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**Report on Stock Index Futures for the
National Stock Exchange of India Ltd**

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January 19, 1998

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Subject Report on Stock Index Futures at the National Stock Exchange of India Ltd

Dear Dr Patil

Price Waterhouse LLP (PW), under the USAID Financial Institutions Reform and Expansion (FIRE) project, arranged for Mr Michael Gorham to spend time with the National Stock Exchange (NSE) derivatives staff during the month of October 1997 Mr Gorham was Vice President of International Market Development at the Chicago Mercantile Exchange (CME) where he worked for 18 years

The attached report contains

- 1 A analysis entitled "Does India Really Need Stock Index Futures If It Has Badla?" which compares the role of badla versus the role of index derivatives,
- 2 A review of NSE's preparedness for trading stock index futures, including a review of the regulations for the new derivatives division as given to him in October 1997, and
- 3 A summary of the workshops Mr Gorham gave while resident at the NSE

PW/FIRE would like to continue to support efforts to launch stock index futures in India in a manner consistent with internationally accepted best practice standards We have discussed specific requests for additional technical assistance which Mr Gorham would be able to carry out from the US with Mr Ashishkumar Chauhan, NSE Vice President If proposed, I have agreed to review such to see if it is consistent with the mandate and goals of the FIRE project before authorizing time and material expenses

If you have any comments or questions, please contact me at 496-3599, fax 496-3555

Sincerely,

W D Grubb

W Dennis Grubb
Principal Consultant, Capital Markets

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Appendix A "Stock Index Futures A 12 Year Review" by Michael Gorham

I Executive Summary

The following report reflects the work of Mr Michael Gorham at the National Stock Exchange (NSE) during the month of October 1997 Mr Gorham is a Price Waterhouse LLP (PW) capital markets consultant under the USAID sponsored Financial Institutions Reform and Expansion (FIRE) Project Previous to PW/FIRE Mr Gorham was Vice President of International Market Development at the Chicago Mercantile Exchange (CME) where he worked for 18 years

The report contains three distinct and separate sections

- 1 An analysis which explores whether badla satisfies the needs addressed by stock index futures in other countries and therefore, makes the introduction of stock index futures redundant
- 2 A review the NSE trading system surveillance system, and rules for derivatives trading as they stood in October 1997
- 3 A summary of the workshops given for NSE by Mr Gorham

A Does India Really Need Stock Index Futures If It Has Badla?

Mr Gorham's analysis shows that badla as a hedging device, is not identical but is very similar to futures on individual stocks The first major difference between badla and stock index futures is one of scope Badla is a means of carrying over a position in an individual stock Stock index futures on the other hand give the participant protection from or exposure to the market as a whole (or to a specific market sector if a relevant index product is available) While in theory one could do badla in a large number of stocks and attempt to replicate a position in a stock index futures contract, such an operation would be expensive risky and much less efficient than stock index futures

The second major difference is the cost of using badla as a forward is not known at the time the badla contract is entered into In badla the market participant must pay commissions plus whatever the market badla rate is for the stock each settlement period it is carried forward While the commissions are known in advance it is difficult to predict the badla rate With a standard futures contract on the other hand the user does know the price in advance

B Review of NSE's Preparedness for Trading Stock Index Futures

In a review of the NSE' derivatives trading system surveillance system and proposed regulations for trading derivatives at the NSE Mr Gorham had the following conclusions

1 Trading System

The NSE s derivatives trading system seemed quite good by international standards from the point of view of security order types and especially market information In Mr Gorham's

view, it gave more complete and robust information than GLOBEX the electronic system used by the CME and MATIF

2 Surveillance System

The NSE's surveillance system for futures is identical to its surveillance system for stocks so any shortcomings it has in the cash market would be present in the futures market

Since Mr. Gorham is not a regulatory expert, he did not therefore opine on NSE's cash market surveillance capability. However, he did identify that if the NSE decides to create position limits on individual traders, there exists no unique personal identification number which would allow the NSE to aggregate a trader's positions across brokerage firms.

3 Regulations

The structure of NSE's regulations is consistent with that used for its stock market and seemingly with that used elsewhere in the Indian financial system. It is **very different** from the structure of regulations used by U.S. exchanges. This could be good, but in at least one respect it is not **because it is extremely difficult for a market participant to know what he can and cannot do**.

To find the answer to a question, one must consult the NSE's Bye Laws, Rules, Regulations and Circulars. Since circulars are issued periodically and stored in chronological order, one must sort through all circulars to find those relevant to a particular question. Most people involved in the stock market give up and just call the exchange to find the answer, which creates its own problems, since not all departments have an equal depth of knowledge of NSE regulations and they appear to have no better way to search. Putting all Bye Laws, Rules, Regulations, and Circulars on the Internet with appropriate links and indexing might solve the problem.

A related frustration with reviewing the futures regulations is that many regulations say nothing and simply refer the reader to circulars from "time to time." Since no circulars were available at the time of the review, it appeared no decisions had yet been made regarding many issues.

C Summary of Workshops Given at the NSE, October 15-27

During Michael Gorham's one-month stay in India, he presented six workshops: two for all NSE staff in general, three were for the NSE's Futures and Options Group, and one for students and faculty of the Indira Gandhi Institute of Development Research (IGIDR). The workshops were:

Workshop	Length	Attendees	Date
Stock Index Futures A 12-Year Review	1 5 hrs	70 NSE staff	Oct 15 1997
Choosing an Appropriate Index	1 0 hrs	14 NSE staff	Oct 17 1997
Energy Futures	1 5 hrs	14 NSE staff	Oct 20 1997
Manipulation Risk in Cash-Settled Futures	1 5 hrs	13 NSE staff	Oct 21 1997
U S Debt Market and Interest Rate Futures	1 5 hrs	40 NSE staff	Oct 22 1997
Stock Index Futures A 12-Year Review	1 5 hrs	15 IGIDR	Oct 27 1997

II DOES INDIA REALLY NEED STOCK INDEX FUTURES IF IT HAS BADLA?

There has been much discussion over whether stock index futures should be introduced in India. This is good. It is a sign of democratic health to have important financial innovations fully vetted and discussed before going forward. Some maintain, however, that stock index futures are not necessary in India given the existence of the badla or "carry forward" system. Badla allows buyers and sellers of shares to carry their position forward for many weeks without having to come up with either the money or the shares.

The purpose of the analysis in this section is to compare stock index futures to badla in order to evaluate that if they are overlapping products which obviate the need for one or the other.

There are sufficient similarities between stock index futures and badla (or at least badla combined with the account period settlement system used in India) to make it appear as though they might serve the same functions. In fact, this is not the case. Each of these systems solves problems which the other cannot solve in any reasonable fashion.

The main difference between badla and stock index futures is one of scope. Stock index futures generally cover the overall market (or at least broad market sectors) while badla covers each individual stock one-by-one. Stock index futures offers a low-cost method of protecting a stock portfolio against downturns in the market or allowing a trader to take a long or short (i.e. buy or sell) position on the market as a whole. A stock index futures position is a substitute (generally a temporary one) for a position in the cash market.

Badla, on the other hand, allows investors in, or short sellers of, individual stocks to carry their positions beyond the settlement period in which the stock was bought or sold. Current regulations (as of the end of 1997) allow positions to be carried forward as long as nine months.

A *Rolling Settlement Versus Account Period Settlement*

There are two basic systems for settling stock transactions in the world—rolling settlement and account period settlement (or "batch" settlement). The United States and most other countries use a system of rolling settlement. Transactions made today must result in settlement (i.e. the seller handing over the shares and the buyer handing over the money) a certain number of days later. In the U.S. it is currently three days (T+3).

A handful of countries, including Italy, France, and India (and the U.K. until 1994) use a batch settlement system. All the trades occurring during a certain period are settled on the same day, after the end of the trading period. These "trading periods" are called account periods, settlement cycles, or settlement periods.

¹ The system in practice is officially called "carry forward" but is also popularly referred to as badla.

In India the account period or "batch" settlement predominates at this time. The major stock exchanges of BSE and NSE have one week settlement cycles and some regional exchanges have longer periods.

The batch system in itself even without badla creates the opportunity to enter into the equivalent of a one-week futures contract in individual stocks. If one buys 100 shares of Reliance on day one of the settlement cycle trading period he can at any time before the last settlement cycle trading day closing bell offset his position by selling 100 shares. The position is closed out (a net zero deliver or receive from the clearing house in the scrip) and there is no delivery of shares. Only the money difference between the trade prices must be paid or received. Futures markets work in a very similar fashion but usually are not limited to one week.

B The Uses of Badla

Even though all 23 of India's stock exchanges use the account period settlement systems at this writing only the BSE allows badla transactions and only in approximately 100 stocks. The BSE account period trading cycle is Monday to Friday. Several other exchanges such as the Calcutta and Delhi Stock Exchanges, do plan to reintroduce badla once they have met the regulatory requirements.

Badla allows the buyer or seller the only legal way in India at this time to carry a position (postpone the obligation to deliver or take delivery) from one settlement to the next. Otherwise delivery must be made.³

Following each settlement, BSE holds a badla session (it starts late Saturday morning at the BSE). In this session traders with buy or sell positions can effectively roll their positions to the next settlement by finding someone who is willing to make or take delivery of stock for them in the current settlement. When a buyer of stock does a deal with a "badlawala" (the person stepping in to buy and hold the stock for him) he must pay the badlawala a fee (known as badla charges) for this financing operation.

How do people use badla? The following situations can be remedied with the help of badla:

A person has purchased shares, cannot immediately come up with the money to pay for them and wants to postpone payment for at least one settlement.

A person has sold shares which he does not have cannot immediately come up with the shares to deliver and wants to postpone delivery for at least one settlement.

The demat trades settled in the depository will be mandatory rolling settlement from January 1998 onwards per a SEBI decree. But demat trade volumes are still negligible as of the writing of this report. SEBI's mandate that institutions must trade certain scrips in demat from only may increase the volume in the demat segment in short order but that has not happened as of this writing.

If delivery is not made and badla is not availed off the short scrips not delivered are sourced by auction. If money payment is not made the exchanges ensure the defaulting broker makes payment. NSE has a clearing corporation which guarantees trades by becoming the legal counterparty to the buy and sell sides of each trade. BSE has a Trade Guarantee Fund which will cover any default in short scrip or money delivery by a broker. Other exchanges which do not yet have any trade or settlement guarantee mechanisms generally attach the members base minimum capital deposit held with the exchange.

A person expects the share price between the two settlements to increase by more than the badla charge

A person wants to be short the stock for more than one settlement cycle and finds that badla is the cheapest and most convenient way to do this (Badla is currently the only way to stay short more than one settlement cycle in India as mentioned earlier)

A person wants to own shares for a period of time but wants to be able to sell them on short notice and fears that he may not receive good delivery in sufficient time to do so (The depository in India is new and sparsely utilized up to this point in time The bulk of settlement still occurs in the physical share segment and the risk of receiving counterfeit or otherwise bad physical share certificates is still very real)

C Differences Between Badla and Futures

1 Badla Versus Futures on Individual Stocks

In the above examples badla extends the life of the settlement by two three or more weeks up to a maximum period up to nine months, which is the current legal limit on carry over This makes badla similar to futures on individual stocks⁴ but with one significant meaningful difference With badla, you do not know what your price to carry forward the transaction will be With a futures contract, you do know

The following examples illustrate the difference For comparison sake assume the price of Reliance is Rs 400 in the first week of January in both examples

a Cost of a Futures Contract On an Individual Stock

If you entered into a futures contract in January to buy June Reliance futures (if they existed) at Rs 420 per share you know that in June you will receive a specific number of Reliance shares at an effective price of Rs 420 each and you will have paid some pre-agreed commission

b Cost of a Badla Contract

With badla you could buy Reliance in the first week of January at Rs 400 and then carry it till June via a series of weekly badla trades To do this you will have to participate in more than 20 badla trading sessions and pay commissions plus whatever the market badla rate is

⁴ Badla could also be compared to a stock loan/borrow program which is currently not available in India at this time However that feature of badla is not directly related to the comparison of badla versus stock index futures so it is not discussed in this paper However short sales and stock loan/borrow is required to allow efficient arbitrage between the stock index futures and the cash market If stock index futures are introduced before short sales and stock lending and borrowing are available one could imagine a scenario where arbitrageurs use badla to do short sales and borrow stock to arbitrage the index However this would be inefficient because the cost of badla carry forward as it currently exists in India is not known at the time of entering the carry forward contract as discussed later in this paper Therefore the no arbitrage band between the index futures and the cash market would be widened making the index futures a less effective hedging device

for Reliance each time. While the commissions are known in advance, it is difficult to predict the badla rate.

With individual stock futures you know in January what your net June price for Reliance will be. With badla you don't. It's a function of market forces in the Saturday badla sessions. And the more thinly traded the stock, the more it is subject to significant fluctuations in badla charges.

2 Badla Versus Index Futures

Note that every one of the badla situations involves a single stock and not the market as a whole. In theory, a trader could buy or sell a large number of stocks during a settlement cycle and then enter into badla agreements on all those stocks and thus create a position similar to stock index futures. Such an operation would be very costly (paying both commissions and badla charges on many stocks) and risky (badla rates can fluctuate significantly from week to week, from stock to stock and even from minute to minute within a badla trading session). While it is difficult to say what futures commissions will be in India, U.S. transaction costs (commissions plus market impact) are much lower in stock index futures than they are for a comparable cash market transaction. The same could well be true in India.

