WHEN TO START FINANCIAL DERIVATIVES TRADING? THE EXAMPLE OF THE ISTANBUL STOCK EXCHANGE

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ABSTRACT

A fundamental step in the development of financial markets is the introduction of derivative products, which are structured to facilitate hedging. By integrating the expectations on the future prices of securities into the market transactions, the resultant liquidity increases the trust-worthiness of the exchange for the individual traders.

Emerging rapidly since the 1970's, the subject of derivatives markets has been attracting much debate both in the markets that currently host derivatives trading and financial centers that are on the verge of launching such market segments.

In this paper, the choice of financial instruments and the timing for the initiation of derivatives trading in the securities markets are briefly assessed and the compatibility of a derivatives market to the ISE's spot market is evaluated in terms of volatility, the representative aspect of the systematic risk as well as the market depth within Ederington's (1989) portfolio approach. In conclusion, futures and/or options, based on stock indices, are deemed as necessary for hedging purposes in the capital markets. However, since the basic risk factor is a result of interest rate volatility, it should be adequately discussed if there should be a priority for derivative instruments based on interest rates.

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1. From Spot to Derivatives Markets

Products in the financial markets can be classified in several ways because of the different economic scales and diverse requirements. The main points in the classification approach are provided below, based on considerations on how the product is structured and how the market is organized:

Table 1: A Grouping of the Financial Products

FINANCIAL PRODUCTS BY STRUCTURE			
A. NON-DERIVED	B. **DERIVED** **1. Main** **2. Hybrid** **3. Composite**		
Equity shares	Forwards	Warrants	Value-sharing certificates
Bonds	Futures	Swaps	Pre-emptive rights coupons
	Options (plain vanilla - flexible)		Depository receipts

FINANCIAL PRODUCTS BY ORGANIZATIONAL STRUCTURE OF MARKETS			
A. OVER-THE-COUNTER		**B. ORGANIZED**	
Spot	**Derivatives**	**Spot**	**Derivatives**
Equity shares	Forwards	Equity shares	Futures
Bonds	Swaps	Bonds	Options (plain vanilla - flexible)
Value-sharing certificates	Options- Warrants	Value-sharing certificates	Warrants
	Other	Depository receipts	
		Pre-emptive rights coupons	

When derivatives are formed, prices are explained by the systematic risk and the maturity, compared to the systematic and unsystematic risk factors for financial instruments in spot markets, within the boundary of the capital market theory.[1] When such explanations are taken into consideration; the fundamental factors for a derivatives market, by definition, will be; the market, transaction hours, size of the agreement, months of the transaction, price margin and prices of the first and last days of transaction.

[1] Risks can be grouped into four broad categories: market risk (delta risk), credit risk, liquidity risk, and operational and legal risk [Sinkey 1998]. With respect to capital market theory, as the market risk representation and the maturity are taken into consideration, these two measurable risks are perceived to include other risks.

Derivatives markets, as a supporter and an inducer instead of an alternative to spot markets, are definitely formed on the basis of some economic indications and/or their derived values in relation to their existing market products. Having just synthesis characteristics, however, again differing from the derived products (warrants and so on) of the spot market, derivatives and options agreements transform uncertainty about future expectations into a definable manner and present a maturity-dependent protective environment by hedging. Given the price of futures contract F and the spot price of the underlying asset S, the expected return or required rate of return of the hedged portfolio can be defined as follows:[2]

$$E(r)= k_sE(S_t-S_{t-1})+k_fE(F_t-F_{t-1})-C(k_f) \quad (1)$$

Unlike the classic model[3] and Working's (1962) model of hedging with derivatives, the model proposed by Ederington (1989) has made the effectiveness of the risk reduction measurable. In measuring the portfolio performance, Ederington's model is based on the measurement of hedging effectiveness, not only taking merely returns as the measure. The rate of hedging is basically defined in terms of the decrease in the variance when a futures agreement is added to the portfolio. Therefore, when a derivative is added to the portfolio, the performance (e) , as the measurement of hedging effectiveness, is as follows:[4]

$$e = \frac{\sigma_{sf}^{\ 2}}{\sigma_s^{\ 2}\sigma_f^{\ 2}} = r^2 \quad (2)$$

where σ_s^2, σ_f^2, σ_{sf} represent the subjective variances and the covariance of the price changes during the period. According to Ederington's model, the performance of launching a futures market can be estimated by using the sample

[2] Hedging ratio, related to portfolios including both spot market instruments and futures contracts, can be derived from the regression below:
$S_t-S_{t-1}= a+b(F_t-F_{t-1})+u_t$
With respect to the determination of the formulations in portfolio risk management with futures contracts, see Ederington (1989) and Chou, Dennis & Lee (1996).

[3] See Lien (1990) for a criticism of a single product hedging model of Ederington (1979).

[4] As Sinkey (1998) defines interrogatory with 'IS MORC ILL?' capturing the risks that the Group of Thirty (1993) considers, the first letter in the mnemonic 'I' denotes covariance risk, that is, the correlation coefficient that also confirms with the Ederington (1979). This model, however, does not concern with the systemic risk.

coefficient of determination. To apply the model (2), the variances for an unhedged portfolio, as well as a portfolio containing both spot and futures, and their covariance should be measured. Shortly, from spot to the futures markets, it is possible to explain volatility reduction theoretically and empirically.[5]

Forward and futures markets provide risk neutralization by transferring partly certain expected futures risk at the spot market to opposite positions and to speculators.[6] For example, while the farmer is taking price risk in the spot market of commodity trade, he can transfer that risk to the opposite positions and/or to the speculators via forwards or futures markets. As a matter of fact, he protects himself from volatility and passes it to the futures markets' investors. Moreover, those who deal in a commodity are willing to be involved in forwards or futures trading so as to enjoy guarantee of making or taking delivery and to increase their competitiveness in trade.

