THE USE OF DERIVATIVES IN BANKING SECTOR

AND

THEIR APPLICATIONS IN TURKEY

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ABSTRACT

THE USE OF DERIVATIVES IN BANKING SECTOR
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As a result of increased volatility in freely floating exchange period, corporations and individuals were faced with serious currency risks after the 1970s. In order to manage these risks new financial instruments named "derivatives" have been widely used. They are currently used in a limited manner in Turkey. The main purpose of this thesis is to present the applications of derivative products that are recently used among the commercial banks in Turkey especially for retail and corporate customers. Primarily structured derivatives are examined and among these structured products, Dual Currency Derivatives (DCDs) are investigated in further details to present their relation with some of the major key market variables. Also throughout the thesis, the reasons for lagging behind in the use of derivative instruments will be presented. Finally, policy recommendations will be made in order to the increase the usage rate of the mentioned derivative products, which are becoming an alternative for the existing investment tools and to facilitate the development of efficient derivatives markets.

Keywords: *dual currency deposits, currency derivatives, over-the-counter (OTC), exchange rate risk, range accrual, wedding cake, double no touch, dual currency loans, exotic options*

ÖZET

TÜREV ÜRÜNLERİN BANKACILIK SEKTÖRÜNDEKİ YERİ VE TÜRKİYE'DEKİ UYGULAMALARI

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1970 sonrasında, değişken kur sistemindeki artan volatiliteden dolayı, kurumlar ve bireyler döviz riskiyle karşılaştılar. Bu riski yönetmek amacıyla dünyada yeni finansal enstrümanlar -türev ürünler- kullanılmaya başlanırken, bu enstrümanların Türkiye'deki uygulamaları kısıtlı kaldı. Bu tezin ana amacı, Türkiye'deki ticari bankalar tarafından özellikle kurumsal ve perakende müşteriler nezdinde yeni uygulamaya sunulan türev ürünlerinin değerlendirilmesidir. Çalışmalarımız sırasında öncelikle yapılandırılmış türev ürünler üzerinde durulmuş, söz konusu ürünler arasında tam teminatlı opsiyonlar temel piyasa değişkenleri ile olan ilişkilerinin gösterilmesi amacıyla değerlendirilmiş, sonuç olarak tam teminatlı opsiyonların gelişiminin tahmin edilebilmesi amacıyla analitik bir model geliştirilmeye çalışılmıştır. Tez boyunca, bahse konu türev enstrümanlarının kullanımında geri kalınmış olunmasının sebepleri ortaya konulacaktır. Son olarak da, mevcut yatırım araçlarına alternatif teşkil eden söz konusu türev ürünlerinin kullanım sıklığının artırılması ve sonuç olarak etkin bir türev piyasasının gelişimi için politikalar önerilecektir.

Anahtar Kelimeler: tam teminatlı opsiyon, döviz türevleri, tezgah üstü, kur riski, tünel mevduat, riskli tünel mevduat, kademeli tam teminatlı opsiyon, çift döviz bacaklı borç, egzotik opsiyonlar

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CHAPTER 1
INTRODUCTION

There is a general consensus that the increased volatility in foreign exchange rates following the breakdown of the Bretton Woods system of fixed exchange rates in the early 1970 and the subsequent oil crisis, have led to a riskier financial environment today.

During the Bretton Woods era, those who dealt with foreign currency knew in advance the exact value of 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 rate among major currencies was now freely floating.

The bilateral exchange rates were determined in the spot foreign exchange market.[1] Each day, a currency price in terms of another one could stay the same, increase, or decrease.

[1] 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.

Unpredictable movements in exchange rates could affect a firm's ability to transact internationally, and as a consequence, its overall performance and financial reports are also affected.

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 few hours.[2] 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 risk. As a result, the currency derivative market, especially the over-the-counter market grew rapidly in the early 1990s.

The rapid development and widespread usage of these instruments attracted a lot of academicians, and many studies were conducted on the various aspects of these new financial instruments.

[2] *Managing Currency Exposure,* Citibank Publications (2001)

Most of these are beyond the scope of this thesis. For the curious reader, Horowitz and Mackay[3] and Gibson and Zimmerman[4] provide excellent surveys.

Academicians have examined the derivatives in Turkey as well. Most studies about these instruments provide examples of their applications in developed countries and recommend policies to be implemented in Turkey. Most were published after the April 1994 economy crisis, as a result of the high and rapid appreciation of foreign currencies versus Turkish Lira. 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. [5]

[3] Horowitz, Donald L., Mackay, Robert J., (October 1995), "Derivatives-State of the Debate"

[4] Gibson, Rayna, Zimmennann, Heinz, (December 1994), "The Benefits and Risks of Derivative Instruments"

[5] Önce, Saime, (1995), *Türev Ürünlerin Muhasebe Sorunları ve Bankalar için Muhasebeleştirme Şekilleri,* Türkiye Bankalar Birliği. Yayın No: 192
Gündüz, Lokman, Tutal, 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 newly formed over-the-counter instruments used in Turkey. This study at first sight is going to provide an insight to the reader about the current status of the currency, over-the-counter derivatives and their applications in Turkey.

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.

The thesis is organized as follows:

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

In Chapter 3, over-the-counter (OTC) currency derivative products and structured derivative instruments used in developed countries and their applications in Turkey are examined. Specifically, the newly developed derivative products for corporate and retail customers are analyzed. Among

these products, dual currency deposits is examined in details following with a dedicated analytical study.

In Chapter 4, recent discussions about the benefits, risks and problems of currency derivatives in the world are explained. Moreover, the future of OTC derivatives is further investigated.

In Chapter 5, the present situation in Turkey is analyzed.

Finally, in Chapter 6, policy recommendations for the development of well functioning derivative markets in Turkey is presented.

Subsequently, the derivative products, which are used for corporate and retail purposes as an alternative for the conventional investment tools, will be examined in details. Also the problems related to these tools will be discussed. Finally, recommendations for the development of efficient currency derivative markets will be discussed.

CHAPTER 2
CURRENCY DERIVATIVES

There is a wide range of instruments that an investor can use to hedge currency risk 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, form basis for other currency derivatives transactions executed today, and include buying one currency for another at a rate agreed upon today, with a settlement at an agreed time 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 eliminates the uncertainty regarding the future foreign currency payments. Thus, it also allows the firm to budget accurately.

At the maturity of a forward contract, if the actual spot price is higher than the forward 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 either party makes profit at maturity, the other party will incur losses. In that case, the losing party may want to abolish the contract, which creates problems for the party with profit.

In forward contracts, the maturity, type of currency and amounts to be transacted is not standardized; they are structured 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 extended maturity options.

Currency forwards are one of the oldest instruments of exposure management and they are still the most popular of them. Even in 1979, 85% of multinationals were using forward contracts[6].

[6]Briggs, W. Peter, (1987), *Foreign Currency Exposure Management,* London Butterworths

International forward markets for four major currencies (Sterling, US dollars, Euro and Japanese yen) are liquid and efficient for transactions up to a maturity of one year, with bid-ask spreads quoted.

2.2. Currency Futures Contracts

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

Today, futures contracts with short maturities are actively traded on exchanges in prominent financial centers worldwide. Contracts are available for major currencies, namely Euro (EUR), Canadian dollar (CAD) and Japanese yen (YEN) against the United States dollar (USD). Each futures market has its own

special rules regarding the contrat 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 flow 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 principal payments only.

A swap contract can be regarded as a series of forward contracts lined up on a schedule[7]. For example, an exporter and an importer agree on a long term contract in which the importer is going to pay EUR 2 million every six months for five years to the exporter. 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 million every six months for the next five years to the exporter and the exporter agrees to pay EUR 2 million on the same dates that to the bank. Here, the currency swap agreement is a series of forward contracts.

[7]Claessens, Stijn, (2002), *Risk Management in Developing Countries,* World Bank Technical Paper Number 235

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

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 (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 terminology, 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 Option’, 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.

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.

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

Unlike forward contracts in which the future price is locked-in, options contracts limits the maximum loss to the option buyer (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 cases, 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[8]. 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.

[8] Claessens, Stijn, (2002), *Risk Management in Developing Countries,* World Bank Technical Paper Number 235

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 the 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 at a pre-specified exchange rate. In the third type, the borrower has the right to choose the currency at the time of the initiation of the loan, and has to repay in that currency.

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 repay in EUR if the currency appreciates beyond a predetermined level. Unless borrower can reasonably expect EUR 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 EUR depreciation either.[9]

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, warrants that have been issued to date have been obligations of only sovereign states and institutions and corporations with excellent credit standing.

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.

[9] Claessens, Stijn, (2002), *Risk Management in Developing Countries,* World Bank Technical Paper Number 235

As bankers realized that the writing of options is a way of enhancing income, they began to sell OTC options during the 1990's. These were flexible in terms of size, expiry date, strike price, and the currencies involved, and matched the very specific currency commitments for 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 are based on exchange traded options. The characteristics of all 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 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, where the commission amount depends on the frequency and size of their transactions.

Once an account has been opened, orders are transmitted and the price at which the order has been executed will be reported back to the customer almost immediately. Deals are confirmed on the next trading day. Customers are 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.[10]

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

[10] *Managing Currency Exposure-Currency Options,* Citibank Publications-2004.

The option buyer must pay the premium to the writer for settlement in two-business day 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:

	Exchange Traded	**Over-the-counter**
Currencies	Major currencies	Any currency with spot rate
Expiry Dates	Fixed cycle	Any
Maximum Life	12 months	Potentially unlimited
Contract Size	Fixed	Any Amount
Strike Price	Fixed	Any
Price Quotation	US cents	%'s or points of a specified currency

The underlying currencies available on the exchanges are the major currencies and the counter currency is normally US dollars, but the OTC market deals with options on any currency with a spot rate against the dollar, or any cross-rate option, in case 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 specified 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.[11]

The most important feature of exchange-traded options is their standardization in terms of size, expiry dates and strikes 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.

[11]*Managing Currency Exposure-Currency Options,* Citibank Publications-2004.

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 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 stand as the most obvious one. Banks with extended 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."[12]

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

[12] Yaşar, Erhan, (October 2002), *Present Day Trends and Issues in Turkish Banking,* The Bank Association of Turkey

Currently, most derivative contracts in Turkey are executed between firms and banks or in interbank market. Depending on the needs of their customers, banks provide them with contracts denominated in foreign currency / TRY 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 other derivative markets. 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. Neither the official market (Central Bank) that began to operate in late 1995 nor the Turkish Derivative Exchange (VOB) established in February 2005 has been sufficient to improve the situation. 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 comes 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 thus ask many banks for such contract offers. Compared to their

other conventional banking operations with large volumes, many banks quote very favorable forward prices for such corporations in order to start a relationship with them or to continue the existing one. As a result, these companies ended making easy arbitrage profits.

2.6.2. Currency Swaps

Currency swaps have been used in Turkey in a limited manner. The Central of Bank Turkey had begun making 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 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.[13] 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.

[13] 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 a front-end fee. If it would have been a conventional loan, the CB would have paid above 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)."[14]

[14] Claessens, Stijn, (2002), *Risk Management in Developing Countries,* World Bank Technical Paper Number 235

CHAPTER 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 1994. New types of currency derivatives regularly appear in the marketplace in developing countries, offering investors and traders a continually expanding variety of specific 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, investors and corporations have started to demand such products from banks in order to hedge themselves against foreign exchange risk. The demand is ascending as their awareness increases and needs vary. However, at present, the market is not as liquid as those in developed countries.

For banks operating in fiercely competitive derivatives market, the difference between the leaders and the also-rans often depends on their respective approaches to product innovation. To achieve market leadership in this highly volatile field, a bank must develop and continually refine the processes and the expertise necessary for identifying new areas of business as well as attracting

and retaining customers. Although the development of derivatives is a complex, expensive process, such development efforts provide the means for satisfying existing clients as well as attracting new customers.

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 non-standard 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.[15] Earlier, professionals 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 clients. On one hand are the speculators who have strong beliefs regarding future price movements and attempt to seize profit from them. On the other hand, are the 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.

[15] "Global Finance: Derivatives and Society" *Global Finance (December 2003),* Volume 9, Number 13

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 [16]

When a client asks a financial institution for a structured derivative, the procedure goes as described below:[17]

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 conveys the information 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 behaviour, stress-test it in different market scenarios and develop pricing guidelines.

6. They explain strategy to salesman.

[16] "Global Finance: Derivatives and Society" *Global Finance (December 2003),* Volume 9, Number 13

[17] "Global Finance: Derivatives and Society" *Global Finance (December 2003).* Volume 9, Number 13

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 the product to be sold to other clients.

3.1.1. Exotic Options

The term "*exotic option"* is commonly used to refer non-standard options. 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 been sufficiently developed in Turkey. The main reason behind that is the lack of sufficient knowledge and experience with derivatives, which in turn keeps the demand for such products limited. As a result, existing OTC derivatives are not constructed so as to meet customer demand as in developed countries; rather, they are developed to obtain funds, increase commissions

earned and make the customers aware of such instruments. In other words, the Banks are playing an important role to make the Turkish investors be aware of the newly constructed derivative products.

In the current part of this study, the instruments, which are publicly available to both corporate and retail customers of the banking system, will be analyzed. At this stage, it is observed that the dual currency deposit instrument is the only product that is offered by all the major Banks in Turkey. There exist some other products such as Range Accrual, Double No Touch, Wedding Cake, Deposit indexed to the foreign exchange rate (DKEM), Parity Insured Deposit (PSM), Market Linked Deposit (MLD) and Margin Trading, which are recently introduced to the customers especially among the Private Banking sections of these major banks. Main focus in this study will be on Dual Currency Deposits that has been offered for 3 years by the banks. Also, an analytical study will be carried out about the future development of this instrument in Turkey.

3.1.2.1. Dual Currency Deposits

Before explaining the dual currency deposit, it would be better to give some brief information about the Certificate of Deposit, as the DCD is a derivative of CD. Certificate of Deposit is a kind of termed deposit and can be considered as a note that shows the amount borrowed by the bank from the customer. Interest is calculated at the due date and paid against the bank's receiving the bond

back. Certificate of deposits can be called back before the maturity date, also they generally have very long maturities and provides a higher fixed interest income at shorter interest periods to the investor. Accordingly, they can be considered as a hedging mechanism against the floating interest rates. There are different types of CD's, which are related with commodities or foreign currencies and can be used as a tool for risk management. The main purpose of using CDs is to provide more income from the deposit at shorter interest rate periods by bearing a specific market risk for the hedger or the investor. Using these characteristics of the CDs, the DCD is created in the developed markets.

In DCD, the investor earns a higher yield compared with the actual deposit rates offered, but agrees to sell his deposit to the bank at a predetermined currency rate at a specific time in the future. Actually, the investor is selling a deposit based call option to the bank. The bank gives an additional interest yield to the deposit as an option premium, and combined with the standard interest yield, the investor gains a relatively higher profit from his deposit. The call option that has been bought by the bank is exercised if the spot currency rate is higher than the exercise rate at the maturity date. After all, the investor is obliged to sell his deposit to the bank at a predetermined exercise rate, which is lower than the spot rate at the due date.

The investor gains high profit in case the spot rate is lower than the exercise rate. But the investor faces with the risk of overvaluation of the deposited

currency compared with the other currency that forms the option. In that case, the investor sells his deposit at a cheaper rate and incurs a loss.

As result, dual currency deposit is an instrument, which can be said to be a combination of deposit and an option. At the same time DCD is designed to have higher yield than the conventional deposit types, whereas it includes lower level of risk factor.

3.1.2.1.1. The Banking Practice of Dual Currency Deposits

The banks in Turkey apply different minimum transaction limits for DCDs varying from 100.000 to 500.000 USD or equivalent currencies. The banks issue credit limits from the related credit departments for the customers that wants to make DCD transaction. The customers demand is transmitted to the treasury departments of the bank using standard forms. With the help of the demand form, the currency rate, maturity and the amount values are determined between the customer and the bank. After then, option buying and writing as well as option exercise contracts are signed by the customer. An account with a corresponding maturity date is opened for the customer in bank records, and the amount TRY or any foreign currency in the termed account is blocked. According to the maturity and the option exercise price, the interest rate that will be used for the TRY or foreign currency account is determined. There will be a tax deduction for the interest paid at a rate of 15%, which is similar to the other time deposit accounts. The commission that will be deducted from the

option premium depends on the type of the customer whether he is a corporate or a retail one. On the other hand, tax withholding is executed only for the retail customers whereas the corporate ones are exempt from that deduction.

In the dual currency transactions, European options are used. In other words, the Banks can only exercise the option that the customers sell at the maturity date. Also there is a specific difference in terms of premium payments between the DCDs and the regular option types. In regular options, the option writer takes the premium related with the option at the beginning of the transaction, whereas in DCDs, the customer, who writes the option to the Bank, gets the premium he deserves at the DCDs maturity. In other words, the customer earns an amount for his DCD which is a combination of the premium and the interest, at the maturity date.

The workflow explained above is summarized with the examples both for the options written in TRY and foreign currency. Case 1 summarizes the DCD transaction on USD deposit with USD/TRY currency and the probable results of this transaction.

Case 1 – DCD transaction in USD with a USD/TRY currency rate

The customer has 1.000.000 USD. He has the expectation that USD/TRY rate's not going to be over 1,33 at the end of the month. At the same time he wants to earn relatively more interest compared to the standard rates for his foreign currency deposit. Customer offers to sell an option containing the right to sell USD and buy TRY at the end of the month. As a result of this transaction, he will increase his profit by gaining both foreign currency interest and option premium. The customer guarantees to sell USD at a rate of 1,33 if the USD/TRY rate is coming over 1,33. Tax deduction is assumed to be 0 in our case.

Capital: 1.000.000 USD
Foreign currency interest rate: 2%
Option premium: 10%
Maturity: 30 days

For 1.000.000 USD, one month termed account is opened and the amount is blocked by the bank.

Result

1. At the due date, if the USD/TRY rate is over 1,33, the bank firstly pays the interest and the option premium to the customer and after then the bank has the right to exchange the capital at a rate of 1,33 to TRY and to pay it to the customer.
2. In case the option's not being exercised (USD/TRY rate < 1,33), the bank pays the customer 12% foreign currency interest and the capital for 1.000.000 USD at the end of the one month period. (1.000.000 x 12 x 30/36500 = 9863 USD interest, totally 1.009.863 USD will be paid.)

Case 2 summarizes the DCD on TRY deposit executed in USD/TRY currency rate and its probable results.

Case 2 – DCD transaction in TRY with USD/TRY currency rate

The customer has 1.515.000 TRY deposit and expects the USD currency rate is not going to be over 1,3 at the end of the month. For that customer, an account with a one-month maturity for 1.515.000 TRY is opened and the amount is blocked by the bank. The bank offers the customer a 10% premium against the option written by the customer. Tax deduction is assumed to be 0 in our case.