3 Other Differences

The following table compares and contrasts features of the Indian cash market, badla, and stock index futures.

Features of Indian Cash Market, Badla, and Stock Index Futures

Feature	Stock Transactions	Badla	Stock Index Futures
Maximum future delivery	Up to 1 Wk	Up to 9 Mths	Up to 1 Yr
Typical margin	0.15%	15%	about 5%
Short Sale possible?	Yes (w/in 1 wk)	Yes	Yes
Position on a single stock possible?	Yes	Yes	No
Position on the whole market possible?	No	No	Yes

As can be seen in the table above, additional differences between badla and stock index futures are:

- Stock index futures allow a future transaction at a known price on a known date. Badla does not allow carry forward at a known price, and
- Stock index futures tend to have lower margins and, in theory, allow a position to be held further into the future.³

³ Indian regulations allow stocks to be carried no more than nine months, though the word on the street is that the vagaries of record keeping would prevent longer carry over from being detected.

D What is a Stock Index Future?

A futures contract is an agreement today to buy or sell at some specified time in the future a specified amount of some commodity currency or financial instrument for an agreed upon price. The person who agrees to buy is called the "long" and the person who agrees to sell is called the "short". A stock index futures contract is an agreement to buy or sell a bundle or basket of stocks in the proportions specified in the stock index being utilized at a certain price on a certain date.

With the index futures however the "baskets" of stock are never delivered in fulfillment of futures contracts. It would be very difficult and expensive to require delivery of such baskets (in part because most of the stocks would be in odd lots based upon the current weights in the index). Therefore stock index futures are virtually always settled in cash based upon the cash market index level at the time the futures contract expires.

1 Margin

When a person goes long or short (informally we also say "buys" or "sells" though technically this is incorrect since the contract is really an agreement today to buy or sell at a later date) any futures contract he must deposit with his broker (who deposits with the exchange) "good faith" money or a performance bond which is called initial margin. The initial margin is generally less than 5% of contract value. Each day all accounts are debited or credited based upon the difference between the closing price for that day and the closing price of the prior day. If a trader's account falls below a certain level he receives a margin call and must deposit additional money into the margin account held by the exchange.

2 Relationship of the Price of the Index Future and the Underlying Index

The price of the stock index futures rises and falls with the underlying index and maintains a very close relationship to it. The relationship results from the activity of arbitrageurs who will buy the cash and sell the futures when the futures gets higher or short the cash and buy the futures when the futures gets lower. Note that this arbitrage does not keep cash and futures equal but rather keeps futures a bit higher than cash with the futures premium increasing the further out the contract's expiration date is. For example on January 2 1997 the spot S&P 500 in the U.S. closed at 975.04, while the March and June futures contracts closed respectively at 984.70 and 994.90, reflecting premiums of .99% and 2.04%.

The futures premiums result from the fact that the arbitrageur who buys cash and sells futures must finance the cost of buying and holding the stock. The net cost of doing this is the interest costs on the loan for the stock purchase price plus commissions less any dividends earned on the stocks.

E The Uses of Stock Index Futures

There are approximately 25 countries listing stock index futures at present. This includes countries in Asia Europe Africa and North and South America. The following are situations where stock index futures are helpful.

A pension fund manager feels there are serious risks of a market drop during the next few weeks. He could sell off all his stocks and shift his funds to the money market during the risky period, then put the money back into the stock market. The same protection can be obtained much more cheaply by going short futures.

A mutual fund manager is written up in the press and money starts flowing in more rapidly than he can invest it. He is bullish on the market, so as money flows in he goes long an equivalent amount of stock index futures, then gradually offsets them as he places the funds in the stocks he wants to own. He has gained immediate exposure for incoming cash.

An investor has decided that a particular stock will do much better than the market as a whole. The problem is that he doesn't know how well the market will do and fears it may fall. He solves his problem by buying the stock and going short the market via stock index futures. Even if both fall, he will still profit as long as his stock falls less than the market.

An investor wants to gain exposure to the market as a whole for a short period of time because he believes the market is going to make a significant up move or down move, though he is not so sure how specific shares will fare. It will be much cheaper for him to take a short or long position in stock index futures than to buy or short a large number of individual stocks in the cash market.

The fact that the futures moves up and down with the cash index means that anyone seeking to gain exposure to or obtain protection from general market moves (at least as represented in the index) can do so with a position in stock index futures. In other words, when the NSE 50 falls by 5%, the NSE 50 futures should fall by a similar degree, allowing an investor with a diversified portfolio of stocks to obtain protection by being short the NSE 50 futures.

F Summary

In summary, there is one key similarity between badla and index futures. Users of both systems want to take advantage of the rise or fall of prices without having to physically deliver or take delivery of stocks. A trader can thus profit from (or suffer a loss from) the ownership of stocks without actually owning them.

On the buy side, both badla and stock index futures are temporary substitutes for positions in the cash market, that is, substitutes for the physical ownership of stock. On the sell side, index futures do represent a substitute for the cash transaction of going short a basket of stocks, while badla is the only practical way to short a stock (for more than a week) in the Indian market. In other words, on the sell side, futures is still a substitute for a cash position, but badla is the cash position.

Even though badla is very similar to futures on individual stocks, it is very different from futures on a broad index of stocks. Badla allows the trader to focus on one stock at a time, while index futures allows him to focus on the entire market (or defined market sector like large cap, small cap, technology, energy, etc. if such indices are available and traded).

Thus badla and stock index futures are two systems with two different sets of uses. Therefore they are not mutually exclusive and one system should not be chosen over the other. Rather the market should decide which product offers the features needed by market participants. It is not contradictory or inconsistent to allow these systems to operate side by side in India since they are addressing different needs.

III REVIEW OF NSE PREPAREDNESS FOR TRADING STOCK INDEX FUTURES

[NOTE THE FOLLOWING ARE THE OBSERVATIONS AND FINDINGS OF MR GORHAM WHILE AT NSE IN OCTOBER 1997, SO COMMENT IS SOMETIMES MADE IN THE FIRST PERSON]

A Trading System

The trading system for the NSE derivatives segment has been in place and ready since December 1996. I spent several hours being guided through the system by Ratna Madeka and Samir Anvekar. The system seems to be quite good by international standards.

Security seems good. The user must enter three pieces of information: a user identification number, a trading member identification number, and a password. If the screen is idle for 20 minutes or more, the password must be re-entered. Passwords must be changed every two weeks. Six consecutive attempts to log on with an incorrect password results in the user being disabled. A user can block trading access without interrupting market information if he wishes to temporarily leave his terminal.

Market information is robust and superior to GLOBEX (the electronic system operated by the Chicago Mercantile Exchange). The basic NSE screen lists the best five bidding prices and best five offering prices and the quantities associated with each. It also shows the total number of contracts available for purchase and total number available for sale for all orders in the system (not just the best five). The same screen indicates the total number of contracts traded and the average price at which they were traded. Of course, it also shows the high, low, and last trade. A second screen goes deeper into the book by showing the number of contracts and number of orders associated with each of the best five selling prices and best five buying prices. The screen can also monitor indexes and individual shares in the underlying stock market.

GLOBEX, by comparison, does not show the total number of contracts available for purchase or sale, the number of orders associated with each of the best five bidding prices or asking prices, the average price of transactions made so far, or individual share prices.

The types of orders available are quite reasonable and again more extensive than GLOBEX. Market orders, limit orders, and stop/loss orders are allowed. Orders can be specified as immediate or cancel, good for the day, good till cancelled, good till a specific date, good for a specific number of days. The orders can disclose the total quantity or only a portion. They can indicate the minimum fill acceptable and can also be specified as all or none. Orders must indicate proprietary or client and whether the order is opening or closing a position.

The market will be open from 9:45 a.m. to 3:30 p.m. with a pre-opening accumulation of orders between 9:30 and 9:45. In addition, there will be a 30-minute post-close session where trades can be done at the market closing price to allow traders to square up.

It should be noted that NSE plans to have an order matching system for their derivatives markets with no market makers liquidity providers or "locals". PW/FIRE knows of no other derivatives market in the world which does not utilize liquidity providers. Mr. Gorham does not comment on this feature of the proposed NSE market nor the ability of the NSE derivatives trading system to be adapted to market making. PW/FIRE cannot comment on the system's ability to be adapted to market making either although in informal conversation NSE has mentioned the system could be modified to handle market making if required.

B Surveillance System

The surveillance system for futures is identical to the surveillance system for stocks. I observed the surveillance system for stocks. It runs real time and is intended to manage members compliance with overall position and turnover limits. Generally a member's position limit is set at seven times their base capital which is the capital they have deposited with the exchange. A member's turnover limit is set at 33.3 times their base capital. A member will receive a warning on their trading screen as they get near either of these limits (Note that it is very rare for a member to hit the trading limit before the position limit since the trading limit is set almost five times the position limit). Warnings appear when the position reaches 80%, 90% and 100% of that allowed. When the position reaches 110% the trader is cut off.

One problem I saw was that if the NSE places limits on the size of a position an individual can hold there will be no way to ensure compliance with these limits. While brokers may key in the customer account number I don't think they are required to do so and the NSE does not currently do anything with this account information. Furthermore since a customer will have a different account number at each brokerage firm at which he has an account the NSE will have no way to aggregate his position across brokerage firms. In the US firms must supply customers social security or tax identification numbers to the exchange allowing the exchange to determine each client's total position across all brokerage accounts. While there are several identification numbers (like voting identification and tax identification numbers) used in India there is currently no unique identification number which all customers would necessarily possess.

One solution to this would be to require that any individual or firm that trades futures must have a tax identification number. However, this is a broader policy issue and I would not recommend this unless it was deemed worthy on its own merits.

C Regulations

1 Accessibility and Ease of Use

Accessibility and ease of use is a problem with the NSE regulations. To figure out what can and cannot be done at the NSE requires that the member or customer look in four places: the Bse Laws, the Rules, the Regulations and the Circulars. Since the Circulars come out on a periodic basis and are stored in chronological order one must search through all the circulars to find out the NSE position on any given topic. In practice the task is so difficult that people simply call the NSE when they want to know the regulations on any given topic. This

seems an inefficient use of the time of both NSE staff and of the members who sometimes have trouble getting through to the right department to get the answer

While local law and custom may require that this four-tiered approach to regulation be kept it could be improved to be more member-friendly NSE has a talented staff with superior system skills The exchange could easily put the Bye Laws Rules Regulations and Circulars on their Web Site The Circulars could be cross referenced with specific Bye Laws Rules and Regulations via hyper links so that the user could easily move from any regulation to all relevant circulars and from any circular to the appropriate bye law rule or regulation as well as to other relevant circulars

2 Ambiguity/Unresolved Procedures

There are many places where the regulations essentially say that the Exchange will let the broker know later what he needs to do For example Regulation 4.4 of Part B - Clearing Regulations states "Clearing and settlement of any or all deals may be on a netted basis or gross basis or trade-for-trade basis or any other basis as may be specified by the relevant authority from time to time"

I assume that there is some good reason to keep much of the substance of the regulations in the form of circulars Even if this is the case there are many cases like the one cited above where the Exchange should have already decided how to proceed and should have draft circulars to accompany these draft regulations

3 Futures and/or Options

In the 'Definitions' section some definitions mention futures only and others mention options only when they should be mentioning both futures and options These include 1.3.7, 1.3.9, 1.3.10, 1.3.12, 1.3.13, 1.3.19, 1.3.20 The remainder of the rules generally speak about trades and contracts and don't explicitly mention futures or options by name which allows them to refer to both If the rules are written to cover both futures and options there may be a few areas where options need to be explicitly mentioned A trivial example is in the Contract Note (Annexure 2) which must somewhere have a place for the strike price to be referenced

4 Specific Comments Part A - Trading Regulations - Futures

1.3.12 & 1.3.13 You have circular definitions since you define the expiration month in terms of the date and the expiration date in terms of the month You may want to define the expiration date as the last day of trading and the expiration month as the month in which that day occurs (For the record there are some futures contracts energy I think in which the last day of trading is actually in the month prior to the expiration month In Chicago the term contract month or delivery month is often used

2.2.9 Can the rejection of an application or the withdrawal of a previously granted approval be arbitrary with no reason given or should the rejected applicant be given the courtesy of a reason?

2 3 2 If the Exchange closes the market on scheduled market days or opens the market on scheduled holidays it should make best efforts to inform all of its members in a timely fashion

2 3 4 d What is 'Surcon' ?

2 6 6 It probably does not hurt to have lot sizes greater than one futures contract but why would you do it? It seems like an indirect way to increase the size of a futures contract

2 6 8 Do you really want to impose turnover limits? Turnover is important for maintaining liquidity There were turnover limits on futures in the U S until the late 1970s when the Commodity Futures Trading Commission (CFTC), the US futures regulator realized that they were really not necessary to ensuring orderly markets

2 7 I find the terms "kind of trade" "trade type," "market type," and "transaction type" to be unclear and potentially overlapping Referring back to the definitions gives the reader some sense of trade type (1 3 26 says 'Trade type means the types of trades in any security admitted to the official list of the Exchange and includes Normal Market trades and Negotiated trades') "Kind of trade" and "transaction type" are not defined and the definition of "Market type" given as 'Market type refers to the different markets in which trading is permitted on the Trading System' in 1 3 15 does not help much It may be that these terms are well understood by stock exchange members but they are less clear to outsiders Also you won't have settlement periods in futures like you do in stocks so why is 2 7 4 required?

2 8 line 7 Can the member fax or e-mail the request?