2. First Derivatives Products in Developed and Developing Markets

Trading in derivative products has a long history. The first recorded accounts of derivative contracts can be traced back to philosopher Thales of Miletus, who, during winter, negotiated what is similar to the contemporary call options on oil presses for the spring olive harvest. On the other hand, De la Vega reported in 1688 that options and futures, which were known as "time bargains," were trading on the Amsterdam Bourse soon after it was opened. Evidences also suggest that futures contracts for rice were traded in Japan in the 17th and 18th centuries, as "Rice Tickets" in the Yadoya Rice Market in Osaka and also in the Dojima Rice Market .[7]

As the first regulated futures exchange in the United States, the Chicago Board of Trade was opened in 1848 with 82 members. In March 1851, the first futures contracts were recorded and they were called for the delivery of 3,000 bushels of

[5] Although here the variance is thought of as constant through time, Akgiray (1989) and Chu&Freund (1996), showing that the variance changes by the time, argue that the GARCH approach is more reliable and meaningful in ex-post variance estimation.
[6] Even though speculation might be perceived as gambling on price movements, speculators have crucial influence in financial markets by providing liquidity at least.
[7] For a chronological order of the commencement of derivative products, see Chance (1995).

corn in June at a price of one cent per bushel. Listed stock options began trading in April 1973 on the Chicago Board Options Exchange (CBOE). Other exchanges began offering stock call options in 1975 and put options in 1977. Today, options on more than 1,000 stocks trade on five U.S. exchanges.

As it is seen in Table (2), the factors to be mentioned in the process of launching futures market throughout the world are based on the level of development and product preference. Additionally, it has been understood that a derivatives market was built in developed countries prior to the developing ones while future and option markets on interest and currency are mostly preferred.

As a similar example to the ISE case, in which the future contract would be based first on the stock market index, the South Korean experiment put emphasis on volatility in order to launch derivative products on the KOSPI 200 index. For the sake of comparison on that matter, exchange volatilities have s been considered and it has been perceived that the futures market is vital to reduce that volatility.[7] But, the decision regarding whether the market is furnishing the required conditions has been assessed according to the market capitalization and the size of market participants. On the other hand, the pace of data dissemination and the level of the internationalization of the market also were major criteria. Although the absence of a self-regulating structure seemed disadvantageous for the Korean Stock Exchange, it reveals importance for setting right the security component in the market gradually.

As the finance theory and information technology advanced, the size and complexity of derivative instruments offered by the banks and exchanges have increased. For example, both the futures and options markets in London and the world-wide swap market have grown over 10-fold between 1988 and 1994 [Grant & Marshall, 1997].

[7] Korea Securities and Exchange Commission Securities Supervisory Board, Annual Report 1995, Seoul 1996, 62.

Table 2: First Derivatives Markets

Country	Name of the Exchange	Types of Derivative Instruments	First Derivatives Tradings
ARGENTINA	Buenos Aires Stock Exchange; Cordoba Stock Exchange; Rosario Futures Exchange.	- forwards - futures - options	May 1992
AUSTRALIA	Sydney Futures Exchange Ltd.	- forwards (commodity, interest rate, currency) - futures (commodity, interest rate, currency, shares, index) - options (commodity, interest rate, currency, shares, index) - swap.	1960: futures (commodity: greasy wool)
AUSTRIA	The Austrian Futures and Options Exchange (ÖTOB)	- futures (public bond, index); - options (index, shares)	10.4.1991; Options (shares).
BELGIUM	Belgian Futures and Options Exchange (BELFOX)	- futures (index, public bond, BIBOR) - options (shares, index, public bond, USA dollar)	12.6.1991; Futures agreement (notional public bond with 9% coupon rate and 2.5 million Bel.francs nominal value); April 1993: Futures (Bel 20 index)
BRAZIL	The Commodities and Futures Exchange (BM&F); Over-the-Counter; The Sao Paulo Stock Exchange; The Brazilian Stock Exchange.	- forwards (interest rate, currency ABD$/R$, Yen/R$, DM/R$, shares) - futures (interest rate, currency, shares, Ibovespa index); - options (interest rate, currency ABD$/R$, shares, Ibovespa futures);	1979: Buy options (shares) 1984: Sell options (shares)
CANADA	Toronto Futures Exchange.	- futures - options	1984: futures, options (index)
COLOMBIA	Banco Andino Colombia.	- forwards (currency C.Peso/USA$); - options (currency, interest rate)	Options (currency); 1995.
DENMARK	Denmark Futures and Options Market (FUTOP).	- futures (shares, public bonds, index and so on) - option(shares, public bonds)	September 1988; First futures and options agreements (Mortgage bonds with 9% coupon rate, maturing in 2006)
ECUADOR	Over-the-Counter.	- forwards (currency, interest rate, shares)	1996: Forward (currency sucre/USA$)
ENGLAND	International Petroleum Exchange(IPE); London Commodity Exchange (LCE); London International Financial Futures and Options Exchange (LIFFE); London Metal Exchange (LME); London Stock and Derivatives Exchange (OMLX).	*IPE - futures (gas, etc.) - options (gas, Brent unrefined petroleum) *LIFFE - futures (long term public bonds of various countries and so on) - options (shares, bonds and so on) *OMLX - futures (various indexes, shares) - options (various indexes, shares)	*IPE-April 1981 futures (gas) *LIFFE-9.30.1982 Futures (Currency, public bond), *LME-1877 *OMLX-12.12.1989 First derivatives trading of Swedish shares with a line connecting to OM Stockholm.
FINLAND	Finnish Options Market (SOM); Finnish Options Exchange Ltd. (SOP).	*SOM - futures (index, shares, Sterling, DM, USA dollar) - options (index, Sterling, DM, USA $, Shares) *SOP - forwards (public bond, and so on.) - futures (FIM/currency)	*SOP: 1986; Derivatives agreements (Standardized currency and interest rate) *SOM: November 1987-Buy and sell options
FRANCE	Paris Options Exchange (MONEP); France International Futures Exchange (MATIF); Potatoes Futures Market (MTPT).	*MATIF - futures (public bond, ECU bond, public bond) *MONEP - options (securities, index) *MTPT - futures (potatoes)	*MATIF 2.20.1986; Futures (public bonds with maturity of 7-10 years) *MONEP 9.10.1987; Options (shares)
GERMANY	German Futures and Options Exchange (DTB).	- futures (interest rate-FIBER, BOBL, BUND, BUXL-, shares) - options (interest rate, shares, index)	1.26.1990; Options(14 shares)
HONG KONG	Hong Kong Futures Exchange Ltd.;	- options (shares, warrant) - warrants	*HKFE 1976 agricultural products; 1980

