A MANAGEMENT THESIS - I

ON

"ARBITRAGE OPPORTUNITIES IN FUTURES MARKET USING RISK FREE INTEREST RATE."

By

(Name)

COMPANY

ABN AMRO BANK

A REPORT ON

"ARBITRAGE OPPORTUNITIES IN FUTURES MARKET USING RISK FREE INTEREST RATE."

By

(Name)

(Institute name)

(PGDBA 20 -20)

Enrollment No.

A report submitted in partial fulfillment of the requirements of

PG PROGRAM (20 -20)

(Institute name)

Copies Marked list

INC Center Head

Faculty Guide

Company Guide

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

There are many people who influence the process of research work. Every individual is in contact with the author by either of the way i.e. directly or indirectly. Similarly in case of this research work there are many people who cannot be thanked enough for their contribution to the project.

First I sincerely express my gratitude towards _____, (Center Head) and _____, Company guide (CG) for giving me an opportunity to do this MT. I would also like to thank _____, DST head, for his continuous support and motivation in preparing this Management thesis and who was the constant source of guidance and inspiration. I offer my special thanks to and _____, faculty Guide (FG), for teaching me as how to apply domain knowledge in real practical situations and visualization of the theory of Futures and options which helps me lot to complete my MT.

I would also take the opportunity to thank the respondents from the target population for being a respondent for the project work without which I couldn't be completed the research work.

Lastly I would like to thank my parents for giving me an opportunity to go through this Project. I would also like to thank all my friends and all the people who are involved in this project directly or indirectly.

(Name)

ABBREVIATIONS

r : risk free interest rates

rf : Risk free interest rates.

So : Stock price today

St : spot stock price

t : Time to expire

u : the proportional increase in stock price

NSE : National stock exchange

BSE : Bombay stock exchange

RBI : Reserve bank of India

NYSE : New York stock exchange

SUMMARY

The topic, *"A study on arbitrage opportunity in futures market uses risk free interest rate as the base"* mainly deals with the derivative instrument viz: futures and options. Its primary focus is on futures pricing using risk free interest rate in the economy and options pricing using binomial trees and the model developed by *Fischer Black's, MYRON Scholes' and Robert Merton's* which here after is referred as black scholes which assumes that percentage changes in the stock price in a short period of time are normally distributed.

The main intention of the study is to find out the arbitrage opportunities (whether they exist or no) among different market instrument but within the same same market. After finding out the arbitrage opportunities the topic goes into the feasibility of those opportunities in the real world and the problems associated with the money market, stock market debt market lot size because of which the market players are/not able to tap the arbitrage opportunities.

The subject under study also deals with the factors that give rise to difference between the futures price, options price and the underlying asset's (or stock for this study) price which result in arbitrage like difference in volatility in futures market, options market and the spot market; the "r" factor study that is study on the risk free interest rate in the economy and the rate that market players use to value the futures price.

The study also focuses on financial reengineering for the Indian financial market like NSE and BSE and provides suggestions to the regulators for establishment of a separate credit market for the stock and the derivative market participant so that they are able to tap the arbitrage opportunities thus helping futures and options prices to go hand in hand, ultimately leading to efficient market.

INTRODUCTION

DERIVATIVES

It can be defined as a financial instrument whose value depends on or derives from the values of other, more basic underlying variables. Variables underlying assets are the prices of the traded assets. A derivative includes Futures, forwards, swaps etc.

History of futures market

The futures market was the development following the forwards market. While the forward market took centuries to evolve, they provided good assurance against price uncertainties and later on, started becoming more standardized and regulated. The futures markets were originally developed to meet the needs of the farmers and merchants. In the 19th century, commodity options were widespread in the US and till the first half of the 20th century were traded in London.

A futures market can be defined as an agreement to buy or sell a standard quantity of a specific instrument at a predetermined future date and at a price agreed between the parties through open outcry on the floor of an organized futures exchange.

Futures are considered to be better when compared to forwards because of the following reasons:

- Standard volume
- Liquidity
- Counterparty guarantee by exchange
- Intermediate cash flows.

Forward Contracts:

It is an agreement to buy or sell an asset at a certain future time for a certain price. Forward contracts can be used to hedge the foreign currency risk.

Spot price

It is an agreement to buy or sell an asset today.

Over-the-counter market:

It is an important alternative to exchanges and measured in terms of the total volume of trading, has become much larger than the exchange-traded market.

Bid price – A price at which they are prepared to buy

Offer price – A price at which they are prepared to sell

Trades in the ‘over the counter market’ are much larger than trades in the exchange traded markets

Advantage -

Market participants are free to negotiate any mutually attractive deal.

Disadvantage -

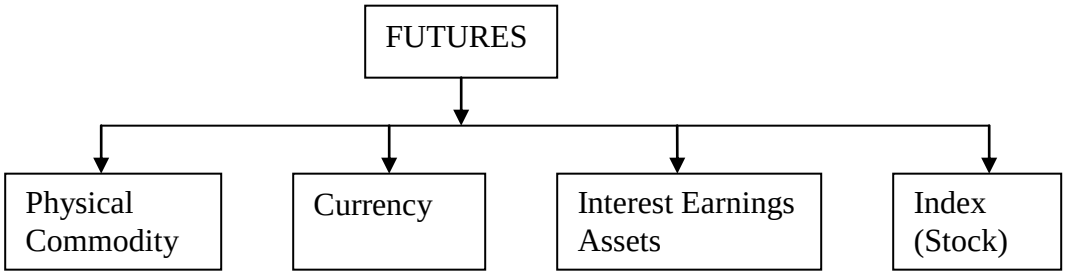
There is usually some credit risk in an over the counter trade. E.g. Contract will not be honored

Difference between Futures and Forwards

There are basic differences between the forwards and futures which are illustrated below:

Sr.No.	PARTICULARS	Financial Futures Market	Forwards Market
1	Location	Futures Exchange	Over- the-counter market
2	Size of contract	Standardized contract	Not standardized
3	Maturity	Standard or Fixed	Depends on the terms of contract
4	Counterparty	Clearing House	Known bank or client
5	Valuation	Market to market everyday	No unique method of Valuation
6	Regulations	Regulated by the Exchanges	Self regulated
7	Settlement	Through Clearing house	Depends on terms of contract
8	Liquidity	Mostly by offsetting the positions	Mostly settled by actual delivery

Types of futures:



A Binding obligation to buy or sell a particular underline asset at a predetermined rate on a specific future date is known as futures market

Mechanism of futures market

Futures contracts are traded in auctions markets, where the prices are order driven. In these markets, each broker and trader can buy at the lowest offered price and sell at the highest bid price and the liquidity is maintained by the participation of these buyers and sellers.