3 2 7 f Why would the exchange ever cancel a trade without giving any reason Seems very arbitrary

3 3 1 Special Term order not defined

3 3 2 c Still not clear what market type means

3 3 5 d ii This says 'The best buy order shall be matched with the best sell order' First there would obviously be no match when the best buy order was below the best sell order (e.g. best buys are 3 4 and 5 while best sells are 6 7 and 8) Second if the best buy orders were 3 4 and 5 and the best sell orders were 4 6 and 7 then at what price would the best buy order of 5 and the best sell order of 4 be matched? Third what if the best buys were 3 4 and 5 and the best sells were 4 5 and 6? Assume all order sizes are equal You'd make the most people happy if you matched the 4 buy with the 4 sell and the 5 buy with the 5 sell But your algorithm would match only the 5 buy with the 4 sell leaving fewer people satisfied This may be worked out on your stock trading system but this was my immediate reaction on reading the regulation

3 6 See previous comment above on 2 6 8

3 8 6 Why would you ever exempt a trading member or participant from margin requirements?

3 8 7 How could you justify requiring extra margin only from selected members or participants?

3 9 a The last lines of paragraphs 2 and 3 say the Trading Member does not have to collect margins from FIs FIIs and mutual funds. Maybe this is acceptable for stock investments but it is not acceptable for future products. As a cosmetic suggestion in line 1 of paragraph 2 following the word 'buy' add the words 'or sell' and eliminate the entire next paragraph.

3 9 b Paragraph 1 has some extra words in line 4. Paragraph 2 refers to a settlement period which is not relevant in futures. The basic language of paragraphs one and two are different and should be made consistent, or the two should be combined into a single paragraph.

4 3 and 4 4 seem to both be the same topic – the Trading Member's relationship with its constituents.

4 4 12 Last sentence allows client to allow bank to take his funds to meet his broker's defaults. Why would you want this?

4 4 13 Because some clients are more risky than others and because some members will be more financially conservative than others I would strongly suggest that exchange-mandated margins be considered minimums and that members be allowed to require higher margins from their clients if they deem it prudent to do so.

4 5 3 f I do not understand the last four lines and do not really understand the purpose of a rule which says that a member cannot make public a specific trade price or transaction unless the member can produce evidence the trade price or transaction took place. If it is to prevent members from making false claims regarding their trading performance (which would be good to do) this doesn't go far enough since a member could falsely claim that 'we made 820% profit on money we managed for our customers' without violating the above rule.

4 5 4 b This prohibits members from doing business in suspended contracts, but would it even be physically possible to do so since I assume that the Exchange would drop the contracts from the electronic system.

4 5 4 d At end of second line after the word 'purchase' add the words 'or sale' since I think that's what you mean. Also you say that this confidential information can be used for solicitation purposes if it is at the request of and on behalf of the issuer. It is not clear what is meant by the issuer. Issuer of what?

4 6 2 1 Both a) and b) prohibit members from engaging in transactions which artificially raise lower stabilize or inject volatility into security prices. The two rules should be consolidated.

Annexure 1 Application for Approval as User This says the Trading member shall ensure that he/she (the user) will not execute any order on account of any one without such

order having been prior approved by us in writing. If this says that the person operating the computer cannot directly take orders over the phone from the customer but must have another representative of the Trading Member approve the trade in writing doesn't this significantly slow down the process of executing a trade?

Annexure 3 Member and Constituent Agreement on page 2 item 5 says I shall not exercise a long or short position where acting alone or in concert with others directly or indirectly I will have exercised in excess of the number of derivative contracts as may be fixed from time to time by the Exchange. Usually the term exercise refers to buyer of an option contract exercising his right to have the seller of the option give him the underlying commodity or security at the specified strike of that option. If this is the meaning here then you should delete the reference to exercising a short position, since you can't exercise a short options position. In addition if this says that the Exchange will have limits on the number of contracts which can be exercised this maybe unnecessary if the position limit rules are written to indicate a maximum combined number of futures and options contracts which may be held.

Position limits should combine futures and options since the trader with 500 deep-in-the-money options and 500 futures would benefit equally from a manipulation of the underlying market at contract expiration as the trader with 1 000 futures. Since most options are not deep-in-the-money and change in price by less than the futures or underlying (i.e. their deltas are less than one) a holder of 500 options will benefit less than a holder of 500 futures. For example if someone manipulated the price of the NSE 50 ("Nifty") up by 5% at expiration the price of the futures would rise by 5% but the price of at-the-money options would rise by only about 2.5%. A reasonable approach to combining futures and options is to reach a total number of "futures equivalents" by multiplying each option by its associated delta and summing the total. So 500 futures and 500 at-the-money options would be 750 futures-equivalent contracts (the at-the-money delta of 0.5 times the 500 options plus the 500 futures equals 750).

Also in Annexure 3 page 1 last paragraph, it states that The agreement entered into between the Trading Member and the constituent shall stand terminated by mutual consent of the parties by giving at least one month notice to each other. This says that you need mutual consent to terminate the broker/customer agreement. Seems like you'd want either party the broker or the customer to be able to terminate the agreement if they no longer wanted to do business. The way this is written the agreement lasts forever unless both parties agree to terminate.

Annexure 5 Risk Disclosure Document The first paragraph under the title Effect of Leverage or Gearing says The index futures contracts available for trading are 3 month futures contract i.e. a near month expiration contract a 2 month expiration contract and a 3 month expiration contract. Thus at any point of time there exists 3 contracts available for trading.

Two problems. First the language is a little unclear. I think what this is trying to say is that there will be index futures for expiration in each calendar month of the year but that at any given moment only the nearest three months will be listed for trading. At the beginning of March for example only the March April and May futures will be listed and available for

trading. If this interpretation is correct, perhaps the language could read: "At any point of time there will be three stock index futures contracts available for trading: a near month expiration, a two-month expiration and a three month expiration."

The second problem is that I do not think that you need to be this explicit because you may wish to change the number of months as the market develops. When eurodollar futures were started in 1981, I believe that the CME listed quarterly contracts out for a year, i.e. four contract months. As the market developed, users asked for more months to be listed. Today the CME lists 10 years into the future for a total of 40 contract months in eurodollars. To avoid having to change the Risk Disclosure Document too often, I think you should just say that every calendar month will have a stock index futures expiring in it; you will start with three, but may add others depending upon market demand.

In section A, you say "the investor may lose a part of or whole margin equivalent to the principal investment amount in a relatively short period of time." Change "relatively" to "very" since the loss could occur in a day or two.

In section B, it says that a change in the value of "substitute securities" can trigger a margin call and in section C that the member can liquidate all or part of the 'substitute securities' if the margin call is not met. What are these substitute securities and will the customer signing this document know what they are?

In the paragraph under the title 'Risk-reducing orders or strategies' it says "Strategies using combinations of positions, such as spread positions, may be as risky as taking simple long or short positions." While this statement is true and useful to make when the customer may be spreading among several different types of futures or even inter-month spreads in futures for certain types of non-storable, non-carrying-charge markets like cattle, it is not true for index futures and could confuse or mislead the customer. You might want to add a phrase like "depending upon the types of futures involved," so it doesn't sound like you are necessarily referring to index futures.

The last words, 'the risk of loss liquidate/offset positions' of page 2 of the Risk Disclosure Document don't make sense to me. There is probably something missing.

5 Specific Comments Part B - Clearing Regulations - Futures

3.3 It sounds as though this means that SEBI (assuming "the relevant authority" means SEBI or is it the Exchange?) can decide to postpone or extend the delivery period for physically delivered futures contracts, either for everyone or for specific traders. It is not clear what this means for a cash-settled stock index contract. If you want to give SEBI or the Exchange latitude in the case of an emergency, you may want to indicate that the Exchange or SEBI can use an alternative means or time for calculating the index should an emergency situation prevent the calculation called for in the regulations.

5.6 This says the settlement price is the closing price, but what is the closing price? The last transaction price? A weighted average of all transactions in the last minute of trading? In the last 30 minutes of trading? Is this defined elsewhere? If not, it must be

5 7 The requirement for paying and receiving variation margin is incomplete because it implicitly refers to new transactions made that day but not to prior transactions This can be corrected by inserting the following words after the end of the first sentence for transactions entered into that day or the difference between the prior business day s settlement price and that day s settlement price for transactions entered into prior to that day

5 9 1 1 This says the final settlement price is the closing quotation of the underlying index Is this correct? I thought it was an average of prices during the last 30 minutes of trading or something to that effect

6 3 Why are there turnover limits for clearing firms based on base capital? Isn t the only risk really from outright positions If a firm bought then sold 100 contracts 1,000 times during the day and ended with a zero position it seems as though neither they nor the Clearing House face any risk other than the risk entailed in the 100-contract position held at various times during the day

13 4 6 This requires clearing members to maintain certain information regarding closed constituents accounts for a period of six years, while 13 1 6 third paragraph requires clearing members to maintain six different types of records for a period of five years The same discrepancy exists in **Part A** where 6 1 3 requires Trading Members to maintain a number of records for a period of five years, while 6 1 11 requires the maintenance of records on closed accounts for six years There is not necessarily a problem, but I point it out in case it is not intentional

IV SUMMARY OF WORKSHOPS GIVEN AT THE NATIONAL STOCK EXCHANGE

In the period October 15 - 27, 1997 Mr Gorham presented six workshops. Five were for NSE staff and one was for students and faculty at the Indira Gandhi Institute of Development Research (IGIDR). Of the five at the NSE two were for all NSE staff and three were for the Futures and Options Group. The workshops included

Workshop	Length	Attendees	Date
Stock Index Futures A 12-Year Review	1.5 hrs	70 NSE staff	Oct 15 1997
Choosing an Appropriate Index	1.0 hrs	14 NSE staff	Oct 17 1997
Energy Futures	1.5 hrs	14 NSE staff	Oct 20 1997
Manipulation Risk in Cash-Settled Futures	1.5 hrs	13 NSE staff	Oct 21 1997
U S Debt Market and Interest Rate Futures	1.5 hrs	40 NSE staff	Oct 22 1997
Stock Index Futures A 12-Year Review	1.5 hrs	15 IGIDR	Oct 27 1997

A *Stock Index Futures A 12-Year Review*

This talk given once to a cross section of 70 NSE staff members (research legal clearing surveillance senior management etc) and once to students and faculty of the Indira Gandhi Institute was based on research conducted by Mr Groham for a talk to the Korean Financial Management Association as Korea was developing its first futures markets and was in a similar situation to India today. Mr Gorham addressed the five questions that the paper addresses, which are

- 1 How important are stock index futures in the world today?
- 2 What lessons can be learned from the original introduction of stock index futures in 1982?
- 3 Can a country successfully trade more than one stock index futures can it successfully trade the stock index of another country and is it best to list the contract at a stock exchange or independent futures exchange?
- 4 What do we know about the effect of stock index futures on the volatility of the stock market after 15 years and one major crash?
- 5 What issues are important in the design of stock index futures?

The full paper is presented in Appendix A of this report.

B *Choosing an Appropriate Index*

This workshop with the NSE's Futures and Options Group focused on the characteristics to consider when choosing an index for futures trading. Aside from factors like underlying capitalization and liquidity we also explored such issues as the role of consumer recognition

For example in 1984 the Chicago Board of Trade (CBOT) listed futures on a stock index that was as close a clone to the Dow Jones Industrial Average as was legally possible. Of course they could not use the DJIA name and the contract failed miserably. When the exchange finally obtained the rights from Dow Jones and Company to list the name-brand index the launch of the DJIA futures was the most successful launch in CBOT's history.

C Energy Futures

I learned several lessons during the development of energy futures in the United States. In 1979 we at the CME made a conscious decision not to develop energy futures contracts. We felt that the hold that OPEC had over the market created such an unlevel playing field that no one would participate in a futures market. We were wrong. Within two years NYMEX heating oil, gasoline and crude oil futures were actively trading. They had energy contracts in place when OPEC started to lose some control and futures trading at NYMEX developed rapidly. It was then too late for the rest of us.

The second lesson I learned was that it is very difficult to create a new futures contract if that contract is closely related to an already established contract. Case in point. In 1983 we at the CME decided we wanted some piece of the energy market. NYMEX had heating oil and gasoline contracts for New York harbor delivery. Our research told us that we should create contracts for delivery on the Texas Gulf Coast. This is where much of the crude oil (both domestic and imported) was refined into products. And Gulf Coast prices did sometimes move independently of New York prices. The oil industry told us there was a need for this contract and in fact that the contract we designed was the best designed energy contract to date. We started the contract amidst much fanfare. It lasted two months. Even though Gulf prices had some independence, industry participants preferred to take that risk and cross hedge their Gulf Coast product in the NYMEX New York harbor contract than face the illiquidity of the new CME Gulf Coast contract.

What does the world look like today? NYMEX has all the marbles in the U.S. and about 75% of world energy futures trading. The CME failed. The CBOT failed. The International Petroleum Exchange in London has most of the other 25%. Singapore's SIMEX has relatively inactive crude and fuel oil contracts and Finland, Australia and New Zealand have small markets in electricity.

Issues worthy of discussion in energy futures are the delivery process, the problem of contract size (where there is a minimum 25,000 barrel requirement to get product into a pipeline, but the ideal contract size from a speculative point of view is only 1,000 barrels), the issue of delivery in both natural gas and electricity. Also, what changes in the electricity market have allowed electricity futures markets to develop in the U.S., Finland, Australia and New Zealand.

