez boyunca, türev enstrümanlarının kullanımında geri kalınmış olunmasının sebepleri ortaya konulacaktır. Son olarak da, etkin bir döviz türev piyasasının gelişimi için politikalar önerilecektir.

Anahtar Kelimeler: döviz türevleri, tezgah üstü, kur riski, vadeli işlemler, futures, opsiyon, çift döviz bacaklı borç, swap, egzotik opsiyonlar, DKEM, Margin Trading, PSM, MLD

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## **1. INTRODUCTION**

There is a general agreement that increased volatility in foreign exchange rates following the breakdown of the Bretton Woods system of fixed exchange rates in the early 1970s and the oil crisis following that, have led to a riskier financial environment today than in the past. This study aims to present the foreign exchange risk resulting from freely floating exchange rates, and the modern financial techniques and strategies used to hedge that risk both in the world and in Turkey. In addition to that, the study will present the over-the-counter applications of currency derivatives, the main problems encountered in Turkey, and will try to develop recommendations for the development of efficient currency derivative markets.

### **1.1. Background**

During the Bretton Woods era, those who dealt with foreign currency knew exactly what exchange rates they would be facing in their transactions. For instance, importers knew what they would pay for the goods they bought, and exporters knew what they would

receive for the goods they sold. However, with the breakdown of the Bretton Woods system, both sides realized that they were exposed to exchange rate risk: Exchange rates among major currencies were now freely floating. The relative value of a currency vis-a-vis another was determined in the spot foreign exchange market.<sup>1</sup> Each day, a currency's price in terms of another one could stay the same, increase, or decrease. Unpredictable movements in exchange rates could affect a firm's ability to transact internationally, and, as a consequence, its overall performance and financial reports.

For example, during 1981, the DEM / USD (Deutsch mark / US dollar) exchange rate moved from DEM 1.95 to DEM 2.52 and back to DEM 2.35 by the end of the year. On September 21st 1984, the DEM / USD rate rose 4% and plunged 7% in the course of a few hours.<sup>2</sup> While moves of this kind were unusual they did occur, and they had dramatic consequences for participants in foreign exchange markets.

As a result, investors and corporations alike demanded a means of hedging their foreign currency commitments. The financial environment responded to this demand by introducing a range of financial instruments and strategies to manage foreign exchange

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<sup>1</sup> The spot (cash) exchange rate market is the market for the settlement of a foreign exchange transaction within two business days. In other words, the currency has to be delivered by the seller two working days after the transaction is executed, and the buyer is also required to pay the other currency two working days after the transaction is executed.

The spot foreign exchange market is also called the interbank market in which banks trade with each other worldwide at the main financial centers like Tokyo, New York, Zurich and Singapore. The transactions are done through brokers and dealers.

<sup>2</sup> *Managing Currency Exposure*, Citibank Publications (1991)

risk. As a result, the currency derivative market, especially the over-the-counter market, grew rapidly in the early 1990s.

The rapid development in their variety and widespread usage attracted a lot of academicians, and many studies were conducted on the various aspects of these new financial instruments. Most of these are beyond the scope of this thesis. For the curious reader, Horowitz and Mackay,<sup>3</sup> and Gibson and Zimmerman,<sup>4</sup> provide excellent surveys.

Academicians paid attention to derivatives in Turkey as well. Most studies about these instruments give examples of their applications in developed countries and recommend policies to be implemented in Turkey. Most were published after the April 1994 economic crisis, as a result of the high and rapid increases in foreign exchange rates. These studies aim to increase awareness of instruments used to hedge against fluctuations in foreign exchange rates. For details, one can refer to the publications of the Bank Association of Turkey between the years 1994-1996.<sup>5</sup>

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<sup>3</sup> Horowitz, Donald L., Mackay, Robert J., (October 1995), "Derivatives-State of the Debate", <http://cml.com/market>.

<sup>4</sup> Gibson, Rayna, Zimmermann, Heinz, (December 1994), "The Benefits and Risks of Derivative Instruments", <http://cs6400.mcc.ac.uk/adnetec/BibEc/papers/etcoig.mont.95-2.html>

<sup>5</sup> Önce, Saime, (1995), *Türev Ürünlerin Muhasebe Sorunları ve Bankalar için Muhasebeleştirme Şekilleri*, Türkiye Bankalar Birliği, Yayın No: 192.

Gündüz, Lokman, Tural, Mehmet, (1995), *Türev Ürünlerin Muhasebeleştirilmesi: Türkiye Uygulaması Üzerine Bir Öneri*, Bankalar Birliği, Yayın No:193.

Yükcü, Süleyman, Yücel, Tülay, (1995), *Bankacılıkta Türev Ürünlerin Muhasebeleştirilmesi, Bugünkü Durum ve Yapılması Gerekenler*, Türkiye Bankalar Birliği, Yayın No: 191.

None of these studies, however, mention the over-the-counter instruments used in Turkey. This study is going to provide an insight to the reader about the current stage of currency over-the-counter derivatives and their applications in Turkey. It will also discuss the main problems related to these. Consequently, we will be able to develop recommendations for the development of efficient currency derivative markets.

## **1.2. Organization**

The thesis is organized as follows:

In Chapter 2, we briefly mention standard risk management tools like forwards, futures, swaps and options, and their applications in Turkey.

In Chapter 3, we look at over-the-counter (OTC) currency derivative products used in developed countries and their applications in Turkey. Specifically, we discuss derivative products offered by Interbank.

In Chapter 4, we focus on the recent discussions about the benefits, risks and problems of currency derivatives in the world. Moreover, we discuss the future of OTC derivatives.

In Chapter 5, we assess the present situation in Turkey.

Finally, in Chapter 6, we present policy recommendations for the development of well-functioning derivative markets in Turkey.

## **2. CURRENCY DERIVATIVES**

There is a wide range of instruments that an investor can use to manage currency risks (hedge) as well as to speculate. The most frequently used ones are currency forwards, futures, swaps and options.

### **2.1. Currency Forward Contracts**

Currency forward contracts, which are the basis for other currency derivatives, are transactions executed today, to buy one currency for another currency at a rate and amount agreed upon today, with a settlement at an agreed upon future time. They are ways of hedging exchange rate risks resulting from transactions agreed upon today and executed in the future. For example, with a forward contract, an export firm can determine its profit today by "locking in" the domestic currency price for the goods that are going to be exported later, and hedge itself against the risk of unfavorable exchange rate fluctuations. In other words, the contract gets rid of the uncertainty regarding the cost of future foreign currency payments. Thus, it also allows the firm to budget accurately.



At the maturity of a forward contract, if the actual price (spot price) is higher than the contract price, the forward buyer makes a profit. If it is lower, the buyer suffers a loss. The payoff of the seller is the opposite of that of the buyer.

There are two important characteristics of forward contracts. First, in forward contracts, no cash transfer occurs up front, except for transaction or guarantee fees, if present. Second, forward contracts involve risk of default by one of the parties. If one party gets richer at maturity, the other party will get poorer. In that case, the poorer one may want to abolish the contract, which creates problems for the one that is supposed to get richer.

In forward contracts, the maturity, type of currency and amounts to be transacted are not standardized; they are fixed according to the needs of the parties. However, sometimes it might be hard for the hedgers to determine the exact maturity that meet their needs. For example, an export firm may not predict the exact date of the forward currency obligation arising from its transactions, and thus may need to extend the forward contract date. In order to solve such problems, some banks provide their customers with contracts with maturities that can be extended.

Currency forwards are one of the oldest instruments of exposure management and still one of the most popular. Even in 1979, 85% of multinationals were using forwards.<sup>6</sup> International forward markets for four major currencies (Sterling, US dollars, Deutsch

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<sup>6</sup> Briggs. W. Peter, (1987), *Foreign Currency Exposure Management*, London Butterworths

mark and Japanese yen) are liquid and efficient for transactions up to a maturity of one year, with bid-ask spreads quoted. The transactions are mostly completed by telephone and telex through brokers and dealers.

## **2.2. Currency Futures Contracts**

A currency futures contract is similar to a currency forward contract: the buyer of a currency futures contract agrees to purchase a specified amount of a specified currency at a specified price on a specified date. There are, however, four major differences between forwards and futures. First, the amount, maturity and other terms of futures contracts are standardized. This improves liquidity. Second, transactions are handled only by organized exchanges through clearing houses. Third, currency futures contracts require depositing an "initial margin". Finally, profits and losses are settled daily. These features significantly reduce the credit or default risk associated with forward transactions.

Today, futures contracts with short maturities are actively traded on exchanges, in prominent financial centers worldwide. Contracts are available for major currencies, such as the Deutsch mark (DEM), Canadian dollar (CAD), Swiss franc (SFR), French franc (FFR), Japanese yen (YEN) and European currency unit (ECU), all against the United States dollar (USD). Each futures market has its own special rules regarding the contract size, maintenance requirements, initial margin, delivery date, exchange fees, etc.

### 2.3. Currency Swaps

A currency swap agreement is the exchange of cash-flows in one currency for cash flows in another for a specified period. In a currency swap, there is an exchange of both interest and principal payments of the two currencies. However, in a fixed payment swap, there is an exchange of the payments only.