Futures contracts are designed in such a way so that their prices should always reflect the prices of underlying cash market. The activities of speculators and arbitragers also bring price alignment.

Contract Specifications

The Asset:

The delivery of the assets needs to be specified at a time of entering in to the contract

The price

The price agreeable to the buyer and seller at a time of delivery of future contract is specified at a time of the agreement.

The Contract Size

This specifies the amount of the asset that has to be delivered under one contract. If the size of the contract is too large, many investors cannot use the exchange for hedging or for speculative purposes. This is because speculators may not wish to take large positions due to risk. However the contract size is too small, trading becomes expensive due to the cost associated with trading

Delivery arrangements:

The place of delivery needs to be specify at the time of contract

Delivery months:

A futures contract is referred to buy its delivery months

Tick Size

The contract also specifies the minimum price fluctuation or tick size.

Limits on daily Price movements:

The daily price movement limits are specified by exchange.

Trading Limit:

The minimum no. of units that are traded on the exchange means trading limit

ABOUT FUTURES

The futures markets were originally developed to meet the needs of the farmers and merchants. In 19th century, commodity options were widespread in the US and till the first half of the 20th century were traded in London. A futures contract is a standardized contract traded on a futures exchange, to buy or sell a certain underlying instrument at a certain date in the future, at a specified price. The future date is called the delivery date or final settlement date. The pre-set price is called the futures price. The price of the underlying asset on the delivery date is called the settlement price.

A futures contract gives the holder the obligation to buy or sell, which differs from an options contract, which gives the holder the right, but not the obligation. In other words, the owner of an options contract may exercise the contract. Both parties of a "futures contract" must fulfill the contract on the settlement date. The seller delivers the commodity to the buyer, or, if it is a cash-settled future, then cash is transferred from the futures trader who sustained a loss to the one who made a profit. To exit the commitment prior to the settlement date, the holder of a futures position has to offset his position by either selling a long position or buying back a short position, effectively closing out the futures position and its contract obligations.

Futures contracts, or simply futures, are exchange traded derivatives. The exchange's clearinghouse acts as counterparty on all contracts, sets margin requirements, etc.

DIFFERENCE BETWEEN FUTURES AND FORWARDS

While futures and forward contracts are both a contract to deliver a commodity on a future date at a prearranged price, they are different in several respects as follows:

A. Forwards only transact when purchased and on the settlement date. Futures, on the other hand, are rebalanced, or "marked-to-market", every day to the daily spot price of a forward with the same agreed-upon delivery price and underlying asset.

B. The lack of rebalancing of forwards means that, in some cases, due to movements in the underlying's price, a large differential will build up between the forward's delivery price and the settlement price.

C. This means that one party will incur a big loss at the time of delivery (assuming they must transact at the underlying's spot price to facilitate receipt/delivery).

D. This in turn creates a credit risk. More generally, the risk of a forward contract is that the supplier will be unable to deliver the required commodity, or that the buyer will be unable to pay for it on the delivery day.

E. In addition, the daily futures settlement failure risk is borne by an exchange, rather than an individual party, thus further reducing credit risk in futures.

F. Example for a future with a $100 futures price: Let's say that on day 50, a forward with a $100 delivery price (on the same underlying asset as the future) costs $88. On day 51, that forward costs, say, $90. This means that the mark-to-market would require the holder of one side of the future to pay $2 on day 51 to track the changes of the forward price. This money goes, via margin accounts, to the holder of the other side of the future. (A forward-holder, however, would pay nothing until settlement on the final day, potentially building-up a large balance. So, except for tiny effects of convexity bias or possible allowance for credit risk, futures and forwards with equal delivery prices result in the same total loss or gain, but holders of futures experience that loss/gain in daily increments which track the forward's daily price changes, while the forward's spot price converges to the settlement price.)

G. Futures are always traded on an exchange, whereas forwards always trade over-the-counter, or can simply be a signed contract between two parties.

H. Futures are highly standardized, whereas some forwards are unique.

I. In the case of physical delivery, the forward contract specifies to whom to make the delivery. The counterparty for delivery on a futures contract is chosen by the clearinghouse.

A futures exchange is an exchange which provides a marketplace where one can buy and sell futures; that is a contract to buy specific quantities of a commodity or financial instrument at a specified price with delivery set at a specified time in the future. Futures and forward exchanges come under derivatives. Derivatives are financial instruments whose value is derived from the value of something else. They generally take the form of contracts under which the parties agree to payments between them based upon the value of an underlying asset or other data at a particular point in time. The main types of derivatives are futures, forwards, options and swaps.

ARBITRAGE

It involves locking in a risk less profit by simultaneously entering into transactions in two or more markets. Arbitrageurs are in business to take advantage of discrepancy between prices in two different markets. For example, they see the futures price of an asset getting out of line with the cash price; they will take offsetting positions in the two markets to lock in profit

Illustration

Consider a stock is traded on both the NYSE and LSE. Suppose that the stock price is $152in New York and £ 100 in London at a time when the exchange rate is $ 1.5500 per pound. An arbitrageur could simultaneously buy 100 shares of the stock in New York and sell them in London to obtain a risk free profit of

100*[($1.55*100) - $152]

Or $300 in the absence of transactions cost.