D Manipulation Risk in Cash-Settled Futures

Those who design physically delivered futures contracts worry about "squeezes." In particular, they worry about the risk that an individual or group of individuals will hold such a large long (buying) position through contract maturity that those holding the short positions will not be able to acquire sufficient product to honor their requirement to deliver. This can

happen because the longs have themselves somehow gained control of a large portion of the deliverable supply or because the outstanding futures position at contract maturity is simply larger than the naturally available supply. Should such a squeeze or corner occur, it can seriously undermine the credibility of a futures market.

Some people think that cash settlement avoids problems of manipulation. Not true. It only changes the nature of the game. The basic idea is still that a party with a large futures position attempts to profit from some artificial tampering in the market. The difference in the case of cash settlement is that the tampering involves uneconomic buying or selling in the cash market during the period in which the cash index is calculated. The idea is to spend some money pushing the index out of line during the calculation period in order to profit from the futures position. As long as the profits on the futures position are greater than the costs of the manipulation, there is an incentive to manipulate.

Futures exchanges guard against such manipulation by setting limits on the size of positions allowed to any single trader. Some futures contracts have position limits, others do not. Generally, in the U.S., position limits are used when it is judged that there is manipulation risk in a market. Not all markets have significant risk of manipulation. Some cash markets like three-month dollar LIBOR are so large and liquid that manipulation is extremely difficult. The Eurodollar futures contract based on three-month dollar LIBOR accordingly does not have a position limit, though the positions of large traders are monitored by the exchange.

In some cases, the position limits are set at relatively high levels and are then scaled down as the market approaches expiration since it is during the delivery or cash settlement period that manipulation risk is highest.

The question for the NSE is whether it would be feasible for a trader, or a small group of traders working in concert, to buy or sell aggressively in the cash market during the last 30 minutes of stock trading (the period during which the stock index's value would be calculated for the purposes of final settlement) in order to move the final settlement price. More specifically, could the trader profit sufficiently on his futures position to make such a manipulation worthwhile?

It's a very imprecise science, to be sure, but a simplistic analysis goes something like this: With the Nifty trading around at 1,000, how much would it cost a trader to buy selected stocks in sufficient quantity during the last 30 minutes of trading to push the Nifty up by 5% (50 points) and then sell those stocks at the beginning of the next trading period?

Let's say the trader loses Rs. 10 million (1 crore) in overpaying for stocks on Tuesday afternoon and selling them back into the market at a lower price on Wednesday morning. To make back that Rs. 10 million (1 crore) from the 5% increase in the value of his futures position, the trader would need a futures position of Rs. 200 million (20 crore) or 4,000 Nifty futures contracts. (One contract is worth Rs. 50,000 at an index level of 1,000.) If the trader or group of traders working in consort had a position substantially greater than 4,000 contracts, the manipulation described could begin to look attractive.

The difficulty in this analysis is the cost of the manipulation. Only those involved in the market can tell us much about those costs. After that the math is easy. The NSE should spend some time researching this question. The answer will tell the exchange whether it is necessary to impose position limits on traders and what those limits should be.

E The U S Debt Market and Interest Rate Futures

There are people who have money and people who need money. The debt market is the means by which these two groups are linked. It serves a wonderful economic function by moving money out of the hands of those willing to temporarily part with it into the hands of those with creative ideas about how to use it to build and expand the economy. People participate in this market because they get something out of it. The lenders, buyers of debt securities, get paid interest for the use of their money, and the borrowers get the money temporarily to invest in hopefully high-return activities.

THE U S DEBT MARKET

In the U S we divide the debt market into two broad segments: the money market and the bond market.

1 The money market

The money market is short-term debt of up to one year made up of interest bearing securities and discount securities.

interest bearing securities

eurodollar deposits	deposits of U S dollars in overseas banks mostly 1 - 6 months yield higher than deposits in U S because of lack of guarantees by FDIC
federal funds	mostly one-day loans among banks to cover Fed requirements on reserves loan is transfer from one banks Federal Reserve account to another
negotiable CDs	mostly one to six months issued by banks
repo agreements	generally overnight loans among banks, security dealers and corporations, collateralized by a marketable instrument

discount securities

agency notes	obligations of agencies of U S govt guaranteed by govt
bankers acceptances	1-6 mos issued by corporation guaranteed by a bank
commercial paper	uncollateralized 11-270 day corporate debt

T-bills the safest and lowest yielding 3 and 6 month issues issued every Monday 12 month issued only once a month

2 The bond market

The bond market is longer-term debt of over a year Different types of bonds are

US government bonds

- 30-year T-bonds
- 10-year T-notes
- 5-year T-notes
- 3-year T-notes
- 2-year T-notes

The U S Treasury is the single largest issuer of debt in the world (over \$2 trillion) U S Treasuries are dematerialized entries in the books of the Federal Reserve The market is highly liquid

Municipal Securities -- the debt of state and local governments typically used for capital projects (e g schools roads airports, bridges) but sometimes to cover operating deficits Buyers typically high income individuals who benefit from the tax-exempt interest from munis

Corporate Bonds -- the debt of corporations Bond holders have priority over stockholders should a corporation be liquidated

Mortgage-Backed Securities -- U S mortgage market is largest debt market in the world Mortgages are pooled into securities, guaranteed by a U S government agency (Ginnie Mae Freddie Mac, and Fannie Mae) and sold to investors

INTEREST RATE FUTURES

Quick History of Interest Rate Futures

- 1974 Beginnings with package of mortgage rates called GNMA Successful then failed 6 times
- Next successful contract was a short-term T-bill at CME
- Quickly overtaken by T-bonds at CBOT
- This was eventually overtaken by eurodollars at CME
- The two exchanges have specialized short rates at CME long rates at CBOT sort of
- Interest rate futures is the most actively traded segment of futures markets both in the U S and world wide

Using Interest Rate Futures

Be careful Because interest rate futures are quoted as prices of the securities you buy futures to protect against rising prices (i.e. falling interest rates) and sell futures to protect against falling prices (i.e. rising interest rates)

To insure against rising rates e.g. you are going to borrow long-term money in three months and you are worried rates will rise (an anticipatory hedge)
-- sell bond futures

To insure against falling rates e.g. to protect value of a bond inventory (an inventory hedge)
-- buy bond futures

To convert from fixed rate to floating rate
I loan money at a floating rate but I want to convert it to fixed rate to ensure a constant stream of income
If rates fall I want income -- buy futures so when rates fall prices will rise and I receive offsetting funds

To convert from floating rate to fixed rate
I loan money at a floating rate to please my customer, but my source of funds is floating rate I'm worried rates will rise and erase my profits
Sell futures If rates rise prices will fall and I will receive appropriate funds to offset my losses

CURRENCY FUTURES - QUICK NOTE

- 1972 start
- Some contracts failed like Dutch Guilder, Italian lira, French franc
- Mexican peso -- in, out in
- What if the currency is not convertible on the capital account -- case of the Brazilian real
- Covered interest rate arbitrage -- when you look at the futures rates does that mean the currency is going down? No
- Emerging market currencies Mexican peso Brazilian real South African rand Russian ruble Hungarian forint

Appendix A

"Stock Index Futures, A 12 Year Review" by Michael Gorham

**Stock Index Futures:
A 12-Year Review**

by
Michael Gorham
Vice President
International Development
Chicago Mercantile Exchange

Presentation at the
Korea Financial Management Association Conference
May 21, 1994
Seoul, Korea

My purpose today is to attempt to evaluate the status of an important financial innovation -- stock index futures -- now that we have had 12 years to observe their performance. Many countries already have stock index futures. Others, like Korea, are considering their introduction. Are there lessons to be learned by those newly embarking down this path from those who have been treading upon it for many years? I will organize my thoughts on the matter by addressing five questions.

- 1 How important are stock index futures in the world today?
- 2 What lessons can we learn from the introduction of stock index futures 12 years ago?
- 3 Can a country successfully trade more than one stock index futures, can it successfully trade the stock index of another country, and is it best to list the contract at a stock exchange or futures exchange?
- 4 What do we know about the effect of stock index futures on the volatility of the stock market after 12 years and at least one market crash?
- 5 What issues are important in the design of stock index futures?

There are, of course, many interesting questions which could be asked about stock index futures. I've attempted to select those which would be interesting to me if I were faced with the task of developing or regulating these new markets in a country like Korea. I have also attempted to include questions put to me by the organizers of this conference.

In order to keep the discussion manageable, I am focusing solely on stock index futures and, for the most part, ignoring stock index options. I am not suggesting that options are not important. Quite the contrary. In some countries they are much more widely used than the futures. However, including them would more than double the amount of data we have to analyze and make this paper unreasonably lengthy. So as an act of kindness to the audience, we will save options for another time. Let's now see what we can discover about each of these questions.

1 **How important are stock index futures in the world today?**

In February of 1982, there was one stock index futures traded on one exchange in one country. Last year, there were 36 stock index futures contracts traded at 25 exchanges in 20 countries (Chart 1). Thirty-six contracts. Twenty-five exchanges. Twenty countries. We have come a long way in the past 12 years. Stock index futures is a financial innovation.

which has taken strong root in the country of its birth and spread like a vine over the financial vineyards of Europe, Asia and Latin America. It is an innovation which is clearly here to stay.

The US still dominates stock index trading with a 21% market share of total stock index contracts traded (Chart 2). Amazingly, Spain, which started stock index futures less than two years ago is now the number two country for stock indexes (with 15% of the market), followed closely by Japan (with 15%) and Brazil (with 14%).

I should caution you that ranking countries or exchanges by the number of futures contracts changing hands is somewhat misleading. The very high numbers for Spain and Brazil are partly due to the fact that their contracts are very small. In fact, the value of one S&P 500 contract is more than 100 times the value of one IBEX 35 contract. Unfortunately, the data reported by the exchanges and collected by the Futures Industry Association are generally in terms of the number of contracts traded, and ignore the differences in contract size.

However by using the index levels, contract multipliers and exchange rates prevailing in mid-1993, we can convert the volume (number of contracts traded) figures in Charts 1 and 2 to dollar value of trading figures in Charts 3 and 4. The effect of doing this is dramatic. Both Spain and Brazil, each of which accounted for about 14% of the number of stock index contracts traded, find their market shares fall to below 1%.

And the large markets become even more dominant. Only two countries, the US and Japan, together account for 72% of the dollar value of world stock index trading. And if you add in Singapore, Germany, France and the UK, you've accounted for 95% of the world market. The other countries split the remaining 5%.

Within the US futures industry, stock indexes play a relatively modest role (Chart 6). They account for about 4% of all futures business in the US. This is less than interest rates (which account for 51%), less than agricultural commodities (which account for 17%), less than energy (which accounts for 13%), less than currencies (which account for 9%) and less than metals (which account for 5%). So stock indexes are the smallest slice of the US futures pie.

It was not always this way (Chart 7). After their introduction in 1982, stock index futures grew more rapidly than other markets, peaking with a market share of 13% in 1985 and 1986. The crash of October 1987 resulted in a 40% drop in stock index trading and the product's market share has been held to 4 to 5% ever since. We are in our seventh post-crash year and volume has not quite come back to its pre-crash peak.

However, in most other countries stock indexes account for a much larger share of all futures trading (Chart 8). More than 90% in Hong Kong, South Africa and the Netherlands. And 25% or more in Austria, Switzerland, Spain, Norway, Singapore, Denmark, Brazil, and Germany. And if options were included in the calculations, the stock index share would be

even higher since stock index options are even more popular than stock index futures in many countries. In Switzerland and Austria, for example, stock index options trade four times the level of the equivalent futures.

In the mature markets, countries with large volumes of futures trading, countries which have been trading futures for a number of years, countries like the US, the UK, France and Japan, the stock index share tends to be at or below 10%. This is due not to any deficiency in stock index business, but rather to well developed business in other areas, especially in interest rates.

Stock index futures have become very important to pension fund managers. According to a recent survey by Pensions and Investments, fully one-third of the top 200 pension plans in the US use stock index futures. This includes the pensions of such firms as RJR Nabisco, J.C. Penney, Sears Roebuck, Shell Oil, ALCOA, AT&T, Ameritech, IBM and Exxon, to name a few.¹

Stock index futures have become important not just for traditional inventory hedging, but also for allowing quick and cost effective shifts in asset allocation. In addition, fully half of the pension funds using derivatives in a 1993 survey used them, at least in part, to create income via index arbitrage or writing options.²

In summary, over the past 12 years stock index futures have become an important international phenomenon – 20 different countries now have stock index contracts. About 95% of the value of stock index trading is based on indexes of the countries with the largest economies and capital markets – the US, Japan, Germany, France and the UK. In almost all those countries stock index futures are a relatively small part of all futures trading – other contracts, especially those on interest rates, are much more important. In the smaller economies, stock index futures tend to account for a larger share of the futures market.

2 What lessons can we learn from the introduction of stock index futures 12 years ago?

Stock index futures were introduced in the United States in 1982 and I still remember the euphoria associated with this new innovation. Many exchanges felt this would be a very important new market and they all wanted to be part of this new world. We at the CME felt so strongly about this in the early 1980s that we recruited our new president from a major stock exchange, rather than from the agricultural sector, as we had done with our previous two presidents.

When you look at the US market today, the CME has 92% of all US stock index futures trading and is without a doubt the preeminent stock index futures market in the world, both in terms of volume and the number of different contracts listed. However, it was not at all clear in 1982 that this would be the outcome of the stock index futures competition. In fact, a reasonable person could have confidently predicted that the eventual leader in this area

would be the Kansas City Board of Trade (KCBT) or the New York Futures Exchange (NYFE) or the Chicago Board of Trade (CBOT). Each one of these exchanges had some obvious advantage in its favor in 1982.