Capital: 1.515.000 TRY
TRY interest rate: 16%
Option premium: 10%
Maturity: 30 days

Result

1. At the due date, if the USD/TRY is below 1,3, the bank gets the customer's TRY deposit and sells the customer foreign currency corresponding to his capital amount at a rate of 1,3, that is a rate over the spot market.
2. If the USD/TRY rate is over 1,3 at the due date, customer's TRY deposit will be paid in TRY including the interest and the premium. In this case, where the option is not exercised by the bank (USD/TRY > 1,3), 32.375 TRY (1.515.000 x 26 x 30/36500) will be paid to the customer for interest and capital at the end of one month.

On the other hand, the banks are carrying out contrary transactions with the other foreign banks to hedge their risk resulting from DCDs. Except from hedging the currency risk, the banks are also obtaining commission yields from these kinds of transactions. An example of USD DCD with the contrary bank transaction is presented in Case 3. TRY DCD transaction will not be shown as an example separately as the process flow is all the same as the USD DCD except the currency notations.

As it can be seen from the examples, DCD transactions include reduced risks and opportunities both for the customers and the banks. DCD is said to be suitable for the investors who execute import-export transactions and using more than one currency type in their daily operations as well as for the customers with a higher risk preference (speculators). With DCD, an interest rate, which is above the spot rate in the market, is guaranteed. But the customer undertakes the risk of change in parity and changes in the prices of the bonds.

In case DCD is considered as a product package for a bank, customers are served with a combined yield of interest and the premium. And if the interest rate is lowered and the premium rate is elevated, the yield of the package does not change for the customer, but the interest paid for the deposit is lowered. In other words, banks can decrease their cost of deposit with these kinds of transactions. Additionally, banks gain the opportunity of hedging themselves, as

they are buyer of the option. At the same time, DCD has an important role in increasing the derivative transaction volume mainly because of increasing product variety and the customer satisfaction offered as a result of its relatively higher yield.

Case 3 – DCD transaction in USD with USD/TRY currency rate and the contrary bank transaction

Example

1.000.000 $

CUSTOMER ⟶ BANK

Maturity: 30 days
Spot Exchange Rate: 1,470
Option Exercise Exchange Rate: 1,515
Foreign Deposit Account Int.Rate: 11,61% (3% Interest Gross + 8,61% Premium Net)

The interest rate that will be announced to the customer is calculated considering the option premium earned from the contrary bank.

Maturity Date

Situation 1: Currency Rate < 1,5150

11,61% For.Cur.Dep. Int.Rate (Premium+Interest)

CUSTOMER ⟵ BANK

Situation 2: Currency Rate >1,5150

11,61% For.Cur.Dep. Int.Rate (Premium+Interest)

CUSTOMER ⟵ BANK

1.000.000 $ ⟶

⟵

1.515.000 TRY
(1,515 option exercise price)

Contrary Bank Transaction

0,745% option premium from the capital

BANK ⇄ CONTRARY BANK

1.000.000$ at 1,5150 exercise price (call option)

Result

Premium earned from the contrary bank: 0,7450%; 7.450 USD
Tax payment (BSMV) 5%; 372,5 USD
Net: 7.077 USD
Interest+premium that will paid to the customer
Interest: 1.000.000 x 30 x 3/36500=2465,75 USD (*369,86 tax deducted); Net: 2095,89 USD
Premium: 1.000.000 x 30 x 8,61/36500=7.077 USD net
Net to the customer: 2095,89+7077= 9172,89 USD
Here the cost for the bank is equal to the foreign currency deposit interest. Bank has already earned the amount paid as a premium to the customer from the contrary bank as premium.
*:Equals to the 15% of the interest amount

3.1.2.1.2. An Analytical Approach to DCD Market in Turkey

In order to conduct the study on dual currency deposits, the realized transaction data is obtained from the major banks (T. İş Bankası A.Ş., Akbank T.A.Ş., Finansbank A.Ş.) that are forming approximately %80 of all dual currency deposits transaction volume in Turkey. The transaction data includes the volumes that have occurred for the last two years 2005 and 2006. In Turkey, the banks are selling three main types of options, which are in terms of EUR/TRY, EUR/USD and USD/TRY. Due to the difference in their types, DCDs are transacted in three different currencies including TRY, USD and EUR. After the examination of raw transaction data that belongs to the years 2005 and 2006, it is found out that

- In 2005, 302 DCD transactions whereas in 2006, 366 DCD transactions have occurred.
- Among all 668 that have occurred in two years period, the percentages for each type of DCD in terms of transaction units are %16 (EUR/TRY), %18 (EUR/USD) and %66 (USD/TRY) respectively.
- During these years, the maximum amount of transaction for a specific DCD is 30.061.000 USD on the other hand the minimum amount of transaction is 100.000 USD. Also the %68 of all the transactions occurred is above 1.000.000 USD.

Table 1: DCD volume data for major banks in Turkey in 2005 and 2006

		2005	2006
	EUR	52.946.010	61.873.362
	TRY	109.062.314	187.861.802
	USD	257.565.500	260.994.721
TOTAL (in USD)		**419.575.829**	**510.729.885**

Table 1 provides the DCD volume data for Turkey in 2005 and 2006. The data are compiled from individual banks' DCD transactions.

In terms of maturity, the results are as follows:

Table 2: The average maturity in the realized DCD transactions in Turkey

	2005 (days)	2006 (days)
EUR	19,5	17,2
TRY	12,6	10,6
USD	15,1	11,9

As it can be seen from the realized values, the DCD volume has been increased by %22 percent between the years 2005 and 2006. At the same time the maturities in all types of DCD transactions is getting shorter.

So in order to handle three different types of DCD together, DCDs that are transacted in EUR and TRY are transformed into USD with the currency rate realized at the date of transaction. After then, the transaction data is consolidated on a daily basis to form a continuous progress for each working day in two years period. During this consolidation, the DCDs sold to the customers are added to the overall DCD balance at the transaction date and the DCDs at their maturity, are subtracted from the overall DCD balance. As a

result, a DCD balance has been created for each working day in 2005 and 2006. Also, the DCD balances are transferred to the consecutive working day unchanged if there has not been any transaction occurred in these days.

Through the studies, main focus is on the behavioural development of the DCD transaction volumes with respect to some of the key variables in the market. The DCD volume is taken into account as a dependent variable considering its transaction volume level, which can be said to be fairly low at the time of the study. In other words, the DCD transaction volume is treated as not to significantly affect any of the other independent variables that are chosen for the model. While choosing these variables for comparison, the other investment instruments are taken into consideration as the investment alternatives for DCD customers. As a result, the USD,EUR currency rates, the stock exchange index and the TRLIBOR rates are included in the study and these instruments' behavior with respect to the DCD volume is analyzed.

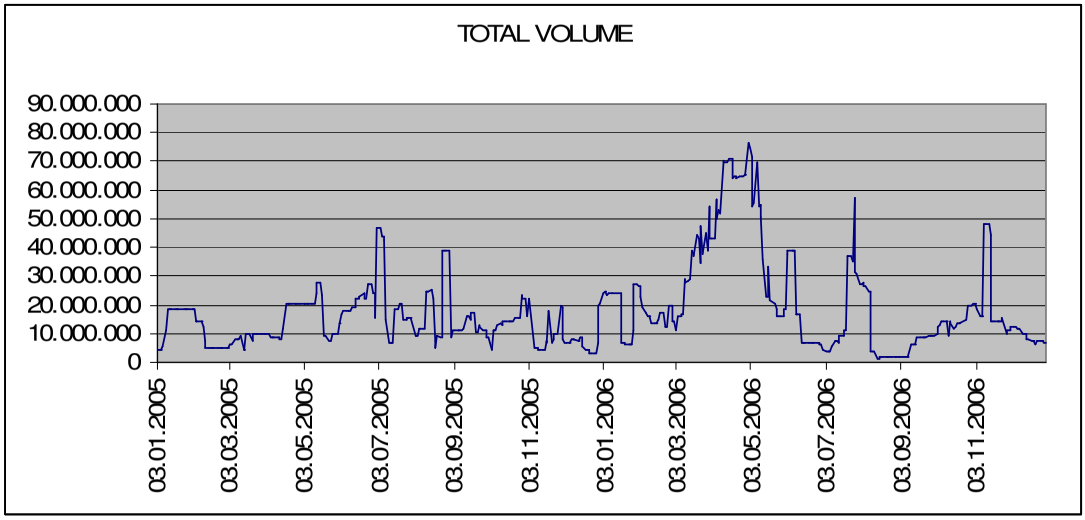
Specifically, the currency rates are used for the customers that prefer foreign currency instruments and have an income or make transactions in terms of foreign currencies. On the other hand, TRLIBOR is accepted as a good indicator of the daily interbank interest rates. Therefore, these rates reflect the interest rates that are paid for deposits and especially for repo transactions with different maturities. Thus, the customers that are willing to invest on YTL deposit or in repo transactions is taken into consideration. Finally, stock

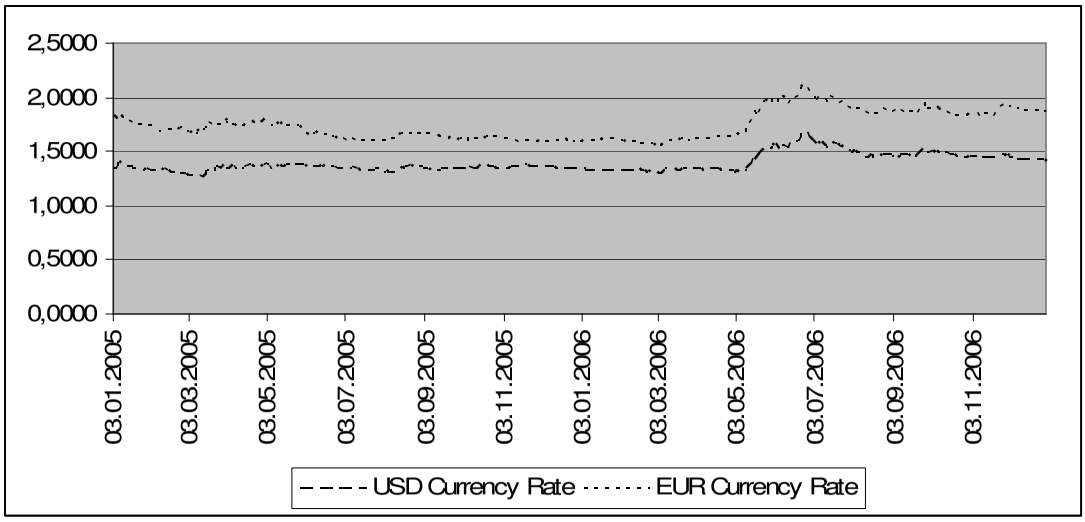
exchange index is used as it can be regarded as one of the most popular investment tools in Turkey. Apart from its being an investment tool, the stock exchange index usually reflects the current economical situation depending on the expectations of both domestic and foreign investors. As a result, the existence of a relation between the current level of the index and the overall DCD volume that occurs in the derivative markets is investigated through our studies.

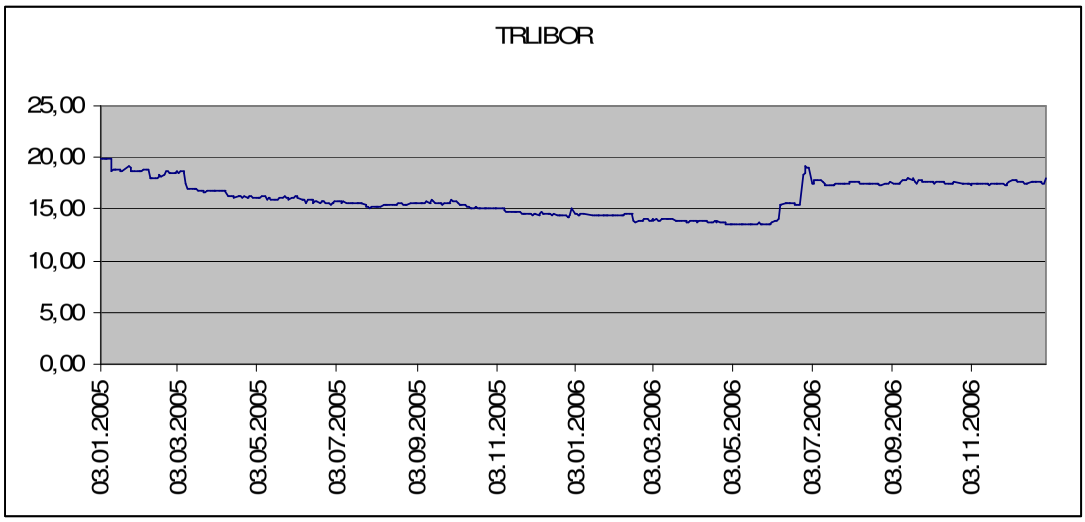
As a result, the relation among the DCD volume and the level of the mentioned independent variables is going to be investigated. In other words, the study is carried out in order to state how the investors are affected with different levels of the independent variables and how their choice of making DCD transaction is affected.

The data set that includes DCD volumes and the other key market variables in daily basis can be found in APPENDIX C.

Below, the figures of the transaction volumes and the market variables are presented to display the progress through the examination period.


TOTAL VOLUME
90.000.000
80.000.000
70.000.000
60.000.000
50.000.000
40.000.000
30.000.000
20.000.000
10.000.000
0
03.01.2005
03.03.2005
03.05.2005
03.07.2005
03.09.2005
03.11.2005
03.01.2006
03.03.2006
03.05.2006
03.07.2006
03.09.2006
03.11.2006


2,5000
2,0000
1,5000
1,0000
0,5000
0,0000
03.01.2005
03.03.2005
03.05.2005
03.07.2005
03.09.2005
03.11.2005
03.01.2006
03.03.2006
03.05.2006
03.07.2006
03.09.2006
03.11.2006
USD Currency Rate
EUR Currency Rate


TRLIBOR
25,00
20,00
15,00
10,00
5,00
0,00
03.01.2005
03.03.2005
03.05.2005
03.07.2005
03.09.2005
03.11.2005
03.01.2006
03.03.2006
03.05.2006
03.07.2006
03.09.2006
03.11.2006

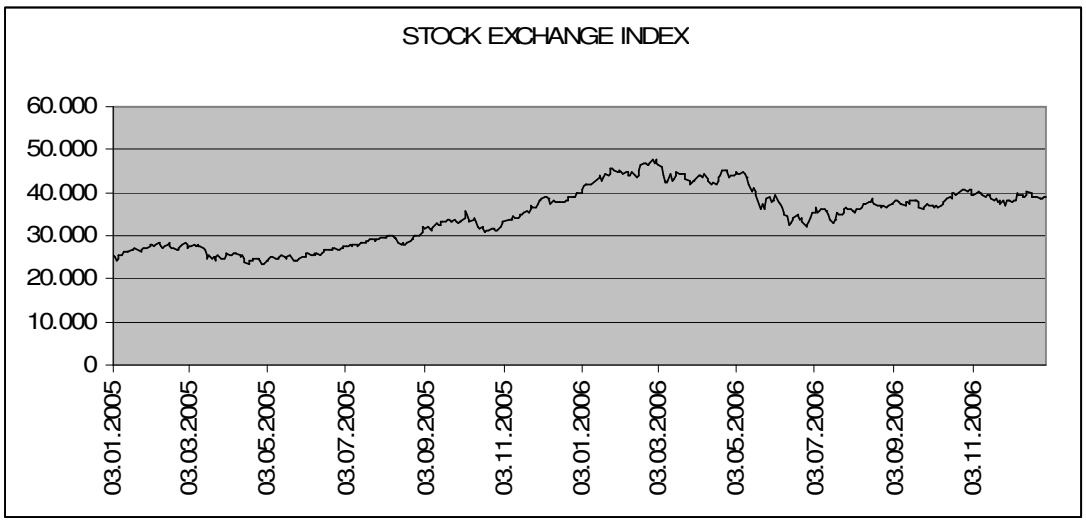


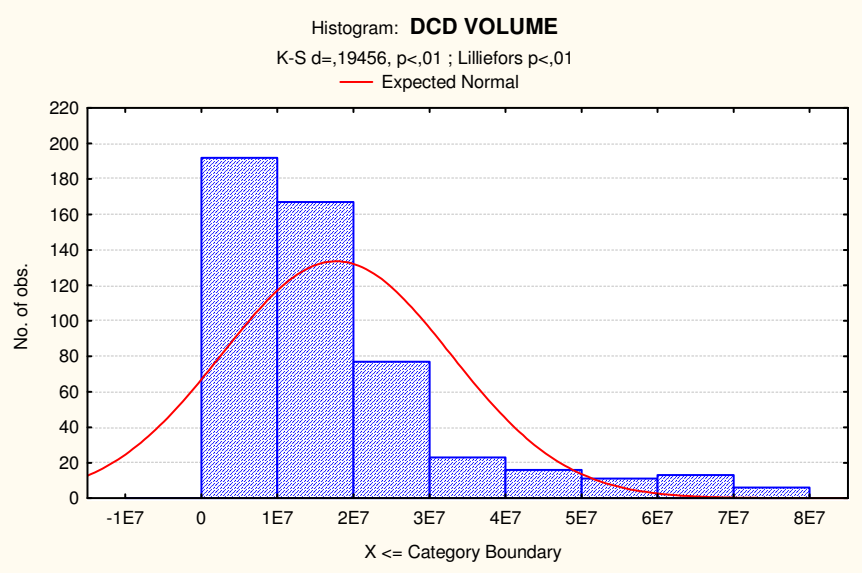
Figure 1. Dual Currency Deposit Volume, USD and EUR Currency Rates, Trlibor Rate and Stock Exchange Index data of Turkey for the period 01.01.2005 – 31.12.2006.