	Stock Exchange of Hong Kong (SEHK).		gold; 1986 first futures agreement; 1990 first derivative on warrant. *SEHK 1995 First stock options.
IRELAND	Ireland Futures and Options Exchange (IFOX).	- futures (long, medium, short term Irish public bond and DIBOR)	5.29.1989; Futures agreements (Long term public bonds with maturity of 20 years, DIBOR of 3 months, Irish Pound/US $)
ISRAEL	Tel Aviv Stock Exchange.	- futures (index, currency) - options (index, currency)	August 1993; TA-25 index options. October 1995: index futures. October 1994 NIS/$ options
ITALY	Italian Financial Futures Market (MIF); BIF.	*MIF - futures (public bonds with maturity of 5 and 10 years) - options (public bonds with maturity of 10 years) *BIF - futures (10000 ITL*Index point)	*MIF 9.11.1992; Futures (Italian public bonds with 250 million Italian lirets nominal value and 12% coupon rate, with maturities of 8-10 years) *BIF 11.27.1994; Futures (MIB 30 index)
JAPAN	Tokyo Stock Exchange; Tokyo International Financial Futures Exchange.	- futures - options - warrant	1988: futures (currency); 1989: Options (currency)
MALAYSIA	Kuala Lumpur Commodity Exchange; Kuala Lumpur Options and Financial Exchange.	- futures - options - warrants	*KLOPFE December 1995; futures-options
MEXICO	Mexico Stock Exchange.	- derivatives market (Mexder)	1977 petrobond (Mexican Government)
NETHERLANDS	European Options Exchange (EOE) ; Financial Futures Exchange (FTA); Rotterdam Energy Futures Exchange (ROEFEX); Amsterdam Agricultural Products Futures Market (ATA).	*EOE - futures (public bond, index, currency) - options (shares, bond, currency, and so on.) - warrants *FTA - futures (public bond, index, USA Dollar) *ROEFEX - futures (unrefined petroleum, etc.) *ATA - futures	1958: Futures (potatoes) *EOE 4.4.1978 call options *FTA 6.19.1987 Futures (on bonds) *ROEFEX 10.31.1989
PERU	Lima Stock Exchange.	- forwards market (currency) - derivatives market	1991
POLAND	Warsaw Board of Trade; Warsaw Stock Exchange.	- forwards - futures (index WIG20) - options (currency, interest rate, index, shares)	1994: futures (index)
PORTUGAL	OPORTO.	-futures (index, interest rate)	1995 : Futures (Fixed yield public bond with a maturity of 10 years) 1996: Futures (shares of 'blue-chip' index)
SINGAPORE	Singapore Commodity Exchange; Singapore International Monetary Exchange Ltd.	- futures (commodity) - company warrants - third party warrants	1992; futures (tobacco)
SOUTH KOREA	Korean Stock Exchange.	- futures (index)	May 1996: Futures (Kospi 200 index)
SPAIN	Spanish Financial Futures Market (MEFF); Over-the -Counter.	- futures (interest rate) - options (interest rate) - swap	1990
SWEDEN	Swedish Futures and Options Market (OM STOCKHOLM AB) .	- forwards (shares) - futures (shares, bond, public bond) - options (shares, bond)	6.12.1985; Standard buy options on six listed Swedish shares.
SWITZERLAND	Swiss Options and Financial Futures Exchange.	- forwards - futures (index, conf) - options (shares, index, conf) - swap	1988 SMI futures.
TAIWAN	Taiwan Stock Exchange.	- options - swap - warrant	March 1977
USA	Chicago Board of Trade;	- forwards	1851: Forward (corn);

	Kansas City Board of Trade; MidAmerica Commodity Exchange; NYSE; The Pacific Stock Exchange.	- futures - options - swap	1973: Options (securities) 1982: Options (Value Line, S&P500, NYSE Compound).

Sources: The Euromoney Derivatives Handbook 1997, London 1997; The IFR Handbook of World Stock and Commodity Exchanges, IFR Pub., London 1997.

3. The Advantages and Risks of Financial Derivatives

The advantages and risks of financial derivatives may be evaluated under two different perspectives. While the first perspective applies to a financial derivatives market that has recently started its activities, the second perspective relates to the advantages and risks of a market which has gained a certain level of maturity and where, say, the future contracts market has been operating. In a new market, the investors will not be acquainted with the securities and therefore will incur the cost of failure to exploit the possible advantages, rather than incurring risks. Foster & Viswanatahan (1994) suggest that less knowledgeable investors will benefit from the advantages of the market less in the beginning compared to those that are more knowledgeable. On the other hand, investors that trade on the market without sufficient knowledge will try to stay in the market either obliviously or by following the leading investors.