Let me first briefly describe the events of that period, which are laid out in Chart 9³. The KCBT, one of the smallest exchanges in the country, had the foresight to apply to the CFTC to trade a stock index futures contract as far back as October 1977. They originally proposed to use the Dow Jones Industrial Average (DJIA) the most widely followed index of the day. When they were unable to reach a licensing agreement with Dow Jones and Company, they substituted the Value Line Average, published by Arnold Bernhard and Company. By the time they were approved, more than four years after the original submission, the CFTC was also considering applications from three other exchanges: the CME, COMEX and the NYFE -- a three-year old subsidiary of the New York Stock Exchange. The KCBT felt that it was unfair for it to have to face competition from these more recent entrants, given the four-year delay in approval, and it went to court to ask that the Commodity Futures Trading Commission delay approving the other exchanges' indexes for one full year. This would give the KCBT a chance to gain a foothold and make a reasonable return on its investment.

Had it been successful in blocking its competitors, the KCBT would have had a full year to establish its contract and Kansas City could well be the world center for stock index trading today. Unfortunately for Kansas City, the court refused and within three months there were two competitors trading stock indexes -- the CME with the S&P 500 and the NYFE with the New York Stock Exchange Composite Index.

Given the stock expertise of the New York Stock Exchange and its futures subsidiary -- the NYSE was, after all, the largest stock exchange in the world -- and given the easy arbitrage that would be possible between the NYFE and its parent, it would have been very reasonable to believe that New York would soon become the center not only for stocks but also for stock index futures.

There was one other important player -- the CBOT, which was at the time the largest futures exchange in the world. The CBOT knew that stock indexes would be an important market and knew that success would most likely come to the exchange which listed the DJIA, the most widely known and popular index of the US stock market. So in March 1982, shortly after the Value Line started trading, the CBOT applied to the CFTC to trade some indexes similar to the Dow Jones averages. (The exchange already had an application on file to trade a broad market index and 10 industry-specific sub indexes.) Undeterred by the fact that Dow Jones had already turned down its request to use its index, the CBOT, in a preemptive strike, went to court to obtain the right to trade the Dow Jones averages without Dow Jones' permission. The court refused, the CBOT lost and Dow Jones was able to protect its index from unauthorized use for a futures contract. To this day no futures contract has ever been listed on the DJIA.

The CBOT eventually listed a stock index futures – the Major Market Index (MMI), licensed to it by the American Stock Exchange (AMEX). The good news was that the CBOT did get its wish to trade the DJIA, or at least something very much like it – 18 of the 20 stocks in the MMI were also in the DJIA and the two indexes were very highly correlated. The bad news is that it didn't have the DJIA name and more importantly, the CBOT didn't list the contract until July of 1984 – more than two years after the other three exchanges started trading their indexes. And by then it was just too late. But had the world's largest futures exchange been able to list the world's most popular stock index back in the spring of 1982, it would probably have been an unbeatable combination.

Why then did the CME beat out the KCBT, which had a two-month head start, and the NYFE, which had the money, reputation and expertise of the New York Stock Exchange behind it? In my opinion, the CME had three things going for it. First, it had a very strong exchange leadership which inspired a member commitment to make the contract a success. Exchange leaders met with the entire membership in smaller groups and asked for a commitment to spend 15 minutes a day in the new pit to trade and lend liquidity to the market. Throughout the day, over the loud speaker the members would be reminded of their commitment with the phrase "15 minutes please," and everyone wore buttons bearing the same slogan.

Second, the CME had well established markets in currencies and interest rates and many brokers and customers who were already using these financial markets. The KCBT, in contrast, was a solely agricultural exchange with no marketing system in place for the financials. And the NYFE, the three-year old child of the NYSE, while it was a financial exchange, had no successful markets yet and therefore few customers. Third and finally, the CME was fortunate in choosing the index which had been for some time the benchmark for performance of institutional portfolios, rather than pursuing the rutted path of the CBOT to obtain rights to trade the most publicly well known index – the DJIA. I wish I could say that this was due solely to wisdom and foresight. In fact, I believe that there was a strong dose of luck involved. If we had the choice, we probably also would have made the DJIA our first choice.

- 3 Can a country successfully trade more than one stock index futures, can it successfully trade the stock index of another country, and is it best to list the contract at a stock exchange or futures exchange?

More Than One Index?

Let's first review the situation internationally. While most countries list a single stock index futures contract at a single exchange, six countries list more than one stock index futures. Japan, Singapore, Netherlands and Norway, each traded two different contracts, South Africa traded three and the US, as we have seen, had trading in 12 different indexes last

year. In four countries, Singapore, Holland, Norway and South Africa, the multiple contracts were listed on a single exchange. In Japan they were listed on two exchanges. In the U.S., they were listed on five different exchanges.

So there is a precedent for a country to list more than one stock index -- one third of the countries trading stock index futures last year did just that.

Futures markets tend to be natural monopolies -- for any given product, traders tend to focus their activities on the most liquid market. So it should be no surprise that in the U.S., one of these 12 contracts, the S&P 500, accounts for 88% of all stock index trading and one exchange, the CME, accounts for 92% of all stock index activity (Chart 10). The surprise to me, quite frankly, is that so many contracts have lasted as long as they have. Of the 12 contracts with some trading last year, three have become inactive: the NYSE Utility at NYFE, the FT-SE 100 at the CME and the Wilshire Small Cap at the CBOT. And if we ignore the NIKKEI 225 (a Japanese index) and the Mini Value Line (a smaller sized futures contract on the Value Line Index), this still leaves futures trading in six indexes of the U.S. stock market. Does this violate the natural monopoly view of futures markets?

Perhaps not. The U.S. stock market is composed of roughly 6500 listed companies. Each of these indexes captures a somewhat different slice of this market and therefore can be used by entities trying to reduce or increase their exposure to these differing market segments.

The MMI, the most narrow of the indexes, is composed of 20 stocks, including the 17 in the DJIA, and is essentially a proxy for the widely followed Dow Jones index. The S&P 500 includes 500 of the most highly capitalized blue chip stocks, over 90% of which are traded at the New York Stock Exchange. The S&P 400, or S&P MidCap, is made up of 400 mid-sized companies, only about 2/3 of which are traded at the NYSE. The Russell 2000 Index includes 2000 of the smallest cap stocks in the U.S. And finally, the Value Line is composed of about 1700 stocks (including all the stocks in the S&P 500) selected to broadly represent the entire stock market. The average capitalization of these indexes varies considerably, ranging from \$229 million for average company in the Russell 2000 to almost \$36 billion for the average company in the MMI (Chart 11).

Japan, South Africa and the Netherlands all trade more than one index. In all countries, one index clearly dominates, though the other indexes have established a foothold. The NIKKEI, for example, has an 80% market share in Japan, compared to 20% for the TOPIX. In South Africa, the All Shares Index accounts for 55% of the business, leaving 30% to the Gold Index and 15% to the Industrial Index. And in the Netherlands, the EOE Index has 93% of the market, leaving only 7% to the Dutch Top 5.

Could Korea successfully trade two stock index futures contracts? If the indexes are covering a very similar set of companies and are highly correlated with one another, the answer is no. If the indexes are very different, perhaps yes. The Korean stock market is

much more actively traded than that of either South Africa or the Netherlands (in fact, 3 times the Netherlands and 16 times South Africa's), so if these two countries can support multiple stock index futures, why not Korea? Of course, if two indexes do establish themselves, one of these indexes will tend to dominate

Other People's Indexes?

Can a country successfully trade a futures contract based on the stock market of another country? Of the 36 stock index contracts traded last year, only 5 were "cross-border" indexes - the NIKKEI 225 contracts at SIMEX and the CME, the MSCI Hong Kong Index at SIMEX, the Eurotop at COMEX and the FT-SE 100 at the CME (Chart 12)

Of these, the NIKKEI 225 is the most interesting since it is traded somewhat successfully at two different exchanges outside Japan. The CME contract is very modestly successful, due, I think, to the fact that the CME contract offers access to the NIKKEI in the U.S. time zone and with dollar denomination. The SIMEX contract is offered in the Asian time zone, is yen settled and differs from Osaka's (OSE) contract only in its size - it's one-half the size. Still, it's very successful. The reason is twofold. SIMEX started its NIKKEI 225 two years prior to Osaka, giving it a serious head start. Second, it's much cheaper to trade - the fixed commission on the OSE NIKKEI is about \$160 per side (i.e. 0.8%) compared to the \$14.30 commission charged by Tokyo brokers for two SIMEX NIKKEI contracts, less than a tenth the cost of an Osaka trade.

Given this cost difference, one might wonder why all the NIKKEI 225 business doesn't shift to SIMEX. The reasons I have been given are a loyalty to the Japanese market, lack of awareness of the SIMEX alternative, possibly greater liquidity at Osaka, and high charges to customers for transferring funds to Singapore.

The other example of an Asian index being traded across borders is the MSCI Hong Kong index attempted by SIMEX. Some exchanges, like LIFFE and SIMEX have thrived from trading the financial instruments of other countries. SIMEX thought it could add to its portfolio of international contracts by capitalizing on the growing interest in the Hong Kong marketplace, which is increasingly a way of taking positions in the activities of China. What you see in Chart 13, unfortunately for SIMEX and fortunately for the Hong Kong Futures Exchange is the profile of a failed contract. In the early part of this year the MSCI has been trading barely five contracts a day - less than 1% of its peak volume last fall. At the same time business in the Hang Seng Futures has soared. This illustrates how difficult it is to steal business from a well established market.

Incidentally, of the other two attempts to trade other countries' indexes, the FT-SE 100 has become inactive at the CME and the Eurotop is pretty lightly traded (about 300 contracts a day) at COMEX.

Stock Exchange or Futures Exchange?

If there were only one stock index futures, should it be traded at the Korea Stock Exchange or KOFFA? I am not foolish enough to give a direct answer to such a highly political question. I will make a few relevant observations.

- Both of Japan's stock index futures are traded at stock exchanges and these two indexes account for 27% of the dollar value of world stock index trading. This situation is, of course, dictated by the government.
- The general practice is not to trade stock index futures at a stock exchange. Of the 36 stock index futures contracts traded last year, only 5 were traded on stock exchanges or their subsidiaries. Today only 3 of the 36 are traded on stock exchanges due to the end-of-the-year sale of the NYFE by the New York Stock Exchange to the New York Cotton Exchange.
- Placing the futures at the stock exchange should allow easier arbitrage between the cash and futures market.
- Placing the futures at a diversified futures exchange allows economies of scale in operating the trading, clearing and other systems unique to a futures exchange.
- Finally, adding stock index futures to a stock exchange does not make the stock exchange any more diversified (business in both markets tends to go up and down together), whereas adding it to a futures exchange does offer a diversification effect.

The easy way out of this problem is the American approach -- let both institutions trade stock indexes and assume the one offering the most to the marketplace will be the one to survive or at least dominate. Quite frankly, that's what I would do. But I'm an American.

The other approach is the Japanese approach, in which the government simply decides which institution is more appropriate to trade stock index futures. Korea has to choose the path that's right for Korea.

- 4 What do we know about the effect of stock index futures on the volatility of the stock market after 12 years and one market crash?

This question can really be divided into three separate questions which have been debated over the past 12 years.

First, have stock index futures generally increased volatility of the underlying stock market?

With very few exceptions, the predominance of research on this subject finds no evidence to support the idea that stock index futures increase stock market volatility⁴ This is, not surprisingly, consistent with the research on numerous other financial and commodity markets

For example, both Edwards (1988) and Schwert (1990) found that the growth in stock index futures and options trading has not increased market volatility Bessembinder and Segun (1992) went even further and found that volatility in the stock market actually declines as futures trading volume and open interest increases This, they argue, is consistent with "the reasoning that the low cost of futures trading attracts additional informed traders, and that equity volatility is reduced in the resulting deeper market "

But there is an extensive literature on this subject and the interested scholar could spend many happy months swimming through it

Second, have stock index futures increased the volatility of the underlying stock market at least on expiration days?

After the introduction of stock index futures in 1982 and stock index options in 1983, concern was increasingly expressed regarding increased volatility in the stock market, especially on the day the futures and options expired Initially, stock index futures, stock index options and options on individual stocks all expired during the last hour of trading at the New York Stock Exchange on the third Friday in March, June, September and December, the four quarterly expirations Due to a perception that this so called "triple witching hour" resulted in abnormally high volume and volatility as traders unwound their programs, the expiration was moved from Friday close to Friday open in 1987

There are respected researchers who did find statistically significant volatility spikes on these Friday afternoons, before the change in expiration time⁵ Hans Stoll and Robert Whaley (1987) found that volume and volatility were higher on these expiration afternoons Franklin Edwards (1988) also found increased volatility on expiration days

Has the shift of expirations from afternoon to morning solved the volatility problem? According to Stoll and Whaley (1991), futures trading activity and price volatility have decreased at the market close since the shift in expiration time However trading activity and price volatility have increased on the opening In a paper just published last month, Chao Chen and James Williams, two California economists, found the same shift in volatility from close to open, found that overall volatility on expiration Fridays had not changed, found that there is still significantly higher volume in the stock market on expiration Fridays (41% more than on other Fridays), but strangely found that expiration Fridays are really not more volatile than other Fridays after all

Based on the bulk of the research, however, Korea probably should expect to find at least occasional higher volatility on the days that their stock index futures expire

Third, did stock index futures somehow cause or worsen the Crash of 1987?