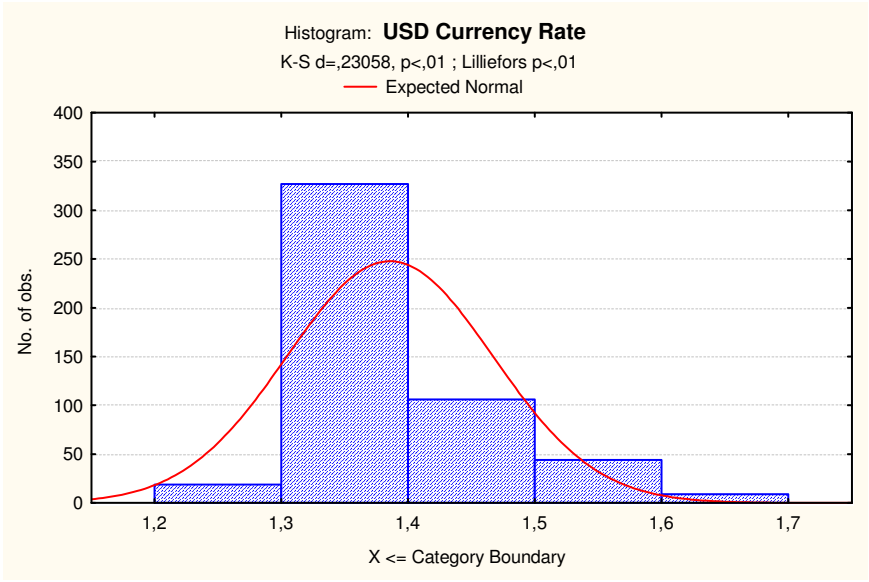
After analyzing the graphs for each of the dependent (DCD volume) and the independent variables, the DCD total volume is observed to be the most fluctuating series among all the other variables. The stock exchange index is the one that follows the DCD volume in terms of degree of volatility. As expected, EUR and USD currency rates are showing similar fluctuations. In overall, there is not a significant volatility interaction between the variables, which can also be observed from the graphs above. Subsequently, descriptive statistics are presented below:

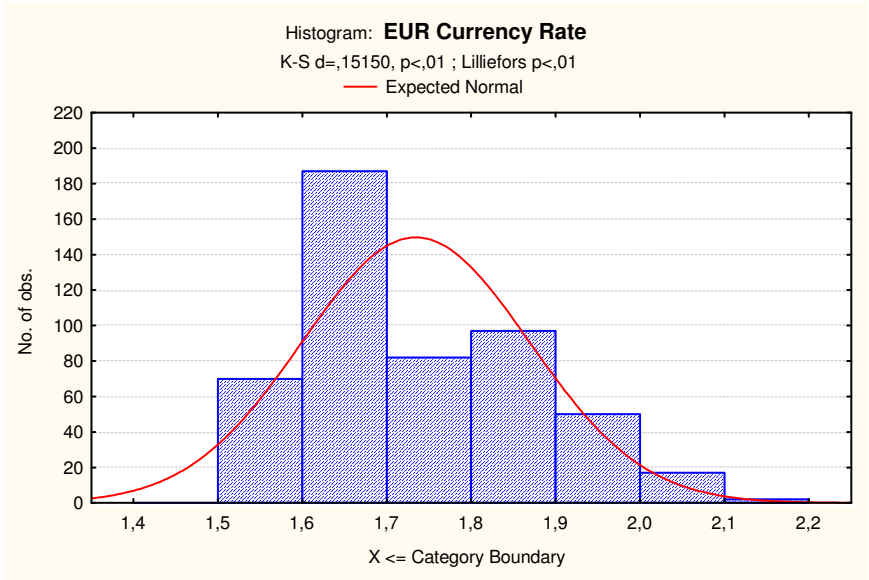
Table 3: Descriptive Statistics for DCD data for the years 2005 and 2006

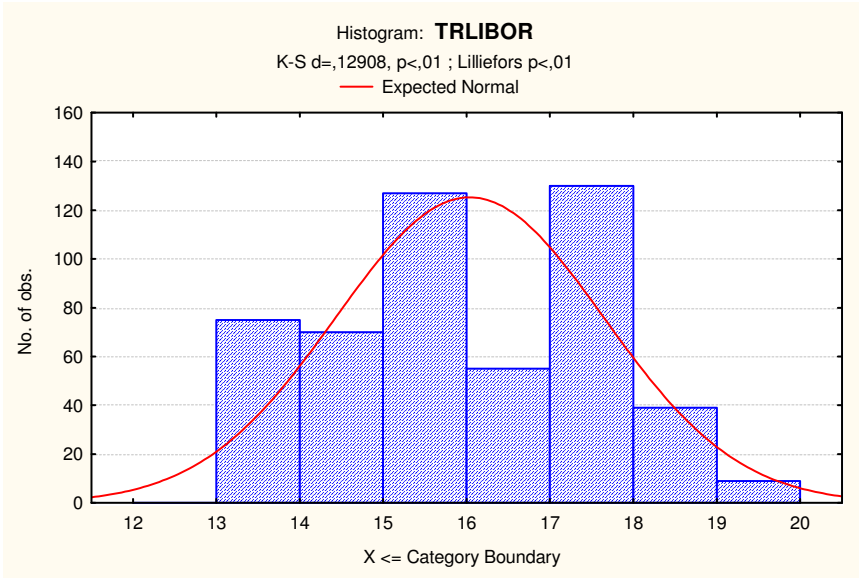
Variable	Descriptive Statistics-I		
	Mean	Minimum	Maximum
DCD Volume	17.744.970	1.020.432	76.627.434
USD Cur.Rate	1,3857	1,2541	1,6934
EUR Cur.Rate	1,7344	1,5495	2,1246
Trlibor	16,04	13,47	19,93
Sto.Exc.Index	34.554	23.286	47.729

Variable	Descriptive Statistics-II		
	Standard Deviation	Skewness	Kurtosis
DCD Volume	15.080.756	1,859061	3,30656
USD Cur.Rate	0,0813	1,232127	0,88675
EUR Cur.Rate	0,1346	0,634715	-0,76862
Trlibor	1,6076	0,164940	-1,02238
Sto.Exc.Index	6.596	-0,001388	-1,16046




Histogram: USD Currency Rate
K-S d=,23058, p<,01 ; Lilliefors p<,01
Expected Normal
No. of obs.
400
350
300
250
200
150
100
50
0
1,2
1,3
1,4
1,5
1,6
1,7
X <= Category Boundary


Histogram: EUR Currency Rate
K-S d=,15150, p<,01 ; Lilliefors p<,01
Expected Normal
No. of obs.
220
200
180
160
140
120
100
80
60
40
20
0
1,4
1,5
1,6
1,7
1,8
1,9
2,0
2,1
2,2
X <= Category Boundary


Histogram: TRLIBOR
K-S d=,12908, p<,01 ; Lilliefors p<,01
Expected Normal
No. of obs.
160
140
120
100
80
60
40
20
0
12
13
14
15
16
17
18
19
20
X <= Category Boundary

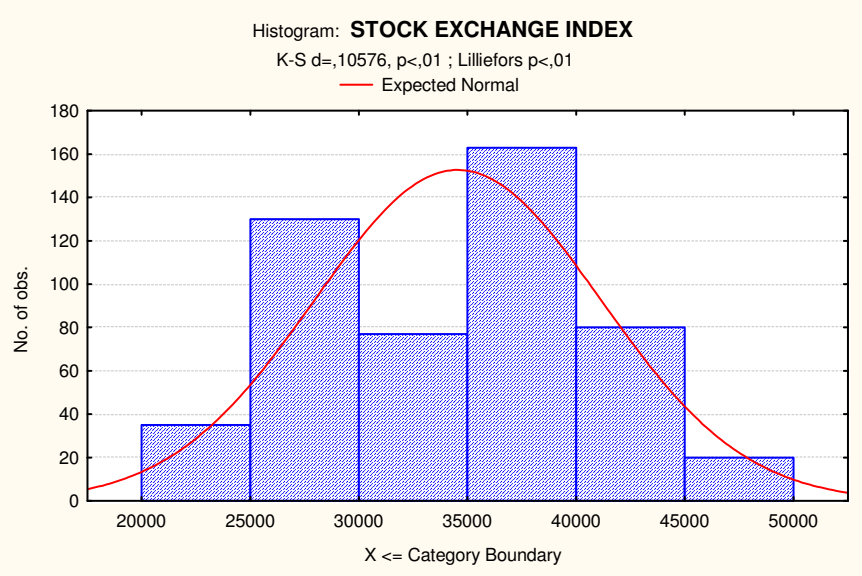
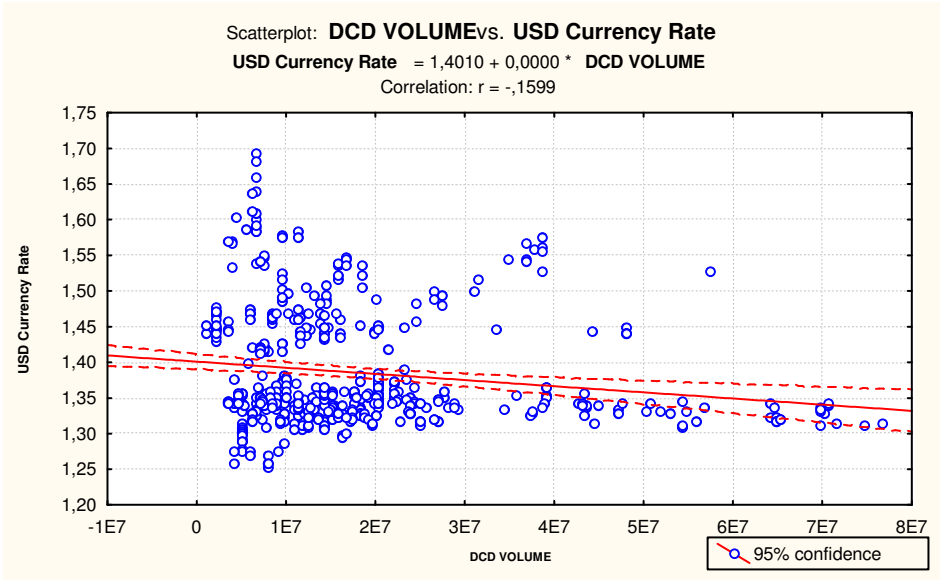
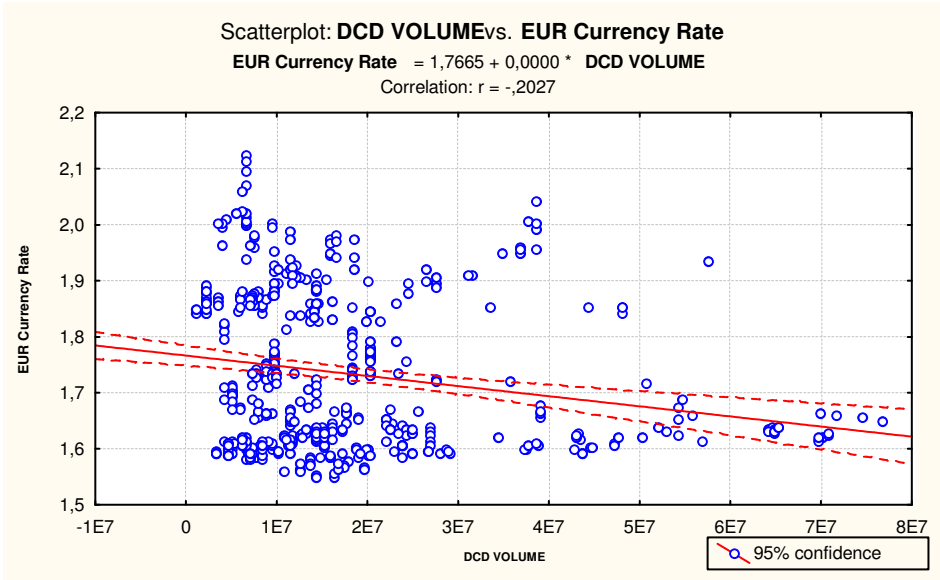


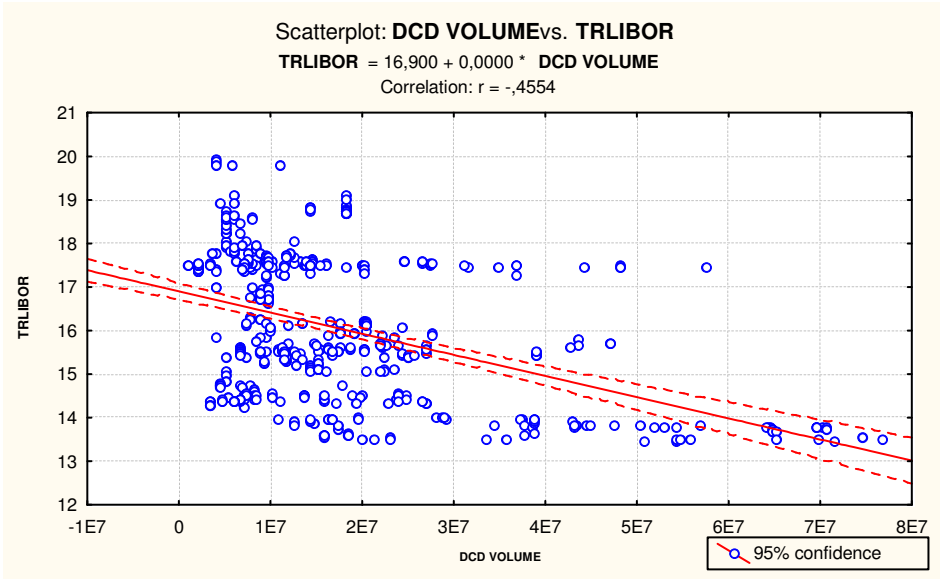
Figure 2. Dual Currency Deposit Volume, USD and EUR Currency Rates, Trlibor Rate and Stock Exchange Index histograms for the period 01.01.2005 – 31.12.2006.

After analyzing the histogram plots for each of the variable that are presented through our studies, it is found out that DCD volume is accumulated between the 0 and 2e7, USD Currency Rate between 1,3 and 1,4, EUR Currency Rate between 1,6 and 1,7, Trlibor both in between 15, 16 and 17, 18, and finally Stock Exchange Index between 35.000 and 40.000.

In this part of the study, the bilateral relations between the dependent and independent variables will be analyzed in order to indicate the correlations among them.


Scatterplot: DCD VOLUMEvs. USD Currency Rate
USD Currency Rate = 1,4010 + 0,0000 * DCD VOLUME
Correlation: r = -,1599
USD Currency Rate
1,75
1,70
1,65
1,60
1,55
1,50
1,45
1,40
1,35
1,30
1,25
1,20
-1E7
0
1E7
2E7
3E7
4E7
5E7
6E7
7E7
8E7
DCD VOLUME
95% confidence


Scatterplot: DCD VOLUMEvs. EUR Currency Rate
EUR Currency Rate = 1,7665 + 0,0000 * DCD VOLUME
Correlation: r = -,2027
EUR Currency Rate
2,2
2,1
2,0
1,9
1,8
1,7
1,6
1,5
-1E7
0
1E7
2E7
3E7
4E7
5E7
6E7
7E7
8E7
DCD VOLUME
95% confidence


Scatterplot: DCD VOLUMEvs. TRLIBOR
TRLIBOR = 16,900 + 0,0000 * DCD VOLUME
Correlation: r = -,4554
TRLIBOR
21
20
19
18
17
16
15
14
13
12
-1E7
0
1E7
2E7
3E7
4E7
5E7
6E7
7E7
8E7
DCD VOLUME
95% confidence

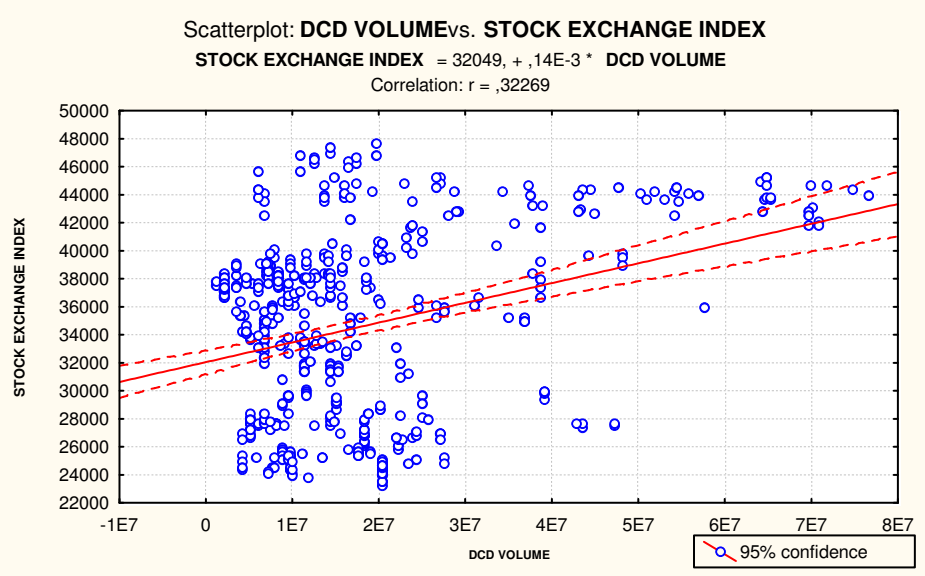


Figure 3. Correlation scatterplots between Dual Currency Deposit Volume and USD and EUR Currency Rates, Trlibor Rate and Stock Exchange Index for the period 01.01.2005 – 31.12.2006.

Table 4. Correlation Matrix for the analyzed variables

Variable	Correlations Marked correlations are significant at p < ,05000 N=505				
	DCD VOLUME	USD Rate	EUR Rate	TRLIBOR	STOCK INDEX
DCD VOLUME	1,00	-0,16	-0,20	-0,46	0,32
USD Currency Rate	-0,16	1,00	0,90	0,31	0,14
EUR Currency Rate	-0,20	0,90	1,00	0,56	-0,04
TRLIBOR	-0,46	0,31	0,56	1,00	-0,45
STOCK EXCHANGE INDEX	0,32	0,14	-0,04	-0,45	1,00

As it can been seen from the scatterplots, histogram studies and correlation matrix, the dependent variable DCD volume shows the highest correlation with the level of TRLIBOR. Ranked in order, TRLIBOR, Stock Exchange Index, EUR Currency Rate and USD Currency Rate have the highest correlation with the DCD volume. Although the TRLIBOR seems to be the most correlated variable with DCD volume, it should be noted that, in general, the degree of

correlation with DCD volume and other variables is not very strong to prove a robust relation among these variables.

Before implementing a simple and a multiple regression study, the data set is analyzed in terms of having a unit root. After implementing Augmented Dickey Fuller Test where Schwarz is taken as the criteria and the least squares method is used, except the DCD VOLUME data, all the other dependent variables turn out to be non-stationary. In other words, except from the DCD VOLUME, all the other dependent variables have a unit root as a result of the implemented ADF test. In order to omit the unit roots, the difference of values for each dependent variable is used as an alternative to the original data set. So, both the original data set and the difference of variables are examined through the regression analysis.

After then, a regression analysis is conducted in order to look for the combined effects of the independent variables on DCD volume. Besides, the behaviour of the DCD volume data will be investigated by the use of this model.

Initially, a simple regression is performed between the DCD volume and the other independent variables. All the regression analyses are carried out in a %95 confidence interval, where the p values smaller than 0,05 are accepted as significant. Through the analysis, the results of the regression studies are presented in a tabular format and the predicted equation for the dependent

variable (DCD Volume) and the other independent variables are stated afterwards. Also the predicted and the observed values according to the estimated equation are plotted in order to show the deviations from the predicted equation.