Corporations use derivatives instruments for hedging purposes for a number of reasons, including the volatility in the financial markets, tax exemptions, increasing the borrowing capacity and reducing the cost of borrowing. Another view suggests that the insufficiency of the bond and stock markets leads corporations to use derivatives in order to arrange their cash flow.

Another advantage provided by the financial derivatives is related to the market participants' changing perspective of the prices of financial derivatives since the real return and risk definitions are used after an initial experience is gained in the derivatives market. Grant & Marshall (1997) assert that the basic motive for the use of financial derivatives is to manage the interest rate and currency risks; although limited, the use of derivatives for managing the risks surrounding the goods and securities is spreading as exotic derivatives are viewed more cautiously due to liquidation difficulties in the underlying markets. The use of derivatives requires a high degree of control within corporations and the risks of derivatives

are measured using complex methods before being submitted to the boards or top executives of the corporations.

The pricing method for derivatives is more complex than the basic calculation methods applied to the financial reporting in the spot markets. Banks and derivative traders have more and more recourse to complex models such as value at risk (VAR) analysis for risk management and measurement. The studies carried out in 1995 show that the most widely-used risk measurement method for derivatives is simply determining the position at risk [Grant & Marshall (1997)]. Some corporations use a method which analyze the profit, loss and new risk parameters in accordance with market criteria and variable data, within the framework of the sensitivity analysis.

Do derivatives lead to a significant increase in the spot market risks? As derivatives are contracts, they carry legal risks. In addition, they have credit risk as one of the parties may fail to fulfill the due obligations. Liquidating derivatives may also introduce problems [Sill (1997)]. Consequently, all the risks inherent in financial instruments are also valid for derivatives.

Derivatives markets lead to a decline in the volatility of spot markets and enhance the organizational efficiency of the units within the market. An example is the decline in the volatility of the spot market in South Korea following the launch of the derivatives market. Futures prices provide a signpost for spot market prices[8] since the price expectations for the relevant date are taken under control through the derivatives market. However, studies about whether the launch of the derivatives market affects the volatility in the spot market may be influenced by the period taken into consideration. To illustrate, after the S&P futures contract was introduced in the U.S. in 1982, volatility in the spot market declined, if we consider the period until 1987, while it increased between 1982-1989 [(Maberly et al (1989)]. On the other hand, in their studies concerning the spot market volatility following the launching of the derivatives market in the U.S., Gerety & Mulherin

[8] Reports and seminar notes submitted by the Korea Stock Exchange officials during the ISE delegation's visit in April 1997.

(1991) showed that no systematic increase was noted in the volatility, including intra-day prices, with the exception of the 1987 October crisis.[9] Subrahmanyam (1996) points to the relationship between volatility and the behavior as well as the knowledge of investors and states that the launching of an index-tracking futures market may lead to an increase in the number of misinformed speculators, a phenomenon which will increase liquidity and lead to a fluctuation of stock prices. To conclude, the basic aspects to be considered in the studies concerning the effects of the derivatives markets on the volatility in the spot market are the periods under scrutiny and the level of knowledge of the market participants.

Considering that the price of futures contracts F can be used in the closed-form formula with partial derivatives ($F=f(S_t, t)$), the discount rate or simply the interest rate effect in pricing is included by integrating the "cost of carry."[10] Thus, the total differential in the futures prices will be given by

$$dF = \left[\frac{\delta F(S_t, t)}{\delta S_t}\right] dS_t + \left[\frac{\delta F(S_t, t)}{t}\right] dt \qquad (3)$$

The first term on the right side in the equation represents the effect of the change in the price of the underlying asset on the futures price while the second term measures the time effect. Given the holding period, the equation is simplified as the following model for the futures price:[11]

$$F(S_t, t) = S_t + S_t \,.\, r.\, (T-t)/365 \qquad (4)$$

Where T denotes the end of period and so, (T-t) denotes the time until maturity, and r represents the interest on a riskless asset.

[9] See Gerety & Mulherin's (1991) on a study on the intra-day prices of the stocks in USA during the 1933-1989 period which aimed at finding out the spot market volatility trend following the launch of a derivatives market.

[10] See Hemler&Longstaff (1991) for a constructive criticism of the Cost of Carry Model in pricing futures. It is noteworthy that an introductory explanation of derivatives pricing models can be found in several books. For example see Ingersoll (1987); Neftçi (1996).

[11] This equation is intended to be used for pricing the ISE 30 index futures contract.

When the model is generalized, the futures price is dependent on the return and risk levels of the underlying asset and the interest rate risk prior to maturity. By viewing the classic CAPM under the theory of efficient markets as an effective pricing in the spot markets, we can explain the futures price with the market risk and the risk-free rate.[12] Kolb (1996) supports the view that investors are not awarded for the systematic risk in the derivatives markets. The market risk already represents the price for the index futures. As understood by the futures pricing function, any change at the interest rates is the main factor that causes a change in the futures prices. At this point, it is obvious that derivative instruments such as index futures are considered to hedge investors against the systematic risk.

Not only are the changes in the market characteristics and in time, commonly viewed as fundamental in measuring company's risk, but also its management affect the pricing. Therefore, the marked-to-market principle is stimulated in observing the risk in derivatives trading. Many findings provide evidence that the monthly valuation is most suitable. In fact, frequency of valuation depends on the related derivative instruments and the risk and so marking-to-market can also be used daily and weekly as well. On the other hand, some firms are using derivatives for hedging and do not need marking-to-market since they do not speculate.

