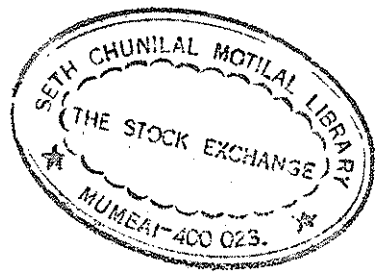

A Guide to

INDEX FUTURES

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Chapter 1: Index Fundamentals

What is an Index?

An Index is a representative of a set, and is generally the indicator of the status of the set. In a stock market context, Index is an indicator of the broad market. For instance, by tracking the changes of the BSE Sensex, one can effectively gauge stock market moods in India.

Any Index is an average of its constituents. For example, the BSE Sensex is a weighted average of prices of 30 select stocks, where the weight is the market capitalization of individual stocks. Market capitalization is the product of stock price and number of shares issued by the company.

Suppose there are 2 stocks, A and B, details of which are included below.

Company	Shares Outstanding (mn)	Price (Rs)
A	10	100
B	1	150

The market capitalization (also known as market cap) for A is Rs1,000mn and for B is Rs150mn. If we were to create a market cap weighted Index, then the Index is defined as

Index (i) = Sum of market cap on day (i)* 100 / Sum of market cap on day (0)

Where i is the day on which Index has to be calculated;
And day (0) is the base date or initial date.

So on day 0, the Index is 100. On day 5, if the A is trading at Rs200 and B at Rs200, the Index (5) would become

Index (5) = (10*200 + 1*200)*100 / (10*100 + 1*150)
Index (5) = 191.3

Why is a market Index important?

A market Index is very important because of the following reasons:

- It acts as a very good barometer for market behavior;
- It is used to benchmark portfolio performance; and
- It is used in instruments like Index funds, Index derivatives, etc.

Are there different kinds of market Indexes?

Yes, they can exist, and its properties would depend on the sponsor and its constituents. For example, in India there exists the BSE Sensex of the Bombay Stock Exchange and the National Stock Exchange sponsored S&P CNX Nifty. The most important (and usually popular) type of market Index is the broad market Index, which comprises large and liquid stocks of the country.

In addition, specialized Indexes like sector specific ones which track the performance of individual sectors. Similarly different types of Indexes can be created depending on the companies included in the set.

What does market Index movements signify?

In general, Index movements reflect changes in the set properties. We are all used to seeing changes in BSE Sensex, which as explained earlier is the Index for the stock prices on the BSE. This reflects changing expectations of the stock market about Future performance of Indian economy, and hence the corporate sector. Whenever the Sensex rises, it means that prices of the stocks constituting the Sensex have risen. Stock prices rise when perception about Future performance of economy and company improves. Thus, the Index is a barometer of the market at that instant.

Companies announce dividends. Does the Index capture this information?

In general, the reported market Index figure is actually the price Index, which reflects only the change in prices. To calculate the Total Returns of any Index, we have to factor in the dividends announced by the companies comprising the Index. The Total Return Index is the correct Index for benchmarking mutual fund performance as they earn dividends.

Is there a financial theory behind the market Index being a good barometer for the overall market?

Stock prices get impacted by two separate factors, which includes

- Company specific events like results, bonus announcements, product launches, accidents, tie-ups, etc.
- Events that impact overall economy like diesel price hike, tax rates, etc.

For example, suppose the government announces a diesel price hike, we expect the BSE Sensex to be negatively impacted. On the same day, if Company A announces a 1 for 1 bonus and a Rs10 dividend, its stock price should increase. In reality, the price movement in stock price of Company A is a combination of good news from Company A and bad news about the economy. The role of a good Index is to reflect only that component which affects the state of the overall market.

See also risk

How does one achieve it?

This is achieved by diversification. As is explained in portfolio theory, one can reduce risk by adding stocks in a portfolio. If the rates of return of individual securities are not perfectly positively correlated, diversification results in risk reduction. Empirical studies have shown that the maximum benefit of diversification by forming a portfolio of 10-15 securities, thereafter gains of diversification are negligible.

As explained earlier, each individual stock price movement is a combination of stock related events and events affecting overall economy, or market. With diversification, events relating to individual stocks tend to cancel each other and one is left with only events common to the entire economy. Hence the risk captured in the Index is systematic risk or market risk.