A swap contract can be regarded as a series of forward contracts lined up on a schedule.<sup>7</sup> For example, an exporter and an importer agree on a long term contract in which the importer is going to pay DEM 2 million every six months for five years for the exporter's goods. However, the exporter wants to lock-in the dollar value of these revenues. Consequently, he enters into a currency swap with a bank. The bank agrees to pay USD 1 million every six months for the next five years to the exporter and the exporter agrees to pay DEM 2 million on the same dates that the bank pays the dollars. Here, the currency swap agreement is a series of ten forward contracts.

The features of swap contracts are like forward contracts: No cash is required at the beginning, but there is credit risk. Also, they are nonstandard contracts, tailored to customer requirements (over-the-counter). However, swap contracts are available for longer maturities than forwards.

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<sup>7</sup> Claessens, Stijn, (1990), *Risk Management in Developing Countries*, World Bank Technical Paper Number 235

Currency swap contracts are mainly used to hedge existing risks and to provide efficient asset/liability management by changing the character of payables and receivables.

#### **2.4. Currency Option Contracts**

A currency option is the right to purchase or sell a certain currency at a preset price on (or before) a specified date. The buyer of the option owns the right to buy (or sell) the currency and the seller (or writer) of the option gives the right to the buyer. In option jargon, an option that gives the right to buy or purchase a currency is a "call" option, and the option that gives the right to sell a currency is a "put" option.

Options that can be exercised at any time before the expiration date are called 'American Options', and those that can be exercised only at maturity are called 'European Options'. In many cases, options that are traded in the OTC market are of the European type.<sup>8</sup>

At the maturity date of a call (put) option, if the spot value is below (over) the contract value, the call (put) option is not exercised and the transaction is executed in the spot market, and the buyer (seller) only loses the premium paid. If the spot market value is higher (lower) than the contract value, the call (put) option is exercised.

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<sup>8</sup> *Managing Currency Exposure- Currency Options, Citibank Publications-1994.*

For example, for an import transaction to take place in three months, let us suppose that a European call option on USD is bought at a premium of 3,000 TL. The agreed future price is 166,000 TL/USD and the spot price is 140,000 TL/USD. At maturity, if the spot rate is less than 166,000 TL/USD, the option is not exercised and the transaction occurs in the spot market. The only loss is the premium paid. If the spot price is between 166,000 TL/USD and 169,000 TL/USD, the option is exercised, and the loss is the difference between the premium paid and the spot minus contract price (as the loss is less than the premium paid). If the spot price is equal to 169,000 TL/USD, no loss or gain is realized, and when it is over 169,000 TL/USD the buyer exercises the option and makes a profit equal to the difference between the spot price and the agreed future price (plus premium).

Unlike forward contracts in which the future price is locked-in, options contracts limit the maximum loss (equal to the premium paid up-front), but leave an opportunity to take advantage of favorable price movements. However, because of the premium to be paid up-front, a significant amount of cash is required to buy options. Moreover, while the buyer of an option faces credit risk or default risk by the counterparty, the seller does not.

The tendency to choose options instead of forwards is mostly seen in companies that have variable or contingent foreign currency payments or receipts. In such a situation, a forward deal is too binding as the need to exchange currencies may not materialize.

Currency options markets are highly liquid and have short-term maturities. These options are traded both in formal exchanges, like futures, and informally like forwards<sup>9</sup>. Options on currency futures are also available on some exchanges (for instance, the Chicago Mercantile Exchange and the Singapore International Monetary Exchange). Long-term options on currencies are not actively traded, but are often attached to loans, such as dual currency loans, or bonds.

#### **2.4.1. Dual Currency Loans**

These are loans with a currency option on all or part of the principal. There are three types of dual currency loans. In the first, a loan is made in one currency, but the lender has the right to choose, at maturity, whether to accept the principal repayment in the original or in another currency at a pre-specified exchange rate. For the lender, this loan is a combination of a conventional loan and the purchase of a currency option written on the principal payment from the borrower. For the borrower, the advantage is that the interest on the loan is lower --maybe as much as one to two percentage points in return for granting the lender the right to choose. The second type is a conventional loan with the sale of a currency option by the lender: the borrower has the right to choose the repayment currency at a pre-specified exchange rate. In the third type, the borrower has the right to choose the currency at the time of the drawing of the loan, and has to repay in that currency.

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<sup>9</sup> Claessens, Stijn, (1990), *Risk Management in Developing Countries*, World Bank Technical Paper Number 235

If the lender chooses the repayment currency, the risk borne by the borrower tends to increase rather than decline: the borrower's cost may be less because of the sale of the currency option, but there is the possibility of loss if the lender exercises the option. For example, consider a USD 100 million dual currency loan that requires the borrower to repay in DEM if the currency appreciates beyond a predetermined level. Unless the borrower can reasonably expect DEM revenues that exceed the amount required to repay at maturity, the borrower is exposed to the risk added by the loan. This type of loan does not provide downside protection against DEM depreciation either.<sup>10</sup>

#### **2.4.2. Currency Warrants**

Currency options with long term maturities are called currency warrants. Unlike listed currency options, there is no guarantee by an exchange clearing house. For this reason, the warrants that have been issued to date have been obligations of only sovereign states and institutions and corporations with excellent credit standing.

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<sup>10</sup> Claessens, Stijn (1990), *Risk Management in Developing Countries*, World Bank Technical Paper Number 235

## **2.5. Exchange Traded Vs. Over-the-counter Derivatives**

Although the exchanges provided an efficient and highly liquid market, the foreign currency commitments of many corporations did not fall into the neat categories of the exchange-traded options market. Corporations therefore put pressure on their bankers to supply tailor-made (OTC) options to match their needs.

As bankers realized that the writing of options a way of enhancing income, they began to sell OTC options during the 1990s. These were flexible in terms of size, expiry date, strike price, and the currencies involved, and matched the very specific currency commitments of their clients. Bankers gained the pricing experience of options from the exchanges, and used the exchanges to offset their risks.

One might argue that apart from the flexibility of the offered instruments, some corporations may prefer to use the OTC market, since they think too much speculation goes on at the exchanges. This opinion does not have a solid basis. However, it may be true that dealing with a bank, with whom a relationship is already established, might benefit a company when personal contact and familiarity is taken into account.

Most OTC derivatives based on exchange traded options. The characteristics of and differences between exchange traded and OTC options are explained below.



### **2.5.1. Exchange Traded Options**

Trading on an options exchange can only be conducted through members who hold or rent a seat on the exchange. Therefore, both individuals and institutions wishing to buy and sell options on an exchange must open an account with a recognized broker. All major banks offer this service. Customers will have to pay commissions to brokers the size of which depend on the frequency and size of their transactions.

Once an account has been opened, orders can be transmitted over the telephone and the price at which the order has been executed will be reported back to the customer almost immediately. Deals are confirmed by telex on the next trading day. Customers are not allowed to purchase options unless they have sufficient funds in their accounts to cover the cost of the premium which will be deducted from the account on the same day as the order is carried out.<sup>11</sup>

### **2.5.2. Over-the-counter Options**

Trading in the OTC options market is conducted over the telephone between counterparties. Most major banks run options books for their customers. They may also be

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<sup>11</sup> *Managing Currency Exposure-Currency Options*, Citibank Publications-1994.

negotiated through a professional broker, who will charge both counterparties a commission for this service. The price of the deal (option premium) will be agreed over the telephone and confirmed, usually on the same day, by a telex listing all the details. A legal document will also be prepared setting out the obligations to both parties.

The option buyer must pay the premium to the writer for settlement in two business days in all currencies except the sterling, which must be settled immediately.

### **2.5.3. Differences Between OTC And Exchange Traded Options**

The principal differences between exchange-traded and OTC options can be summarized as follows:

	<b>Exchange Traded</b>	<b>Over-the-counter</b>
<b>Currencies</b>	Main traded currencies and ECU	Any currency with spot rate against US dollar
<b>Expiry Dates</b>	Fixed cycle	Any
<b>Maximum Life</b>	12 months	Potentially unlimited
<b>Contract Size</b>	Fixed	Any Amount
<b>Strike price</b>	Fixed	Any
<b>Price quotation</b>	US cents	%’s or points of a specified currency

The underlying currencies available on the exchanges are the main traded currencies and the ECU, and the counter currency is normally US dollars, but the OTC market deals in options on any currency with a spot rate against the dollar, or any cross-rate option which may be required.

Expiry dates are in a fixed cycle on the exchanges, but a client can select any business day in the case of an OTC option.

The maximum life of an exchange-traded option is limited to 12 months, but in the OTC market the life of the option is unlimited.

Similarly, although contract size is fixed in the exchanges, a bank can write an option to cover exactly the amount that the client needs. However, there will normally be a minimum amount for which banks are prepared to quote.

The client can choose any particular strike price in the OTC market, but the flexibility of strike prices is slightly illusory, as the magnitude of the strike price with respect to spot rate will be reflected in the intrinsic value element of the premium.

