VALUATION OF FUTURES IN INDIAN STOCK MARKETS:

AN EMPIRICAL ANALYSIS

THESIS SUBMITTED TO GOA UNIVERSITY

IN PARTIAL FULFILMENT FOR THE AWARD OF

DOCTOR OF PHILOSOPHY IN COMMERCE

BY

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STATEMENT BY THE CANDIDATE

I, Anilkumar Gopal Garag, hereby declare that this thesis for Ph.D.Degree in commerce titled **"Valuation Of Futures In Indian Stock Markets: An Empirical Analysis"** is bonfide record of independent research work done by me under the guidance and supervision of Dr. B Ramesh, Dean Faculty of Commerce, Head and Chairman, Department of Commerce, Goa University. I also declare that this dissertation, or part thereof, has not previously formed the basis for award of any Degree, Diploma, Associateship, Fellowship or any other similar title.

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CERTIFICATE OF RESEARCH GUIDE

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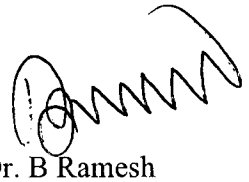

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF CHARTS

STATEMENT ON CONTRIBUTION OF THE THESIS

The Introduction of Derivatives trading in India has ushered in an era of increased turnover and increased activities in the stock markets in India. This has also led to the proliferation of media dedicated to the world of stock markets like never before. Research in the area of derivatives does not seem to have kept pace with the developments in the Stock Markets in India.

After going through the prima facie literature available a need was felt to find out the main concerns in valuations of futures markets in India. It was also felt that not enough literature is available in the realm of futures markets and valuations of single stock futures as well as index futures in the Indian context. This study would help in enhancing the knowledge base of the academic community regarding valuations of single stock futures and Index futures. It would also help investors, arbitrageurs and speculators to form their strategies of participating in the derivatives market and devise better hedging strategies.

There is a popular belief that the prices in the spot market are influenced by the futures market as players in the futures market are more suave and smart. Another belief in the market is that the cost of carry is nothing but the risk free rate of return. The market participants also popularly believe that change in open interest has a bearing on the direction of the price in the contracts. This study envisages testing these assumptions. The results would either confirm and reinforce the belief system in the market or raise doubts on the effect of these parameters with the direction of the market.

This study has the following objectives:

1. To examine the relations between the overnight MIBOR (the risk free rate) and the cost of carry in the futures market on single stock and the index futures.
2. To understand the behaviour of the futures prices vis-à-vis the cost of carry
3. To understand the behaviour of the futures prices vis-à-vis open interest

The study is aimed at validating the cost of carry model and attempts to find out the relationship between cost of carry, risk free rate of return and the change in open interest with the change in futures price.

The study will be useful for the practitioners as well as theoreticians to understand the behaviour of the change in cost of carry, Change in open interest and change in risk free rate of return with the change in futures prices. The findings will be useful in validating and re-establishing these relationships.

CHAPTER 1

EVOLUTION OF DERIVATIVES MARKET IN INDIA

This chapter introduces the concept of derivatives and traces of the development of the derivatives market in India. Here, the international scenario of derivatives is also described in detail. The chapter also contains the glossary of the terms used in the thesis.

1 EVOLUTION OF DERIVATIVES MARKET IN INDIA

1.1 INTRODUCTION TO DERIVATIVES

The emergence of the market for derivative products, most notably forwards, futures and options, can be traced back to the willingness of risk-averse economic agents to guard themselves against uncertainties arising out of fluctuations in asset prices. By their very nature, the financial markets are marked by a very high degree of volatility. Through the use of derivative products, it is possible to partially or fully transfer price risks by locking–in asset prices. As instruments of risk management, these generally do not influence the fluctuations in the underlying asset prices. However, by locking-in asset prices, derivative products minimize the impact of fluctuations in asset prices on the profitability and cash flow situation of risk-averse investors. In the last decade, many emerging and transition economies have started introducing derivative contracts. As was the case when commodity futures were first introduced on the Chicago Board of Trade in 1865, policymakers and regulators in these markets are concerned about the impact of futures on the underlying cash market. One of the reasons for this concern is the belief that futures' trading attracts speculators who then destabilize spot prices. This concern is evident in the following excerpt from an article by John Stuart Mill (1871):

"The safety and cheapness of communications, which enable a deficiency in one place to be, supplied from the surplus of another render the fluctuations of

prices much less extreme than formerly. This effect is much promoted by the existence of speculative merchant. Speculators, therefore, have a highly useful office in the economy of society".