Table 5. Simple Regression results for DCD Volume vs. USD Currency Rate

Dependnt Variable	Test of SS Whole Model vs. SS Residual						
	Multiple R	Multiple R^2	Adjusted R^2	SS Model	SS Residual	F	p
DCD VOLUME	0,159936	0,025579	0,023642	2,932022E+15	1,116923E+17	13,20419	0,000308

Prediction equation for: "DCD VOLUME"
"DCD VOLUME"=58855175,4-29667880,*"USD Currency Rate"

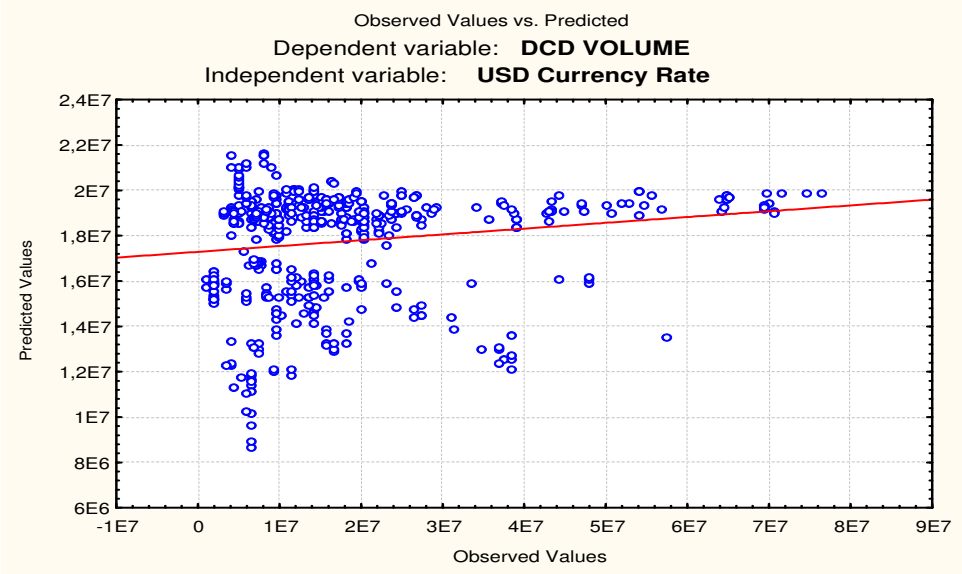


Figure 4. Observed and predicted DCD volume values with USD Currency Rate

Table 6. Simple Regression results for DCD Volume vs. EUR Currency Rate

Dependnt Variable	Test of SS Whole Model vs. SS Residual						
	Multiple R	Multiple R^2	Adjusted R^2	SS Model	SS Residual	F	p
DCD VOLUME	0,202682	0,041080	0,039173	4,708746E+15	1,099156E+17	21,54835	0,000004

Prediction equation for: "DCD VOLUME"
"DCD VOLUME"=57134187,7-22710853,*"EUR Currency Rate"

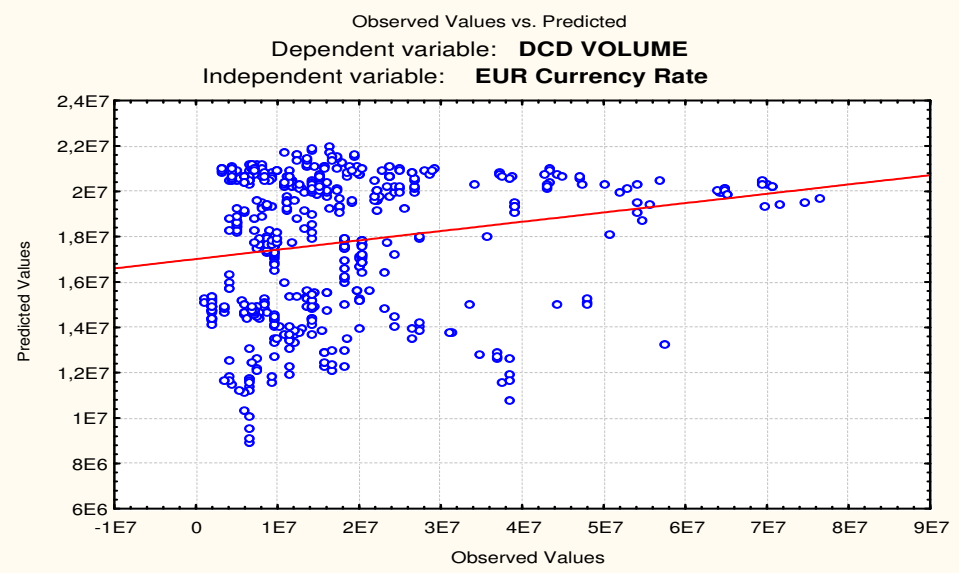


Figure 5. Observed and predicted DCD volume values with EUR Currency Rate

Table 7. Simple Regression results for DCD Volume vs. Trlibor

Dependnt Variable	Test of SS Whole Model vs. SS Residual						
	Multiple R	Multiple R^2	Adjusted R^2	SS Model	SS Residual	F	p
DCD VOLUME	0,455393	0,207383	0,205807	2,377111E+16	9,085321E+16	131,6064	0,00

Prediction equation for: "DCD VOLUME"
"DCD VOLUME"=86259310,8-4271874,1*"TRLIBOR"

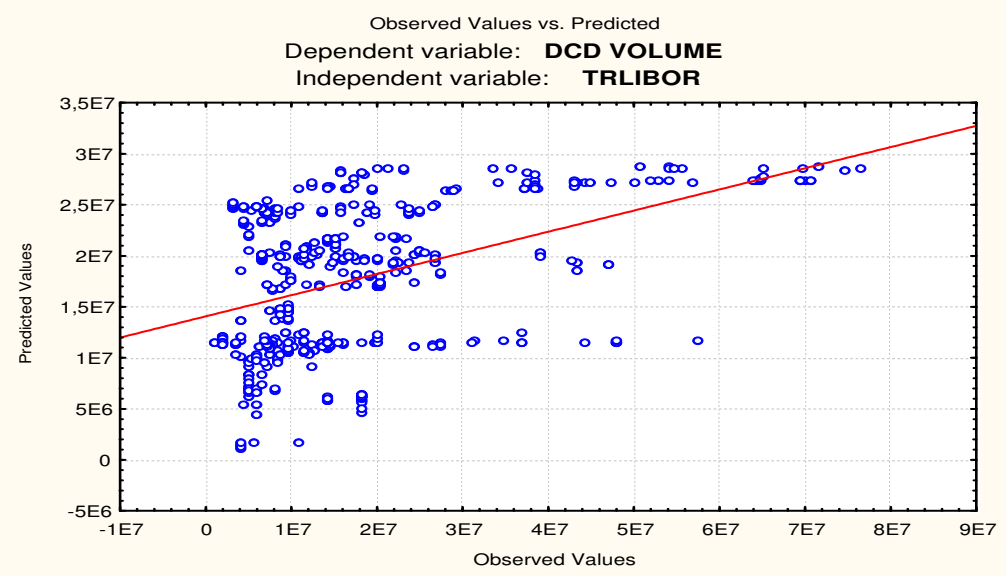


Figure 6. Observed and predicted DCD volume values with Trlibor

Table 8. Simple Regression results for DCD Volume vs. Stock Exchange Index

Dependnt Variable	Test of SS Whole Model vs. SS Residual						
	Multiple R	Multiple R^2	Adjusted R^2	SS Model	SS Residual	F	p
DCD VOLUME	0,322693	0,104131	0,102350	1,193592E+16	1,026884E+17	58,46587	0,000000

Prediction equation for: "DCD VOLUME"
"DCD VOLUME"=-7750076,8+737,838351*"STOCK EXCHANGE INDEX"

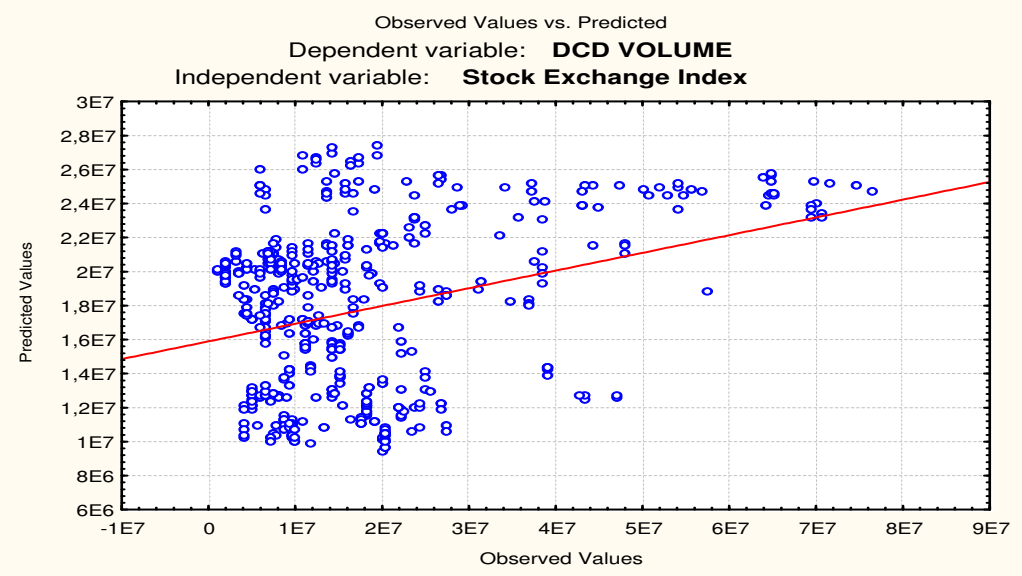


Figure 7. Observed and predicted DCD volume values with Stock Exchange Index

As a result of the simple regression analysis, TRLIBOR has the highest R^2 among all the other independent variables, with the R^2 equals to 0,21.The model is considered to explain the %20 of the variability in DCD volume. In other words the left %80 is the residual variability. Thus, it can be argued that the TRLIBOR model equation is fairly successful in explaining the variability in DCD volume.

After the simple regression analysis, it would be meaningful to conduct a multiple regression analysis in order to explain the combined effects of the independent variables on the DCD volume.

During the multiple regression analysis studies, firstly the difference of the consecutive values for each of the dependent and independent variables are investigated. As a result of this regression of the differences:

Table 9. Multiple Regression results for the difference of analyzed data

N=504	Regression Summary for Dependent Variable: DCD VOLUME R= ,10404282 R²= ,01082491 Adjusted R²= ,00289565 F(4,499)=1,3652 p<,24488 Std.Error of estimate: 5596E3					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(499)	p-level
Intercept			-22401	249588	-0,08975	0,928519
usd	0,056807	0,083015	26237624	38342507	0,68430	0,494106
eur	-0,034050	0,083067	-12244432	29870784	-0,40991	0,682045
trlibor	-0,059839	0,045016	-1635316	1230227	-1,32928	0,184363
index	0,074398	0,045062	694	420	1,65099	0,099369

As it can been from the summary of the regression analysis, R^2 of the model is very low indicating the model is not very powerful in explain the variability of the DCD volume. Additionally, the betas of the independent variables of the model do not turn out to be significant.

After the regression of the differences of the variables is calculated, the original data set (APPDENDIX C) is used for regression study. In this set, as stated before, the consecutive values for each working day for dependent variable total DCD volume and the corresponding values for the independent variables USD, EUR Currency Rate, Trlibor and Stock Exchange Index are used through regression analysis.

Table 10. Multiple Regression results for the analyzed data

N=505	Regression Summary for Dependent Variable: DCD VOLUME R= ,52463166 R²= ,27523838 Adjusted R²= ,26944028 F(4,500)=47,471 p<0,0000 Std.Error of estimate: 1289E4					
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(500)	p-level
Intercept			114179293	12773861	8,93851	0,000000
USD Currency Rate	-0,610549	0,104541	-113256088	19392192	-5,84029	0,000000
EUR Currency Rate	0,665553	0,118282	74576465	13253711	5,62684	0,000000
TRLIBOR	-0,554878	0,058985	-5205110	553314	-9,40715	0,000000
STOCK EXCHANGE INDEX	0,185308	0,045135	424	103	4,10562	0,000047

The whole model R increases to 0,52 and the R^2 to 0,27, where all the independent variable betas are calculated as significant.

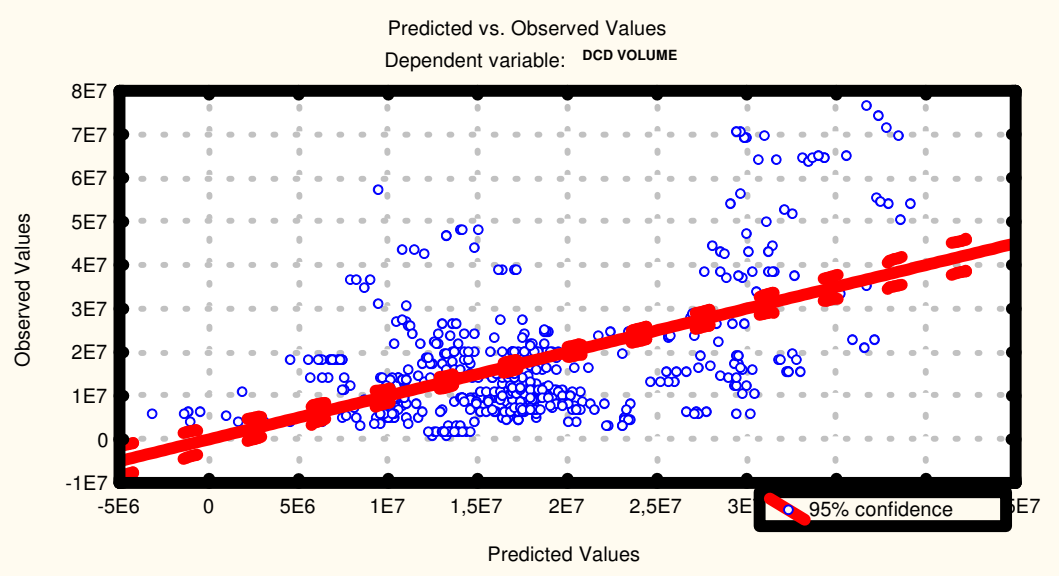


Figure 8. Observed and predicted DCD volume values with USD, EUR Currency Rate, Trlibor and Stock Exchange Index

Prediction equation for: "DCD VOLUME"
"DCD VOLUME"=114179293,-1132561E2*"USD Currency Rate"+74576464,8*"EUR Currency Rate"
-5205109,7*"TRLIBOR"+423,706552*"STOCK EXCHANGE INDEX"

As a result, at %95 confidence interval, the independent variables USD, EUR Currency Rates, TRLIBOR and Stock Exchange Index are explaining approximately %30 of original variability of the DCD volume in the above model equation. This ratio can fairly be considered as sufficient enough to explain the DCD volume volatility, but this is the result of some important factors such that:

- Transaction volumes of Dual Currency Derivatives are fairly low when compared with the other conventional investment tools. As stated above, the transaction volume for 2005 is 419 million USD and 2006 is 510 million USD.

The realized volumes can be summarized as fairly low compared with both the conventional deposit market in Turkey and derivative instruments transactions volume in the Turkish Derivate Exchange (VOB).

- DCDs are traded in the financial markets in Turkey for a short period of time, for about two years, whereas the Turkish Derivative Exchange is operating for about three years.
- Only a few of the major banks contribute to the DCD trade market in Turkey.
- A small number of corporate and retail investors are aware of such kind of an investment tool as an alternative for the other conventional tools.
- The local banks are not flexible enough to market this product as the pricing mechanism has not been developed due to risk management policies concerning the open position for derivative tools.

With further development of derivative markets in Turkey, DCD transactions are expected to attract more attention among different kind of investors. After all, the independent market variables will lead to more accurate results to explain the volatility in DCD models with respect to the level of increase in the DCD transaction volumes.

3.1.2.2. Other Structured Derivative Instruments

In addition to the Dual Currency Deposit, some of the major banks in Turkey are working on brand new investment tools to create an alternative to the

conventional products. The following products have been announced to the customers by the banks in the middle of 2006. Thus any significant transaction data could not be obtained for these products. On the other hand, a comprehensive risk analysis is made from a customer and a bank perspective, following the general description of these products. Additionally, in the upcoming years, the use of these structured tools are expected to widen in the private banking departments of the banks.

3.1.2.2.1. Range Accrual

It is an instrument in which the customer defines the upper and the lower limit for the spot currency or the exchange rate. The customer earns high interest yield if the exchange rate moves between these limits within maturity. The yield is calculated considering the number of days in which the rates stay within these specified limits.

Customer will not be paid any interest for his deposit for the days that the spot or the exchange rate occurs out of the specified limits. On the other hand, the structure constitutes a %100-deposit protection. The transactions can be carried out for TRY deposit pricing as well as for foreign currency deposit.

In Range Accrual, the customer undertakes the risk of depriving some of the deposit interest at a certain amount. This instrument can be said as ideal for the

customers who want higher return on their deposit taking low level of risks. Range Accrual is usually done in USD, EUR and TRY deposits, USD/TRY, EUR/TRY, EUR/USD exchange rates and maturities from one to six month period.

Table 11. An example of a Range Accrual transaction

Range Accrual	
USD/TRY Reference Market Rate	1,3300
One month USD deposit interest rate	4,75 %
Maximum interest	8,20 %
Maturity	One month
Minimum amount	USD 500.000
The limits that the currency rate moves in	1,3000 – 1,3500
Agreement	The customer deposits 500.000 USD in his account. **Interest** The customer has a right to earn interest at a rate of %8,20 for the number of days that USD/TRY rate moves within the specified limits in one month. If the number of days that USD/TRY is between the limits 1,300-1,3500 is 26, the interest earned is calculated as: 26*8,2*500.000/36500 = 2920,54 USD Deposit (500.000 USD) is under %100 protection. The customer takes back his capital with the interest earned at the end of maturity.

3.1.2.2.2. Double No Touch

It is an instrument in which the customer defines the upper and the lower limit for the spot currency or the exchange rate and the customer earns high interest yield if the spot or the exchange rate moves between these limits within maturity.

Through maturity, if the spot or the exchange rate moves out of the specified limits, the customer loses his chance of gaining an interest income. Also the structure constitutes a %100 deposit protection.

In Double no touch, the customer faces with the risk of losing all his interest income. Compared with Range Accrual, Double No Touch comprises more risk considering the level of volatility in the markets but in return, it will result in a higher yield compared to Range Accrual. But still this instrument may be an alternative for the customers who want to earn higher interest incomes with a relatively lower level of market risk. Double No Touch is usually done in USD, EUR and TRY deposits, USD/TRY, EUR/TRY, EUR/USD exchange rates and maturities from one to six month period.

Table 12. An example of a Double No Touch transaction

Double No Touch	
USD/TRY Reference Market Rate	1,3300
One month USD deposit interest rate	4,75 %
Maximum interest	10 %
Maturity	One month
Minimum amount	USD 500.000
The limits that the currency rate moves in	1,3000 – 1,3500
Agreement	The customer deposits 500.000 USD in his account. **Interest** The customer has a right to earn interest at a rate of %10 if USD/TRY rate moves within the specified limits in one month. If the limits 1,300-1,3500 is exceeded, the customer does not gain any interest for his deposit, just get his capital back at the due date. Deposit (500.000 USD) is under %100 protection. The customer takes back his capital (in case he deserves) with the interest earned at the end of maturity in USD.

3.1.2.2.3. Wedding Cake

In this instrument, the customer defines three upper and lower limits for the spot or the exchange rate and the interest rate varies as each consecutive limit is passed through.

The customer deserves the interest rate with respect to the second level of limits if the spot or the exchange rate moves out of the first upper and lower limits,

similarly, earns the interest for the third level of limits if the second level limits are surpassed. Structure is again under %100 deposit protection.