There have been a very large number of studies analyzing the Crash of 1987. I have not read them all, but I'm told that virtually every one that explores the role of futures has found no evidence that futures trading either caused or made the crash worse than it would have otherwise been. Most of these studies focused exclusively on the US market.

One of these, however, stands out because of its international scope. Richard Roll's 1988 study examines the behavior of the stock markets in 23 different countries in October 1987 and attempts to relate the magnitude of the crash to several institutional characteristics.⁶ He finds that countries which had stock index futures or options had crashes of the same average magnitude as countries without these institutions.

What does all this mean for Korea? If the experience of the US holds true, Korea should expect that the introduction of stock index futures to have either no effect or a general dampening effect on general stock market volatility, should expect to see futures neither cause nor exacerbate stock market crashes, should any occur, but probably should expect to find occasional increases in stock market volatility on expiration days.

5 What issues are important in the design of stock index futures?

Since stock index futures are universally cash settled and not physically delivered, the single most important decision to be made is the choice of the index. The only other decisions to be made are the size of the multiplier (that is the number of dollars or other currency the index level is multiplied by to get the index value), the tick size (the smallest increment in the index allowed between one transaction and the next), and any price limits or circuit breakers to deal with periods of severe volatility. Let me comment on two of these.

Choice of the Index In any cash-settled contract, the price average or index chosen should reflect the commodity or asset which people need to hedge. It should also be reliable, respected and trusted. Market users must have confidence that the index cannot be manipulated by an individual or group of individuals conspiring with one another to move the index to profit from their futures or options positions.

The manipulation issue is of prime importance to the US Commodity Futures Trading Commission, so much so that it issued proposed guidelines on the choice of indexes back in January of 1984. The guidelines were never made formal, but there is reason to believe that they are still used as at least a benchmark for the CFTC's acceptance or rejection of a proposed index. The guidelines include

- An index must have at least 25 stocks, with an aggregate capitalization of at least \$75 billion, never falling below \$50 billion
- No single security can have a weight in excess of 25%
- The top three securities cannot have a total weight in excess of 45%
- No single security in a non-capitalization weighted index can have a weight of 10% or more if its capitalization weight is less than a third of that amount

The CFTC does not care whether an index is capitalization weighted or not and has approved non-cap indexes like the MML, the Value Line and the NIKKEI 225. The Japanese government, on the other hand has concluded that the price-weighted NIKKEI 225 is not adequate and has encouraged the development of the new cap-weighted NIKKEI 300. The OSE has listed the new 300 and old 225 side by side and given a push to the new contract in the form of lower margins.

Size of contract (Multiplier) The stock index futures contracts traded around the world come in a great many sizes. The largest, as of mid-1993, was over 100 times the size of the smallest and both were very actively traded (Chart 14). The \$2200 IBEX-35 from Spain traded about 11 million contracts in 1993 -- not too different from the 13 million contracts changing hands in the S&P 500 market, where each contract was worth about \$225,000. In fact, in the top five stock index futures last year were two very large contracts (the S&P and the NIKKEI 225), two very small contracts (the IBEX-35 and the Brazilian Bovespa) and one middle sized contract (the CAC-40). So success came in all sizes in 1993.

There are at least two considerations when choosing the correct size. First, if you want to appeal to what we call the retail or individual market, then you should keep the contract size small, probably less than \$10,000. If, on the other hand, you want to attract the institutional market, you must make it convenient and cheap for them to trade. This means a large contract, perhaps approaching \$200,000. It should be no surprise then that the S&P 500 futures market is largely institutional while the IBEX 35 market is largely retail. If you wish to appeal to both markets, then a middle size contract, perhaps approaching \$100,000 would be in order.

Note, that you don't really choose a constant contract size. You choose the contract multiplier which is multiplied by the index level to yield the current contract value. So the S&P at 450 makes a contract worth $450 \times \$500$ or \$225,000. When the S&P was at 200, the contract value was only \$100,000. Rising markets continually inflate contract values and can take them out of the reach of individual investors. When this happens, the exchange may consider reducing the multiplier, in the same spirit that companies split their stocks and halve their prices to keep them accessible to individual investors.

Conclusion

In this race through five questions, what have we learned?

- 1 We have learned that stock index futures have become an important part of the financial landscape, even though they account for a relatively small portion of all futures trading
- 2 We have learned that when exchanges are competing to develop a new product area, predicting the winner can be difficult
- 3 We have learned that a country can trade multiple stock indexes, that a country can successfully trade futures on other countries' indexes, though the frequency of success in this area is small, and that a country can trade stock index futures successfully either at a stock exchange or a futures exchange
- 4 We have learned that while stock index futures are unlikely to increase general stock market volatility or contribute to crashes, they may result in increased volatility on the four days a year when they expire
- 5 We have learned that the choice of the index and of the contract multiplier or size are very important in the design of these markets

Korea is experiencing very interesting and exciting times as it develops its own version of this very important financial innovation -- stock index futures. I hope that your efforts will be well rewarded.

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Stock Index Futures Traded in 1993 Ranked by Volume

	Contract	Volume	Date Started	Country	Exchange
	SP 500 Index	13 204 413	1982	U S	CME
	IBEX 35	10 843 599	1992	Spain	MEFF RV
	Bovespa Stk Ind Fut	10 374 860	1986	Brazil	BM&F
	Nikkei Stock Fur	8 461 458	1988	Japan	OSE
	CAC 40 Stock Index	5 908 739	1988	France	MATIF
	Nikkei Stock Avg	5 162 199	1986	Singapore	SIMEX
	DAX	3 976 882	1990	Germany	DTB
	FT-SE 100	3,119,024	1984	U K	LIFFE
	Hang Seng Index	2 415 739	1986	Hong Kong	HKFE
	TOPIX Stock Index	2 156,960	1988	Japan	TSE
	All Share Index	1 670,540	1990	S Africa	SAFEX
	All Ord Shr P Ind	980 866	1983	Australia	SFE
	Gold Index	919,759	1990	S Africa	SAFEX
	Swiss Market Index	914 021	1990	Switzerland	SOFFEX
	NYSE Composite Index	848 522	1982	U S	NYFE
	EOE (Index)	811 882	1987	Netherlands	FTA (EOE)
	OMX(Index)	627 706	1986	Sweden	OM Stockholm
	Industrial Index	422 202	1990	S Africa	SAFEX
	NIKKEI 225	356 523	1990	U S	CME
	KFX Stock Index	339 024	1989	Denmark	FUTOP
	SP-400 Index	218 531	1992	U S	CME
	Maior Market Index	204 624	1984	U S	CBOT / CME*
	ATX	174 095	1992	Austria	OTOB
	MSCI Hong Kong Index	80 245	1993	Singapore	SIMEX
	TSE 35 Index	69 058	1987	Canada	TFE
	Dutch Top 5 Ind(FT5)	58 483	1990	Netherlands	FTA (EOE)
	Eurotop 100 Index	56 497	1992	U S	COMEX
	Value Line Index	45,806	1982	U S	KCBT
	Mini Value Line	40 662	1983	U S	KCBT
	Russell 2000	19 479	1993	U S	CME
	OBX	16,650	1992	Norway	Oslo Stock Ex
	Bel 20 Index	12 281	1993	Belgium	BELFOX
	Forty Index Fut	3 633	1991	New Zealand	NZFOE
	Wilshire Small Cap	1 626	1993	U S	CBOT
	FT-SE 100	94	1992	U S	CME
	NYSE Utility Index	10	1993	U S	NYFE
	Total	74 516 692			

The MMI was transferred from the CBOT to the CME at the request of the index owner AMEX in Sept. 7 1993. During 1993, there were 155,338 MMI contracts traded at the CBOT and 49,256 at the CME for a total of 204,594 contracts.

Countries Trading Stock Index Futures, 1993 Ranked by Volume

	<u>Country</u>	<u>Stock Index Volume</u>	<u>Country Share</u>	<u>Contracts</u>	<u>Exchanges</u>
1	U S	14,996 787	20 1%	12	5
2	Spain	10,843 599	14 6%	1	1
3	Japan	10,618 418	14 3%	2	2
4	Brazil	10,324,860	13 9%	1	1
5	France	5,908,739	7 9%	1	1
6	Singapore	5,243 544	7 0%	2	1
7	Germany	3,976,882	5 3%	1	1
8	UK	3,119,024	4 2%	1	1
9	South Africa	3,012,501	4 0%	3	1
10	Hong Kong	2,415,739	3 2%	1	1
11	Australia	980,866	1 3%	1	1
12	Switzerland	914,021	1 2%	1	1
13	Netherlands	870,365	1 2%	2	1
14	Sweden	627 706	0 8%	1	1
15	Denmark	339,024	0 5%	1	1
16	Austria	174,095	0 2%	1	1
17	Canada	69 058	0 1%	1	1
18	Norway	16,650	0 0%	1	1
19	Belgium	12,281	0 0%	1	1
20	New Zealand	3,633	0 0%	1	1
	TOTAL	74,467,792	1	36	25

Source FIA International Report, Dec 1993
FIA Monthly Vol Report, Dec 1993

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Stock Index Futures Traded in 1993 Ranked By Volume

3

Contract	Value of Trade (U S \$ Millions)	Date Started	Country	Exchange
1 SP-500 Index	2 974 492	1982	U S	CME
2 Nikkei Stock Fut	1 547 712	1988	Japan	OSE
3 Nikkei Stock Avg	472 117	1986	Singapore	SIMEX
4 CAC 40 Stock Index	411 975	1988	France	MATIF
5 DAX	395 422	1990	Germany	DTB
6 FT-SE 100	337 385	1984	U K	LIFFE
7 TOPIX Stock Index	332 435	1988	Japan	TSE
8 All Ord Shr P Ind	112 713	1983	Australia	SFE
9 Hang Seng Index	110 755	1986	Hong Kong	HKFE
10 NYSE Composite Ind	105 683	1982	U S	NYFE
11 Swiss Market Index	71 673	1990	Switzerland	SOFFEX
12 Bovespa Stk Ind Fut	53 529	1986	Brazil	BM&F
13 Major Market Index	36 760	1984	U S	CBOT / CME*
14 NIKKEI 225	34 921	1990	U S	CME
15 EOE (Index)	27 479	1987	Netherlands	FTA (EOE)
16 IBEX 35	23 726	1992	Spain	MEFF RV
17 SP-400 Index	18 358	1992	U S	CME
18 All Share Index	14 476	1990	S Africa	SAFEX
19 Value Line Index	9 556	1982	U S	KCBT
20 OMX/Index)	6 835	1986	Sweden	OM Stockholm
21 Eurotop 100 Index	5 707	1992	U S	COMEX
22 TSE 35 Index	5 403	1987	Canada	TFE
23 MSCI Hong Kong Ind	5 210	1993	Singapore	SIMEX
24 KFX Stock Index	4 724	1989	Denmark	FUTOP
25 Industrial Index	4 213	1990	S Africa	SAFEX
26 Gold Index	3 733	1990	S Africa	SAFEX
27 Dutch Top 5 Ind(FT5)	3 652	1990	Netherlands	FTA (EOE)
28 Russell 2000	2 273	1993	U S	CME
29 Mini Value Line	1 697	1983	U S	KCBT
30 ATX	1 597	1992	Austria	OTOB
31 Wilshire Small Cap	249	1993	U S	CBOT
32 OBX	90	1992	Norway	Oslo Stock Ex
33 Forty Index Fut	67	1991	New Zealand	NZFOE
34 Bel 20 Index	44	1993	Belgium	BELFOX
35 FT-SE 100	14	1992	U S	CME
36 NYSE Utility Index	1	1993	U S	NYFE
Total	7 136 677			

The MMI was transferred from the CBOT to the CME at the request of the index owner AMEX, in Sept. 7 1993. During 1993 there were 155 338 MMI contracts traded at the CBOT and 49 256 at the CME for a total of 204 624 contracts.