Price quotation, usually in US cents on the exchanges, is more complex in the OTC market where cross-rate options exist, and percentages or points of a specified currency are preferred.<sup>12</sup>

The most important feature of exchange-traded options is their standardization in terms of size, expiry dates and strike prices. Standardization allows traders to concentrate on the premium, the price of the option, as all other possible variables have already been fixed. Moreover, most options on the exchanges are closed-out, that is sold or repurchased, prior to expiry. If a trader sells an option then he knows he will always be able to buy that option if he wishes, with exactly the same strike price, contract size and expiry date. Thus, standardization helps to create liquid and efficient primary and secondary markets at the exchanges.

## **2.6. Currency Derivatives In Turkey**

In Turkey, the right to establish foreign exchange positions was given to banks in 1974. Until then, only the Central Bank of the Republic of Turkey had this privilege and banks performed their limited foreign exchange transactions through the Central Bank. The foreign currencies bought and sold were respectively credited and debited to the Central Bank accounts. As a consequence, the profit or loss resulting from these transactions accrued to the Central Bank; individuals and banks could not gain arbitrage profits, and

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<sup>12</sup> *Managing Currency Exposure-Currency Options*, Citibank Publications-1994.

could not benefit from favorable changes in the exchange rates. However, for the same reasons, they did not experience foreign exchange losses either.

Even though the rights granted in 1974 were limited, these limitations were gradually reduced. First, banks were allowed to make daily foreign exchange transactions. Later, this right was extended to currency forward transactions and swap transactions as well. While these new opportunities had a positive effect on bank profits, they also introduced new risks for the sector. Exchange rate movements posed the most obvious one. Banks with expanding foreign currency items in their balance sheets became more sensitive to exchange rate movements.

*“Official emphasis on systematic identification of and compatibility among various balance sheet items, and its consequences experienced by the sector have resulted in greater movements in items which had been dormant and regarded as insignificant until that time. The composition of bank balance sheets thus become much more diverse and this forced banks to use better judgment in asset / liability management . Treasury management became high priority, hedging techniques received greater attention, futures and options and swaps started to be employed”<sup>13</sup>*

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<sup>13</sup> Yaşar, Erhan, (October 1992), *Present Day Trends and Issues in Turkish Banking*, The Banks Association of Turkey pp.8-9

Because, treasury and portfolio managers and corporations in Turkey are still learning about derivative products, they are used in a very limited manner. When these parties become more informed about such instruments, their demand is expected to increase and derivatives will therefore become more commonly used.

Currently, most derivative contracts in Turkey are made between firms and banks or between two banks. Depending on the needs of their customers, banks provide them with contracts denominated in foreign currency / TL or in two different foreign currencies.

#### **2.6.1. Currency Forward Contracts**

The currency forward market in Turkey is not yet fully developed, however it is the most developed one when compared with others. Banks, for example, cannot find many opportunities to make forward foreign exchange purchases in the domestic market in order to hedge the risk resulting from their currency transactions. As a consequence, they carry the total risk of the forward transactions they make with their customers. The official market that began to operate in late 1995 has not been able to improve the situation sufficiently either, as the Turkish Central Bank is the only seller, and banks have certain forward transaction volume quotas imposed by the CB. In other words, the CB dominates the market. However, despite its inefficiency and shortcomings, the current forward market will form the basis for a developed market in the future.

The demand for forward contracts mostly come from multinational corporations in Turkey and from large public and private institutions. They perform these transactions through banks. They seek very competitive prices in their forward transactions and so, ask many banks for such contract offers. As, their other conventional banking operations have large volumes, many banks give unrealistic forward prices for such corporations in order to start a relationship with them or continue the existing one. As a result, these companies end up making easy arbitrage profits.

### **2.6.2. Currency Swaps**

Currency swaps have been used in Turkey in a limited manner. The Central Bank of Turkey had started to make swap transactions with commercial banks in 1985. However, at that time, the conditions to make a swap with the CB were very restricted:

1. The maturity of the swap could not exceed 6 months.
2. The exchange rate used in the swap had to be the CB's bid rate.
3. The interest rates used for the foreign currencies had to be taken from the international money markets, and the Turkish Lira (TL) interest rate was to be determined by the CB.

Despite these obligations, Turkish banks swapped currencies they borrowed abroad with Turkish Lira. For example, in 1989, the Turkish Development Bank and the Central Bank of Turkey performed a swap on 10 billion Japanese Yens for Turkish Lira with a maturity

of 10 years. Also, the first long term swap agreement between a bank and an institution was made by Ankara Municipality and the Turkish Central Bank (see Appendix-A for the details of the transaction).

Forward and swap contracts are the most frequently used hedging techniques in Turkey and the number of these contracts has been increasing in recent years.<sup>14</sup> They are mostly made by foreign banks in Turkey and by some private Turkish ones. Banks usually ask their customers for collateral (%10-20 of the contract) when they enter into such contracts. However, if the customer has a credit limit at the bank, collateral is not required. Forward contracts are more common than swaps and both are made for the purpose of speculation as well as hedging.

### **2.6.3. Currency Futures And Exchange Traded Options**

As futures and options contracts can only be traded on organized exchanges, it is hard for Turkish banks to enter into such contracts. Still, private and customer-focused banks are known to make such transactions through their foreign intermediaries, although very limited in number. The margins required for a futures contract vary from one bank to another, and a commission of USD 30 to 45 is charged per position.

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<sup>14</sup> The exact volume of these transactions can not be obtained, as some of the banks in Turkey do not report some of the transactions they enter for tax purposes.



Also, a few banks in Turkey offer OTC options on TL and some major currencies, but these constitute a very small part of the derivative market.

#### Dual Currency Loans:

Like many developing countries, Turkey has also used dual currency loans to benefit from the interest cost reduction from the sale of the option:

*“The Central Bank of Turkey frequently uses DEM/USD loans because it expects ample DEM revenues in Turkish workers' remittances from Germany. For instance, it agreed to take a USD 100 million dual-currency syndicated loan in March 1988. The loan had a three-year maturity, with a DEM option written on the USD 100 million principal. The premium from the sale of the DEM option was used to reduce the cost of funding. As a result, the loan carried a floating interest rate of 0.015 percent over LIBOR without any front-end fee. If it would have been a conventional loan, the CB would have paid about 1.25 percent over LIBOR. The Central Bank did, of course, incur the (potentially unbounded) risk of an adverse change in the DEM/USD exchange rate. It could have mitigated that risk by putting a cap on the possible DEM/USD exposure (in exchange for which it would, of course, not have received as low a spread).”<sup>15</sup>*

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<sup>15</sup> Claessens, Stijn. (1990). *Risk Management in Developing Countries*, World Bank Technical Paper Number 235

### **3. THE OTC MARKET**

The over-the-counter foreign currency derivative market is a new and dynamic market which has attracted considerable public interest all over the world, especially in the 1990s. New types of currency derivatives regularly appear in the marketplace in developed countries, offering investors and traders a continually expanding variety of special features. The number of market participants is also growing, as financial institutions and investment managers acquire the knowledge and sophistication necessary to work with these instruments.

In Turkey too, investors and corporations have started to demand such products from banks in order to hedge themselves against foreign exchange risk, and certainly will demand much more as their awareness increases and needs vary. However, at present, the market is not as developed as those in developed countries.

### 3.1. Custom-made (Structured) Derivatives

The OTC market mostly involves structured derivatives in developed countries. Building a structured derivative is conceptual manufacturing. It requires intensive research and development and uses standard components to create nonstandard finished products, but it also often relies on improvising. As business is becoming more client driven in the world today, three quarters of OTC derivatives are client requests.<sup>16</sup> Earlier, people could not understand clearly what was possible and what could be done. However, now, they are more proactive in defining problems and seeking specific solutions.

Derivatives producers in developed markets generally deal with two types of client. On one hand are speculators who have strong beliefs regarding future price movements and ask how to profit from them. On the other, are corporations with operational or financial risks that look for ways to hedge their exposures. Clients of the latter type tend to be more demanding, because they usually are not fully aware of hedging limitations. Derivatives strategists point out that their job is to reassign risk, transferring it from one counterparty to another, rather than make it disappear magically. They have a broad agreement that clients are becoming more canny and seeking solutions from a number of competing banks rather than relying on a single provider.<sup>17</sup>

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<sup>16</sup> "Global Finance: Derivatives and Society" *Global Finance (December 1995)*, Volume 9, Number 13

<sup>17</sup> "Global Finance: Derivatives and Society" *Global Finance (December 1995)*, Volume 9, Number 13

When a client asks a financial institution for a structured derivative, the procedure goes as described below:<sup>18</sup>

- “1. derivatives sales guy talks to client- gets picture of specific needs and problems in managing a risk. Client may ask several banks to bid.
2. he communicates problem to derivatives desks -currency, interest rate, equity- often all three
3. at desks, traders and analysts review existing products; discuss new permutations and their pricing / hedging aspects
4. traders and analysts propose new derivative strategy, which may involve the combination of different instruments
5. analysts model the strategy on computers, get a sense of its behavior, stress-test it in different market scenarios, develop pricing guidelines
6. they explain strategy to salesman
7. salesman reports back to client, gets client reaction
8. he relays client reaction to desks - strategy may be reworked
9. once wrinkles ironed out, strategy put in inventory; becomes part of product line, ready to be sold to other clients”

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<sup>18</sup> “Global Finance: Derivatives and Society” *Global Finance (December 1995)*, Volume 9, Number 13

### **3.1.1. Exotic Options Used In Developed Countries**

The term *exotic options* is commonly used to refer to options which are not standard. New exotics are being invented every day, and each appeals to different investors with different risk preferences. The construction of new types of options is only limited by human ingenuity and regulatory constraints. Some of these options might catch on and gain some popularity with traders, but probably most will remain as mathematical curiosities for which there is never any substantial demand. The most popular ones are presented in Appendix-B.