In Wedding Cake, the customer faces with the risk of losing some part of his interest income. This instrument is fairly suitable for the ones who want to posses higher interest income with lower level of risk. Wedding Cake is usually done in USD, EUR and TRY deposits, USD/TRY, EUR/TRY, EUR/USD exchange rates and with maturities ranging from three to six months.

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Table 13. An example of a Wedding Cake transaction

Wedding Cake	
USD/TRY Reference Market Rate	1,3250
Three month TRY reference deposit interest rate	14 %
Minimum interest	7 %
Maturity	Three month
Minimum amount	TRY 1.000.000
The limits that the currency rate moves in	1.Level 1,3000 – 1,3500 %31 2.Level 1,2950 – 1,3550 %23 3.Level 1,2900 – 1,3650 %14
Agreement	The customer deposits 1.000.000 TRY in his account. **Interest** The customer has a right to earn interest at a rate of %31 if USD/TRY rate moves within 1,300 – 1,3500 for three months. If the first level limit is exceeded, and the rate stays within 1,2950 – 1,3550, the customer earns interest at a rate of %23 for his deposit. If the second level limit is exceeded and the rate stays within 1,2900 – 1,3650, the customer earns interest at a rate of %14 for his deposit. If the third level limit is exceeded, the customer earns an interest at a rate of %7. The best scenario : %31 The worst scenario : %7 Deposit is under %100 protection. The customer takes back his 1.000.000 TRY capital with the interest earned at the end of maturity in TRY.

3.1.2.2.4. Risk Analysis from Bank's Perspective

In the above part of the study, the newly introduced instruments Range Accrual, Double No Touch and Wedding Cake are analyzed and the risks associated with these instruments are presented from an investor stand point.

In this part of the study, the above-mentioned products will be analyzed from a bank's perspective and the potential risk factors associated with these instruments will also be examined.

As explained above, the mentioned products stands on a basis that the customers define some upper and lower limits and as long as the spot or the exchange rate stays within these limits, the customers gain higher interest yield, otherwise they lose their interest yield partially or completely.

3.1.2.2.4. 1. Market Risk

As these products are defined as a kind of option with respect to Banking regulations and the Banking practices, the main market risk is the change in the price of the option's underlying asset as a result of the volatility in the economical factors.

In general for all the above instruments, the high interest rate cost arises for the banks if the spot or the exchange rate moves within the limits through the maturity. On the other hand, the banks in Turkey usually make the contrary transaction with the other foreign banks with the same limits and maturity for an exchange of an option premium. Hence, the option's yield and the cost are said to be hedged against market risk.

However, even though the market risk is eliminated by engaging in a contrary transaction with foreign banks, interest yield and the risk relation is no longer controllable by the issuer bank and becomes fully controllable by the customer and the foreign bank. As a result, the price dependency and marketing risk is expected to arise.

The banks turn out to be the option traders by marketing these instruments through contrary transactions. As they are not the writers of these options, they may face with the risk of not finding the desired options that are demanded by the customers from the market leading to dissatisfaction by the customers. For the sake of the marketing activities, the customer demand and the other bank's option supplies should be closely tracked. Keeping this marketing issue in mind, the local banks should carry out these marketing activities considering the profitability and market conditions and thus would better guide their customers in accordance with the expected market conditions.

3.1.2.2.4.2. Credit Risk

During the marketing stage of these products, appropriate collaterals such as blocking the deposit amount in the foreign currency deposit account is generated by the bank. The probability of customer's not fulfilling his obligation ceases to exist and as a result, customer based credit risk is eliminated. On the other hand, the contrary transaction that is carried out in order to hedge the market risk causes "cost of substitution" risk. Therefore, the

contrary bank's credit worthiness should be taken into consideration during these kinds of transactions.

3.1.2.2.4. 3. Liquidity Risk

Local banks are eliminating the liquidity risk during the marketing of these instruments by the help of the contrary bank transactions. Also, considering that customer's deposit is blocked by the bank, the funding risk in case the contrary bank's default on its payment obligation, is limited to the interest that will be paid to the customer.

3.1.2.2.4. 4. Operational Risk

Due to its complex payment procedure as well as its complex accounting transactions and pricing mechanism, these instruments constitute a higher operational risk compared with the conventional investment tools. Moreover, the inclusion of different departments taking part in pricing and marketing stage of these instruments is another factor that raises the operational risk.

3.1.2.2.4.5. Legal Risk

These products are treated as an over the counter market instrument due to their option based structure and the absence of standardized contract characteristics in general. The customers are signing option contracts with the banks, but due to its non-standardized structure, these contracts may not include all the relevant issues that might arise as a result of any possible dispute.

3.1.2.2.5. 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 New Turkish Lira for long stretches of time, causing foreign currency deposits to yield lower returns than New Turkish Lira (TRY) 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	:12.05.2006
Interest rate	:6% annual (net)
Maturity	:13.06.2006 (32 days)
Forward exc. Rate	:1,458 TRY/USD
Multiplier*	:1,7109

At maturity,

a) if the exchange rate is lower than 1,458 TRY/USD, for example 1,405 TL/USD; then the effective interest rate is calculated as:

(1,458-1,405) /1,405*1,7109 + 6% = 12,05 % p.a.

Value at maturity = USD 1.515.846,58

= TRY 2.129.763

b) if the exchange rate is higher than 1,458 TRY/USD, for example 1,478 TRY/USD; then, the deposit yields more than a TRY time deposit as the forward rate is based on the interest rate differential of USD and TRY, and the investor receives only the 6 % annual interest rate agreed upon initially.

Value at the maturity = USD 1,507,890.41

= TRY 2.228.661

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

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 predetermined forward value, some of the loss is prevented through a higher interest rate.

On the other hand, the most significant drawback 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 TRY or major foreign currencies.

3.1.2.2.6. 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 EUR, 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 1/1/2006

USD/EUR parity = 1,65

Maturity Date : 1/3/2006

USD/EUR parity = 1,72

At maturity, the investor gets EUR 1.720.000- instead of EUR 1.650.000, as he/she deposited either USD 1.000.000- or EUR 1.650.000- at the contract date. If at maturity USD depreciated against EUR, the investor would either receive EUR 1.650.000 or USD worth EUR 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 when sometimes their business may not permit that.

3.1.2.2.7. 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 a profit equal to the level of 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 / 2006

S&P500 value = 442,80

Maturity Date : 23 / 06 / 2007

S&P500 value = 549,71

Net gain = 24.14% annually on USD

b)When the invesior buys a put option

Investment : USD 100.000 on Nikkei 225

Contract Date : 24 / 06 /2006

Nikkei 225 value = 20,766.75

Maturity Date : 23 / 06 / 2007

Nikkei 225 value = 15.265,18*

Net gain = 26,492% annually on USD

* The values of the indexes used above do not reflect the real ones.

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.

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

3.1.2.2.8. 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. The currencies used in "margin trading" include major currencies like Japanese yen (JPY), United States dollars (USD), Euro (EUR), 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 foreign currency purchased, and pays the interest on the sold one. This transaction is carried out every day throughout the period in which the position is held.

*: Foreign exchange term indicating a dealer's purchase commitments in a given currency are offset by sell commitments.

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 50.000

USD/EUR Parity : 1,4720(bid) /1,4725 (ask) at 2:00 p.m.

The investor chooses to buy USD and sell EUR in an amount of USD 1.000.000. The position of the investor is now (+) USD. 1.000.000, (-) EUR 1.472.500.

USD/EUR Parity : 1,4825 (bid) / 1,4830 (ask) at 4:30 p.m.

The investor sells USD and buys EUR. His position is now (-)USD 1.000.000 (-) EUR 1.482.500

Net profit/loss : (+)EUR 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. (Leverage effect)
- The investor can seek advice from the bank, if he/she has not formed expectation regarding parity movements.
- Two quotations (bid and ask) are given for the exchange rate, and the investor choose 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.

3.1.2.2.9. Judgmental Analysis of Structured Products

As foreign currency deposits constitute a large part of the total deposits in Turkey, these instruments were introduced in order to increase the alternative use of these currency deposits at the bank, and to obtain funds.

The demand for these products was low compared to that for conventional instruments, like time deposits or treasury bills. Due to their low level of demand, the banks are acting as an intermediary between the foreign banks and the investors in Turkey. This result stems from Turkish banks' choice of not carrying any open position resulting from a structured derivative transaction. Instead, they reflect their profit expectation to the prices of these instruments. Another characteristic of banks intermediary role is that they do not deal with the pricing mechanisms of these structured products in details. The foreign banks instead carry out the pricing activities and market these instruments to the commercial banks in Turkey. Another significant point, to be mentioned as an obstacle in the increase of transaction volumes, is the insufficiency of marketing studies. As these products are commonly announced by the private banking sections of the banks, they highly concentrate on marketing these special

products to retail customers. Therefore, corporate customers are positioned in secondary priority in marketing activities. As a result, making aware of the corporate customers about the mentioned structured product may facilitate the development of this market in Turkey.

After all, Dual Currency Deposit can be said to be the most commonly used derivative instrument among the Turkish banks from this perspective. Also Margin Trading is considered to be one of the other popular tools since it could potentially yield much higher return than conventional instruments. On the other hand, Range Accrual, Double No Touch and Wedding Cake are expected to be commonly used by the development of the structured derivative market in Turkey.

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 when foreign currencies appreciate in real terms against the TRY, DKEMs provide lower fund costs than ordinary time deposits (as their guaranteed interest rates are lower).

The demand for the other two derivatives; namely MLD and PSM are 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 a close track of the daily economical, financial and political developments in international market: which in turn might seriously augment the information cost for individual investors. In addition, the fact that the maturity of MLD and PSM is not flexible, could have decreased the demand for these products.

Interbank market has benefited from the introduction of these instruments It became more reputable as it has begun to serve customers with non-conventional instruments. Moreover, coupled with a decline in cost of funding and a relative increase in commission fees earned, the market was able to collect more funds.

CHAPTER 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."[20]

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 the 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 ?

3. Do the studies recommend banning or restricting derivatives use?"[18]

[18] Horowitz Donald L., Mackay, Robert J. (October 1995), "Derivatives-State of the Debate"

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 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 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, 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 to actively engage 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.[19] 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.

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.

[19] 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 oversees 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.

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[20] criticizes and compares six important reports[21] 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 behaviour of its users? Are there behavioural risks?",
- "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

[20] Varnholt, Burkhard, (1996), "Six Recent Reports on Financial Derivatives: A Critical Appraisal",

[21] 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)

- "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, some predictions can be made 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. It can be forecasted that 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. Thus, it is predicted 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.

CHAPTER 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 the background of the Turkish financial system is considered, it is seen 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.

5.1. Current Situation

Comments provided below reflect the existing situation of the financial and the related derivative markets in Turkey:

- The derivative transaction volumes had increased remarkably with the change in the currency regime to floating. Moreover, with the increase in the use of foreign currency options in the interbank market, the transaction volumes had reached to higher levels,
- Even though the forward transactions are executed mainly between the banks and the internal customers, the options volume are mainly composed of the transactions between the banks and the foreign counterparty,
- Forward transactions executed between the banks and the customers are evenly distributed in Euro and USD. Consistent with the foreign trade characteristics of the country, the option transactions, on the other hand, have occurred only in USD terms,
- Majority of the derivative transactions realized have a maturity of less than one year,
- The transactions based on the interest instruments are considerably lower in volumes than those in foreign currency.

5.2. Development Dependencies

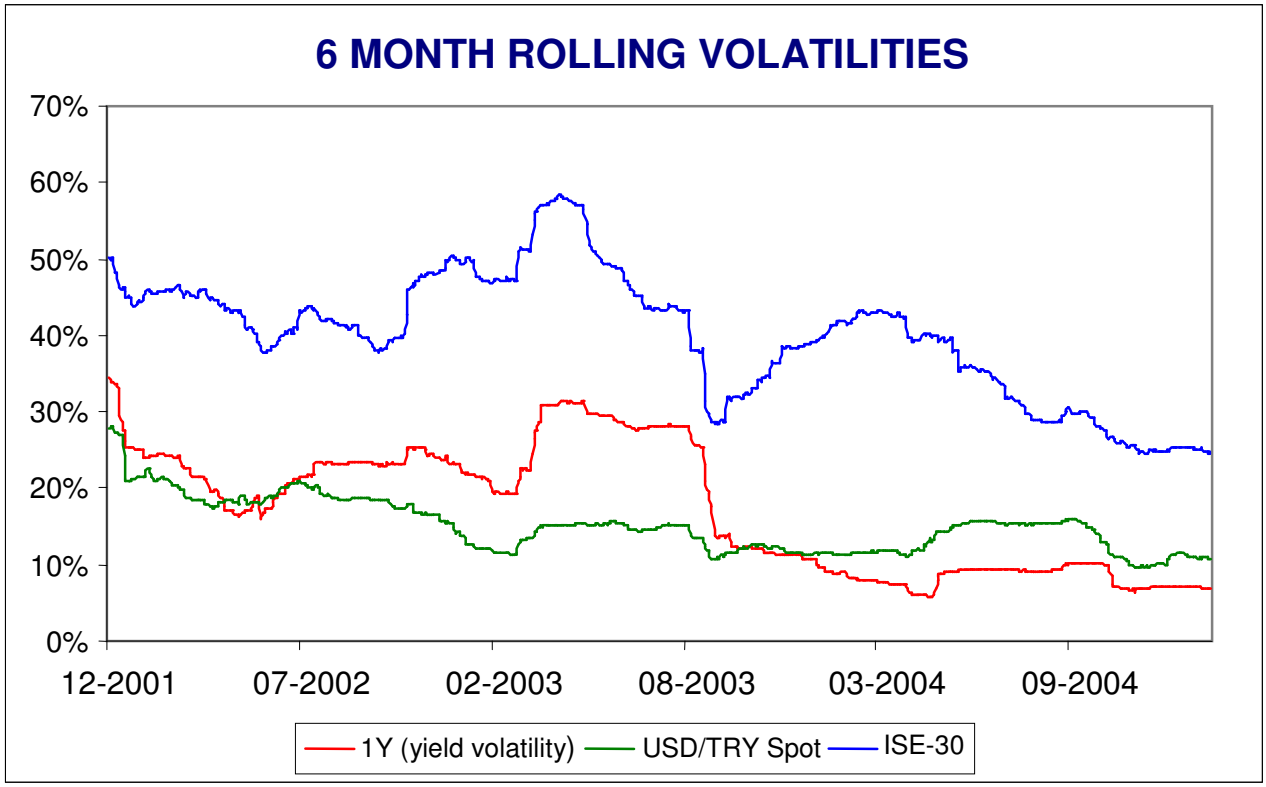
The potential of the development of the derivate markets depends on the issues such that,

- If the interest rates keep declining, the demand for the currency forwards and options will expected to increase and the buy-sell ratio of the realized transactions will be balanced accordingly,
- Again with the decrease in the interest rates, the forward price of the related security will approach to its spot price, so the risk perception of the firms which are using derivative instruments for hedging purposes and their hedging need will supposedly increase,
- The settlement of the Turkish Derivative Exchange (VOB) and its full attainability from the other parts of the country is a remarkable improvement for the development of the market,
- By the help of the increase in the maturity of the efficiency curve and the development of the longer termed credit market in terms of domestic currency, the derivatives on interest will be expected to increase accordingly, also in conjunction with this development, the markets of forward interest rate agreements, interest swaps and the interest options will also be expected to progress further and the possibility of executing longer termed foreign currency transactions may occur,

- TRLIBOR interest rates' becoming an effective indicator interest rate has removed the difficulties in the improvement of the forward rate agreement and interest swap markets,

5.3. Opportunities in Derivatives

Normalization in the market dynamics played and will continue to play an important role in the development of derivatives markets. For the last three years, volatilities declined in the major markets. This is a good sign in terms of normalization.



5.3.1. Opportunities for Financial Institutions

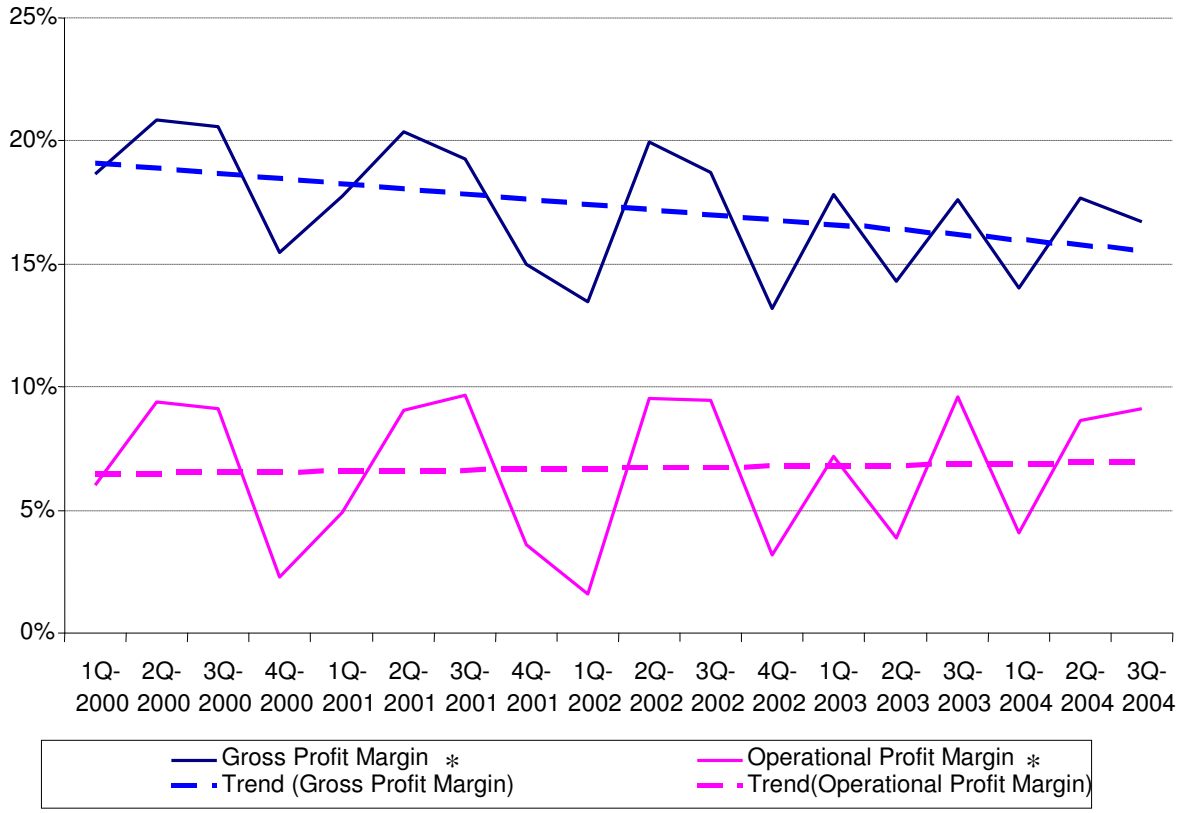
- Turkish banks carry dual currency Balance Sheets . Therefore, development of derivatives market is crucial for risk management.
- Interest rate derivatives provide an indispensable tool pack for interest rate risk management in financial institutions. The current financial structure of Turkish Banking Sector displays an imbalance between assets and liabilities in terms of maturity.
- On the liabilities side, short-term TRY and FCY deposits occupy a considerable share due to the substantial weight of less-than-three-month deposits.
- Even if the maturity of deposits can be extended, it is unlikely to improve beyond 1 year. Hence, maturity gap will remain.
- Development of derivatives markets will eliminate an important source of fragility and vulnerability to rises in interest rates.
- It will also be crucial to have instruments to hedge maturity gap risk in TRY balance sheet. Naturally, management of the risk arising from maturity differential is extremely difficult without derivatives.
- Proliferation of interest rate derivatives can contribute to reductions in hedging costs. Hence, improvement in Profit and Loss predictability and attaining sustainable ROE figures will follow.
- Currency derivatives, on the other hand, can help financial institutions offer their customers a diverse set of products with different risk levels

and yields, which will have important implications on currency substitution.