Source: FIA International Report, Dec 1993
FIA Monthly Vol Report, Dec 1993

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Countries Trading Stock Index Futures, 1993

Ranked by Value of Trade

4

	Country	Stock Index Value of Trade (U S \$ Million)	Country Share	Contracts	Exchanges	Value of a Contract*
1	U S	3 189 711	44 7%	12	5	132 758
2	Japan	1 880 147	26 3%	2	2	168 518
3	Singapore	477 327	6 7%	2	1	78 192
4	France	411 975	5 8%	1	1	69 723
5	Germany	395 422	5 5%	1	1	169 763
6	UK	337 385	4 7%	1	1	72 500
7	Australia	112 713	1 6%	1	1	114 912
8	Hong Kong	110 755	1 6%	1	1	4 585
9	Switzerland	71 673	1 0%	1	1	78 415
10	Brazil	53 529	0 8%	1	1	5 160
11	Netherlands	31 131	0 4%	2	1	48 146
12	Spain	23 726	0 3%	1	1	2 188
13	South Africa	22 422	0 3%	3	1	7 568
14	Sweden	6 835	0 1%	1	1	10 889
15	Canada	5 403	0 1%	1	1	78 234
16	Denmark	4 724	0 1%	1	1	13 934
17	Austria	1 597	0 0%	1	1	9 174
18	Norway	90	0 0%	1	1	5 385
19	New Zealand	67	0 0%	1	1	18 365
20	Belgium	44	0 0%	1	1	3 614
TOTAL		7 136 676	1	36	25	

Simple average of Stock Index Contracts traded in that Country

Source FIA International Report Dec 1993
FIA Monthly Vol Report Dec 1993

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Stock Index Futures Trading Relative to Stock Market Trading and Market Capitalization*

Country	\$ Value of Stock Index Futures Trading (U S \$ Million)	\$ Value of Stock Market Trading (U S \$ Million)	Total Market Capitalization (U S \$ Million)	Ratio of Fut Trad to Stock Trad (%)	Ratio of Fut. Trad to Market Cap (%)
1 U S	3 189 711	3 797 149 1	6 490 245 4	84 0%	49 1%
2 Japan	1 880 147	932 575 1	5 333 503 4	201 6%	35 3%
3 Singapore	477 327	70 344 7	132 667 9	678 6%	359 8%
4 France	411 975	167 160 7	455 990 2	246 5%	90 3%
5 Germany	395 422	595 133 0	441 696 2	66 4%	89 5%
6 UK	337 385	848 684 6	1 150 283 4	39 8%	29 3%
7 Australia	112 713	67 791 8	204,462 8	166 3%	55 1%
8 Hong Kong	110 755	132 264 3	385 042 7	83 7%	28 8%
9 Switzerland	71 673	209 816 4	270 879 2	34 2%	26 5%
10 Brazil	53 529	42 307 7	197 392 2	126 5%	27 1%
11 Netherlands	31 131	66 682 4	181 754 2	46 7%	17 1%
12 Spain	23 726	49 361 9	365 472 4	46 1%	6 5%
13 South Africa	22 422	13 399 3	217 097 5	167 3%	10 3%
14 Sweden	6 835	40 455 9	100 510 1	16 9%	6 8%
15 Canada	5 403	142 554 0	600 814 0	3 8%	0 9%
16 Denmark	4 724	22 399 6	39 933 4	21 1%	11 8%
17 Austria	1 597	7 249 5	26 238 1	22 0%	6 1%
18 Norway	90	17 401 7	27 371 1	0 5%	0 3%
19 New Zealand	67	6 857 6	25 620 9	1 0%	0 3%
20 Belgium	44	13 960 8	77 975 7	0 3%	0 1%
TOTAL	7 136 676				

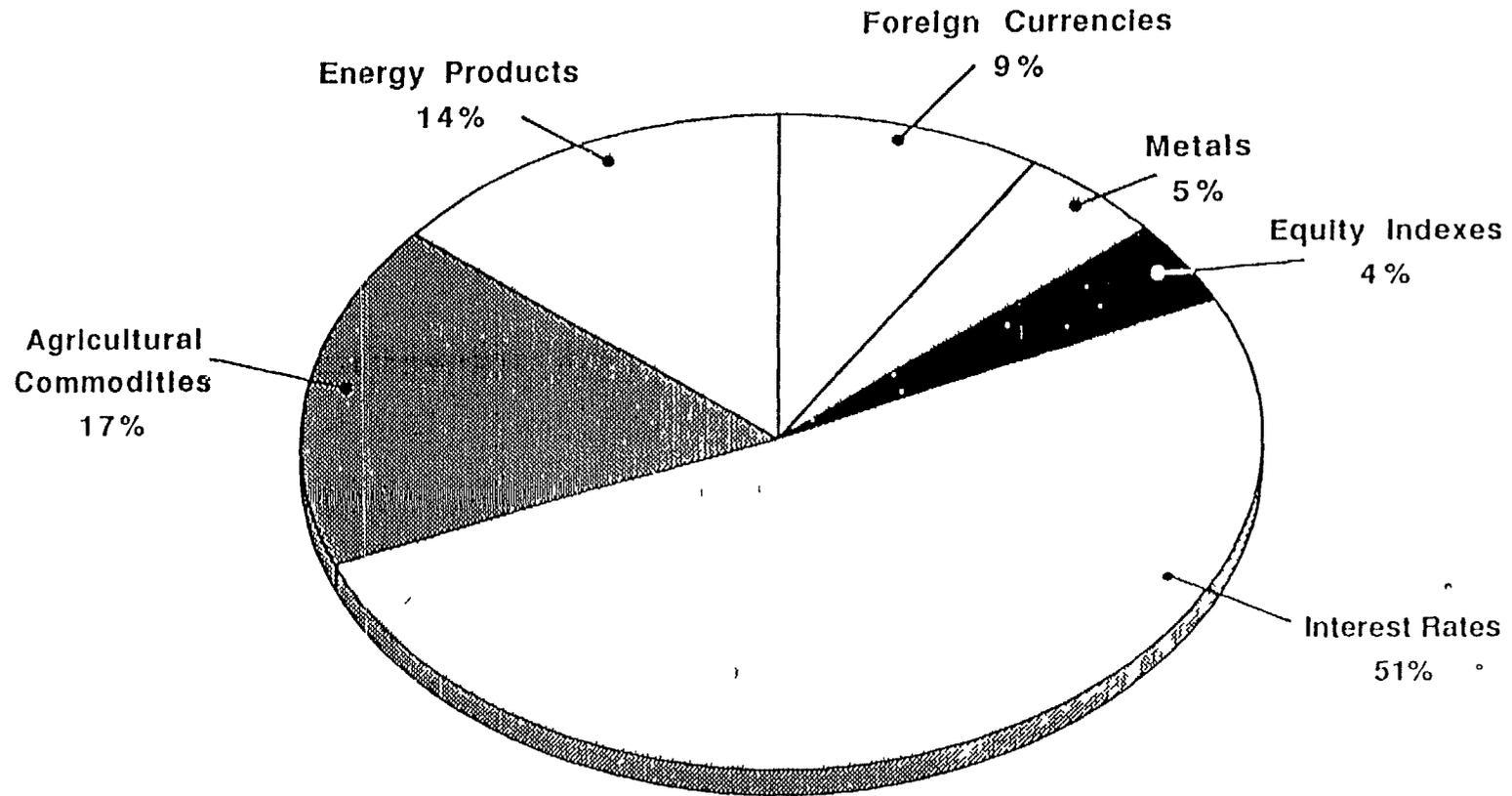
Ranked by \$ value of stock index futures trading

Source: FIA International Report Dec 1993
FIA Monthly Vol Report Dec 1993
FIBV Statistics 1993

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U.S. Futures Trading by Category 1993



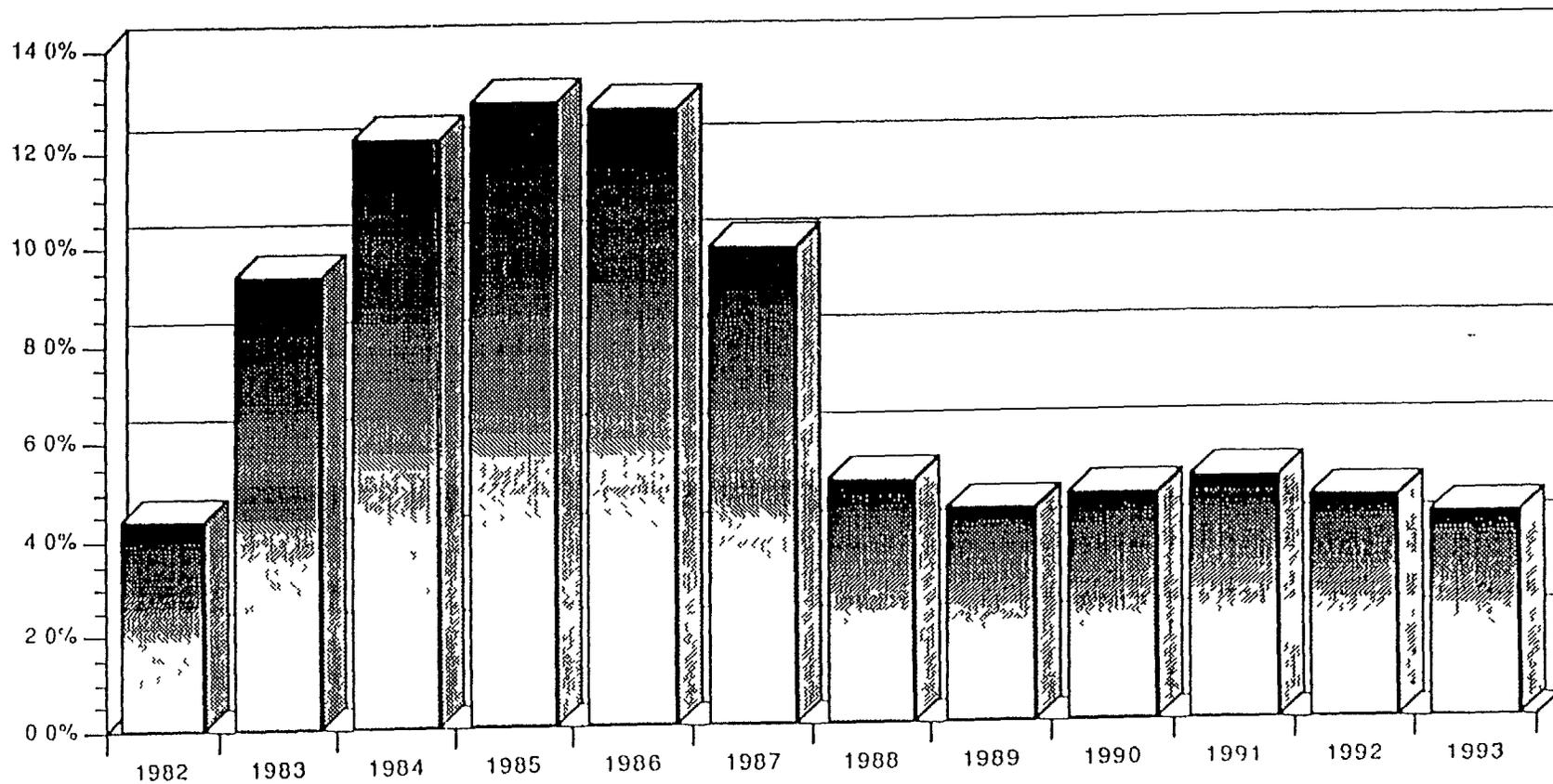
Source: FIA Monthly Vol Rep, Dec 1993

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Stock Index Share of
U.S. Futures and Options Business
(1982 - 1993)



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Stock Index Share of Futures Volume by Country,
1993

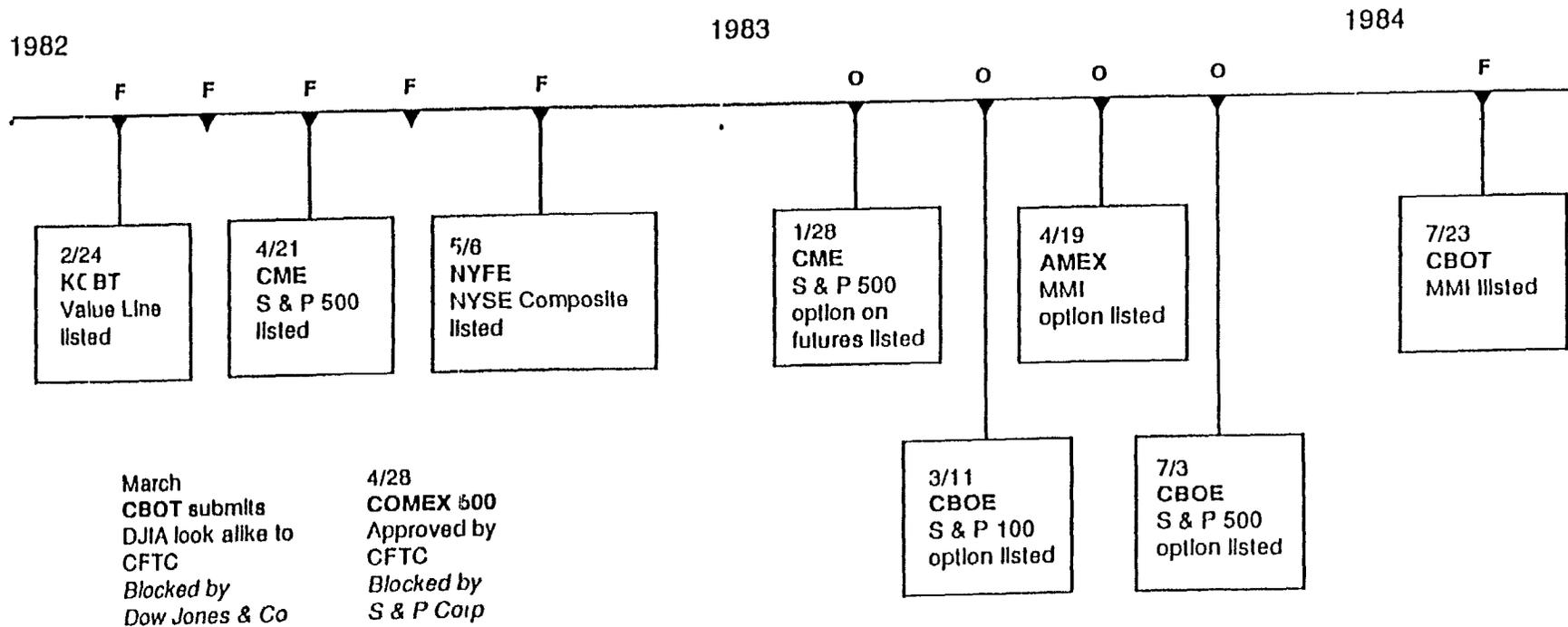
	Country	Total Future Volume	Stock Index Future Volume	Stock Index Share
1	Hong Kong	2,416,711	2,415,739	100.0%
2	South Africa	3,022,877	3,012,501	99.7%
3	Netherlands	963,855	870,365	90.3%
4	Austria	217,505	174,095	80.0%
5	Switzerland	1,213,575	914,021	75.3%
6	Spain	17,763,409	10,843,599	61.0%
7	Norway	44,895	16,650	37.1%
8	Singapore	14,768,322	5,243,544	35.5%
9	Denmark	981,699	339,024	34.5%
10	Brazil	39,223,603	10,324,860	26.3%
11	Germany	16,135,029	3,976,882	24.6%
12	France	55,853,295	5,908,739	10.6%
13	Japan	103,694,672	10,618,418	10.2%
14	Sweden	11,970,960	627,706	5.2%
15	Australia	19,121,256	980,866	5.1%
16	U S	339,075,663	14,996,787	4.4%
17	UK	129,741,121	3,119,024	2.4%
18	Canada	3,174,471	69,058	2.2%
19	Belgium	788,187	12,281	1.6%
20	New Zealand	612,743	3,633	0.6%
	Total	758,367,137	72,052,053	9.5%