### **3.1.2. Applications Of Structured Derivatives In Turkey**

Certainly, the structured derivative construction process stated in the previous part has not developed that much in Turkey. The main reason behind that is the lack of sufficient knowledge of and experience with derivatives, which keeps the demand for such products low. As a result, the few existing currency OTC derivatives are not constructed in response to customer demand as in developed countries; rather, they are developed to obtain funds, increase commissions earned and make the customers aware of such instruments.

The only publicly available instruments are offered by Interbank. Others, that are developed for specific customers, are kept confidential by banks. As a consequence, no information about them is available. We will now discuss the Interbank products.

### **3.1.2.1. DKEM (Deposit indexed to the foreign exchange rate)**

As is well known, in Turkey, people invest in foreign currency because of expectations of appreciation rather than the interest gain. However, as a result of economic policies, it is quite common for major foreign currencies to depreciate in real terms against the Turkish Lira for long stretches of time, causing foreign currency deposits to yield lower returns than Turkish Lira (TL) time deposits.

This product is marketed to recover this loss to some extent by paying extra interest on the foreign currency deposit. DKEMs guarantee an interest rate lower than that of regular foreign currency time deposits on the principal, and if the exchange rate at maturity is lower than a pre-determined forward value, an extra interest higher than that of regular foreign currency time deposits is paid on the amount of this difference (i.e. the difference between the pre-determined forward value and the realized spot rate at maturity). Moreover, if the deposit is withdrawn before maturity, no interest is earned, as in time deposits.

An example:

Initial investment	: USD 1,500,000
Investment Date	: 12 / 05 / 1997
Interest Rate	: 6 % annual (net)
Maturity	: 13 / 06 / 1997 (32 days)
Forward exc. rate	: 145,000 TL/USD
Multiplier*	: 1.7109

At maturity,

a) if the exchange rate is lower than 145,000 TL/USD, for example 140,050 TL/USD,

then the effective interest rate is calculated as:

$$(145,000-140,050) / 140,050 * 1.7109 + 6\% = 12.05 \% \text{ p.a.}$$

Value at maturity = USD 1,515,846.58

$$= \text{TRL } 212,294,000,000$$

b) if the exchange rate is higher than 145,000 TL/USD, for example 145,500 TL/USD;

then, the deposit yields more than a TL time deposit as the forward rate is based on the interest rate differential of USD and TL, and the investor receives only the 6 % annual interest rate agreed upon initially.

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\* The multiplier is calculated by the bank for each contract based on the maturity and the interest rates of the currencies in the question.

Value at the maturity = USD 1,507,890.41  
= TRL 219,398,000,000

This product is available in all foreign currencies that suit the bank's strategies, and for any amount greater than USD 50,000- or its equivalent value in other currencies. Also, the buyer can determine the maturity.

The main advantages of this product are:

- the principal and a pre-specified interest gain is under guarantee.
- there is a flexibility in determining the maturity date; i.e. the investor can decide on the maturity he/she wants.
- if the exchange rate does not increase as much as the pre-determined forward value, some of the loss is prevented through a higher interest rate.

The most significant characteristic of DKEMs is that; the investor has limited opportunity to find out whether the forward exchange rate determined by the bank is a reasonable one, as it can be hard for him/her to compare the given forward value with those offered by other banks. Furthermore, the interest rate used in the calculation of the 'multiplier' is determined and kept confidential by the bank and its magnitude is crucial in determining the yield of the investment. However, DKEMs are very suitable for investors who cannot decide on which currency to invest in among Turkish Lira or major foreign currencies..



### 3.1.2.2. PSM (Parity Insured Deposit)

The main purpose of this product is to remove the loss that an investor faces when foreign parities fluctuate. In PSM, the investor invests in a foreign currency, for example USD or DEM, with a specified maturity. At maturity, if the foreign currency loses value with respect to another pre-specified currency, then the investor is paid as if he had invested in the other currency at the contract date. In other words, PSM is equivalent to investing in two foreign currencies, and being paid the one that appreciates against the other at maturity.

#### An example:

Initial investment : USD 1,000,000-

Contract Date : 1 / 1 / 1997

USD/DEM parity = 1.6500

Maturity Date : 1 / 3 / 1997

USD/DEM parity = 1.7200

At maturity, the investor gets DEM 1,720,000- instead of DEM 1,650,000, as he/she deposited either USD 1,000,000- or DEM 1,650,000- at the contract date. If at maturity USD depreciated against DEM, the investor would either receive DEM 1,650,000.- or USD worth DEM 1,650,000.- which is more than the original USD investment.

The minimum initial investment in PSM is USD 45,000- or its equivalent. The maturity is decided upon by the investor and the valid parity is the Turkish Central Bank's parity (CBTA) specified at 3:00 p.m. every day on the Reuters Screen.

The main advantage of this instrument is that the initial investment is under guarantee, although the interest gain is foregone. However, parity fluctuations can result in a higher return than the potential interest gain.

This product can be used as a hedging instrument by corporations that can face losses due to unfavorable exchange rate fluctuations in their foreign trade transactions. However, it has no leverage, as it requires a large amount of idle funds. In other words, corporations willing to use this instrument have to put aside a considerable amount of funds where sometimes their business may not permit that.

### **3.1.2.3. MLD (Market Linked Deposits)**

This is a product introduced for investors who wish to place their idle funds in foreign currency. MLD is like a call or put option (European type) on one of the four foreign stock indexes; S&P-500, DAX, FT-SE 100 and NIKKEI 225. When the investor buys a call option; if the invested index value increases at maturity compared to the contract date, he gains the amount of the increase in the index. When he buys a put option, he gains the amount of the decrease in the index at maturity.

An example :

a)When the investor buys a call option

Investment : USD 100,000- on S&P 500

Contract Date : 24 / 06 / 1997

S&P500 value = 442.80

Maturity Date : 23 / 06 / 1998

S&P500 value = 549.71

Net gain = 24.14% annually on USD

b)When the investor buys a put option

Investment : USD 100,000- on Nikkei 225

Contract Date : 24 / 06 / 1997

Nikkei 225 value = 20,766.75

Maturity Date : 23 / 06 / 1998

Nikkei 225 value = 15,265.18<sup>19\*</sup>

Net gain = 26.492% annually on USD

The main advantage of this instrument is that the principal is guaranteed and there is a chance of unlimited gain. If an unexpected (reverse) movement of the indexes occurs, the only loss is the annual interest on USD 100,000-. In other words, the interest foregone is the premium paid for the option.

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<sup>19</sup> The values of the indexes used above do not reflect the real ones.

MLD can appeal to investors who have made forecasts regarding movements in foreign stock indexes and want to benefit from speculation on them.

#### **3.1.2.4. Margin Trading**

Margin Trading is for investors who want to profit by trading between foreign currencies. It enables the customer to trade an amount 20 times his/her original investment, between foreign currencies that are used frequently in financial markets, like Japanese yen (JPY), United States dollars (USD), Deutsch mark (DEM), Swiss francs (CHF), and British pounds (STG).

The investor has the chance to square his/her position on the day he makes the transaction, or he can choose to establish either a long or a short position. An investor who establishes a position receives interest on the bought foreign currency, and pays the interest on the sold one (The interest rates are taken from the Reuters FWDS Screen). This transaction occurs every day during the time in which the position is held.

The investor can transact between 8:30 a.m. and 7:00 p.m., and the net profit-loss calculation is realized once a month. However, if the account of the investor decreases below a certain level, an extra margin must be deposited.

An Example:

Initial investment : USD 50000,-

USD/DEM Parity : 1.4720 / 1.4725

at 2:00 p.m.

The investor chooses to buy USD and sell DEM in an amount of USD 1,000,000.- The position of the investor is now (+) USD 1,000,000.- , (-) DEM 1,472,500.-

USD/DEM Parity : 1.4825 / 1.4830

at 4:30 p.m.

The investor sells USD and buys DEM. His position is now (-)USD 1,000,000.- , (+) DEM 1,482,500.-

Net profit/loss : (+)DEM 10,000.- or (+)USD 6,745.-

The main advantages of this instrument are:

- The investor can transact an amount 20 times his/her original investment.
- The investor can seek advice from the bank, if he/she has not formed expectations regarding parity movements.
- Two quotations (bid and ask) are given for the exchange rate, and the investor chooses his position by executing his/her transaction based on the given quotations. In other words, he buys the currency at the ask rate, and sells it at the bid rate.

In Margin Trading, the investor bears the risk of an adverse movement in the exchange rate. In return, there is a chance of unlimited gain.

### **3.1.2.5. Judgmental Analysis of Interbank Products**

The products described and examined above were marketed during the 1994-96 period. As foreign currency deposits constitute a large part of the total deposits in Turkey, these instruments were introduced in order to increase the amount of currency deposits at the bank, and to obtain funds.