5.3.2.Opportunities for Corporates

Margins are lower now as inflation eased. However increasing productivity, cheaper capital and flexibility in labour market achieved; have kept margins still sustainable.

ISE-100 INDUSTRIAL COMPANIES



*: Gross Profit Margin includes the profit ratio incurred considering all the facilities performed by an institution, including the marketing, managerial, operational, whereas operational profit margin indicates the profitability of the firm in terms of operational activities.

- Lower margins require more careful risk management practice in non-operational activities ("other income") in order to maintain certain levels of ROEs.
- A proper risk management framework for corporates should be in three dimensions; commodity risk, financial risk, credit risk. Here, derivatives will serve as hedging tools for corporates.
- Developed derivatives markets and/or financially-engineered tailored-made products will offer solutions for the above listed risks.
- Economic stability will also open new doors to corporates in capital markets for their financing needs; debt instruments, equity financing and structured instruments are few to mention.
- As the effect of "crowding out" lessens and real interest rates fall, market will have an appetite for corporate credit risk. Thus, corporates with prudent risk management practices will benefit in two ways:
    - They will be able to borrow at lower rates, longer maturities and bigger sizes due to perceived low risk profile,
    - This will feed into higher ROE levels, thus creating shareholder value.

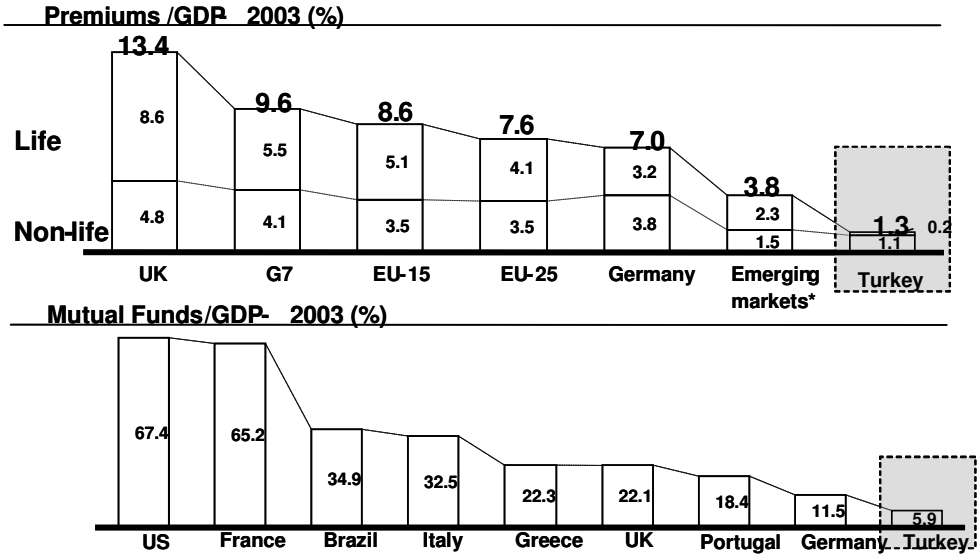
5.3.3. Opportunities for Retails

- As markets evolve, individuals will have many alternatives for their investment and financing needs.

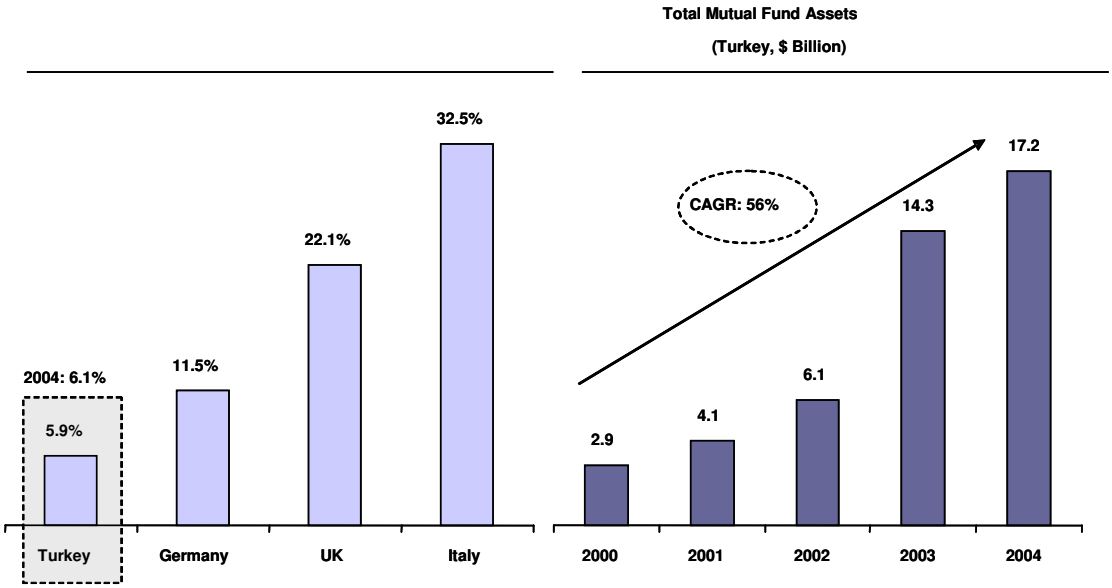
- There will be a proliferation of investment and financing products with particular emphasis on mortgage banking and other long term financing instruments.
- In search for ultra-high nominal and real returns, which are no longer available, individual investors will realize (for the first time) the merits of asset and risk diversification.

Besides, the existing situation as well as possible future course of other investment instruments offered for retails including insurance, mutual funds can be stated as follows:

- Insurance and asset management are underpenetrated in Turkey as it can be seen from the figures below.

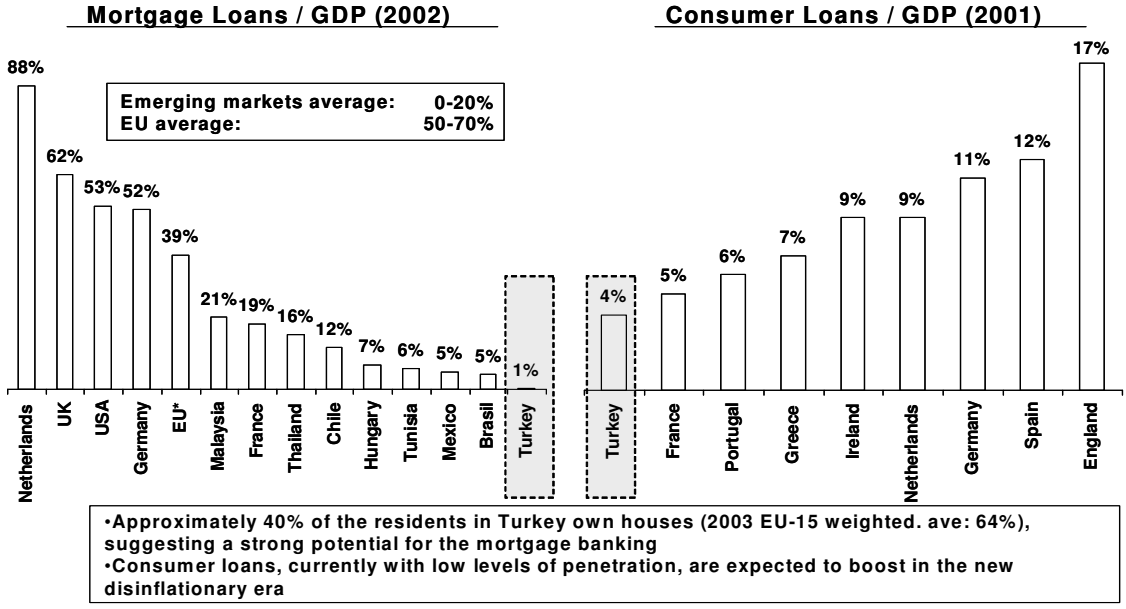


- Having rapidly taken off, mutual funds are expected to be one of the products with high potential for retails .



Source: Worldwide Mutual Fund Assets & Flows ICI 2003
* CAGR: cumulative average growth rate

- Finally, Retails will benefit from the new products to be introduced in the low inflation era. Mortgage loans and consumer loans will also catalyse the expected growth in banking system.



* 2001 data, Turkey data updated as of September 2004, Source: European Mortgage Federation, World Bank

5.4. Main Problems

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

1. Instability of the Turkish Economy

Turkish economy is still said to be volatile, due to the fact that insignificant economic and political events may have the ability of affecting interest rates and

currency prices. 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 by the public. In the United States, commodity derivatives were first developed almost 150 years ago. Currency derivatives,on the other hand, were first traded 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 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 is limited somehow in Turkey. The establishment of the Turkish Derivative Exchange (Turk Dex) on Februbary 2005 is a major contribution to facilitate the development of the derivative markets in Turkey. However, due to its short operating period, TurkDex has not reached the desired trade volumes for the instruments that is

serving at the moment, and there is still room for reaching an efficient derivative market in Turkey.

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. Also the required accounting standards are not sufficiently realized by the corporate firms, which are supposed to use the forward transactions for hedging purposes. This is one of the other explanation for the low usage rate of derivate tools among corporate customers.

4. Transparency and Legal Infrastructure

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 thus, will improve the reputation of the participants as well.

5. Other Problems

- The banks' technical infrastructures are not sufficient enough to handle the transactions that have to be executed.
- The banks are lacking in educated staff to fulfil the needs of both the high level management in the bank and the customers in informing about the kinds of derivative tools and the ways of implementing these tools.
- Due to higher volatility rates in the instruments related with the forward transactions, the collateral amounts are much higher compared with the developed countries.
- The standard of legal basement has not been established for the transactions occurred in the market.
- The interbank market has a lower liquidity than expected.
- Long termed reference government securities do not exist in the market in order to be used in the forward interest rate agreements.
- Derivative instruments are not used just for hedging needs also for speculative purposes and this fact had proved that this instruments might lead to great losses such as the ones in Barings, Orange County, Procter & Gamble cases. Due to this reason, the firms that aims to actively contribute to the derivative market should have established internal control systems and this is one of the most important key factors to transact securely in the market.

5.5. Area for Improvements in Turkish Derivative Market

The main suggestions for the improvement of the derivative markets can be classified as follows:

- Legal
    - The financial institutions should act parallel with the proposals offered by the Capital Markets Board of Turkey.
    - Document standardization should take place such that the International Swaps and Derivatives Association Master Agreement needs to be customized in order to comply with Turkish Law.
- Taxation
    - The flat tax for all securities income should be tracked whether it is applied accordingly.
- Risk Management
    - Proper systems for market risk management and credit risk management should be established among the participant banks and the firms in the market
    - Counterparty and operational risk management systems should work in synch in order to prevent any kind of both customer and staff fraud activities.
- Operations Management
    - Technological system set-up should be constructed adequately to handle the transactional activities occurred.

- Considering the fact that human capital for the participants of the derivative market is a crucial factor to act efficiently, necessary educational background should be provided to cope with the needs.

- Marketing
  - Banks should re-organize their sales and marketing forces with a focus on the new instruments, considering the fact that the newly structured derivative products can only be efficiently traded in case they become one of the key components of marketing strategies.

- Standardization in Accounting
  - The firms should comply with the international accounting standards keeping in mind that only one third of the ISE quoted (Istanbul Stock Exchange) companies publicize the IAS statements.
  - In terms of derivatives accounting, standardization is needed especially for corporates.
    - The ones quoted at ISE: Booking with respect to CMB rules, i.e. Off Balance Sheet booking, compulsory Market-to- Market valuation (intrinsic or real value) in commercial Balance Sheet, taxation upon Profit and Loss realization.
    - The ones non-quoted at ISE: Booking with respect to Turkish Tax Rules, ie. Off Balance Sheet booking, optional

Market-to-Market valuation in commercial Balance Sheet, taxation upon Profit and Loss realization.

CHAPTER 6
CONCLUSION

As previously stated, today, the most important factors preventing the growth of derivatives markets and hedging techniques in Turkey include, lack of knowledge, experience, financial infrastructure, proper accounting standards, as well as the lack of relative stability in 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.

The presence of OTC currency products has important positive effects on the learning process about derivatives. As OTC instruments become more commonly used, the expertise of both investors and portfolio managers are expected to improve. However, it should also be emphasized that mostly, 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 to deal with accounting problems arising from the use of these instruments, which, in turn, prevent their further participation in derivatives contracts. Thus, 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 diligently.

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 and implemented rapidly, the number of OTC products offered will increase, which will contribute to the development of such markets in Turkey.

On the other hand, there are some new derivative instruments such as the dual currency deposits, range accruals, double no touch, wedding cake, DKEM, PSM, MLD and margin trading, which are gradually becoming the alternative investment and hedging tools for both the retail and corporate customers. Among those tools, dual currency deposit is more popular than the other ones and has been in use for about three years in Turkey. An empirical analysis investigating the impact of the selected alternative instruments on DCD volume, namely; US Dollar and Euro, TRLIBOR and stock index are conducted. The findings indicate that the selected independent variables explain the volatility in the DCD transaction volume to some degree but the level of identified volatility does not turn out to be adequate to reach concrete conclusions. This result may be adhered to the insufficiency of the DCD transaction volumes in 2005 and 2006. The total DCD transaction volumes in these two years are only about 900 million USD. On the other hand, it can be stated that with the further progression of the derivative markets and

especially including the corporate and retail investors, the regression model is supposed to explain a higher percentages of volatility in DCD volumes.

The policy recommendations for the development of not only currency but also other derivative markets in Turkey can be summarized 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 early development. The abnormal growth of banks and non-bank intermediaries or sudden abolishment of these institutions creates 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

proficiency 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".

REFERENCES

Aksel Eyüboğlu, Ayşe H., (2002), *Risk Yönetim Aracı Olarak Futures Piyasaları, Yapısı, İşleyiş Mekanizmaları ve Bazı Ülke Örnekleri,* Sermaye Piyasası Kurulu Yayın No:21.

Arditti, Fred, (1996), *Derivatives -A Comprehensive Resource For Options, Futures, Interest Rate Swaps and Mortgage Securities,* Harvard Business School Press.

Banks , Erik, (2001), *Credit Risk of Complex Derivatives.*

Briggs, W. Peter, (1987), *Foreign Currency Exposure Management,* London Butterworths.

Claessens, Stijn, (2002), *Risk Management in Developing Countries,* World Bank Technical Paper Number 235.

Derose, F. David, (1992), *Options on Foreign Exchange,* An Institutional Investor Publication.

Eckett, Stephen, (1996), "A Guide to Derivatives".

Fabozzi, Frank J., Modigliani, Franco, Ferri, Michael G, (1994), *Foundations of Financial Markets and Institutions,* Prentice-Hall International Editions.

Gibson, Rayna, Zimmermann, Heinz, (December 2002), "The Benefits and Risks of Derivative Instruments".

Güven, Vedat, (1994), *TRL Bacaklı Döviz Gelecek Kontratları ve Borsası,* Türkiye Bankalar Birliği Yayınları, Yayın No: 183.

Horowitz, Donald L., Mackay, Robert J., (October 2003), "Derivatives-State of the Debate".

Müminoğlu, Miray, (1994), *Yeni Mali Ürünler ve Türkiye'de Uygulaması İçin Gerekli Düzenlemeler,* Türkiye Bankalar Birliği.

Ogden, Joan, "Tree Falling Derivatives Prices", *Global Finance (July 1996),* Vol. 10, Number 7, pp. 23-28.

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

Peltz, Michael, (1994), "Days Of Futures Past?", Institutional Investor (June 1994).

Smithson, Charles W., Smith, W. Clifford, Wilford, D. Sykes, (2003), *Managing Financial Risk - A Guide to Derivative Products, Financial Engineering, and Value Maximization,* Irwin Professional Publishing.

Sümer, Serdar, (Kasım 2005), *Düşen Enflasyon ile birlikte ortaya çıkan yeni arayışlar: Opsiyonlu mevduat*, Active Dergisi No:45

Vadeli İşlemler Piyasası Müdürlüğü, (Haziran 1995), *Türev Piyasa Araştırmaları Serisi No:1 ve No:3,* IMKB Yayınları.

Varnholt, Burkhard, (1996), "Six Recent Reports on Financial Derivatives: A Critical Appraisal".

W. Kolb, Robert, (2002), *Futures, Options and Swaps,* Blackwell Publishers.

Wilmot, Tom, (1985), *Inside The OTC Market,* Woodhead-Faulkner Publications.

Yaşar, Erhan, (October 2002), *Present Day Trends and Issues in Turkish Banking,* The Banks Association of Turkey.

Yılmaz, Mustafa K., (Aralık 1995), *Menkul Kıymetler Piyasasında Vadeli işlemler ve Opsiyonlar Kullanılarak Oluşturulan Bazı Temel Stratejiler,* IMKB Yayınları.

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

Zhang, Peter, (1995), *Barings Bankruptcy and Financial Derivatives,* World Scientific Publishing.

A Glossary of Exotic Options, BNP Publications (2002).

Informative Interbank Brochures about DKEM, MLD, Margin Trading and PSM.

Introduction to The Financial Markets, DC Gardner Workbook 2001.

Managing Currency Exposure- Currency Options, Citibank Publications-2004.

The International Options Market, Sponsored supplement to Euromoney, Banker's Trust Company Publications (2002).

Treasury Risk Management, DC Gardner Publication 2001.

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% pa., 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

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.

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 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. Ouanto 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 kinds 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 instalments. Both the payment dates and the periodic instalments are designated at the time of the transaction. The buyer of the option has the right

to stop paying the instalments. However, the option ceases to exist if the instalments 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 instalments are paid, the option will cost more than a standard option with similar specifications (i.e. same strike and maturity). Instalments 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 instalments. 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 instalments 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= whichever is greater. l)the underlying asset price at the time of the "shout" minus the strike, or 2) zero.

B= whichever is greater: l)the underlying asset price at the time of the "shout" 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 vent 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 customised 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 those 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.