Arbitrage is the practice of taking advantage of a price differential between two or more markets: combinations of matching deals are struck that capitalize upon the imbalance, the profit being the difference between the market prices. When used by academics, an arbitrage is a transaction that involves no negative cash flow at any probabilistic or temporal state and a positive cash flow in at least one state; in simple terms, a risk-free profit. A person who engages in arbitrage is called an arbitrageur. The

term is mainly applied to trading in financial instruments, such as bonds, stocks, derivatives, commodities and currencies.

If the market prices do not allow for profitable arbitrage, the prices are said to constitute an arbitrage equilibrium or arbitrage free market. Arbitrage equilibrium is a precondition for a general economic equilibrium.

CONDITIONS FOR ARBITRAGE

Arbitrage is possible when one of three conditions is met:

- The same asset does not trade at the same price on all markets ("the law of one price").
- Two assets with identical cash flows do not trade at the same price.
- An asset with a known price in the future does not today trade at its future price discounted at the risk-free interest rate (or, the asset does not have negligible costs of storage; as such, for example, this condition holds for grain but not for securities).

Arbitrage is not simply the act of buying a product in one market and selling it in another for a higher price at some later time. The transactions must occur simultaneously to avoid exposure to market risk, or the risk that prices may change on one market before both transactions are complete. In practical terms, this is generally only possible with securities and financial products which can be traded electronically.

Arbitrage has the effect of causing prices in different markets to converge. As a result of arbitrage, the currency exchange rates, the price of commodities, and the price of securities in different markets tend to converge to the same prices, in all markets, in each category. The speed at which prices converge is a measure of market efficiency. Arbitrage tends to reduce price discrimination by encouraging people to buy an item where the price is low and resell it where the price is high, as long as the buyers are not

prohibited from reselling and the transaction costs of buying, holding and reselling are small relative to the difference in prices in the different markets.

TYPES OF ARBITRAGE

- Merger Arbitrage
- Municipal bond arbitrage
- Convertible bond Arbitrage
- Depository receipts
- Regulatory arbitrage
- Telecom Arbitrage

RISK FREE INTEREST RATE

The risk-free interest rate is the interest rate that it is assumed can be obtained by investing in financial instruments with no default risk. However, the financial instrument can carry other types of risk, e.g. market risk (the risk of changes in market interest rates), liquidity risk (the risk of being unable to sell the instrument for cash at short notice without significant costs) etc.

OBJECTIVES

The objectives of the doing this management thesis is as follows:

- To get the practical knowledge of the futures market.
- To know is there any Arbitrage opportunity exists or not?
- To know how the Arbitrage profit can get.
- To know the factors which affects the arbitraging?
- Analyzing the different factors which responsible for the Violation of spot-futures parity theorem.
- To know how the Risk free interest rate can be used for calculating Arbitrage in Futures Market
- To know the limitations to get arbitrage profits in futures market?
- To know how the SEBI's rules became hurdle in taking profits through arbitrage

- To know practical implementation of the Arbitraging.
- To know how the spot price and futures price are helpful to calculate the arbitrage.

LIMITATIONS

There are numbers of limitations come during preparing this thesis and these limitations are as follows:

1. Obstacles in collecting the right historical data of Futures Stock
2. The study assumes the risk free interest rates to be constant (that is there are no major changes in the monetary policy)
3. It also assumes that the future prices, premiums and volatility represent the historical data which may not be entirely true.

METHODOLOGY

A Methodology which I used to complete my management thesis is as follows:

1. Collection of secondary data that is the data on futures, options and spot market prices from NSE website.
2. Appling the theoretical concepts to this prices.
3. Observing the results and finding its cause and effect relationship and its implications.
4. The basic data which I had collected from the official website of the NSE.
5. The spot – futures parity relationship has been verified using daily data on value of NSE Nifty; time to maturity for different futures contract available for trading; and number of contracts traded for different futures contracts.
6. To understand the theoretical framework of Futures, Risk free interest rates and arbitrage, I gone through the Reference books and for practical understanding I read the financial magazines and old research works on the arbitrage opportunities.

7. To find out the opportunity in Futures market for arbitrage firstly, whatever data I collected from NSE Nifty; i.e. FUSTK prices I calculated the volatility in it and then find the spot price and what the future price of that and if is there any difference in futures price and spot price that itself is the "ARBITRAGE". And if there is no any difference then there is no any arbitrage opportunity is existed.
8. For getting arbitrage by using Risk free interest rate I used the following formulae:

$$Fo = So * e \wedge rt$$

Here,

Fo = Future price

So = Spot price

r = Risk free interest rate

t = Duration

REVIEW OF THE LITERATURE

Topic: *"Arbitrage opportunities, are they theoretical or do they actually exist".*

Researcher: J Adams

Abstract: This study was undertaken in 1988. In this topic J Adams has studies the NYSE to find out whether actually the arbitrage opportunities exist. The method used by him is same and the underlying formula used is Ft = St*e^(rt). Based on this formula he valued the futures contract and looked in for arbitrage opportunities.

The conclusion of this study was that actually there were arbitrage opportunities but were only restricted to small caps stock and the mid caps stock which lacked liquidity.

This study is different from that of the research undertaken by me in respect of the underlying asset in the study is limited ti futures contract, also balck scholes model is not

being used. Moreover the time it had done was backward in terms of financial engineering.

Topic: *"Arbitrage opportunities in currency markets"*

Researcher: A P Apte

Abstract: The researchers are the finance professor in IIM, Bangalore. He has also published his books on currency markets. Here the arbitrage is studied among different currencies like Inr vs. $ or € vs. £
Or ¥ vs. Inr. The study is basically done to make the players of the currency markets about the arbitrage opportunities. The study also comments on the monetary policy of RBI like intervention in currency markets so as to avoid rupee appreciation or depreciation which actually add to the ongoing arbitrage opportunity.