In the financial system, it is logical to introduce index futures and/or options for the purpose of proving the advantages of derivatives markets. Considering a thought-provoking paper of Markowitz (1952), efficient portfolios can be obtained by accepting the market composite index as the measurement of the systematic risk. Many analysis, concerning the capital markets, choose the market index to represent notionally the market portfolio according to the CAPM of Sharpe (1964). Brenner (1989) argues that the index futures and options can provide a risk avoidance against the changes in volatility and the interest rate changes but not to the changes in volatility. Obviously, in pricing financial derivatives, besides the

[12] Kolb (1996), finds a negative linear relationship between systematic risk and the returns for futures contracts.

spot price and interest rates, their volatility should be taken into consideration.

The easier the valuation of spot market portfolios by using the derivative instruments is, the more efficient the dynamic portfolio analysis is. From these points of view, derivatives markets would be helpful to increase the efficiency levels of the spot markets.

On the other hand, as other components exist in markets, risks are being globalized and made more systemic by the reason of both the reverberation of advanced stage of technology to markets and also the smoothing and removing effect of every newly-structured product towards differences in terms of time and location among markets. As the Group of Thirty (1997) mentioned that these events, which are causing the systemic risk, may be defined as a risk type, what is sudden, unanticipated and damaging all the financial system, once emerged the normal functioning of the financial markets, would be obstructed by destroying the mutual trust that is the most striking component lubricating the financial transactions flow.

Especially in the stock market crash of October 1987, portfolio insurance strategies that used futures markets partially have been blamed and also large losses associated with the use of derivatives by firms such as Procter&Gamble ($157 million)[13], Metalgesellschaft ($1.3 billion)[14] and by public institutions such as Orange County ($1.7 billion)[15] and financial market intermediaries such as Baring Futures Pte. Ltd. ($1.4 billion)[16], Sumitomo Bank ($1.8 billion)[17] have led to fear among some market participants that derivatives trading could lead to a

[13] With respect to the losses of $157 million of Procter &Gamble, one of the biggest US firms, by the reason of using interest rate swap, see Dimartino&Ward&Stevens&Sargisson (1996).
[14] With respect to the realisation and effects of the losses of $1.3 billion of Metallgeselschaft AG which is a German firm, by the reason of using derivative products, see. Kuprianov (1995).
[15] With respect to the losses of $1.7 billion of Orange County which is a local managerial unit in California, USA, after investing its funds with the help of derivative products, see Sill (1997, 22).
[16] With respect to the reasons and effects to financial markets, of the losses of $1.4 billion of Barings Bank Pte. Ltd., which is Britain's oldest merchant bank, while its intensified using of derivative instruments, see Kuprianov (1995) and also for an official view and finding about Barings Bank Crises, see inquiry report prepared by inspectors, on behalf of Singapore Ministry of Finance, San&Kuang (1995).

widespread disruption of the financial system.

In order to investigate those crises with more detail, which were mentioned respectively above, an on the basis of claims that they are disturbing users and intermediaries within the system, various studies on a national scale have been carried out and abundant facts and figures have been gathered by international organizations. Thus, various recommendations, which were covering lessons derived from findings regarding the reason of the crises and important points to be considered with utmost care, have been designed.[18] According to those findings, the failure of internal control of the intermediary institutions, the complexity of the existing rules in regard to derivatives accounting and the existing non-standardization of such rules, unawareness of the end users' top management about the leverage effect of the derivatives and, as a result of that, the accumulated financial risk could be explained as major reasons of the above mentioned financial crises.

When it comes to the mutual utilization of the relevant information among national exchanges, harmonization of national rules according to international standards and, therefore, the removal of the systemic risk effect, it seems that there are important gaps in terms of both mechanisms and also the legal environment. Especially, as it is seen within the Barings case, the intermediary institutions, which might take positions in various countries' derivatives markets at the same time, could have the ability to misuse the system. International meetings and working groups established, in relation to derivatives products and the systemic risk, consented on various recommendations. Following international announcements and much publishing on the subject, the consensus to be reached

[17] With respect to cornering the market (short squeeze) as a strategy resulted $1.8 billion losses and transactions realised by the use of derivative instruments based on copper, of Sumitomo Bank, which is one of the largest Japanese bank, see Kooi (1996).

on the mutual utilization of all information regarding the derivative products and a trigger-mechanism has been formed, which is planned to act upon some risk levels predetermined under the auspices of the Global Task Force structured within FIA.[19]

4. Proper Timing for the Start of Financial Derivatives at the ISE

Equities cash market transactions have started since 1986 at the ISE, tracing back to 11 years. While most of the developed exchanges launched derivative products in the 1980's, the ISE was realizing well-designed attempts towards structuring an organized market in terms of legal and technical dimensions. In this process, primary aim at the ISE markets was steps regarding the promotion of the capital markets and the enhancement of liquidity as well as the depth of the cash market. In developed markets, following the launching of forward contracts on commodities, warrants, futures and options markets, based on financial products, have begun to be structured and, therefore, the existing cash market risks were spread upon maturity. Thus, the aim of catching the average rationality for customers under the existing market conditions were reached appropriately.

On the other hand, risk management issues are interconnected with valuation and pricing. Thus, weakness in approaches of valuation are likely to carry over weaknesses in hedging. As it is mentioned by Grant&Marshall (1997), inappropriate valuation will mislead companies themselves, users or regulators regarding the long term gains and losses on their derivatives activity. At the same time, it is obvious that inappropriate valuation will cause important losses when its short term risk reverberations are considered.