APPENDIX C : DCD AND OTHER MARKET VARIABLES DATA SET

DATE	TOTAL VOLUME	USD Currency Rate	EUR Currency Rate	TRLIBOR	STOCK EXCHANGE INDEX
03.01.2005	4.070.076	1,3363	1,8233	19,86	25445
04.01.2005	4.070.076	1,3383	1,8105	19,93	25042
05.01.2005	4.070.076	1,3427	1,7976	19,89	24423
06.01.2005	4.070.076	1,3775	1,8249	19,81	24562
07.01.2005	5.728.076	1,4000	1,8460	19,80	25308
10.01.2005	10.963.523	1,3723	1,8135	19,80	25605
11.01.2005	18.263.523	1,3822	1,8108	18,75	26110
12.01.2005	18.263.523	1,3737	1,8065	18,86	26271
13.01.2005	18.263.523	1,3732	1,7998	18,83	26493
14.01.2005	18.263.523	1,3500	1,7866	18,88	26363
17.01.2005	18.263.523	1,3496	1,7692	18,78	26863
18.01.2005	18.263.523	1,3317	1,7452	18,74	26813
19.01.2005	18.263.523	1,3364	1,7431	18,74	26918
24.01.2005	18.263.523	1,3364	1,7431	19,12	26469
25.01.2005	18.263.523	1,3341	1,7447	19,03	26860
26.01.2005	18.263.523	1,3270	1,7318	18,70	27056
27.01.2005	18.263.523	1,3267	1,7259	18,72	27303
28.01.2005	18.263.523	1,3340	1,7416	18,69	27074
31.01.2005	18.263.523	1,3287	1,7320	18,74	27330
01.02.2005	18.263.523	1,3295	1,7297	18,75	27850
02.02.2005	18.263.523	1,3252	1,7268	18,72	27937
03.02.2005	14.193.447	1,3203	1,7261	18,73	27555
04.02.2005	14.193.447	1,3166	1,7140	18,83	27813
07.02.2005	14.193.447	1,3114	1,7005	18,85	28202
08.02.2005	14.193.447	1,3093	1,6821	18,78	28270
09.02.2005	12.535.447	1,3230	1,6874	18,06	27528
10.02.2005	7.300.000	1,3220	1,6896	18,06	27309
11.02.2005	5.000.000	1,3327	1,7052	18,06	27736
14.02.2005	5.000.000	1,3165	1,6938	17,94	28004
15.02.2005	5.000.000	1,3089	1,6977	17,97	28164
16.02.2005	5.000.000	1,3051	1,6950	18,23	27662
17.02.2005	5.000.000	1,3063	1,7017	18,24	27000
18.02.2005	5.000.000	1,3050	1,7038	18,23	27293
21.02.2005	5.000.000	1,3000	1,6965	18,32	26864
22.02.2005	5.000.000	1,3016	1,7000	18,73	26657
23.02.2005	5.000.000	1,2927	1,7061	18,67	26921
24.02.2005	5.000.000	1,2980	1,7149	18,52	27355
25.02.2005	5.000.000	1,2905	1,7102	18,41	28031
28.02.2005	5.000.000	1,2885	1,6985	18,56	28396
01.03.2005	5.000.000	1,2785	1,6949	18,56	27768
02.03.2005	5.000.000	1,2768	1,6861	18,62	27226
03.03.2005	5.900.000	1,2772	1,6758	18,58	27559
04.03.2005	5.900.000	1,2710	1,6712	18,65	27663
07.03.2005	7.990.000	1,2699	1,6657	18,60	27790
08.03.2005	7.990.000	1,2541	1,6566	18,58	27698
09.03.2005	7.990.000	1,2585	1,6668	17,42	27746

DATE	TOTAL VOLUME	USD Currency Rate	EUR Currency Rate	TRLIBOR	STOCK EXCHANGE INDEX
10.03.2005	7.990.000	1,2590	1,6833	16,99	27520
11.03.2005	9.064.531	1,2747	1,7113	16,96	27573
14.03.2005	4.064.531	1,2590	1,6894	17,01	26937
15.03.2005	4.064.531	1,2760	1,7105	16,99	26547
16.03.2005	9.706.531	1,2869	1,7212	16,99	25332
17.03.2005	9.706.531	1,3224	1,7676	16,94	24476
18.03.2005	9.706.531	1,3174	1,7637	16,76	25349
21.03.2005	7.616.531	1,3101	1,7444	16,75	24637
22.03.2005	9.716.531	1,3297	1,7562	16,76	25218
23.03.2005	9.716.531	1,3290	1,7517	16,67	24439
24.03.2005	9.716.531	1,3580	1,7720	16,65	25068
25.03.2005	9.716.531	1,3483	1,7522	16,73	25503
28.03.2005	9.716.531	1,3457	1,7439	16,83	24842
29.03.2005	9.716.531	1,3574	1,7537	16,73	24480
30.03.2005	9.716.531	1,3838	1,7899	16,77	24601
31.03.2005	9.716.531	1,3706	1,7757	16,73	25558
01.04.2005	9.716.531	1,3462	1,7439	16,83	25741
04.04.2005	9.716.531	1,3429	1,7411	16,73	25445
05.04.2005	8.816.531	1,3600	1,7530	16,74	25683
06.04.2005	8.816.531	1,3644	1,7489	16,80	26057
07.04.2005	8.816.531	1,3447	1,7322	16,74	25831
08.04.2005	8.816.531	1,3356	1,7248	16,85	25786
11.04.2005	8.816.531	1,3455	1,7262	16,28	25370
12.04.2005	8.816.531	1,3408	1,7378	16,26	25078
13.04.2005	7.742.000	1,3376	1,7369	16,30	25293
14.04.2005	7.742.000	1,3358	1,7284	16,27	24542
15.04.2005	11.862.840	1,3500	1,7354	16,15	23853
18.04.2005	20.220.840	1,3723	1,7631	16,23	23286
19.04.2005	20.220.840	1,3720	1,7799	16,23	24144
20.04.2005	20.220.840	1,3689	1,7808	16,23	24176
21.04.2005	20.220.840	1,3547	1,7669	16,16	24419
22.04.2005	20.320.840	1,3554	1,7728	16,19	24731
25.04.2005	20.320.840	1,3499	1,7640	16,13	24798
26.04.2005	20.320.840	1,3565	1,7616	16,15	24484
27.04.2005	20.320.840	1,3550	1,7597	16,21	24070
28.04.2005	20.320.840	1,3626	1,7611	16,18	23520
29.04.2005	20.320.840	1,3730	1,7737	16,16	23592
02.05.2005	20.320.840	1,3844	1,7942	16,12	24253
03.05.2005	20.320.840	1,3788	1,7737	16,18	24138
04.05.2005	20.320.840	1,3665	1,7573	16,13	24560
05.05.2005	20.320.840	1,3429	1,7388	16,18	25100
06.05.2005	20.320.840	1,3363	1,7325	16,18	24951
09.05.2005	20.320.840	1,3422	1,7386	16,18	24702
10.05.2005	20.320.840	1,3501	1,7317	16,00	24688
11.05.2005	20.320.840	1,3555	1,7407	16,14	24663
12.05.2005	24.289.122	1,3645	1,7584	16,11	25114
13.05.2005	27.510.815	1,3527	1,7269	15,96	25326
16.05.2005	27.510.815	1,3612	1,7218	15,89	24921

DATE	TOTAL VOLUME	USD Currency Rate	EUR Currency Rate	TRLIBOR	STOCK EXCHANGE INDEX
17.05.2005	23.389.974	1,3760	1,7353	15,84	24846
18.05.2005	9.389.974	1,3751	1,7375	15,84	25206
20.05.2005	9.389.974	1,3708	1,7297	16,18	25465
23.05.2005	7.189.974	1,3564	1,7132	16,15	24329
24.05.2005	7.189.974	1,3823	1,7351	16,19	24141
25.05.2005	9.843.610	1,3772	1,7345	16,09	24120
26.05.2005	9.843.610	1,3806	1,7359	16,03	24054
27.05.2005	9.843.610	1,3778	1,7286	16,01	24453
30.05.2005	9.843.610	1,3691	1,7166	16,07	24978
31.05.2005	13.363.610	1,3656	1,7077	16,17	25236
01.06.2005	13.363.610	1,3550	1,6742	16,20	25231
02.06.2005	16.363.610	1,3595	1,6668	16,20	25799
03.06.2005	17.599.133	1,3436	1,6483	16,16	26052
06.06.2005	17.599.133	1,3554	1,6654	15,99	25533
07.06.2005	17.599.133	1,3605	1,6693	15,96	25478
08.06.2005	17.599.133	1,3536	1,6642	15,94	25780
09.06.2005	17.599.133	1,3610	1,6769	15,63	25500
10.06.2005	19.009.154	1,3559	1,6589	15,97	25725
13.06.2005	19.009.154	1,3523	1,6537	15,94	25610
14.06.2005	22.076.101	1,3721	1,6550	15,92	25930
15.06.2005	22.076.101	1,3638	1,6540	15,63	26209
16.06.2005	22.076.101	1,3728	1,6546	15,68	26580
17.06.2005	22.576.101	1,3602	1,6469	15,68	26529
20.06.2005	23.801.101	1,3528	1,6445	15,67	26709
21.06.2005	21.940.335	1,3527	1,6528	15,70	26746
22.06.2005	21.940.335	1,3583	1,6434	15,68	26779
23.06.2005	26.940.335	1,3481	1,6377	15,67	27022
24.06.2005	26.915.335	1,3498	1,6316	15,50	27033
27.06.2005	26.915.335	1,3466	1,6253	15,59	26598
28.06.2005	24.231.007	1,3448	1,6361	15,47	26811
29.06.2005	24.231.007	1,3429	1,6262	15,51	27136
30.06.2005	15.414.007	1,3413	1,6167	15,57	26957
01.07.2005	47.070.759	1,3337	1,6100	15,71	27617
04.07.2005	47.070.759	1,3304	1,6065	15,72	27702
05.07.2005	43.526.360	1,3369	1,5927	15,83	27378
06.07.2005	43.526.360	1,3399	1,5940	15,69	27781
07.07.2005	42.677.360	1,3433	1,6009	15,61	27690
08.07.2005	14.685.607	1,3550	1,6227	15,74	27842
11.07.2005	6.612.612	1,3434	1,5998	15,62	27808
12.07.2005	6.587.338	1,3361	1,6040	15,63	27689
13.07.2005	6.587.338	1,3315	1,6212	15,58	28062
14.07.2005	6.588.838	1,3255	1,6151	15,59	28501
15.07.2005	18.588.838	1,3284	1,6047	15,60	28427
18.07.2005	18.590.338	1,3223	1,6006	15,63	28403
19.07.2005	20.099.509	1,3270	1,6014	15,60	28675
20.07.2005	20.099.509	1,3277	1,5915	15,58	28713
21.07.2005	20.100.509	1,3255	1,6008	15,56	28992
22.07.2005	15.100.509	1,3201	1,6076	15,54	29188

DATE	TOTAL VOLUME	USD Currency Rate	EUR Currency Rate	TRLIBOR	STOCK EXCHANGE INDEX
25.07.2005	15.100.509	1,3201	1,6061	15,37	29273
26.07.2005	15.106.782	1,3322	1,6068	15,27	28731
27.07.2005	15.106.782	1,3410	1,6108	15,22	29165
28.07.2005	15.107.782	1,3366	1,6028	15,15	29343
29.07.2005	15.107.782	1,3307	1,6060	15,25	29615
01.08.2005	9.339.315	1,3212	1,5988	15,27	29777
02.08.2005	9.339.315	1,3152	1,6068	15,27	29543
03.08.2005	9.339.315	1,3181	1,6105	15,29	29727
04.08.2005	11.640.028	1,3127	1,6123	15,31	30124
05.08.2005	11.640.028	1,3089	1,6128	15,29	29945
08.08.2005	11.640.028	1,3079	1,6187	15,34	29925
09.08.2005	11.640.028	1,3125	1,6242	15,38	29701
10.08.2005	24.933.246	1,3176	1,6303	15,40	29683
11.08.2005	24.934.746	1,3128	1,6270	15,45	29112
12.08.2005	24.934.746	1,3186	1,6371	15,41	28176
15.08.2005	25.542.978	1,3370	1,6676	15,45	28075
16.08.2005	22.371.974	1,3486	1,6706	15,40	28258
17.08.2005	7.371.974	1,3404	1,6537	15,42	27906
18.08.2005	5.072.761	1,3586	1,6700	15,39	28000
19.08.2005	9.348.232	1,3606	1,6653	15,52	28457
22.08.2005	8.728.232	1,3676	1,6639	15,52	28951
23.08.2005	8.728.232	1,3612	1,6602	15,49	29192
24.08.2005	39.029.023	1,3531	1,6555	15,48	29372
25.08.2005	39.029.023	1,3649	1,6654	15,44	29814
26.08.2005	39.029.023	1,3645	1,6781	15,46	30020
29.08.2005	39.029.023	1,3530	1,6665	15,54	30015
31.08.2005	8.728.232	1,3508	1,6627	15,55	30908
01.09.2005	11.325.232	1,3473	1,6445	15,61	31948
02.09.2005	11.325.232	1,3344	1,6514	15,55	31702
05.09.2005	11.325.232	1,3325	1,6728	15,53	31879
06.09.2005	11.325.232	1,3290	1,6674	15,61	31833
07.09.2005	11.325.232	1,3273	1,6553	15,59	31385
08.09.2005	11.325.232	1,3262	1,6558	15,63	31485
09.09.2005	11.948.867	1,3293	1,6515	15,71	32203
12.09.2005	16.146.250	1,3255	1,6451	15,62	32711
13.09.2005	16.146.250	1,3305	1,6389	15,56	32541
14.09.2005	16.146.250	1,3292	1,6326	15,92	32632
15.09.2005	14.918.018	1,3348	1,6403	15,68	33271
16.09.2005	17.248.132	1,3345	1,6311	15,55	33294
19.09.2005	17.228.004	1,3330	1,6347	15,54	33221
20.09.2005	10.728.004	1,3393	1,6255	15,60	33719
21.09.2005	10.728.004	1,3340	1,6217	15,53	33864
22.09.2005	13.113.702	1,3346	1,6301	15,48	33466
23.09.2005	12.490.352	1,3311	1,6268	15,54	33250
26.09.2005	11.268.096	1,3360	1,6195	15,56	33516
27.09.2005	11.268.096	1,3423	1,6171	15,52	33319
28.09.2005	11.268.096	1,3376	1,6081	15,63	32745
29.09.2005	8.882.398	1,3436	1,6156	15,84	33396

DATE	TOTAL VOLUME	USD Currency Rate	EUR Currency Rate	TRLIBOR	STOCK EXCHANGE INDEX
30.09.2005	8.417.398	1,3406	1,6161	15,78	33333
03.10.2005	4.043.398	1,3422	1,6154	15,84	34301
04.10.2005	11.335.398	1,3558	1,6184	15,56	35625
05.10.2005	11.335.398	1,3368	1,5943	15,47	34776
06.10.2005	11.335.398	1,3445	1,6072	15,33	33510
07.10.2005	12.775.493	1,3513	1,6296	15,46	33414
10.10.2005	13.275.493	1,3463	1,6364	15,38	33506
11.10.2005	12.715.493	1,3368	1,6211	15,22	34040
12.10.2005	14.215.493	1,3412	1,6133	15,21	33118
13.10.2005	14.215.493	1,3479	1,6168	15,13	32054
14.10.2005	14.215.493	1,3613	1,6307	15,11	31440
17.10.2005	14.215.493	1,3644	1,6381	15,11	31851
18.10.2005	14.194.271	1,3546	1,6325	15,17	31587
19.10.2005	14.194.271	1,3560	1,6218	15,15	30767
20.10.2005	14.194.271	1,3649	1,6291	15,10	31404
21.10.2005	15.194.271	1,3592	1,6265	15,13	31429
24.10.2005	15.194.271	1,3573	1,6326	15,13	31846
25.10.2005	15.194.271	1,3574	1,6211	15,14	31670
26.10.2005	15.194.271	1,3548	1,6274	15,13	31474
27.10.2005	23.355.114	1,3479	1,6274	15,11	31273
28.10.2005	22.355.114	1,3473	1,6345	15,11	31039
31.10.2005	22.355.114	1,3473	1,6345	15,06	31964
01.11.2005	16.096.114	1,3417	1,6175	15,08	32792
02.11.2005	21.902.710	1,3433	1,6129	15,08	33152
07.11.2005	4.995.176	1,3433	1,6129	15,08	33830
08.11.2005	4.995.176	1,3554	1,6014	15,01	33749
09.11.2005	4.995.176	1,3584	1,5940	14,84	33848
10.11.2005	4.495.176	1,3546	1,5928	14,81	34710
11.11.2005	4.495.176	1,3579	1,5989	14,77	34096
14.11.2005	4.495.176	1,3577	1,5884	14,76	34172
15.11.2005	4.495.176	1,3552	1,5904	14,71	34324
16.11.2005	7.642.983	1,3565	1,5844	14,74	34867
17.11.2005	6.642.983	1,3520	1,5820	14,75	35127
18.11.2005	17.817.637	1,3526	1,5804	14,76	35314
21.11.2005	6.727.884	1,3644	1,5939	14,71	35655
22.11.2005	8.197.884	1,3588	1,6059	14,54	35254
23.11.2005	10.030.006	1,3611	1,5937	14,55	36179
24.11.2005	10.030.006	1,3530	1,5960	14,59	36908
25.11.2005	10.030.006	1,3519	1,5951	14,50	36760
28.11.2005	19.912.315	1,3510	1,5884	14,55	36621
29.11.2005	18.912.315	1,3552	1,5863	14,51	37495
30.11.2005	8.197.884	1,3497	1,5947	14,43	38089
01.12.2005	7.013.884	1,3500	1,5900	14,54	38297
02.12.2005	7.013.884	1,3505	1,5898	14,51	38574
05.12.2005	7.013.884	1,3527	1,5838	14,41	39131
06.12.2005	7.013.884	1,3515	1,5847	14,51	38918
07.12.2005	8.229.078	1,3486	1,5886	14,66	38442
08.12.2005	8.229.078	1,3497	1,5834	14,63	38588