The demand for the products was low compared to that for conventional instruments, like time deposits or treasury bills. Still, some received great attention from the public. 'Margin Trading' was the most popular one since it could potentially yield much higher returns than conventional instruments.

'DKEM' attracted some investors as well, since it is very similar to a time deposit, and therefore not difficult to understand. Moreover, its guaranteed interest rate on the principal is higher than the interest rates offered by most banks in Turkey. As for Interbank, where a long position in major foreign currencies is profitable, in other words foreign currencies appreciate in real terms against the Turkish Lira, DKEMs provided lower fund costs than ordinary time deposits (as their guaranteed interest rates are lower).

The demand for the others -'MLD' and 'PSM'- were not as much as that for 'Margin Trading' and 'DKEM'. This is either because of inadequate knowledge of options or insufficient experience with them. Besides, using these instruments requires the investor to

follow the daily economical, financial and political developments in international markets, which is very hard for an ordinary person. Also, the fact that the maturity of MLD and PSM is not flexible, could have decreased the demand for these products.

Interbank benefited from the introduction of these instruments. It became more reputable since it served customers instruments other than conventional ones. Moreover, it was able to collect more funds, fund costs decreased and commission fees earned increased as a result.

#### 4. BENEFITS AND RISKS OF CURRENCY DERIVATIVES

*“The dramatic growth of derivatives actively coupled with the recent spate of widely publicized derivatives-related losses has triggered public debate about the benefits, risks, and proper regulation of these financial instruments. Some legislators, regulators, and members of the press express concern that this now-global financial activity might pose unique and excessive risks to individual firms, specific markets, and the overall economy.”<sup>20</sup>*

A survey conducted by The Center for Study of Futures and Options Markets at Virginia Tech over one hundred studies of, and articles on derivatives concludes that this literature sought answers to the following questions:

- “1. What do the studies identify as the benefits of derivatives?
2. What do the studies identify as the risks of derivatives?

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<sup>20</sup> Horowitz, Donald L., Mackay, Robert J., (October 1995), “Derivatives-State of the Debate”, <http://cml.com/market>.



3. Do the studies recommend banning or restricting derivatives use?”<sup>21</sup>

The results can be summarized as follows:

1. The growth in derivatives activity over the past twenty years has yielded substantial benefits to public and private institutions using these financial tools and to the economy.
2. The risks of derivatives are the same types of risk that public and private institutions face in their traditional businesses. Generally, derivatives have not exposed them to new risk sources.
3. Not a single study reviewed called for banning or severely restricting the use of derivatives.

#### **4.1. Benefits Of Derivatives**

There is a great consensus, both in the private and public sectors, that derivatives have numerous and substantial benefits. First, they provide a method to hedge and manage exposures at a low cost. Second, they lead to effective asset/liability management. Third, corporations, governmental entities, and financial institutions also benefit from derivatives

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<sup>21</sup> Horowitz, Donald L., Mackay, Robert J., (October 1995). “Derivatives-State of the Debate”. <http://cml.com/market>.

through lower funding costs and more diversified funding sources. Fourth, portfolio managers and institutional investors protect their illiquid securities by using derivatives.

As a result of the benefits stated above, corporations using derivatives become competitive in the global economy. With risk exposures under control, they can focus on their core businesses, improving the quality and lowering the cost of their products.

#### **4.2. Risks Of Derivatives**

According to the survey results, the fundamental risks of derivatives are the same types of risk -credit, market, operational, and legal- that many financial institutions and firms face in their traditional businesses.

The credit risk arises as a result of the failure of the counterparty to make payments as due. In that case the loss on a derivatives contract is the cost of replacing the contract with a new counterparty. In order not to face default, the credit risk has to be well managed, i.e. the creditworthiness of the counterparties have to be evaluated, risk limits have to be set in order to avoid excessive concentrations. Moreover, exposures have to be regularly managed. There is a great concern in the public that the level of credit risk is poorly managed.

The market risk is the decline in the value of a position in a contract when market conditions change. This risk must be evaluated on the basis of its effect on the net

exposure of an overall portfolio. It should be properly identified and measured, and then effectively managed through frequent marking-to market of portfolios, setting of risk limits, and monitoring of positions against these limits.

The operational risk in derivatives comes into the scene as a result of inadequate control systems and, contingency planning, human error, or management failure. There is a great concern in the public that techniques that are necessary for effectively controlling risk have not been implemented adequately. Furthermore, there is complete consensus that this requires institutions actively engaged in derivatives activities to have well-trained and knowledgeable staff involved in senior management.

The legal risk arises when a contract cannot be enforced or the contract terms fail to achieve the intended goals of the parties. The main reason behind that risk is the novelty of derivatives transactions, which leads to ambiguity in their treatment under existing laws and regulations.

#### **4.3. Main Issues About Derivatives**

Many issues about the use of derivatives are brought up in articles appearing in various magazines and journals world-wide. Among these, the one that attracts most attention is

“loose internal control”. This issue has been discussed extensively, especially after the bankruptcy of Barings on February 27, 1995.<sup>22</sup>

The second issue has been brought up by derivatives producers or traders in United States. They state that, the prices of currency exotics have fallen dramatically in the recent years, as a result of new players in the market who wanted a share of large profits and the rapid spread of the technology used to model, price, and hedge derivatives. They also mention that some of the banks and derivative houses have withdrawn from complex currency products because of the lower bid-ask spreads, compared to the ones 2-3 years ago. As a result, currently 90% of the exotics business is performed at European and Asian markets.<sup>23</sup>

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<sup>22</sup> The world's oldest --233 years old-- merchant bank went into bankruptcy in a few days as a result of excessive trading in financial derivatives products in Singapore.

**Barings Case:** Many participants in the derivatives industry believe that the crisis was more than a managerial problem than a system or trading problem. The supervision of the bank's overseas operation was extremely loose. It was claimed right after the announcement of the collapse of Barings that, Barings' top management had no idea where and for what reason their trader Nicholas Leeson moved an amount of money exceeding their capital base. The loss of internal control was also observed in the duties of Mr. Leeson. He was responsible for both trading and settlement. He was supervising the back-office team, cheque signing, signing off the reconciliation of activities at SIMEX, and signing off bank reconciliation. These functions encouraged Mr. Leeson to take great risks without anyone controlling him. As a result, the world's biggest bank bankruptcy occurred.

<sup>23</sup> Ogden, Joan. "Free Falling Derivatives Prices" *Global Finance (July 1996)*, Volume 10, Number 7

Yet another problem is related to the bookkeeping of derivatives. The accounting standards for derivatives related to hedging purposes were first established in United States, and they form the basis for the determination of the international standards. However, these standards cannot keep up with the rapid innovations in the derivatives industry.

Another concern with derivatives is their effects on the stability of financial system. Varnholt<sup>24</sup> criticizes and compares six important reports<sup>25</sup> that address this concern. They recommend policy guidelines regarding the use of derivatives. However, according to Varnholt, there are some relevant issues that they do not discuss. These are:

- “How much financial risk can a society bear?”,
- “How does the use of derivatives affect the behavior of its users? Are there behavioral risks?”,

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<sup>24</sup> Varnholt, Burkhard, (1996), “Six Recent Reports on Financial Derivatives: A Critical Appraisal”, <http://finance.watch/genevaPapers/paper.htm>.

<sup>25</sup> The six reports are:

1. “Recent Developments in International Interbank Relations, BIS, Basle (1992)
2. “Derivatives: Report of an Internal Working Group” , Bank Of England (1993)
3. “Derivatives: Practices and Principles, G-30, Washington (1993)
4. “OTC Derivative Markets And Their Regulation”, CFTC, Washington (1993)
5. “Financial Derivatives: Actions Needed To Protect The Financial System”, General Accounting Office, Washington (1994)
6. “Risk Management Guidelines For Derivatives”, BIS, Basle (1994)

- “Have derivative markets reallocated credit risks by crowding out bad risks from derivative markets to other financial markets?”,
- “What are the settlement risks involved in derivative markets and how can they be managed?”, and
- “What are the interactions between debt, derivatives and equity markets?”

Although the questions above have been extensively pondered upon, definite answers have not been presented yet.

#### **4.4. What Should Be Done About Derivatives?**

Despite being heavily criticized, as stated above, derivatives are very convenient tools for risk management since they help change the risk characteristics of portfolios, and achieve a specific objective cheaply and conveniently. They are dangerous only when they are not used properly. In other words, the danger comes from how one uses them. Therefore, the arguments that call for banning derivatives are not legitimate. Moreover, they have become so enmeshed in modern life that it is very hard to remove them.

Still, the risks of derivatives must be minimized through appropriate regulatory measures. However, regulators must be careful not to unduly limit their use. They should follow a conscious and disciplined approach based on sound principles and practices.

#### **4.5. The Future Of The OTC Market In Developed Economies**

Based on the observations above, we can make predictions about the future of this market:

First, senior management and boards of directors at corporations will notice that they are responsible for overseeing their firms' derivatives activities. They will be well-equipped in derivatives knowledge, at least as much as their employees who deal with these activities, so that, they can easily control their overall risk exposure.