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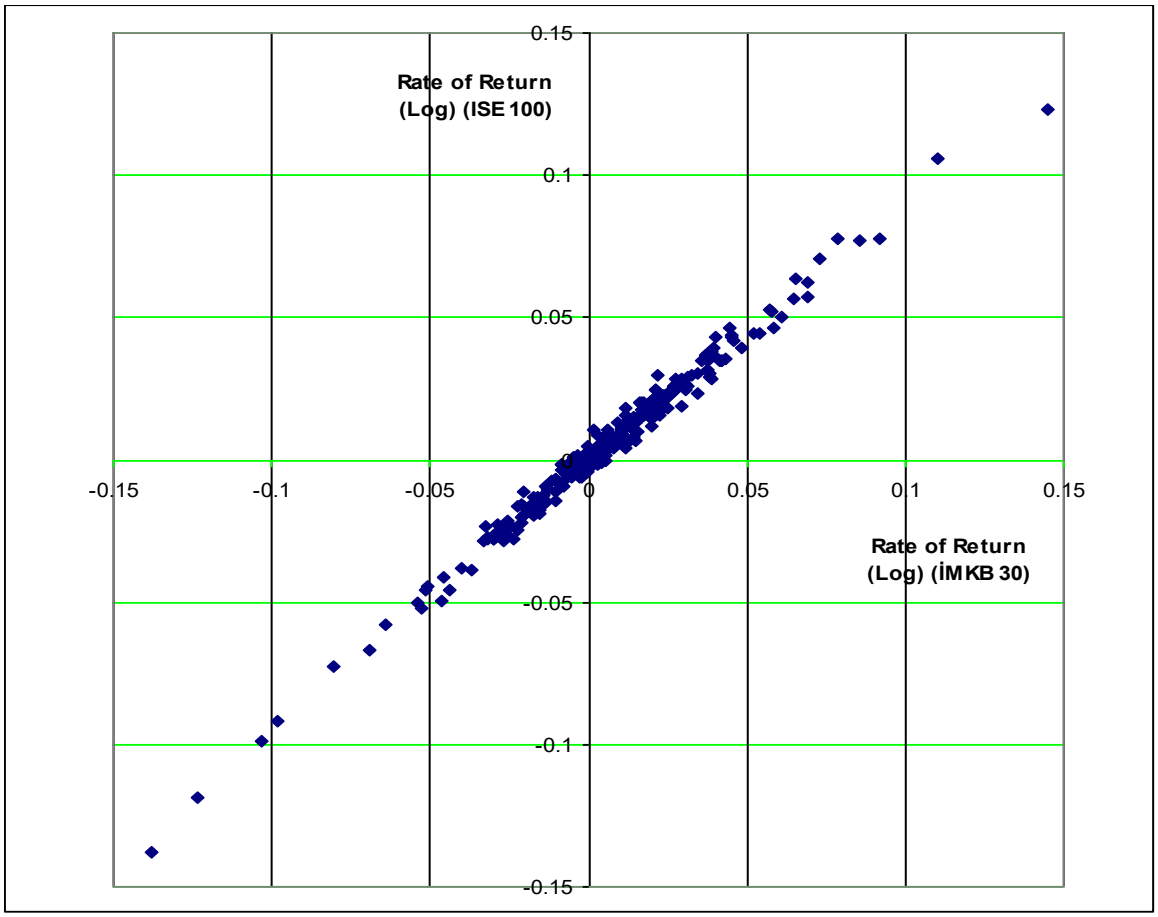
[18] For an example of inquiry and studies regarding to derivative products prepared by international community through various organisations, see "Derivatives: Practices and Principles" (1993) by the Group of Thirty, "Financial Integrity Recommendations" (1995) by Future Industry Association. Adding to that the results of those inquiry and studies regarding to derivative products announced under the name of "Windsor Declaration " in Windsor Meeting in which member countries of IOSCO gathered in May 1995 and it was open to sign under the name of "Declaration on Cooperation and Supervision of International Futures Exchanges and Clearing Organisations" and also as a complementary to this document "Memorandum of Understanding and Agreement" for supervisors in Boca Raton, USA in March 1996, then these documents has been signed by 55 future and option exchanges and clearing institutions from 18 country and 15 supervisors respectively.

In this study, introduction of first the derivatives market, with index futures, is evaluated with respect to the risk analysis. Accepting that a market composite index represents systematic risk according to the finance theory, it might be expected that those derivatives instruments could be used for facilitating hedging against the systematic risk. In trading of the ISE-30 futures contracts, interest rates, inflation and currency risks could be avoided by the investors. In order to extend the number of the observations, it is examined, first of all, whether the ISE-100 can be used to represent the ISE-30. For this purpose, daily returns by the ISE-30 and the ISE-100 in 1997 are regressed. At the 1% level, it was found that the ISE-100 can be significantly used to represent the ISE-30.[20]

Figure 1: Correlations Between the Returns of the ISE-100 and the ISE-30

[19] With respect to the report covering summarised results of implications in terms of national institutions, joined to the Windsor Meeting (May 1995) and recommendations regarding last situation, see World Securities Law Report (1996, 36-40).

[20] A similar regression results based on the simulated data for the period of April 3rd 1995 to August 22nd 1996, gives 98.56% correlation coefficient. See [ISE, The Report by The Adhoc Committee of Futures Trading Index, 09.17.1996].



Notes: Returns are logarithmic. Data: Daily closings of 1997.