Topic: Arbitrage opportunities in futures market using risk free interest rate.

Researcher: John c Hull

Abstract: This paper examines whether there is a violation of the spot-futures parity theorem in the case of NSE Nifty futures, and tries to find out the different factors behind such violation. The factors, which have been considered as the determinants of arbitrage profits, are the time to maturity; whether violation is more in rising markets or in declining markets; whether violation is more when theoretical futures price exceeds actual futures price or when actual futures price exceeds theoretical futures price; the number of contracts traded; and the change in open interest. The results indicate that there is a violation of the spot-futures parity relationship for many futures of the NSE Nifty. The results further indicate that arbitrage profits are more for far month futures contracts than for near month futures contracts; for undervalued futures market (relative to the spot market) than for overvalued futures market (relative to the spot market); for

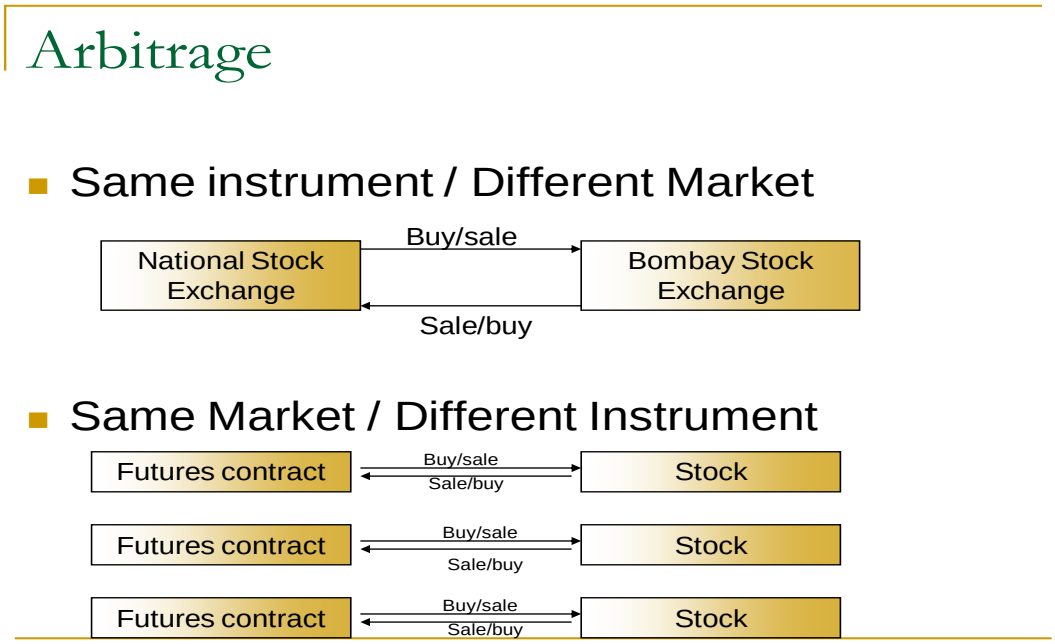
high liquid futures than for less liquid futures; and when new contracts are added than when outstanding contracts are settled. The results do not support higher or lower arbitrage profits in declining or in rising markets.

EMPIRICAL ANALYSIS

Arbitrage can be defined as locking in a riskless profit by simultaneously entering into tree below

As action in two or more markets.

The procedure of arbitrage can be explained as



Arbitrage in the different markets can be explained as

Same market /Different Instrument

- **Suppose St = 100, Fp = 103,**
- **Exp = 3 month.**

At exp Loan amt would be

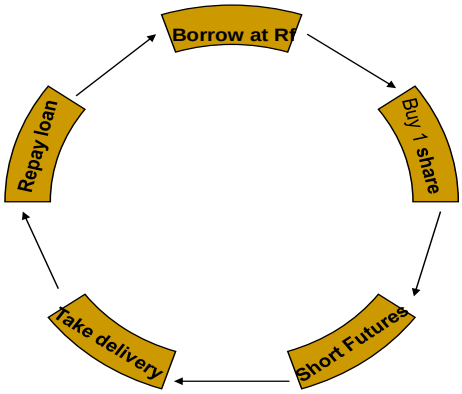
St x e^.07*.25

100 x e^.07*.25 = 101.76

Selling Futures will give Rs 103 at exp

Therefore at exp Rf profit =

103 – 101.76 = Rs 1.24/share



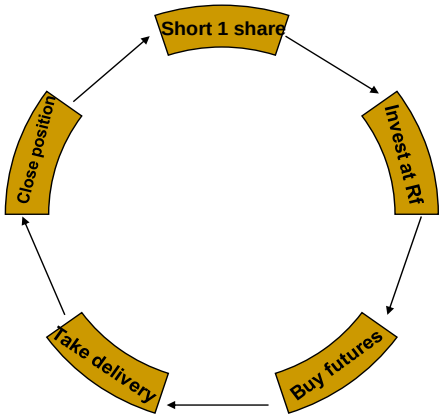
Thus if Fp > St*e^rf*T ⟶ follow the above mentioned strategy to get risk free profit

Technically

- **Suppose St = 100, Fp = 99,**
- **Exp = 3 month**

Sell 1 share at 100
Invest at Rf, so amt till futures exp will
Grow to = St x e^.07*.25
100 x e^.07*.25
= Rs 101.78