Secondly, many corporations are still reluctant to use currency derivatives, as they feel that derivatives are expensive as a means of hedging. Still, rather than reducing the prices of OTC derivatives significantly in order to increase corporate demand, taxation schemes will be adjusted to foster the use of derivatives.

Third, exchange traded options are at present limited to the major world currencies and the ECU and some exchanges only trade options in two or three currencies. We forecast that new OTC currency options on minor currencies are going to be steadily introduced.

Fourth, the existence of the OTC and exchange traded options markets side by side might seem strange at first sight, and some people may question the need for this dual structure. However, OTC derivatives have an important role to play in the financial system. In fact, far from a battle between competing options products, OTC and exchange traded options

compliment each other and will probably continue to do so. The flexibility of the OTC market and its attractions to the corporate sector are enhanced by the liquidity of the exchanges where OTC-generated risk can be easily offset. So, we predict that some corporations will continue to demand tailor-made options, whereas those with complex trading strategies will require the standardization and two-way markets of the exchanges. However, there is a danger that OTC options may become exchange traded look alikes and the two products may actually begin to compete, because of the standardization in the OTC market.

Currency options have been criticized for siphoning off interest in the more traditional form of hedge, the forward exchange contract. The fact remains that a currency option is a more subtle instrument than a forward exchange contract as it provides greater flexibility in both hedging and trading, and in the case of a contingent currency commitment, it provides the answer to the problem. Consequently, options have contributed new techniques to today's foreign exchange markets, and it seems possible that currency options will become the dominant form of managing exchange rate risk.



## **5. THE SITUATION IN TURKEY**

Turkey is far behind developed countries in the use of not only currency derivatives but also commodity, interest rate or equity derivatives. However, when we consider the background of the Turkish financial system , we see that this is a natural consequence of the fact that freedom in foreign currency transactions was granted much later in Turkey than in developed countries. Even the shift to a floating exchange rate system occurred 10 years later in Turkey than in developed countries.

Nevertheless, it is certain that, the Turkish financial system is not far from having sophisticated currency and other derivatives markets. However, certain conditions must be fulfilled for the development of these markets and their acceptance by the investors. Some of these conditions are micro requirements like technical infrastructure, and some are macro ones related to the general structure of the Turkish economy. On the other hand, as a result of fast technological development and integration to world financial markets, the Turkish banking sector is ready to offer new financial risk management techniques and

tools that are widely used elsewhere. In fact, banks have developed some products. However, these are not marketed aggressively. Therefore, their use remains limited

The main problems that slow down the development of currency derivatives in Turkey are:

### 1. Instability of the Turkish Economy

The Turkish economy is too volatile, and even insignificant economic and political events affect interest rates and currency prices easily. As a result, currency derivatives are offered mostly for short periods, since the banks do not want to take the risk involved with long-term contracts. An efficient derivatives market can actually help reduce this unexplained volatility, but the volatility makes the existence of such a market impossible.

### 2. Non-Existence of an Exchange Traded Market

One of the main problems in the use of derivatives is the lack of awareness and knowledge of the public. In the United States, commodity derivatives first developed almost 150 years ago, and then currency derivatives started in the 1970s. Consequently, their adoption by the public was quite easy: people were already familiar with such instruments; only the underlying commodity had changed, all other characteristics were quite similar. However, in Turkey, the use of derivatives started with currencies; the public had no prior experience with such instruments before. This obviously had an adverse effect on the growth of the market. Moreover, in the US, the institutions that deal with OTC instruments are a few big market-maker banks. They can buy risks in bulk and then divide and hedge them. This opportunity does not exist in Turkey. Still, we are hopeful that the

recent developments regarding the establishment of cotton futures market in İzmir, the İstanbul Stock Exchange (ISE) Index futures, and the announcement in the Turkish Official Gazette on Oct. 16, 1996 regarding the operation and the regulation of the İstanbul Gold Exchange futures will form the basis for an effective currency derivative market.

### 3. Bookkeeping Problems

The other main problem in the use of currency derivatives is related to the bookkeeping of these instruments. For derivatives to be widely accepted and used, accounting standards that indicate how to show the profit or loss and how to tax the income resulting from these transactions should be established. Moreover, these standards have to keep up with the developments in the market; in other words, they have to be quickly adjusted to meet new needs. This requires adequate knowledge of derivatives by the regulators.

There are some proposals for a “Simple Standardized Accounting Plan” (Tek Düzen Hesap Planı) for that purpose. Some were published by the Bank Association of Turkey between the years 1994-1996.<sup>26</sup> In addition to these, some others were made for private banks.

### 4. Transparency and Legal Infrastructure

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<sup>26</sup> Önce, Saime, (1995). *Türev Ürünlerin Muhasebe Sorunları ve Bankalar için Muhasebeleştirme Şekilleri*, Türkiye Bankalar Birliği, Yayın No: 192.

Gündüz, Lokman, Tatal, Mehmet, (1995). *Türev Ürünlerin Muhasebeleştirilmesi: Türkiye Uygulaması Üzerine Bir Öneri*, Türkiye Bankalar Birliği, Yayın No: 193.

In Turkey, it is necessary to form the legal infrastructure of OTC derivatives and take steps to provide transparency of current OTC derivatives markets. Here, coordination with market participants is important, because they understand the problems of the market, since they are in it themselves, and therefore act quickly and effectively to protect the market against undesirable results. This will induce public trust in the market in its early growth stage and so, will improve the reputation of the participants as well.

## 6. CONCLUSION

As previously stated, today, the most important factors preventing the growth of derivatives markets and hedging techniques in Turkey are, lack of knowledge and experience, as well as insufficient accounting, and unstable financial markets. It is expected that these markets and new hedging techniques are going to develop along with the improvements in the performance of the Turkish economy and financial sector.

In our view, the presence of OTC currency products has important positive effects on the learning process about derivatives. As OTC instruments become more commonly used, the knowledge level of both investors and portfolio managers will go up. However, one should not forget that most such products are kept confidential by the banks, limiting the number of people that are aware of derivative instruments and markets.

Moreover, most banks have accounting problems with these instruments, preventing their further participation in derivatives contracts. So, an effective accounting method for these instruments must be developed in order to increase their supply. This accounting system

should provide banks with incentives to report their transactions honestly. Besides, banks must form their internal systems to control and manage the risks arising from their derivative exposures.

Shortly, if an effective accounting system for derivative instruments can be set up as early as possible, the number of OTC products offered will increase, which will help the development of such markets in Turkey.

We can summarize policy recommendations for the development of not only currency but also other derivative markets in Turkey as follows:

- Total stabilization of the Turkish economy is necessary, since the unexplained volatility of foreign exchange rates impedes the use of derivatives.
- Proper control of intermediary institutions is needed. Therefore, an effective derivatives activities control system must be developed. This will induce trust in the derivative markets that are at the establishment stage. The abnormal growth of banks and non-bank intermediaries or sudden abolishment of these institutions create a distrust in these markets among the public.
- An efficient underlying spot market is required for the establishment of a derivative one. Therefore, manipulation, which reduces confidence in the market, must be prevented in spot markets.

- All regulations regarding derivative markets must be set up in such a manner that no inconsistency occurs among them. Frequent changes in these regulations will certainly hinder the development of the markets by creating distrust in them.
- The technological infrastructure that provides efficiency in these markets should be established.
- The development of the institutional investors that these markets need must be supported by providing the right incentives. The education and knowledge level of the market participants must be increased as well through training programs, workshops, etc.
- A standardized accounting and report system must be developed. In relation to that, new codes and accounts that reflect to the investors the contract price, net profit or loss position, etc. should be added to the ‘Tek Düzen Hesap Planı’.

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**APPENDIX A :**  
**SWAP OPERATIONS OF ANKARA MUNICIPALITY**

### **Swap Operations of Ankara Municipality:**

In May 1991, Ankara Municipality issued a 8,5 billion Japanese Yen-5 year bond in the Tokyo Capital Market with an annual interest rate of 8.4%. It decided to hedge its bond commitment against interest and foreign exchange rates. For that purpose, it exchanged JPY 3,5 billion of its bond commitment with USD 27,6 million. In that operation, Ziraat Bank undertook the payment of JPY 3,5 billion with an interest rate 8.4% p.a., and Ankara Municipality undertook the payment of USD 27,6 million with a floating interest rate of 6 month LIBOR+2.1%. Moreover, in order to minimize the Municipality's interest rate risk, a cap of USD LIBOR=8.5% was put on 6 month.

Ankara Municipality performed its second swap operation with Mitsui Taiyo Kobe Bank. The Municipality exchanged JPY 4,1 billion with USD 30 million. Mitsui Bank undertook the payment of JPY 4,1 billion with an interest rate of 8.4%, and the Municipality undertook the payment of USD 30 million with a 6 month interest rate of LIBOR+1.4%. Again a cap of USD LIBOR=8,5% was put on 6 month to minimize the risks.

Ankara Municipality decreased its credit cost by these swap operations: At the time it made the swap agreements, LIBOR was 6.20% and the total cost was 7.6% (6.20+1.4). In 1993, LIBOR was 3.25%, and the total cost was reduced to 4.65% (3.25+1.4). A profit of 2.95% was observed in the Ankara Municipality accounts.