DATE	TOTAL VOLUME	USD Currency Rate	EUR Currency Rate	TRLIBOR	STOCK EXCHANGE INDEX
09.12.2005	8.229.078	1,3510	1,5903	14,53	37496
12.12.2005	7.229.078	1,3497	1,5918	14,57	38202
13.12.2005	7.229.078	1,3473	1,6022	14,54	37742
14.12.2005	8.399.969	1,3420	1,6001	14,52	37871
15.12.2005	8.399.969	1,3370	1,6079	14,45	37632
16.12.2005	5.252.162	1,3410	1,6110	14,48	37717
19.12.2005	4.564.047	1,3439	1,6123	14,39	37960
20.12.2005	4.564.047	1,3424	1,6118	14,45	37729
21.12.2005	4.564.047	1,3428	1,6079	14,38	38210
22.12.2005	3.348.854	1,3448	1,5976	14,41	38353
23.12.2005	3.348.854	1,3463	1,5919	14,38	38920
26.12.2005	3.348.854	1,3435	1,5943	14,32	39139
27.12.2005	3.348.854	1,3424	1,5922	14,29	39016
28.12.2005	7.071.030	1,3433	1,5929	14,26	39220
29.12.2005	19.801.248	1,3422	1,5994	14,46	39837
30.12.2005	20.269.072	1,3430	1,5904	15,08	39778
02.01.2006	23.830.072	1,3418	1,5875	14,56	39791
03.01.2006	24.832.973	1,3441	1,5920	14,52	40665
04.01.2006	24.832.973	1,3419	1,5943	14,46	41362
05.01.2006	23.662.082	1,3317	1,6070	14,46	41722
06.01.2006	23.837.143	1,3298	1,6079	14,53	41905
09.01.2006	23.837.143	1,3284	1,6073	14,53	41905
16.01.2006	23.837.143	1,3284	1,6073	14,41	43629
17.01.2006	6.610.450	1,3270	1,6107	14,41	44077
18.01.2006	6.610.450	1,3277	1,6063	14,42	42623
19.01.2006	6.559.206	1,3313	1,6142	14,43	43645
20.01.2006	6.051.541	1,3299	1,6066	14,40	44466
23.01.2006	6.051.541	1,3301	1,6059	14,38	43851
24.01.2006	6.051.541	1,3208	1,6199	14,39	44435
25.01.2006	6.051.541	1,3171	1,6172	14,37	45746
26.01.2006	10.897.334	1,3156	1,6176	14,37	45784
27.01.2006	26.941.653	1,3170	1,6130	14,34	45315
30.01.2006	26.941.653	1,3183	1,6085	14,34	44891
31.01.2006	26.571.424	1,3219	1,5972	14,39	44590
01.02.2006	26.571.424	1,3199	1,5983	14,37	45251
02.02.2006	22.801.631	1,3177	1,5964	14,34	44841
03.02.2006	19.185.277	1,3213	1,5940	14,36	44228
06.02.2006	17.202.611	1,3193	1,5923	14,34	44856
07.02.2006	15.817.388	1,3232	1,5861	14,39	44653
08.02.2006	15.817.388	1,3229	1,5860	14,44	43843
09.02.2006	15.817.388	1,3281	1,5894	14,51	44117
10.02.2006	13.608.559	1,3240	1,5861	14,51	44773
13.02.2006	13.608.559	1,3208	1,5815	14,52	44046
14.02.2006	13.608.559	1,3242	1,5745	14,51	43508
15.02.2006	13.608.559	1,3211	1,5733	14,47	43804
16.02.2006	14.668.559	1,3322	1,5868	13,90	45361
17.02.2006	17.362.099	1,3246	1,5724	13,75	46244
20.02.2006	17.362.099	1,3202	1,5681	13,86	46689

DATE	TOTAL VOLUME	USD Currency Rate	EUR Currency Rate	TRLIBOR	STOCK EXCHANGE INDEX
21.02.2006	12.481.629	1,3093	1,5636	13,90	46711
22.02.2006	12.481.629	1,3114	1,5623	13,92	46265
23.02.2006	12.421.629	1,3245	1,5746	13,83	46554
24.02.2006	19.570.202	1,3127	1,5673	14,00	46838
27.02.2006	19.570.202	1,3145	1,5641	13,97	47729
28.02.2006	14.237.682	1,3113	1,5541	13,94	47016
01.03.2006	14.237.682	1,3060	1,5510	13,95	47493
02.03.2006	10.819.423	1,3075	1,5613	13,96	46891
03.03.2006	16.274.830	1,2979	1,5495	13,95	46366
06.03.2006	16.278.830	1,2964	1,5586	13,99	45997
07.03.2006	16.664.054	1,3006	1,5658	13,95	43890
08.03.2006	16.664.054	1,3225	1,5764	13,95	42340
09.03.2006	29.124.084	1,3358	1,5922	13,97	42863
10.03.2006	28.044.084	1,3362	1,5946	14,01	42522
13.03.2006	28.661.066	1,3440	1,6018	14,01	44346
14.03.2006	28.826.066	1,3377	1,5966	14,03	42907
15.03.2006	38.826.066	1,3432	1,6070	13,96	43237
16.03.2006	37.376.066	1,3289	1,5985	13,97	44051
17.03.2006	37.219.742	1,3264	1,6017	13,96	44688
20.03.2006	44.430.801	1,3161	1,6023	13,85	44426
21.03.2006	43.350.050	1,3269	1,6163	13,84	44399
22.03.2006	34.306.414	1,3350	1,6207	13,86	44329
23.03.2006	47.507.767	1,3426	1,6219	13,83	44531
24.03.2006	37.567.979	1,3323	1,6072	13,83	43274
27.03.2006	44.819.826	1,3408	1,6050	13,84	42710
28.03.2006	38.540.592	1,3386	1,6105	13,80	41742
29.03.2006	54.157.042	1,3464	1,6237	13,78	42507
30.03.2006	43.195.395	1,3562	1,6284	13,78	42942
31.03.2006	42.962.830	1,3427	1,6211	13,93	42911
03.04.2006	43.052.313	1,3417	1,6254	13,84	44028
04.04.2006	56.788.787	1,3389	1,6141	13,82	44071
05.04.2006	50.208.061	1,3319	1,6216	13,82	44089
06.04.2006	52.971.971	1,3300	1,6313	13,77	43711
07.04.2006	51.891.971	1,3308	1,6378	13,80	44284
10.04.2006	70.106.115	1,3295	1,6211	13,79	43099
11.04.2006	69.603.691	1,3370	1,6196	13,80	42890
12.04.2006	69.603.691	1,3331	1,6155	13,81	42505
13.04.2006	69.603.691	1,3360	1,6221	13,80	41919
14.04.2006	70.715.112	1,3409	1,6242	13,78	42212
17.04.2006	70.715.112	1,3440	1,6271	13,77	41861
18.04.2006	64.173.808	1,3424	1,6371	13,78	42865
19.04.2006	64.560.225	1,3366	1,6379	13,80	43732
20.04.2006	64.753.434	1,3239	1,6349	13,77	43873
21.04.2006	64.039.434	1,3233	1,6333	13,79	45076
24.04.2006	64.727.434	1,3224	1,6289	13,72	45278
25.04.2006	64.727.434	1,3181	1,6316	13,73	45353
26.04.2006	64.727.434	1,3168	1,6326	13,72	44746
27.04.2006	65.127.434	1,3216	1,6403	13,72	43752

DATE	TOTAL VOLUME	USD Currency Rate	EUR Currency Rate	TRLIBOR	STOCK EXCHANGE INDEX
28.04.2006	65.127.434	1,3195	1,6410	13,49	43880
01.05.2006	76.627.434	1,3155	1,6506	13,50	44030
02.05.2006	74.587.476	1,3131	1,6572	13,56	44414
03.05.2006	71.587.476	1,3157	1,6606	13,48	44648
04.05.2006	54.187.476	1,3104	1,6553	13,47	44251
05.05.2006	55.760.807	1,3178	1,6602	13,49	44213
08.05.2006	69.768.397	1,3132	1,6658	13,49	44713
09.05.2006	54.268.397	1,3124	1,6754	13,50	44563
10.05.2006	54.670.041	1,3321	1,6902	13,52	43599
11.05.2006	50.745.862	1,3431	1,7174	13,47	43713
12.05.2006	35.604.938	1,3545	1,7228	13,53	41971
15.05.2006	23.054.181	1,3909	1,7945	13,54	40269
16.05.2006	23.054.181	1,4498	1,8615	13,52	41044
17.05.2006	33.500.341	1,4484	1,8553	13,53	40439
18.05.2006	21.301.760	1,4185	1,8291	13,50	39644
22.05.2006	20.035.917	1,4878	1,9017	13,53	36351
23.05.2006	18.473.500	1,5055	1,9207	13,63	37235
24.05.2006	15.756.500	1,5173	1,9483	13,60	36101
25.05.2006	15.756.500	1,5368	1,9754	13,59	36730
26.05.2006	15.756.500	1,5396	1,9663	13,56	38593
29.05.2006	15.756.500	1,5229	1,9503	13,59	38909
30.05.2006	18.383.413	1,5227	1,9427	13,60	37861
31.05.2006	18.383.413	1,5368	1,9748	13,61	38132
01.06.2006	37.664.823	1,5600	2,0080	13,61	38395
02.06.2006	38.621.484	1,5607	1,9917	13,66	39286
05.06.2006	38.621.484	1,5271	1,9583	13,87	37964
06.06.2006	38.621.484	1,5765	2,0434	13,94	37464
07.06.2006	38.621.484	1,5559	2,0046	13,99	36710
08.06.2006	16.568.574	1,5480	1,9825	15,48	35339
09.06.2006	16.568.574	1,5463	1,9721	15,46	34803
12.06.2006	16.568.574	1,5371	1,9445	15,54	34330
13.06.2006	6.568.574	1,5390	1,9401	15,57	32384
14.06.2006	6.568.574	1,6005	2,0134	15,56	32900
15.06.2006	6.568.574	1,5897	2,0004	15,52	33627
16.06.2006	6.568.574	1,5844	1,9992	15,50	34048
19.06.2006	6.568.574	1,5833	2,0039	15,52	34808
20.06.2006	6.568.574	1,5942	2,0069	15,48	34601
21.06.2006	6.568.574	1,6088	2,0216	15,48	33762
22.06.2006	6.568.574	1,6414	2,0726	15,48	34229
23.06.2006	6.568.574	1,6607	2,0955	15,47	33132
26.06.2006	6.568.574	1,6934	2,1246	18,24	31951
27.06.2006	6.568.574	1,6836	2,1158	18,49	32470
28.06.2006	6.068.574	1,6375	2,0603	19,14	33207
29.06.2006	6.068.574	1,6118	2,0251	18,92	34031
30.06.2006	4.441.661	1,6029	2,0095	18,95	35453
03.07.2006	4.000.000	1,5697	1,9963	17,44	35456
04.07.2006	4.000.000	1,5679	2,0043	17,39	36481
05.07.2006	4.000.000	1,5350	1,9655	17,81	35385

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06.07.2006	3.500.000	1,5699	2,0043	17,79	35699
07.07.2006	5.500.000	1,5878	2,0222	17,85	36202
10.07.2006	7.500.000	1,5475	1,9797	17,78	36148
11.07.2006	7.500.000	1,5510	1,9820	17,65	35956
12.07.2006	7.500.000	1,5379	1,9593	17,47	35816
13.07.2006	7.000.000	1,5436	1,9659	17,35	35010
14.07.2006	9.390.000	1,5778	2,0050	17,26	33832
17.07.2006	9.390.000	1,5748	1,9956	17,27	32703
18.07.2006	11.390.000	1,5841	1,9896	17,27	33618
19.07.2006	11.390.000	1,5751	1,9739	17,26	33554
20.07.2006	36.848.166	1,5681	1,9593	17,26	35311
21.07.2006	36.848.166	1,5456	1,9501	17,52	34989
24.07.2006	36.848.166	1,5434	1,9558	17,50	34959
25.07.2006	34.848.166	1,5459	1,9519	17,48	35264
26.07.2006	57.478.229	1,5296	1,9341	17,48	35985
27.07.2006	31.520.063	1,5169	1,9093	17,46	36747
28.07.2006	31.020.063	1,4994	1,9095	17,51	36102
31.07.2006	27.405.000	1,4954	1,8971	17,51	36038
01.08.2006	27.405.000	1,4811	1,8897	17,58	35743
02.08.2006	27.479.000	1,4958	1,9073	17,56	35722
03.08.2006	26.479.000	1,4994	1,9198	17,57	35263
04.08.2006	26.479.000	1,4879	1,9002	17,59	36160
07.08.2006	24.479.000	1,4827	1,8968	17,60	35968
08.08.2006	24.479.000	1,4593	1,8771	17,61	36536
09.08.2006	3.410.432	1,4581	1,8725	17,54	37563
10.08.2006	3.410.432	1,4478	1,8638	17,53	37389
11.08.2006	3.410.432	1,4446	1,8579	17,49	37418
14.08.2006	1.020.432	1,4414	1,8420	17,50	37631
15.08.2006	1.020.432	1,4529	1,8494	17,51	37807
16.08.2006	2.050.656	1,4657	1,8660	17,50	38433
17.08.2006	2.050.656	1,4452	1,8480	17,53	37885
18.08.2006	2.050.656	1,4313	1,8422	17,47	37385
21.08.2006	2.050.656	1,4365	1,8414	17,43	37165
22.08.2006	2.050.656	1,4483	1,8678	17,42	37131
23.08.2006	2.050.656	1,4477	1,8603	17,45	37122
24.08.2006	2.050.656	1,4505	1,8594	17,37	36651
25.08.2006	2.050.656	1,4729	1,8878	17,36	36862
28.08.2006	2.050.656	1,4729	1,8804	17,38	36687
29.08.2006	2.050.656	1,4780	1,8930	17,42	36897
31.08.2006	2.050.656	1,4682	1,8819	17,50	37286
01.09.2006	2.050.656	1,4478	1,8609	17,57	37415
04.09.2006	2.050.656	1,4608	1,8713	17,51	38139
05.09.2006	2.050.656	1,4507	1,8653	17,51	38180
06.09.2006	2.050.656	1,4420	1,8502	17,52	37690
07.09.2006	2.050.656	1,4521	1,8601	17,53	37457
08.09.2006	2.050.656	1,4722	1,8811	17,55	37372
11.09.2006	5.903.224	1,4708	1,8699	17,77	37173
12.09.2006	5.903.224	1,4762	1,8764	17,89	37625

DATE	TOTAL VOLUME	USD Currency Rate	EUR Currency Rate	TRLIBOR	STOCK EXCHANGE INDEX
13.09.2006	5.903.224	1,4699	1,8690	17,84	37775
14.09.2006	5.903.224	1,4622	1,8548	17,91	37479
15.09.2006	8.334.224	1,4702	1,8679	17,92	38144
18.09.2006	8.334.224	1,4667	1,8624	17,88	38246
19.09.2006	8.334.224	1,4550	1,8427	17,96	38345
20.09.2006	8.347.234	1,4618	1,8526	17,67	38275
21.09.2006	8.347.234	1,4648	1,8568	17,52	37791
22.09.2006	8.847.234	1,4687	1,8693	17,80	36390
25.09.2006	9.547.234	1,5252	1,9554	17,73	36084
26.09.2006	9.547.234	1,5020	1,9193	17,72	36432
27.09.2006	9.547.234	1,5168	1,9284	17,60	36819
28.09.2006	9.547.234	1,4872	1,8876	17,58	37268
29.09.2006	9.547.234	1,4919	1,8971	17,68	36925
02.10.2006	10.147.234	1,4971	1,8964	17,61	36984
03.10.2006	12.147.234	1,5069	1,9117	17,59	36830
04.10.2006	13.147.234	1,4936	1,9033	17,59	36390
05.10.2006	14.323.900	1,5085	1,9148	17,54	36917
06.10.2006	14.373.900	1,4895	1,8937	17,64	36738
09.10.2006	14.373.900	1,4853	1,8829	17,64	36886
10.10.2006	14.373.900	1,4952	1,8842	17,62	37449
11.10.2006	9.500.900	1,4920	1,8741	17,63	37660
12.10.2006	14.402.900	1,4827	1,8602	17,61	38317
13.10.2006	13.702.900	1,4824	1,8593	17,51	38486
16.10.2006	11.446.900	1,4651	1,8399	17,52	38998
17.10.2006	12.446.900	1,4692	1,8382	17,54	38457
18.10.2006	13.722.685	1,4689	1,8404	17,51	39744
19.10.2006	13.722.685	1,4701	1,8445	17,51	39824
20.10.2006	13.722.685	1,4552	1,8279	17,59	39644
26.10.2006	14.562.627	1,4501	1,8299	17,54	40591
27.10.2006	19.862.627	1,4447	1,8289	17,50	40683
30.10.2006	19.862.627	1,4420	1,8288	17,50	40081
31.10.2006	20.220.180	1,4501	1,8450	17,50	40582
01.11.2006	20.220.180	1,4540	1,8460	17,43	40602
02.11.2006	20.220.180	1,4481	1,8469	17,34	39504
03.11.2006	18.220.180	1,4533	1,8552	17,49	39307
06.11.2006	16.043.515	1,4602	1,8653	17,50	39676
07.11.2006	16.043.515	1,4414	1,8311	17,55	40164
08.11.2006	16.043.515	1,4354	1,8317	17,49	39737
09.11.2006	48.104.515	1,4488	1,8529	17,51	39891
10.11.2006	48.104.515	1,4424	1,8442	17,49	39627
13.11.2006	48.104.515	1,4401	1,8541	17,48	39030
14.11.2006	44.220.515	1,4432	1,8534	17,49	39655
15.11.2006	14.159.515	1,4414	1,8491	17,48	39654
16.11.2006	14.159.515	1,4427	1,8472	17,34	39268
17.11.2006	14.159.515	1,4324	1,8350	17,50	38433
20.11.2006	14.159.515	1,4369	1,8364	17,50	38347
21.11.2006	14.194.436	1,4496	1,8611	17,53	38501
22.11.2006	14.194.436	1,4512	1,8604	17,51	37734

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23.11.2006	14.194.436	1,4653	1,8874	17,50	38077
24.11.2006	15.441.121	1,4703	1,9054	17,51	37582
27.11.2006	10.094.429	1,4705	1,9221	17,46	38239
28.11.2006	10.879.429	1,4597	1,9144	17,34	37184
29.11.2006	11.379.429	1,4756	1,9398	17,28	38067
30.11.2006	11.378.984	1,4600	1,9211	17,46	38169
01.12.2006	12.578.984	1,4458	1,9081	17,69	38197
04.12.2006	12.078.984	1,4400	1,9066	17,74	37655
05.12.2006	12.078.984	1,4501	1,9291	17,79	38163
06.12.2006	11.578.984	1,4454	1,9256	17,76	38185
07.12.2006	11.578.984	1,4395	1,9118	17,73	39858
08.12.2006	11.578.984	1,4267	1,8970	17,70	39320
11.12.2006	9.578.984	1,4276	1,8958	17,69	39462
12.12.2006	9.578.984	1,4269	1,8825	17,63	39213
13.12.2006	9.578.984	1,4174	1,8765	17,51	38875
14.12.2006	7.775.984	1,4202	1,8837	17,48	39595
15.12.2006	7.925.984	1,4165	1,8717	17,55	40205
18.12.2006	7.425.984	1,4154	1,8578	17,56	39833
19.12.2006	7.425.984	1,4190	1,8589	17,61	39071
20.12.2006	7.425.984	1,4270	1,8779	17,63	38997
21.12.2006	6.115.277	1,4224	1,8807	17,61	39083
22.12.2006	7.115.277	1,4216	1,8748	17,56	39180
25.12.2006	7.115.277	1,4186	1,8725	17,58	38705
26.12.2006	7.115.277	1,4222	1,8686	17,57	38767
27.12.2006	7.115.277	1,4198	1,8650	17,48	38611
28.12.2006	6.925.527	1,4192	1,8668	17,44	39138
29.12.2006	6.925.527	1,4131	1,8586	17,98	39117