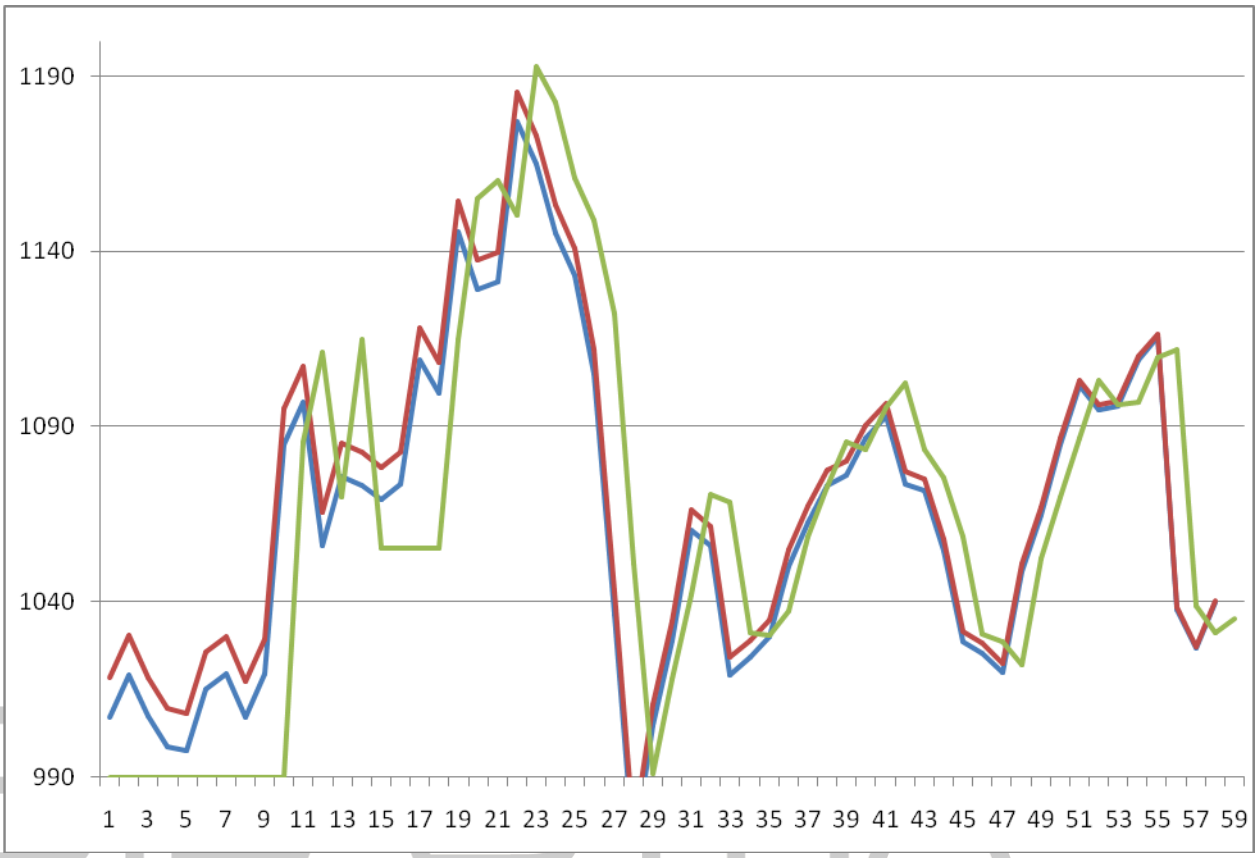
Buy futures at Rs 99
So profit at exp = 101.78 – 99
Therefore Profit = Rs 2.78/share



Thus if Fp < St*e^rf*T ➡ follow the above mentioned strategy to get risk free profit

FINDINGS

From the empirical research down above the following conclusions have been found.

1. 