**APPENDIX B :**  
**TYPES OF EXOTIC OPTIONS**

## **Types Of Exotic Options<sup>27</sup>**

### **1. Compound Options:**

A compound option differs from a standard option because the underlying asset of a compound option is a standard option. In other words, a compound option is an option imbedded within another option.

Compound options come in four basic forms: Call on a call, call on a put, put on a call and put on a put. The four forms provide potential users with considerable flexibility. Moreover, they provide the user with tremendous leverage. A standard option gives the buyer exposure to a currency's value for a fraction of the cost of the underlying currency. A compound option gives the buyer exposure to a standard option's value for a fraction of the cost of the underlying option. It therefore follows that compound options provide a great deal of leverage with respect to the value of the underlying currency.

Therefore, having comparatively small premiums may appeal to those who wish to hedge or acquire currency exposure, but have limited funds to spend on such activities.

Besides that, since they provide the buyer with the right to acquire a hedge, they are often an effective tool for customers who are uncertain if a hedge will actually be needed.

### **2. Best of Options:**

A best-of option's final payoff is determined by the greater return of two or more assets.

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<sup>27</sup> BNP Publications.

The option can be purchased for less than the amount necessary to buy an option on each of the underlying currencies. This is because the option's payoff ultimately will be determined by only one of the underlying currencies; the payoff is not determined by the returns of all the currencies in total. Also, best-of options on negatively correlated assets are more expensive than their positively-correlated counterparts.

The instrument can appeal to those who feel that a group of currencies --or at least one of the currencies-- will rally, the best-of option is one way in which one can benefit if this happens without having to buy an option on each of the currencies.

### 3. Threshold Options:

Threshold options provide a payoff only if the final underlying asset price is beyond a predetermined level (the threshold). If the final underlying asset price finishes beyond the threshold, the payoff is calculated in the same manner as that of a standard option.

The threshold options are less expensive than similar standard options (i.e. same strike and maturity) because of their lower probability of providing a payoff. Using the same reasoning, threshold options are also less expensive than knock-in options because knock-in options become standard options if their barrier is hit at any time during the life of the option. Threshold options, however, only deliver a standard payoff if the final underlying currency price surpasses the threshold.



If one has very specific expectations regarding a currency, two thresholds can also be set. In order for such an option to provide a payoff, the underlying currency must settle in-between the two thresholds.

The main reason for using this exotic is the belief that a currency will move significantly in the future. Provided the underlying currency reaches the threshold, the buyer will receive a payoff equal to that of a standard option while the premium expended is less. Besides threshold options can provide an effective, comparatively less-expensive hedge for those who only wish to protect their position against a large move.

#### 4. Knock-out Options:

A knock-out option is a type of barrier option. Barriers are options in which the payoff is dependent upon whether or not the underlying asset touches a designated level (the barrier) during the life of the option. The knock-out option's payoff is calculated in a similar manner to that of a standard option except that the option will cease to exist ("knock out") if the underlying asset touches the barrier.

The main characteristic of this exotic is the option's price is significantly less than that of a similar standard option (i.e. same strike and maturity). Besides, there is also "double knock-outs" that has two barriers. Moreover, the barrier and the strike can be set at different levels. This feature provides for significant flexibility when creating the desired risk profile.

The main reason for using this exotic is the desire to receive a payoff similar to that of the standard option, but at a significantly lower cost. This lower cost is due to the fact that the option stands a risk of becoming “knocked-out” if the underlying currency touches the barrier.

#### 5. Knock-in Options:

It is a type of barrier option in which the payoff is dependent upon whether or not the underlying asset touches a designated level (the barrier) during the life of the option. A knock-in option will only come to life (“knock-in”) if the underlying asset touches the barrier. If the option is “knocked-in,” the payoff will then be calculated in the same manner as that of a standard option.

The main characteristic of this option is the option’s price being less than that of a similar standard option (i.e. same strike and maturity). This is due to the fact that the option first must trade at the barrier before it can provide any payoff. Besides that, like knock-out options, there is also “double knock-in” that has two barriers. The barrier and the strike can be set at different levels, enabling a user to inherit an ITM or ATM option position if the barrier is reached.

The reason for using such an option is that it allows one to use his/her market insights to establish a position which can have a payoff similar to that of a standard option, but at a reduced cost.

## 6. Quanto Options:

A quanto is typically defined as an option on an asset in which the payoff is denominated in another currency.

In quanto options, the exchange rate at which the payoff of the option is converted to the preferred currency may or may not be established at the time of the transaction. That is to say, the conversion rate can be designated at the time of the transaction, or the conversion rate can be allowed to float with the spot rate. Moreover, if the conversion rate is fixed at the time of the transaction, the level at which it is fixed will affect the value of the quanto. If the conversion rate is fixed at the time of the transaction, the correlation between the cross rate and the preferred currency becomes an integral part of pricing the quanto. If the conversion rate is allowed to float, the correlation will not matter. As well as these, if the conversion rate is fixed at the time of the transaction, both the volatility of the cross rate and the preferred currency will play a role in the pricing of the quanto. If the conversion rate is allowed to float, the volatility of the preferred currency will not matter.

The quanto option is a suitable choice, if one has certain expectations regarding a particular cross rate, but prefers that the payoff be in his/her own currency. They are also useful when one purchases options on any foreign asset, but prefers the payoff to be denominated in another currency.

### 7. Basket Options:

A basket option's payoff depends on the value of a group of underlying assets, as opposed to only one underlying asset.

It is less expensive than the combined cost of buying options of each currency in the basket. The correlations between the individual currencies that comprise a basket will affect the volatility of the basket and, consequently, the value of the basket option.

If one has exposure in many currencies and the objective is to hedge the net risk of all the currencies against one dominant currency, the basket option is well suited for this task. These kind of options are useful if one has an opinion regarding how a currency will perform against other currencies in general, as opposed to how the currency will perform against each individual currency.

### 8. Digital (Binary) Options:

A digital option rewards the buyer with a fixed payoff if the underlying asset is at any level above the option's strike price in the case of a call, or below the strike price in the case of a put.

The payoff of a digital option is not dependent upon how much the option expires "in the money." The option could expire 5 or 50 pips in the money and the resulting payoff will be the same. Writing digital options does not expose the seller to the unlimited risk of a standard option position because the payoff is fixed. The payoff can be contingent upon

the underlying currency settling beyond the strike at expiry, or it can be contingent upon the underlying currency touching the strike at any time prior to expiry.

By the help of digital options, one can benefit from expectations or cover concerns about the range in which a currency will trade. One may purchase a digital option when a range is expected to be broken, or sell one if a range is expected to be maintained.

### 9. Average Rate (Asian) Options

An Asian option derives its payoff from the average underlying asset price over the history of the option. To clarify, if an option is a fixed-strike Asian call, the payoff will be calculated by multiplying a chosen notional amount by whichever is greater: a) the average underlying asset price over the history of the call minus the fixed strike, or b) zero.

The main benefit of this option is that the cost is less than the similar standard option (i.e., same strike and maturity) due to the fact that a currency's average value is less volatile than its terminal value. The average value calculation can be customized by using only specific days, weeks, months or years that reflect the user's currency exposure. Besides that, the average exchange rate can also be a weighted calculation. If the user knows that 30% of a currency exposure will be incurred during a particular period, this period could be given a 30% weighting when determining the average exchange rate.

Also, the average exchange rate could also be used to determine the strike price of an Asian option. This type of Asian option is commonly referred to as a "variable-strike

Asian option.” The payoff for such a call option is calculated by multiplying a chosen notional amount by whichever is greater: A) the final asset price minus the average underlying asset price, or B) zero.

Asian options are ideal for those seeking to hedge steady or predictable currency flows over time. The payoff reflects the fact that the user’s risk is a function of the foreign exchange rate on multiple dates as opposed to only one date.

#### 10. Range Options:

A range option’s payoff is calculated by multiplying a fixed amount by the number of days during the life of the option in which the underlying asset remains between two specified levels.

In range options maturity and range width can be customized according to meet the user’s needs. The range can be set at any level; it does not need to be set so as the current spot price is at the center of the range at the onset of the transaction. The contract specifications can be altered slightly so that the payoff function will not include any days after which the underlying currency has left the range, regardless of whether it returns to the range.

The range option buyer’s potential loss is limited to the premium paid for the option. This provides an interesting contrast to the unlimited liability associated with writing standard straddles or strangles.

Range options are useful for one whose currency exposure is defined by whether or not a currency remains within a certain range. Occasionally, one might forecast that a currency will remain in a range for a period of time, but once the currency breaks out of the range, it could move dramatically. Range options are well suited for such a situation. The option gives the holder a chance to profit even if the holder's timing is slightly inaccurate. Provided that the underlying currency remains in the range for most of the forecasted period, the holder can still profit even if the currency breaks out of the range and moves dramatically.

#### 11. Contingent-Premium Options:

A contingent-premium option's payoff is calculated in the same manner as that of a standard option. However, the buyer does not pay the premium of the option at the time of the transaction, but rather will pay the premium provided the underlying asset reaches a specified level (the trigger).