See also risk

What are Index funds?

Index funds are funds that passively invest in a basket of securities that exactly imitate the market Index. For example, suppose you have a Sensex based fund, the fund manager will invest in all Sensex constituents in the same proportion they appear in the Sensex. It is a passive form of portfolio management.

Chapter 2: Futures

What are derivative instruments?

A derivative is an instrument whose value is derived from the value of one or more underlying, which can be commodities, precious metals, currency, bonds, stocks, stocks indices, etc. Examples of derivative instruments are Futures, Options, etc.

What are Futures?

Futures designate all contracts covering the sale of financial instruments or physical commodities for Future delivery on any exchange. There is an agreement to buy or sell a specified quantity of financial instrument/ commodity in a designated Future month at a price agreed upon by the buyer and seller. The contracts themselves are traded on the Futures market, which is a market in which contracts for Future delivery of a commodity or a share are bought or sold. For example, if you buy 100 Company X Futures at Rs100 for May 31 delivery, it means that on May 31, you would pay the seller Rs10,000 and get in return 100 shares of Company X. In general there is no physical delivery of the underlying asset but the settlement is done by paying or receiving the difference of the actual price on May 31 and the contracted price. In the same example, if the price of Company X was Rs150 on May 31, you would get Rs5,000 (Rs5,000 = 100*(Rs150-Rs100) and if the price of Company X was Rs50, then you would have to pay Rs5,000.

We hear that Futures are standardized. What are the Standardized Terms in Futures?

The standardized items in any Futures contract are

- Quantity of the underlying
- Quality of the underlying (not required in financial Futures)
- The date and month of delivery
- The units of price quotation (not the price itself) and minimum change in price (tick-size)
- Location of Settlement

Can there be Futures on individual stocks?

Such instruments exist in some countries but in general not very popular. Price volatility in individual stocks is much higher than Index. This results in higher risk of clearing corporation and margin requirements. In addition, such instruments suffer from lack of depth and liquidity in trading. In most cases, Futures based on individual stocks often have a physicalm settlement resulting in more complex regulatory requirements. From a trader's perspective, it is difficult to manipulate an Index than individual stock, resulting in price manipulations.

What is the difference between Commodity and Financial Futures?

The basic difference between commodity and financial Futures is the nature of the underlying instrument. In a commodity Futures, the underlying is a commodity which may be Wheat, Cotton, Pepper, Turmeric, corn, oats, soybeans, orange juice, crude oil, natural gas, gold, silver, pork-bellies etc. In a financial instrument, the underlying can be Treasuries, Bonds, Stocks, Stock-Index, Foreign Exchange, Euro-dollar deposits etc.

As is evident, a financial Future is fairly standard and there are no quality issues while a commodity instrument, quality of the underlying matters.

What do you mean by Closing out contracts?

Most contracts are not held to expiry, and so delivery does not take place. If held until expiry, some are settled for cash and others for physical delivery.

Is the settlement mechanism different for Cash and Physical Delivery?

In case it is impossible, or impractical, to effect physical delivery, open positions are closed out on the last day of trading at a price determined by the spot "cash" market price of the underlying asset. This price is called "Exchange Delivery Settlement Price" or EDSP.
In case of physical settlement short side delivers to long side the specified quantity / quality of underlying asset. The long side pays the EDSP.

Chapter 3: Forward Contracts

What are Forward contracts?

A forward contract is a customized contract between two parties, where settlement takes place on a specific date. The settlement date and price is agreed in advance by the parties concerned.

The main features of forward contracts are

- They are bilateral contracts and hence exposed to counter-party risk.
- Each contract is custom designed, and hence is unique in terms of contract size, expiration date and the asset type and quality.
- The contract price is generally not available in public domain.
- The contract has to be settled by delivery of the asset on expiration date.
- In case, the party wishes to reverse the contract, it has to compulsorily go to the same counter party. This can result in payment of an exit premia.

What is the difference between Forward contracts and Futures contracts?

The basic difference between a Forward and Futures contracts is that one is customized and the other is standardized. To be more specific, the terms of a Forward Contracts are individually agreed between two counter-parties, while Futures however are traded on exchanges where the terms of the contract are standardized by the exchange.