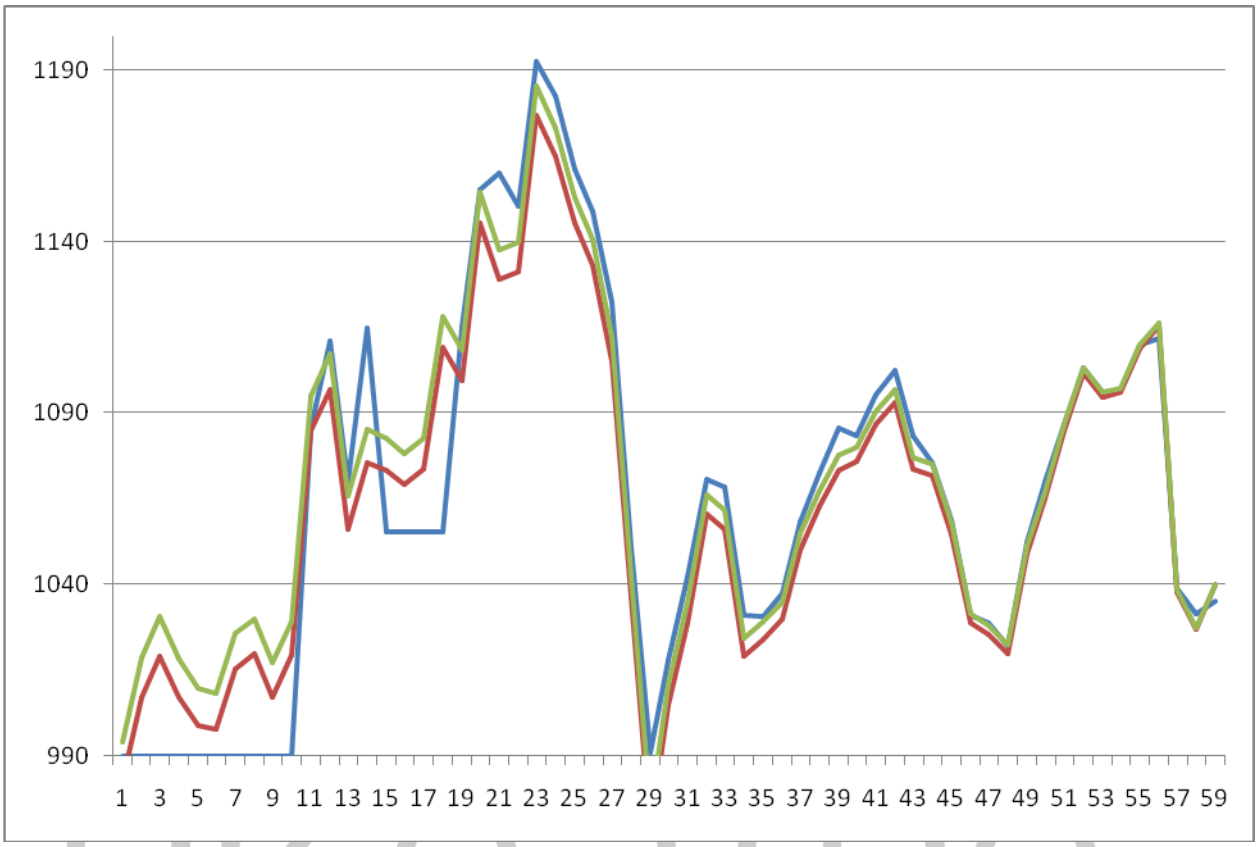
In this figure

1. green line represents the actual futures price,
2. red line represents the theoretical futures price
3. blue line represents the actual spot market price.

From the above diagram it can be seen that there is difference between the actual futures and spot price. Theoretically the difference between the spot and the futures price has to be the equal to that of the risk free rate of interest, which represents red line.

So the actual futures price has to be same as that of the red line. But there this not the case.

Contract from 1st nov 2006 to 25th jan 2007



Here the

1. Blue line represents the actual futures price
2. Red line represents the actual spot price
3. Green line represents the theoretical price.

Here also the same thing as been observed that the actual futures price and the spot price diverge more that the risk free interest rates.

Contract from 1st Feb, 2007 to 26th Apr, 2007

Here

1. blue line represents actual futures price
2. Green line represents the theoretical futures price
3. Red line represents the actual spot price

Here the market sentiments are bearish and thus market is going down. From the figure is is clearly seen that actual futures price is always above the theoretical price. Here the blue line is most of the time is above that of the green line.

SUGGESTIONS

As said earlier, there “r” factor used by the market is higher than that of the risk free interest rates, it means that the participants are unable to take credit at risk free interest rates. And the reason for this is the market lot size. If we see the money market lot size and the derivatice market sopt prices, there is a huge difference. That is if a person wants to trade in money market the minimum amount he must have is 5000000 whereas when it comes to derivatives market it is just 500000. The implication of this is, very few participants are able to take credit at risk free interest rates as they do not have money of avbout 5000000 with them. This means that majority of the participant use other interest rates like PLs interest rates or any other that are higher than that of the risk free interest rates. Thus in orde to make markets efficient by appropriate pricing in futures and the spot market the regulators must reduce the lot size in the money market so that the participant’s get the credit at risk free interest rates and help introducing the difference between futures prce and the spot price and make market efficient.

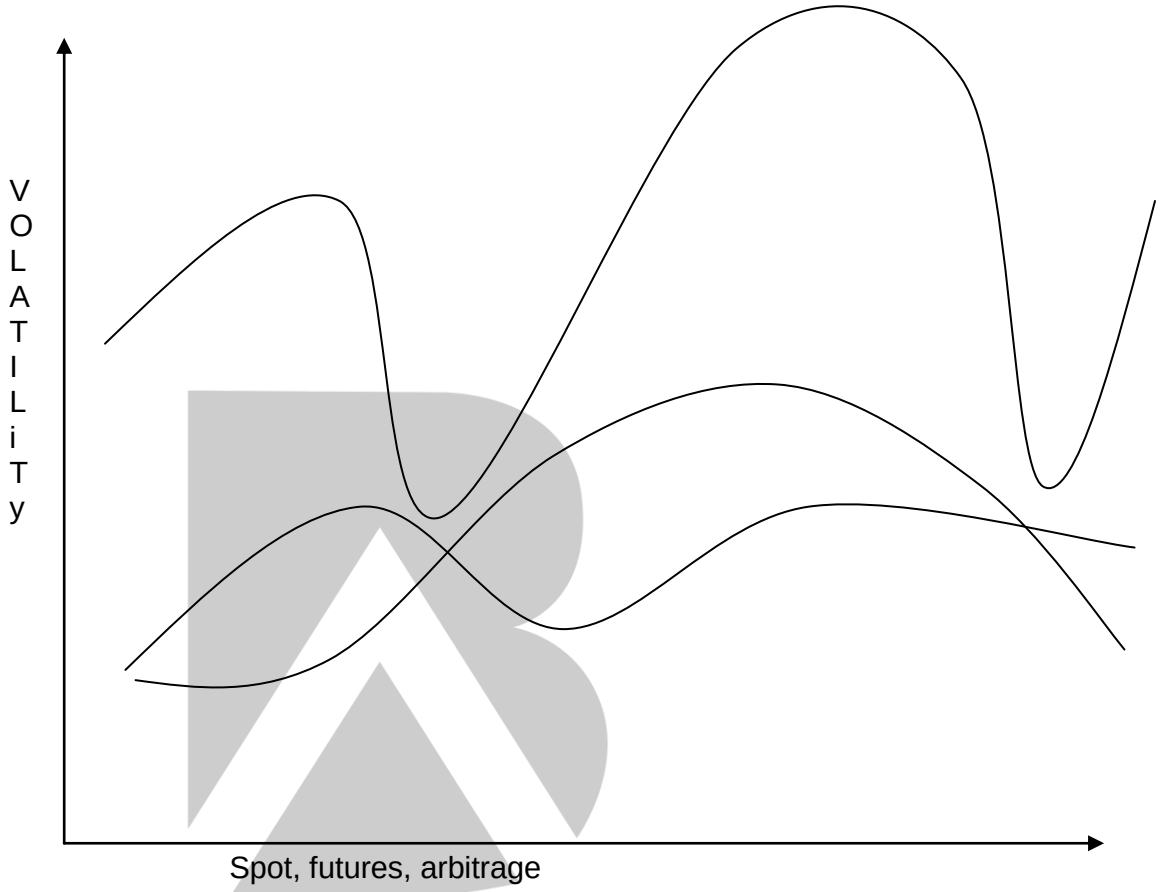
CONCLUSION

From the findings mentioned sbove we find that there are large arbitrage opportunities available in the India markets.