The main characteristic is that, it requires no cash flow at inception. The option offers flexibility with respect to where the trigger level is set. Multiple triggers (steps) can be incorporated. This causes differing amounts of premium to be paid, depending upon which trigger levels are reached. The contingent-premium payment, if triggered, may be significantly greater than the price of a standard option at inception. Also, the premium payment can be contingent upon the exchange rate exceeding the trigger at expiry, or at any time during the life of the option.

Contingent-premium options are useful when one desires his/her hedging activities to have different cash flows, given various currency levels. This kind of option can be desirable when one feels that a currency will move sharply if it hits a certain level , but will remain roughly unchanged if the level is not reached. In this case, the cash flows for the premium can be structured to coincide with the cash flows of the payoff.

#### 12. Chooser Options:

This option allows the buyer to designate at a future point in time whether he/she wishes the option to be a call or a put. The contract specifications for the call and the put are designated at the onset of the transaction. Once the type of option is decided, the payoff is calculated in the same manner as that of a standard option.

The chooser of this option makes it less expensive than purchasing a standard straddle.

This is because the chooser option will eventually become one standard option while the two-way coverage a straddle provides lasts until expiry. Contract specifications can be further customized to allow for different strikes and/or time to expiry for the call versus the put . This structure called a “complex chooser ,” enables a user to create an option that clearly meets his/her objectives.

The user of such kind of an option might expect that an upcoming event will cause the market to move significantly in one direction or the other. The chooser option can allow



the holder to wait until the event's results are known before deciding whether he/she would prefer a call or put.

### 13. Forward-Start Options:

A forward-start option is unique in that it does not begin until a designated future point in time. Otherwise, it is very similar to a standard option in that its payoff is calculated in the same manner as that of a standard option and its premium is paid for at the time of the transaction.

Regardless of when the option comes into existence, its initial strike can be defined in terms of the underlying currency at that point in time (e.g. 5 % OTM call begins in three months and expires in six months). The value of a forward-start option is virtually insulated from movements in the market which occur prior to its start date.

This instrument can be useful for those who have an opinion concerning the potential movement of a currency from one future point in time to another, but they are uncertain what the currency may do between now and the beginning of the time frame for which they have formed this expectation. The user can define the forward-start option's strike in terms of the underlying currency level at the forward-start date. This feature enables the user to have, for example, an ATM option at a designated future point in time. This option can be a useful tool for benefiting from potentially market-moving events such as elections or economic numbers. Moreover, they enable one to lock in today the price of an option which is based upon a future time period versus waiting for the future time period to

arrive before initiating a position. If one chooses to wait, the price of the option may change as market conditions dictate.

#### 14. Lookback Options:

A lookback option allows the buyer, at a future in time, to literally “look back” over the life of the option and utilize the most favorable exchange rate achieved when calculating the option’s payoff. In other words, the payoff of a fixed-strike lookback call is calculated by multiplying a chosen notional amount whichever is greater: A) the highest recorded underlying asset price achieved over the life of the option minus the strike, or B) zero. The payoff of a fixed-strike lookback put is calculated by multiplying a chosen notional amount by whichever is greater: A) the strike minus the lowest recorded underlying asset price achieved over the life of the option, or B) zero.

Despite they have premiums twice the level of similar standard options, the terms of the contract can be customized, so that the underlying currency level is only acknowledged at points in time which are desired by the user (e.g. continuous, daily, monthly, etc.)

The lookback option comes in two general forms: A) fixed strike, and B) variable strike. The payoff of the fixed-strike form is already defined above. The payoff of a variable-strike call is calculated by multiplying a chosen notional amount by the difference between the final underlying asset price and the lowest underlying asset price achieved over the life of the option. The payoff of the variable-strike put is calculated by multiplying a chosen

notional amount by the difference between the highest underlying asset price achieved over the life of the option and the final underlying asset price.

If one thinks that a currency will move in certain direction but is concerned that it may retrace violently before he/she has the chance to liquidate his/her position, purchasing a lookback option can effectively address this concern.

These options can be particularly effective if one wants to establish a position in a thinly-traded currency or is concerned that a currency may become illiquid during market extremes. Since the option's payoff recognizes the level of the underlying currency throughout the life of the option, it is not necessary to actually liquidate the position when the currency trades at its most extreme level in order to benefit from that event. Provided the extreme level was recorded for purposes of calculating the option's payoff, the buyer will benefit from the underlying currency having achieved such a level, even if the event was for only a brief period of time.

#### 15. Pay-as-you-go Options:

The premium of a pay-as-you-go (PAYGO) option is paid in periodic installments. Both the payment dates and the periodic installments are designated at the time of the transaction. The buyer of the option has the right to stop paying the installments. However, the option ceases to exist if the installments are not paid. If the option is held until expiry, the payoff is calculated in the same manner that of a standard option.

In Paygo options, if all the installments are paid, the option will cost more than a standard option with similar specifications (i.e. same strike and maturity). Installments dates can be set to occur just after potentially market-moving events. One can further customize the option to allow the buyer to exercise the option early and avoid making the remaining installments. Options that allow for this additional feature are commonly referred to as “extendible-maturity options”.

This kind of option is useful in a turbulent market. It gives the buyer a chance to change his/her mind and cut his/her losses at each payment date. It is also useful when one feels that the results of an upcoming event will cause a currency to react in one fashion given one result and another fashion given another result. Elections are a typical example. Shortly, a PAYGO option gives the buyer the ability to play his/her view on the outcome and be able to limit losses to the installments already paid, in the event that his/her expectations turned out to be incorrect.

#### 16. Shout Options:

A shout option allows the buyer to change (“shout”) the type(call vs. put) of an option at any time during the life of the option. For example, one can “shout” the option from a call to a put at any point before expiry. The payoff in such a case is then calculated as follows:

Let  $A = \text{whichever is greater: 1) the underlying asset price at the time of the “shout”}$   
 $\text{minus the strike, or 2) zero.}$

$B = \text{whichever is greater: 1) the underlying asset price at the time of the "shout"}$   
 $\text{minus the final underlying asset price, or 2) zero.}$

Then, the Payoff = (Notional)\*(A+B)

The length of the "shout" period can be customized in order to reflect the user's objectives. Therefore, the user only pays for the amount of "shout" period desired. Also, the contract specifications can be altered to allow the holder of the option to receive an option of the same type when he/she "shouts" as opposed to an option of the opposite type, in effect resetting the strike price at the time of the "shout." In such a case, the definition of "B" written above would become, "whichever is greater: 1) the final underlying asset price minus the underlying asset price at the time of the 'shout', or 2) zero."

Shout options are appropriate for those who feel that market conditions may become chaotic if a currency becomes overextended, thereby making it expensive to negotiate the liquidation of a contract and the initiation of another contract. These can be useful instruments for those who wish to express a view on the direction of a currency, but wish to hedge somewhat against an incorrect forecast. In the event of an incorrect forecast, the shout option will keep its value better than a standard option.

### 17. Ladder Options:

A ladder option enables the buyer to lock in value as the underlying asset crosses predetermined levels (rungs). For a given strike and ladder rungs, the ladder call's final

payoff is calculated by multiplying a chosen notional amount by whichever is greater: A) the final underlying asset price minus the strike price, B) the highest ladder rung crossed by the underlying asset over the history of the call minus the strike price, or C) zero. The ladder put's final payoff is calculated by multiplying a chosen notional amount by whichever is greater: A) the strike price minus the final underlying asset price, B) the strike price minus the lowest ladder rung crossed by the underlying asset over the history of the put, or C) zero.

Although the option is more expensive than a similar standard option (i.e. the same strike and maturity), the levels at which the rungs are set can be customized to fit the user's needs. They are also much like lookback options with the exception that the ladder option's payoff recognizes the underlying currency's ability to achieve discrete levels, whereas the lookback option recognizes the underlying currency continuously.

This option can be a useful instrument if one forecasts that a currency will be volatile with a propensity to violently retrace its movements. Besides, if one is of the opinion that a currency will remain in a tight range, the writing of ladder options can be one way in which to play this view. If the forecast is correct, the rewards can be significant since these options have high premiums. However, one must recognize that short ladder options which are unprotected have unlimited risk.

### 18. Cliquet Options:

A cliquet option is merely a series of forward-start options. The buyer of a cliquet receives the sum of the payoffs of all the individual forward-start options that comprise the cliquet. In other words, the buyer will receive the combined payoff of a series of options which begin at a future point in time and end at a point in time thereafter.

The main characteristic of the instrument is that a cliquet protects one from a sharp market reversal because the strike of each forward-start option that comprises the cliquet is set in terms of the spot (e.g. at the money, 5% out of the money, etc.) at the time of the option's life begins. Therefore, if a currency moves adversely over a short period of time, only the forward-start options that are alive will be impacted by this event. The payoffs of the forward-start options that have already expired and the ones that have yet to begin will not be significantly affected.

This exotic is ideal for someone who believes that a currency will generally move in one direction, but is concerned that it may retrace violently before his/her position liquidated. The cliquet's value is somewhat insulated from sharp reversals because the option's payoff is based upon a series of forward-start options, the majority of which may not be impacted by a sharp reversal. As well as that cliquets allow one to lock in today's prices for options based upon future time periods. If one waits until the future time periods arrive, he/she will be subject to prices which may no longer be desirable.