Other salient differences are

a. Counter party risk - In case of Futures, after a trade is confirmed by two members of exchange, the exchange itself becomes the counter-party to every trade. The credit risk, which in case of forward contracts was on the counter-party, gets transferred to exchange, reducing the risk to almost nil.

b. Liquidity - Futures contracts are much more liquid and their price is much more transparent due to standardization and market reporting of volumes and price.

c. Squaring off - A forward contract can be reversed only with the same counter-party with whom it was entered into. A Futures contract can be reversed with any member of the exchange.

Chapter 4: Pricing of Futures

Is there a theoretical way of calculating Index Future?

The theoretical way of calculating any Future is to factor in the current price and holding costs, i.e. interest expenses. If not, then there is an arbitrage opportunity. Arbitrage is a risk less profit earned by buying and selling same securities at different prices and exchanges. The other subjective things that enter the pricing mechanism are sentiments and event expectations.

In general, the Futures Price = Spot Price + Cost of Carry

Cost of carry is the equivalent of interest costs or carry costs. This depends on opportunity cost, cost of storage, insurance, etc. The largest component is the opportunity cost of capital, which is the equivalent of interest costs.

Apart from the theoretical value, the actual value may vary depending on demand and supply of cash and Futures contract. In this context, this is also similar how other instruments in any market behave.

In general, the Futures price is greater than the spot price. In special cases, when cost of carry is negative, the Futures price may be lower than Spot prices.

What is the concept of Basis?

The difference between spot price and Futures price is known as basis. Although the spot price and Futures prices generally move in line with each other, the basis is not constant. Generally basis will decrease with time. And on expiry, the basis is zero and Futures price equals spot price.

What is Contango?

Under normal market conditions Futures contracts are priced above the spot price. This is known as the Contango Market

What is Backwardation?

It is possible for the Futures price to prevail below the spot price. Such a situation is known as backwardation. This may happen when the cost of carry is negative, or when the underlying asset is in short supply.

Chapter 5: Index Futures

What are Index Futures?

Index Futures are Future contracts where the underlying asset is the Index. This is of great help when one wants to take a position on market movements. Suppose you feel that the markets are bullish and the Sensex would cross 5,000 points. Instead of buying shares that constitute the Index you can buy the market by taking a position on the Index Future.

What are uses of Index Futures?

Apart from usual use of speculating, Index Futures can be used as a very good instrument for hedging. Other uses include Cash flow management and Asset allocation.

See also hedging

When do we expect Index Futures in India?

Both the Bombay Stock exchange (BSE) and the National Stock Exchange (NSE) are planning to launch the 3 month Futures in India. We expect trading to commence as soon as SEBI approves the same. In Nov. 1999 the Parliament amended the Securities Contracts (Regulation) Act, 1956 to allow trading in derivative instruments.

What are the specifications of the proposed BSE Index Futures?

The main features of the BSE Index Futures are

- The underlying instrument would be the BSE Sensex.
- Lifetime of each series would be three months
- At any point of time, there shall be three series open for trading. This effectively results in a virtual monthly cycle - i.e. one month series of Futures contracts.
- Tick size 0.10 of a point.

- Contract Multiplier - Each contract would be 50 times the Sensex. This is equivalent of the minimum lot in case of shares in the physical delivery mechanism.
- Each point will be valued at Rs5 (0.1 x 50)
- The contract would mature on the last Thursday of the respective month.
- A new series comes into existence on the immediately succeeding business day.

Is the National Stock exchange also planning to introduce trading in Index Futures?

The National Stock Exchange (NSE) is also planning to launch Index Futures. The basic difference will the underlying Index, which for the NSE will be the Standard & Poor's CRISIL NSE Nifty (S&P CNX Nifty).

Chapter 6: Margin

What is margin money?

The aim of margin money is to minimize the risk of default by either counter-party. The payment of margin ensures that the risk is limited to the previous day's price movement on each outstanding position. However, even this exposure is offset by the initial margin holdings.