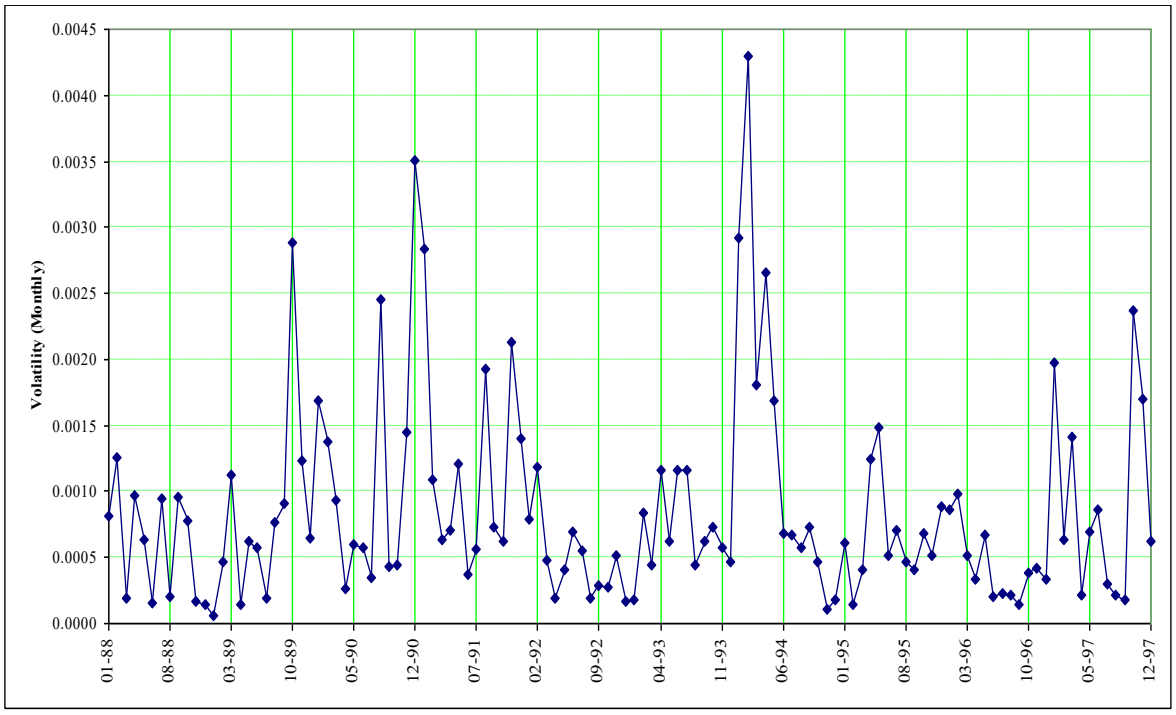
Table 3: Regression Results (Dependent Variable Return of the ISE-100)

	Coefficient	*Standard Deviation*	*t Stat*
Constant	0	-	-
Return ISE 30	0.91727	0.00656	139.77

Notes: R=0.9937 ; Adj.R^2=0.987 ; Standard Dev.: 0.0034 ; N: 249 ; F: 19534.

In order to determine the estimated volatility of the ISE-100, we also compute the daily return variances for each month for the period from 1988 to 1997. It is noteworthy that the variance is changing from month to month and year to year. Accordingly, although introducing a futures market to facilitate hedging would decrease the volatility, it would be still debatable if that is the solution around the shock and stampedes times.

Figure 2: Volatility of the ISE-100 Returns



Notes: Daily returns are used to calculate the monthly variances. Period: Jan. 1988 - Dec.1997.

Following the determination of high volatility in the Istanbul Stock Exchange; the correlation coefficients between interest rates, inflation, currency returns and index returns for the period from January 1993 to May 1997 are given in Table 4.

Table 4: Correlations

	Interbank Interest Rates	**Inflation**	**Currency Return ($)**
Inflation	0.644*	1	
Currency Return ($)	0.657*	0.914*	1
Index Change (TL)	-0.287*	-0.099	-0.150

*: Determination coefficients are significant at 5% level to F test.
Notes: January 1993 - May 1997. Interbank overnight interest rates are weighted by the transaction volumes. See. CB, Quarterly Bulletins. Wholesale Price Indices are taken as the indicator of inflation by the State Institute of Statistics. Index (ISE-100) change is calculated to represent returns on market portfolio.

The findings indicate that the interest rate is the key variable that explains the index change most significantly. Besides, the high positive correlation between inflation rates and currency returns implies that the PPP is operational in this market.

The results of regressions between monthly interest rates (IR) and index returns for the period from January 1993 to May 1997 and between the interest rate sensitivity (∆IR) and the returns are given in Table 5. Interest rate itself explains the monthly market return at 5% significant level (Panel A). More importantly, the findings of Panel B implies that the 1 % change in the interest rates can cause a 4.2 basis-point decrease in the market return. This result complies with some studies[21] that find a negative and significant correlation between the interest rate changes and the market returns. Excluding the interest rate effect, the market expectation is positive. Significance of the result, based on f and t statistics (1% level) suggests that, in the Turkish capital markets, the interest rates are the dominant factor in securities pricing. Finally, as both the derivatives trading is related to the systematic risk while the market index returns seem very sensitive to interest rates, the prior requirement to structure futures or options on interest rates should rigorously be considered.

Table 5: Interest Rate Sensitivity of the Market

Panel A
R_m = 0.2015 - 2.3571 IR
*(t) (3.40)** (-2.14)**
Notes: R:-0.287 ; Adj: R^2:0.065 ; Standard Deviation: 0.155 ; F: 4.59 ; Obs: 53.
Panel B
R_m = 0.0829 - 4.2385 ∆IR
*(t) (3.40)** (-2.98)**
Notes: R:0.39 ; Adj.R^2:0.137; Standard Deviation: 0.15 ; F:18.9 ; Obs: 52.; * and ** indicates statistically significant at the 5% and 1% levels, respectively.