Source: FIA International Report Dec 1993
FIA Monthly Vol Report Dec 1994

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SELECTED EVENTS

Early Years of U. S. Stock Index Futures and Options



F = Futures
O = Options

Source Based upon account given in
Weiner Neil *Stock Index Futures A Guide for Traders Investors and Analysts* Chapter 6 New York John Wiley & Sons 1984

U.S. Stock Index Futures Contracts Traded in 1993

Contract	Volume	Share of Market	Exchange
S&P 500	13,204,413	88.05%	CME
NYSE Composite	848,522	5.66%	NYFE
NIKKEI 225	356,523	2.38%	CME
S&P 400 Mid Cap	218,531	1.46%	CME
Major Market	204,624	1.36%	CME*
Eurotop	56,497	0.38%	COMEX
Value Line	45,806	0.31%	KCBT
Mini Value Line	40,662	0.27%	KCBT
Russell 2000	19,479	0.13%	CME
Wilshire Small Cap	1,626	0.01%	CBOT
FT-SE 100	94	0.00%	CME
NYSE Utility	10	0.00%	NYFE
Total	14,996,787		

The MMI was transferred from the CBOT to the CME at the request of the index owner the AMEX, in Sept. 7, 1993. During 1993 there were 155,338 MMI contracts traded at the CBOT and 49,256 at the CME for a total of 204,624 contracts.

Capitalization of United States Stock Indexes
(\$ million)

<u>Index</u>	<u>Total Cap</u>	<u>Average Cap</u>	<u># Issues</u>
MMI	715,900	35,795	20
S&P 500	3,177,425	6,355	500
Value Line	5,188,000	3,118	1,664
NYSE Composite	4,314,000	2,110	2,045
S&P 400	470,700	1,177	400
Wilshire 5000	4,566,167	699	6,533
Russell 2000	458,759	229	2,000

As of March 31, 1994

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Cross Border Stock Index Futures

<i>Index</i>	<i>1993 Volume</i>	<i>Home Country</i>	<i>Where Traded</i>
NIKKEI	5 163,199	Japan	SIMEX (Singapore)
NIKKEI	356,523	Japan	CME (U S)
MSCI Hong Kong	80,345	Hong Kong	SIMEX (Singapore)
Eurotop	56 497	Europe	COMEX (U S)
FT-SE 100	94	UK	CME (U S)

Source FIA International Report Dec 1993
FIA Monthly Vol Report Dec 1993

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Competition in the Hong Kong Index Futures*

	MSCI-Hong Kong	Hang Seng
JAN, 1993		117,194
FEB		150,811
MAR	2,660	204,829
APR	19,692	116,010
MAY	15,597	133,904
JUN	10,168	146,174
JUL	9,640	183,922
AUG	13,975	191,298
SEP	3,880	190,957
OCT	4,241	282,089
NOV	392	351,127
DEC	0	347,424
JAN, 1994	90	407,119
FEB	93	326,915

*The Hang Seng Index futures has been trading on the Hong Kong Futures Exchange since 1986. The MSCI-Hong Kong futures has been trading at SIMEX since March 1993.

Stock Index Futures Contracts Traded in 1993 Ranked by Value

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	Contract	Exchange	Value of Contract (\$ U S)**
1	S&P 500 Index	CME	225 265
2	Value Line Index	KCBT	208 625
3	Nikkei Stock Fut	OSE	182,913
4	Major Market Index	CBOT / CME*	179 645
5	TOPIX Stock Index	TSE	154 122
6	Wilshire Small Cap	CBOT	153 135
7	FT SE 100	CME	145 000
8	NYSE Composite Index	NYFE	124 550
9	Russell 2000	CME	116 675
10	NYSE Utility Index	NYFE	115 515
11	All Ord Shr P Ind	SFE	114,912
12	FT SE 100	LIFFE	108 170
13	Eurotop 100 Index	COMEX	101 009
14	DAX	DTB	99 430
15	NIKKEI 225	CME	97 950
16	Nikkei Stock Avg	SIMEX	91 457
17	S&P 400 Index	CME	84 005
18	Swiss Market Index	SOFFEX	78 415
19	TSE 35 Index	TFE	78,234
20	CAC 40 Stock Index	MATIF	69,723
21	MSCI Hong Kong Index	SIMEX	64,926
22	Dutch Top 5 Ind(FT5)	FTA (EOE)	62,445
23	Hang Seng Index	HKFE	45,847
24	Mini Value Line	KCBT	41 725
25	EOE Stk Ind(FTI)	FTA (EOE)	33,846
26	Forty Index Fut	NZFOE	18 365
27	KFX Stock Index	FUTOP	13,934
28	OMX(Index)	OM Stockholm	10,889
29	Industrial Index	SAFEX	9,979
30	ATX	OTOB	9 174
31	All Share Index	SAFEX	8,666
36	OBX	Oslo Stk Ex	5 385
32	Bovespa Stk Ind Fut	BM&F	5 160
33	Gold Index	SAFEX	4 059
34	Bel 20 Index	BELFOX	3 614
35	IBEX 35	MEFF RV	2 188

* The MMI was transferred from the CBOT to the CME at the request of the index owner AMEX in Sept 7 1993 During 1993 there were 155,338 MMI contracts traded at the CBOT and 49 256 at the CME for a total of 204 624 contracts

** Using index level and exchange rate for June 28 or 30 1993

Source FIA International Report Dec 1993
FIA Monthly Vol Report Dec 1993

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Stock Index Futures Traded in 1993

	Contract	Exchange	# of Stocks	Date Started	Contract Multiplier	Index Level**	Value** of a Contract (Local Cur)	Value of a Contract (\$ US)	Total \$ Value * of Trade	Currency per \$
1	S&P 500 Index	CME	500	1982	* \$500	450 5	225,265	225,265	2,974,492,094,445	1 00
2	IBEX 35	MEFF RV	35	1992	* 100	2,854 6	285,460	2,188	23,726,346,551	130 48
3	Bovespa S&I Ind Fut	BM&F	58	1986	* CR\$5000	53,745 0	268,725,000	5,180	53,529,297,667	52,083 33
4	Nikkei Stock Fut	Osaka S&I Ex	225	1988	* Y1000	19,590	19,590,000	182,813	1,547,712,065,546	107 10
5	CAC 40 Stock Index	MATIF	40	1988	* F1200	1,991 0	398 190	69,723	411,975,417,000	5 71
6	Nikkei Stock Avg	SIMEX	225	1986	Y500	19,590 0	9,795,000	91,457	472,117,079,412	107 10
7	DAX	DTB	30	1990	* Dm100	1,697 6	169,763	99,430	395,422,129,288	1 71
8	FT SE 100	LIFFE	100	1984	* L25	2,900 0	72,500	108,170	337,385,473,860	0 67
9	Hang Seng Index	HKFE	33	1986	* HK50	7,099 3	354,964	45,847	110,754,748,874	7 74
10	TOPIX Stock Index	TSE	1229	1988	* Y10,000	1,580 3	15 802,500	154,122	332,434,519,981	102 53
11	All Share Index	SAFEX	140	1990	R10	4,078 0	40,780	8,666	14,476,482,005	4 71
12	All Ord Shr P Ind	SFE	274	1983	* A\$100	1,715 1	171,510	114,912	112,712,979,532	1 49
13	Gold Index	SAFEX	14	1990	R10	1,910 0	19,100	4,059	3,733,071,841	4 71
14	Swiss Market Index	SOFFEX	23	1990	* SwFr50	2,376 2	118 810	78,415	71,672,591,107	1 52
15	NYSE Composite Index	NYFE	2045	1982	\$500	249 1	124,550	124,550	105,683,415,100	1 00
16	EOI S&I Ind(FTI)	FTA (EOE)	25	1987	D1200	324 2	64,840	33,846	27,479,347,875	1 92
17	OMX(Index)	OM Stockholm	30	1988	Sk100	844 1	84,414	10,889	6,835,345,483	7 75
18	Industrial Index	SAFEX	72	1990	* R10	4,698 0	46,960	9,979	4,213,153,758	4 71
19	NIKKEI 225	CME	225	1990	* \$5	19,590 0	97,950	97,950	34,921,427,850	1 00
20	KFX Stock Index	FUTOP	20	1989	* Dk1,000	91 5	91 490	13,934	4,723,935,667	6 57
21	S&P 400 Index	CME	400	1992	\$500	168 0	84,005	84,005	18,357,896,655	1 00
22	Major Market Index	CBOT / CME*	20	1984	* \$500	359 3	179,645	179,645	38,759,678,480	1 00
23	ATX	OTOB	17	1992	* ATS100	1,102 7	110,270	9,174	1,597,228,310	12 02
24	MSCI Hong Kong Index	SIMEX	38	1993	* HK\$100	5,033 0	503,300	64,928	5,209,962,797	7 75
25	TSE 35 Index	TFE	35	1987	* C\$500	200 6	100,300	78,234	5,402,683,572	1 28
26	Dutch Top 5 Ind(FT5)	FTA (EOE)	5	1990	* D1200	598 1	119 626	62,445	3,851,957,601	1 92
27	Eurotop 100 Index	COMEX	100	1992	* \$100	1,010 1	101,009	101,009	5,708,705,473	1 00
28	Value Line Index	KCBT	1664	1982	\$500	417 3	208,625	208,625	9,556,276,750	1 00
29	Mint Value Line	KCBT	1664	1983	* \$100	417 3	41,725	41,725	1,696,621,950	1 00
30	Russell 2000	CME	2000	1993	* \$500	233 4	116,675	116,675	2,272,712,325	1 00
31	OBX	Oslo S&I Ex	25	1992	* NOK100	388 5	38,851	5,385	89,658,064	7 22
32	Bel 20 Index	BELFOX	20	1993	* BEF100	1,268 4	126,841	3,614	44,379,851	35 10
33	Forty Index Fut	NZFOE	40	1991	* NZ\$20	1,710 0	34,200	18,365	66,721,498	1 86
34	Wilshire Small Cap	CBOT	250	1993	\$500	306 3	153,135	153,135	248,997,510	1 00
35	FT SE 100	CME	100	1992	* \$50	2,900 0	145 000	145 000	13,630,000	1 00
36	NYSE Utility Index	NYFE	191	1993	* \$500	231 0	115,515	115,515	1,155,150	1 00

* If MMF is selected (CBOE to CME) at the request of the
 J. W. AMEX, Sept 7, 1993. D. G. 1993. There were 155,338 MMF
 contracts and the CBOE and 49,256 (CME) for a total of 204,624
 contracts.

* Us. g. ind. x. l. and exchange
 * for June 28 or 30, 1993

Source: FIA International Report Dec 1993
 FIA Monthly Vol Report Dec 1993

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Exchange Acronyms

<u>Abbrev</u>	<u>Full Name</u>	<u>Location</u>
BELFOX	Belgian Futures and Options Exchange	Brussels, Belgian
BM&F	Bolsa de Mercadonas & Futuros	Sao Paulo, Brazil
CBOT	Chicago Board of Trade	Chicago, IL
CME	Chicago Mercantile Exchange	Chicago, IL
COMEX	Commodity Exchange Inc	New York, NY
DTB	Deutsche Terminboerse	Frankfurt, Germany
FTA (EOE)	Financiele Termijnmarkt Amsterdam European Options Exchange	The Netherlands
FUTOP	Copenhagen Stock Exchange	Copenhagen, Denmark
HKFE	Hong Kong Futures Exchange, Ltd	Hong Kong
KCBT	Kansas City Board of Trade	Kansas City, MO
LIFFE	London Int'l Financial Futures and Options Exc	London
MATIF	Marche a Terme International de France	Paris, France
MEFF RV	Mercado de Opciones Y Futuros Financieros	Barcelona, Spain
NYFE	New York Futures Exchange	New York, NY
NZFOE	New Zealand Futures & Options Exchange	Auckland, NZ
OM	OM Stockholm AB	Stockholm, Sweden
OSE	Osaka Stock Exchange	Tokyo, Japan
OTOB	Austrian Futures and Options Exchange	Vienna, Austria
SAFEX	South African Futures Exchange	Johannesburg, S.Africa
SFE	Sydney Futures Exchange	Sydney, Australia
SIMEX	Singapore International Monetary Exchange, Ltd	Singapore
SOFFEX	Swiss Options and Financial Futures Exchange	Zunch, Switzerland
TFE	Toronto Futures Exchange	Toronto, Canada
TSE	Toronto Stock Exchange	Toronto, Canada