The various resons that can be assigned to there larege arbitrage opportunities are

1. Difference between the volatility

   Many a times what we find is that the futures market is very much volatile and the spot market at that time is not. Or many a times the spot market is much volatile and the futures market is relatively stable. This means that there is difference between the volatility of spot market and the futures market. But actually, there should not be difference between the volatility in spot market and the futures market because the underlying asset in spot market and the futures market is the same the is “stock”. But as this is the case, there are large arbitrage opportunities. Thus to conclude we can say that the difference in the volatility in the market is a sorce of volatility. This can be explained with the help of the figure below.



From the figure it can be seen that the as and when there is the difference in the volatility there is large arbitrage opportunity ans when the move in same tandom the arbitrage opoortunities are reduced.

"R" factor : From the pricing of the futures there can be one more reason assigned to the arbitrage opportunities. This is the "R" factor used in the pricing of the futures. As per the theoretical concepts, the futures must be valued at spot price plus the interest involved for that particular time period. Now according to theoretical concepts the "r" used in finding the futures price must be risk free interest rates prevailing in the economy because there is same or no risk risk involved when I hold a futures contract rather than that of the underlying asset, here it is "share". So the value of the futures and the spot must differe by the interest amount calculated by taking into account the period involved. But this is

not the case, the difference between the futures price and the spot price is higher than that of the risk free interest rates. So this means that the interest rates used by the market participant is not the risk free interest rates. Now this is the fundamental problem as far as Indian markets are concerned As the “R” used by the market is higher than that of the risk freee interest rates the futures are valued on the hogher side with reference to the spot prices and thus this gives rise to arbitrage opotunities.

INDUSTRY PROFILE

Stock Markets

While the value of total business conducted at the Bombay Stock Exchange has crossed the US$ 200 billion milestone, the National Stock Exchange is set to record an annual turnover of well above US$ 400 billion for the first time in its history in FY07.

The current financial year (2006-07) saw a record amount (US$ 5.80 billion) mobilised by initial public offerings (IPOs) which was more than double the IPOs in 2005-06. Refinery, construction, engineering and media & entertainment are among the major sectors that led the way into the primary market.

With the government approving the purchase of 6 per cent stake in the National Stock Exchange by Morgan Stanley, Citigroup and private equity firm Actis, US-based Depository Trust & Clearing Corporation (DTCC) is planning to pick up 5 per cent stake in the Bombay Stock Exchange.

Foreign institutional investors (FIIs) continue to be bullish on India. They have pumped in a hefty US$ 6 billion in equities to date in calendar 2007.

Also, reflecting confidence in the stock market, many leading domestic financial institutions, led by LIC, UTI, SBI and the Bank of India (BoI), are buying a major chunk of the broker shareholders' combined stake of 41 per cent being offered by the Bombay Stock Exchange (BSE) as part of its demutualisation process.

The general market buoyancy and the rupee appreciation have resulted in taking the number of US$ 1 billion m-cap stocks to 149, which account for 81 per cent of m-cap of BSE. Also, the number of companies with over US$ 20 billion m-cap rose to 8.

The value of participatory notes in the stock market grew 70 per cent in just one year between January 2006 and January 2007, accounting for over one-third of total foreign portfolio investments in the Indian stock markets, according to government estimates.

Mutual Funds

Mutual fund assets grew by 41.23 per cent in 2006-07 following a stellar stock market during the year. The industry ended the financial year with assets under management (AUM) of US$ 79.709 billion, a growth of 41.23 per cent over US$ 56.435 billion in 2005-06. With this, the industry has grown around 142 per cent since March 2004, when its AUM was US$ 32.935 billion.

Reliance topped the AUM chart, followed by ICICI Prudential and UTI MF. HDFC continued to be at the fourth position

Also, Reliance Mutual Fund cemented its position as the country's largest fund house with its assets crossing the US $12.213 billion level. The Anil Dhirubhai Ambani Group firm, which owns Reliance Mutual Fund, has also been accorded ISO 9001:2000 certificate, making it the second asset management company in the country to get this quality standard, covering all functional areas.

Indian investors now have a wider choice for investing abroad, either in foreign stocks or mutual funds with two fund houses - Fidelity and Sundaram BNP Paribas Mutual Fund - in the queue to offering products for investments abroad. The Government is also set to liberalise norms for mutual funds investing in overseas debt/equity instruments. The individual cap of US$ 200 million for fund houses for investment abroad is likely to be hiked.

Indian mutual funds have also bagged as many as 22 awards for best performance across various categories in the Gulf region, with the Anil Ambani Group entity Reliance MF stealing the show with highest number of accolades, followed by Franklin Templeton, HDFC, UTI, DSP Merrill Lynch and Birla Sunlife MF.

Realty Funds

Global realtors, banks and bond houses are finding the opportunity to invest in India irresistible, with more than 35 big-ticket foreign funds having already checked into the real estate sector. and many more like the Philippines-based Ayala, and Signature group, Och-Ziff Capital, EurIndia and Old Lane from Dubai among others have shown a interest to make an entry into India.

Merrill Lynch forecasts that the Indian realty sector will grow from US$ 12 billion in 2005 to US$ 90 billion by 2015. Prominent global funds, including Carlyle, Blackstone, Morgan Stanley, Trikona and Warbus Pincus have a total corpus of US$ 12-15 billion earmarked for India. Other foreign investors with a presence in the Indian real estate sector are HSBC Financial Services, Americorp Ventures, Barclays and Citigroup.