The dominance of interest rates in the financial markets shows that it may have a striking impact on developments regarding the derivatives market. But, the obvious dominance of the public sector in defining the interest rates in Turkey may create

[21] Chen & Chan (1989) calculates the coefficient of linear relationship -0,049 between the portfolio and interest rates of T-Bills; Schrand (1997), calculates that -0,041 for the period of 1984-1988 for 57 financial institutions. It is noteworthy that there is negative correlation according to many findings.

confusion in the completion of the markets.[22]

As it is seen in Table 6, the public sector has dominance as near to almost %100, in terms of both the accumulated amount of fixed-income securities and the secondary market transactions. For that reason, it is evident that the reduction in the size of the public sector and the free formation of the interest rates in the markets are obligatory for effectiveness of the derivatives market, which is a complementary part of the capital markets.

Table 6: Public Share in the Fixed-Income Securities Market

Outstanding Fixed Income Securities (TL Million)									
Year	**Government Bonds**	**Treasury Bills**	**Public Sec. Total**	**Company Bonds**	**Commercial Papers**	**Private Sec. Total**	**Total**	**Public Share (%)**	**Private Share (%)**
1990	18,801.2	5,468.6	24,269.8	1,391.3	208.6	1,599.9	25,869.7	**93.82**	6.18
1991	24,678.4	18,258.0	42,936.4	1,635.6	532.3	2,167.9	45,104.3	**95.19**	4.81
1992	86,387.6	42,246.7	128,634.3	1,670.8	756.3	2,427.1	131,061.4	**98.15**	1.85
1993	189,713.2	64,488.1	254,201.3	1,667.6	1,197.7	2,865.3	257,066.6	**98.89**	1.11
1994	232,825.4	304,229.7	537,055.1	1,411.9	213.2	1,625.1	538,680.2	**99.70**	0.30
1995	511,769.0	631,298.0	114,3067.0	2,354.4	1,533.0	3,887.4	1,146,954.4	**99.66**	0.34
1996	987,106.0	1,745,350.0	2,732,456.0	2,718.7	2,880.0	5,598.7	2,738,054.7	**99.80**	0.20
1997/9	3,223,827.0	1,620,798.0	4,844,625.0	2,812.0	2,280.0	5,092.0	4,849,717.0	**99.90**	0.10
Secondary Market Trading Volume (TL Billion)									
Year	**Government Bonds**	**Treasury Bills**	**Public Sec. Total**	**Company Bonds**	**Commercial Papers**	**Private Sec. Total**	**Total**	**Public Share (%)**	**Private Share (%)**
1990	61,802.9	32,044.8	93,847.7	3,006.2	670.8	3,677.0	97,524.7	**96.23**	3.77
1991	142,192.6	131,825.2	274,017.8	12,428.8	512.8	12,941.6	286,959.4	**95.49**	4.51
1992	208,709.4	375,972.9	584,682.3	11,301.8	1,150.1	12,451.9	597,134.2	**97.91**	2.09
1993	657,639.6	1,027,528.0	1,685,167.6	7,858.0	761.2	8,619.2	1,693,786.8	**99.49**	0.51
1994	1,678,731.5	3,478,468.4	5,157,199.9	9,090.6	719.7	9,810.3	5,167,010.2	**99.81**	0.19
1995	4,580,106.0	14,831,095.8	19,411,201.8	42,650.8	11.7	42,662.5	19,453,864.3	**99.78**	0.22
1996	12,889,759.2	57,192,959.9	70,082,719.1	152,835.5	0.0	152,835.5	70,235,554.6	**99.78**	0.22
1997/9	52,372,740.0	49,397,011.2	101,769,751.2	153,783.9	0.0	153,783.9	101,923,535.1	**99.85**	0.15

Source: Treasury, 1997; Capital Market Board, Monthly Bulletins, 1997.

4. Conclusion

This paper examines the advantages and risks of the introduction of derivative

[22] The obvious dominance of public sector has been embodied under the case, in which behaving insensitive to free market interest rates. Though public sector has important share in some developed country markets as similar to USA, sensitive approach of Treasuries toward interest rates set by free market, has been the smoothing component of the problem.

products, and discusses the suitability in timing for the initiation of derivatives trading in the securities markets, and then evaluates the compatibility of a derivatives market to the ISE's spot market in terms of volatility, systematic risk representation as well as the market depth in the light of Ederington's (1989) portfolio approach.

The widespread launching of derivatives markets all over the world corroborates that those markets are helpful for and welcomed in the existing spot markets. While futures and options markets have been launched and grown dramatically in most countries since the second half of 1970's; markets, lacking a derivatives product for transaction, are just the hot debate of discussions on how to initiate.

In this paper, the preference for the financial instrument and timing in initialization of derivatives trading in the securities market have been studied in terms of Ederington's hedging approach, finding out that the derivative products on the equity market index is necessary. But there are some pre-conditions, which are the maintenance of the required depth and liquidity in the underlying market and the institutionalization of investors. When it is considered that derivatives products based on an index are providing hedging against the systematic risk according to the risk management point of view, it is so obvious that the derivatives market, based on interest and currency rates in which systematic risks have a direct impact, will have the priority for launching purposes.

Moreover, as experienced by the developed markets so far, the systemic risk should be taken into consideration during the introduction of derivatives instruments in any capital market. This concern for the systemic risk is actually a worldwide diffusion of a problem occurred either in a company or in a market and is causing the collapse of the financial system. For that reason, it seems that exploiting from the real experiences classified by international organizations against the systemic risk, derived results and mutually-established preventive practices and mechanisms within the countries, in which the derivative products will be considered for introduction, is the underlining condition for a success.

In summary, it is accepted that futures and/or options based on stock indices are necessary for hedging in the capital markets. However, with respect to the experiences of the developed markets, certain rules and techniques should be established in the course of time. Furthermore, especially in Turkey, as the basic risk factors can be explained with the interest rate sensitivity and the high concentration of public borrowing instruments and their short-term maturity, it is discussed if there is a priority for the futures and options markets based on fixed-income securities and interest rates.

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