Margin money is like a security deposit or insurance against a possible Future loss of value. This is the money deposited with your broker or exchange to mitigate default risk. Suppose you buy 100 shares of Company X at Rs100, you have an exposure of Rs10,000. In the unlikely event of you failing to honor your commitment, your broker would incur a loss of Rs10,000. To avoid this, the exchange or broker would insist on a margin of a percentage of the exposure, generally 10-25%. The per cent margin is decided on the basis of the maximum price change permitted in a given period. In India, the price of a share cannot increase or decrease by over 8% in a single trading day. So the daily margin should be around 8%. In general, the exchange imposes an additional margin over and above 8%. If your margin is inadequate to cover the exposure, the exchange can demand additional funds because of adverse price movement.

Are there different types of Margin?

Yes, there can be different types of margin like Initial Margin, Variation margin, Maintenance margin and Additional margin.

What is the objective of Initial margin?

The basic aim of Initial margin is to cover the largest potential loss in one day. Both buyer and seller have to deposit margins. The initial margin is deposited before the opening of the day of the Futures transaction.

What is Variation Margin?

All daily losses must be met by depositing of further collateral - known as variation margin, which is required by the close of business, the following day. Any profits on the contract are credited to the client's variation margin account.

What is the concept of Maintenance Margin?

Some exchanges work on the system of maintenance margin, which is set at a level slightly less than initial margin. The margin is required to be replenished to the level of initial margin, only if the margin level drops below the maintenance margin limit. For eg. If Initial Margin is fixed at 100 and Maintenance margin is at 80, then the broker is permitted to trade till such time that the balance in this initial margin account is 80 or more. If it drops below 80, say it drops to 70, then a margin of 30 (and not 10) is to be paid to replenish the levels of initial margin. BSE has specified the Maintenance margin level to be equal to the initial margin level.

What is the concept of Additional Margin?

In case of sudden higher than expected volatility, additional margin may be called for by the exchange. This is generally imposed when the exchange fears that the markets have become too volatile and may result in some crisis, like payments crisis, etc. This is a preemptive move by exchange to prevent breakdown.

What is the concept of Cross Margining?

This is a method of calculating margin money account balance and this takes into account combined positions in Futures, options, cash market etc. Hence, the total margin requirement reduces due to cross-Hedges. This is unlikely to be introduced in India immediately.

Chapter 7: Some commonly used terms

What are long/ short positions?

In simple terms, long and short positions indicate whether you have bought or sold the security. For example, if you have bought 100 shares of Company X, then you are long Company X and if you have sold 100 shares of Company X, you are short. Thus, it reflects a person's established market position.

Who is a market maker?

A dealer is said to make a market when he quotes bid and offered prices at which he stands ready to buy and sell the security. Thus, he is a person that brings buyers and sellers together. He lends liquidity in the system by making trading feasible.

What is marked-to-market?

This is an arrangement whereby the profits or losses on the underlying are settled each day. Suppose you have bought 100 shares of Company X on day 1 and the closing price was Rs102. By marked-to-market, it means that you have a notional profit of Rs.200 at end of day 1. Thus, it reflects your notional profit or loss at a particular moment using current prices. Most Futures contracts are marked to market at the end of the day. This enables the exchange to calculate margin requirements and reduces chances of defaults. BSE has specified that MTM margins have to be paid in cash before start of trading the immediately succeeding day.

What is Gearing?

Gearing (or leveraging) is akin to funding an asset by taking a loan. To put it simply, suppose you want to buy an asset of Rs100 and have only Rs50. You need to borrow Rs50 to own the desired asset. In such an event, the gearing is 2. In most cases, the higher the gearing, the higher is the risk.

What is the role of the clearing house?

The role of the Clearing House is like any other exchange or market mechanism which clears the trades daily. It also matches the deal tickets, reconciles sales and purchases and keeps account of margin payments.

The other role of the Clearing House is to act as a guarantor for every trade. Clearing house stands between each counter-party of a Futures contract to ensure that every contract is honored. It only guarantees fulfillment of the contract to a clearing member of the exchange.

Chapter 8: Risk

What is Risk?

Risk is defined as the standard deviation of returns generated by any asset. This indicates how much individual outcomes deviate from the mean. For example, an asset with possible returns of 5%, 10% and 15% is more risky than one with possible returns of –10%, 1% and 25%.

What are the different types of Risk?

Diversifiable risk (also known as non market risk or unsystematic risk) of a security arises from the security specific factors like strike in factory, legal claims, non availability of raw material, etc. This component of risk can be reduced by diversification.