REFERENCES

www.nseindia.com

www.nsecash.com

www.moneycontrol.com

www.economywatch.com

www.bseindia.com

www.wekepedia.org

"Futures options and other derivatives" by John C Hull

"Currency markets" by A P Apte

"Treasury management" by ICMR Publication

GLOSSARY

Primary markets : Market in which buyers and sellers negotiate and transact business directly, without any intermediary such as resellers. Financial market in which newly issued securities are offered to the public.

Secondary markets : A market on which an investor purchases an asset from another investor rather than an issuing corporation market that trades in existing stocks rather than new stock issues, for example, a stock exchange. The money earned from these sales goes to the dealer or investor, not to the issuer

Cash market / Spot market: Market where people buy and sell actual commodities or financial_instruments for instant delivery. The **cash market** contrasts with the futures market, in which contracts are completed at a specified time in the future.

Derivatives market: The Market on which futures, such as derivatives are sold.

Futures contract : In finance, a **futures contract** is a standardized contract, traded on a futures_exchange, to buy or sell a certain underlying instrument at a certain date in the future, at a specified price.

Delivery date: The future date is called the **delivery date** or **final settlement date**.

Futures price: The pre-set price is called the **futures price**.

Forward contracts: A cash market transaction in which a seller agrees to deliver a specific cash commodity to a buyer at some point in the future.

Long position: A purchaser of a futures contract has the **long position**.

Short position: The seller of the contract has a **short position**.

Margins: To minimize credit risk to the exchange, traders must post margin or a performance bond, typically 5%-15% of the contract's value.

Initial margin : Is paid by both buyer and seller. It represents the loss on that contract, as determined by historical price changes that is not likely to be exceeded on a usual day's trading.

Settlement: Settlement is the act of consummating the contract, and can be done in one of two ways, as specified per type of futures contract:

Options : A contract giving an investor a right to buy (call) or sell (put) a fixed amount of shares (usually 100 shares) of a given stock (or indexes and commodities) at a specified price within a limited time period (usually three, six, or nine months).

Strike price: The specified price on an option_contract at which the contract may be exercised, whereby a call_option buyer can buy the underlier or a put_option buyer can sell the underlier.

Expiration date: The date on which an option, right or warrant expires, and becomes worthless if not exercised. For stock options, this is the third Saturday of the month in

which the contract expires, or the third Thursday of the month if the third Friday is a holiday. The date on which an agreement is no longer in effect.

Writer of an option: The seller of an option_contract. **Also called** grantor or option writer.

Call option : An option contract that gives the holder the right to buy a certain quantity (usually 100 shares) of an underlying security from the writer of the option, at a specified price (the strike price) up to a specified date (the expiration date). **also called** call option.

Put option : An option contract that gives the holder the right to sell a certain quantity of an underlying security to the writer of the option, at a specified price (strike price) up to a specified date (expiration date); here **also called** put option.

Risk free return : A theoretical interest rate that would be returned on an investment which was completely free of risk. The 3-month Treasury Bill is a close approximation, since it is virtually risk-free.

Implied volatility : A theoretical value designed to represent the volatility of the security underlying an option as determined by the price of the option. The factors that affect implied volatility are the exercise price, the riskless rate of return, maturity date and the price of the option. Implied volatility appears in several option pricing models, including the Black-Scholes Option Pricing Model

Option pricing curve : A graphical model of the price of an option at a given point in time. The price of the option varies with the price of the underlying security according to the Black-Scholes Option Pricing Model. At any point on the curve, the slope is equal to the delta.

Theoretical value : In options pricing, the hypothetical value of an option as calculated by the Black-Scholes Option Pricing Model.

Covered option : An option contract backed by the shares underlying the option. The two types are covered call and covered put.

Uncovered option : A call option written (uncovered call) or a put option purchased (uncovered put) without ownership of the underlying asset. **also called** naked option.

Covered call : The selling of a call option while simultaneously holding an equivalent position in the underlier. This is an attempt to take advantage of a neutral or declining stock. If the option expires unexercised, the writer keeps the premium. If the holder exercises the option, the stock must be delivered, but, because the writer already owns the stock, risk is limited. This is the opposite of an uncovered call, when the writer sells a call for a stock that he/she does not already own, a dangerous strategy with unlimited risk.

Covered put : The selling of a put option while being short an equivalent amount in the underlying security.

Naked put : A short put option position in which the writer does not have the corresponding short position in the underlier, or has not deposited in a cash account an amount equal to the exercise value of the put. **also called** uncovered put.

American option : An option which can be exercised at any time between the purchase date and the expiration date. Most options in the U.S. are of this type. This is the opposite of a European-style option, which can only be exercised on the date of expiration. Since an American-style option provides an investor with a greater degree of flexibility than a European style option, the premium for an American style option is at least equal to or higher than the premium for a European-style option which otherwise has all the same features. **also called** American option

European option : An option which can only be exercised for a short, specified period of time just prior to its expiration, usually a single day. **also called** European option.

In-the-Money : Any option (call or put) that has intrinsic value is said to be in-the-money by the amount of its intrinsic value. For a call, it is the amount by which the futures price is above the strike price. For a put, it is the amount by which the futures price is below the strike price.

Out-of-the-Money : A call option is said to be out-of-the-money if the underlying futures price is currently below the option strike price. A put option is out-of-the-money if the futures price is above the option strike price.

At-the-Money : If the options strike price and the underlying futures price are the same, the option is at-the-money.

Arbitrage : Buying securities in one country/market and selling them in another

This is to certify that the management thesis - I titled “Arbitrage opportunities in futures market using risk free interest rate as base.” submitted by Ramesh Awati, Enrl.no. 6ND 28625, during Sem –III of the PG program (Class 2008) embodies original work done by him/her.

Name:
Designation:
Center:

BIZASTRA

Let's Business

BIZASTRA

Let's Business