Non-diversifiable risk (also known as systematic risk or market risk) is an outcome of economy related events like diesel price hike, budget announcements, etc that affect all the companies. As the name suggests, this risk cannot be diversified away using diversification or adding stocks in portfolio.

Can Risk be controlled?

Yes, but to an extent. As mentioned earlier, the different types of risk impacting any stock or company can be classified into two categories:

a. Company specific; and
b. Economy or market related.

As discussed earlier, the Company specific risks (also known as diversifiable risk or non market risk or unsystematic risk) can be reduced to zero by proper diversification.

Chapter 9: Hedging

What is hedging?

Hedging is a mechanism to reduce investment risk using derivative instruments like call options, put options, short selling, or Futures contracts. A Hedge can help lock in existing profits. Its purpose is to reduce the volatility of a portfolio, by reducing the risk of loss. Suppose you have a portfolio and there is a likelihood of a war, in such an event the value of your portfolio would diminish. You would not like to sell off your entire portfolio because of tax issues or liquidity problems. The best Hedge would be to sell Index Futures. The loss on your portfolio would be covered by the gains on sell position in Index Futures.

What are general hedging strategies?

The basic logic is "If long in cash underlying - Short Future and If short in cash underlying - Long Future". Let us understand this by a simple example. If you have bought 100 shares of Company A and want to Hedge against market movements, you should short an appropriate amount of Index Futures. This will reduce your overall exposure to events affecting Company A only. In case a war breaks out, the entire market will fall (most likely including Company A). So your loss in Company A would be offset by the gains in your short position in Index Futures.

Some examples of where hedging strategies are useful include:

- Reducing the equity exposure of a Mutual Fund by selling Index Futures;
- Investing funds raised by new schemes; and
- Partial liquidation of portfolio.

See also risk

What is the Hedge Ratio?

The Hedge Ratio is defined as the number of Futures contracts to buy or sell so as to provide the maximum offset of risk. This depends on the

- Value of a Futures contract;
- Value of the portfolio to be Hedged; and
- Sensitivity of the movement of the portfolio price to that of the Index (Beta).

The Hedge Ratio is very closely linked to the correlation between the asset to be Hedged and the portfolio against which it has to be done.

What will one do if the period of Hedge is longer than available Futures?

In such an event one can Roll forward a Hedge. This implies closing one Future position and take the same position on another Future with the same specifications but having a later delivery date. However, this leaves the basis-risk open for uncovered period.

See basis, Futures

What is hedging effectiveness?

Suppose you have some portfolio, and you use Index Futures for hedging. For high hedging effectiveness, the Index should correlate well with your portfolio. A good Index would give a very high risk reduction when a portfolio owner short sells the Index Futures.

Chapter 10: Market players

Who are Hedgers, Speculators and Arbitrageurs?

Hedgers wish to eliminate or reduce the price risk to which they are already exposed. Speculators are those class of investors who willingly take price risks to profit from price changes in the underlying. Arbitrageurs profit from price differential existing in two markets by simultaneously operating in two different markets. All class of investors are required for a healthy functioning of the market.

Hedgers and investors provide the economic substance to any financial market. Without them the markets would lose their purpose and become mere tools of gambling. Speculators provide liquidity and depth to the market. Arbitrageurs bring price uniformity and help price discovery.

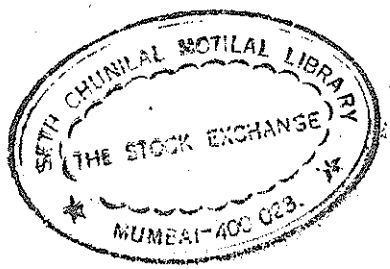
The market provides a mechanism by which diverse and scattered opinions are reflected in one single price of the underlying. Markets help in efficient transfer of risk from Hedgers to speculators. Hedging only makes an outcome more certain. It does not necessarily lead to a better outcome.

What are the general strategies for Speculating?

In general, the speculator takes a view on the market and plays accordingly. If one is bullish on the market, one can buy Futures, and vice versa for a bearish outlook.
There is another strategy of playing the spreads, in which case the speculator trades the "basis"

See Hedging

See also Basis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