1.2 DERIVATIVES DEFINED

Derivative is a product whose value is derived from the value of one or more basic variables, called bases (underlying asset, index, or reference rate), in a contractual manner. The underlying asset can be equity, forex, commodity or any other asset. For example, wheat farmers may wish to sell their harvest at a future date to eliminate the risk of a change in prices by that date. Such a transaction is an example of a derivative. The price of this derivative is driven by the spot price of wheat which is the "underlying".

In the Indian context the Securities Contracts (Regulation) Act, 1956 (SC(R)A) defines "derivative" to include –

1.2.1 A security derived from a debt instrument, share, loan whether secured or unsecured, risk instrument or contract for differences or any other form of security.

1.2.2 A contract which derives its value from the prices, or index of prices, of underlying securities. Derivatives are securities under the SC(R)A and hence the trading of derivatives is governed by the regulatory framework under the SC(R)A.

1.3 PRODUCTS, PARTICIPANTS AND FUNCTIONS

Derivative contracts have several variants. The most common variants are forwards, futures, options and swaps. The following three broad categories of

participants - hedgers, speculators, and arbitrageurs trade in the derivatives market. Hedgers face risk associated with the price of an asset. They use futures or options markets to reduce or eliminate this risk. Speculators wish to bet on future movements in the price of an asset. Futures and options contracts can give them an extra leverage; that is, they can increase both the potential gains and potential losses in a speculative venture. Arbitrageurs are in business to take advantage of a discrepancy between prices in two different markets. If, 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 a profit.

The derivatives market performs a number of economic functions.

First, prices in an organized derivatives market reflect the perception of market participants about the future and lead the prices of underlying to the perceived future level. The prices of derivatives converge with the prices of the underlying at the expiration of the derivative contract. Thus derivatives help in discovery of future as well as current prices.

Second, the derivatives market helps to transfer risks from those who have them but may not like them to those who have an appetite for them.

Third, derivatives, due to their inherent nature, are linked to the underlying cash markets. With the introduction of derivatives, the underlying market witnesses higher trading volumes, because of participation by more players, who would not otherwise participate for lack of an arrangement to transfer risk.

Fourth, speculative trades shift to a more controlled environment of derivatives market. In the absence of an organized derivatives market, speculators trade in the underlying cash markets. Margining, monitoring and surveillance of the activities of various participants become extremely difficult in these of mixed markets.

Fifth, an important incidental benefit that flows from derivatives trading is that it acts as a catalyst for new entrepreneurial activity. The derivatives have a history of attracting many bright, creative, well-educated people with an entrepreneurial attitude. They often energize others to create new businesses, new products and new employment opportunities, the benefit of which are immense.

Finally, derivatives markets help increase savings and investment in the long run. Transfer of risk enables market participants to expand their volume of activity.

1.4 TYPES OF DERIVATIVES

The most commonly used derivatives contracts are forwards, futures and options which we shall discuss in detail later. Here we take a brief look at various derivatives contracts that have come to be used.

Forwards: A forward contract is a customized contract between two entities, where settlement takes place on a specific date in the future at today's pre-agreed price.

Futures: A futures contract is an agreement between two parties to buy or sell an asset at a certain time in the future at a certain price. Futures contracts are

special types of forward contracts in the sense that the former are standardized exchange-traded contracts.

Options: Options are of two types - calls and puts. Calls give the buyer the right but not the obligation to buy a given quantity of the underlying asset, at a given price on or before a given future date. Puts give the buyer the right, but not the obligation to sell a given quantity of the underlying asset at a given price on or before a given date.

Warrants: Options generally have lives of up to one year, the majority of options traded on options exchanges having a maximum maturity of nine months. Longer-dated options are called warrants and are generally traded over-the-counter.

LEAPS: The acronym LEAPS means Long-Term Equity Anticipation Securities. These are options having a maturity of up to three years.

Baskets: Basket options are options on portfolios of underlying assets. The underlying asset is usually a moving average of a basket of assets. Equity index options are a form of basket options.

Swaps: Swaps are private agreements between two parties to exchange cash flows in the future according to a prearranged formula. They can be regarded as portfolios of forward contracts. The two commonly used swaps are :

Interest rate swaps: These entail swapping only the interest related cash flows between the parties in the same currency.

Currency swaps: These entail swapping both principal and interest between the parties, with the cash flows in one direction being in a different currency than those in the opposite direction.

Swaptions: Swaptions are options to buy or sell a swap that will become operative at the expiry of the options. Thus a swaption is an option on a forward swap. Rather than have calls and puts, the swaptions market has receiver swaptions and payer swaptions. A receiver swaption is an option to receive fixed and pay floating. A payer swaption is an option to pay fixed and receive floating.

1.5 DEVELOPMENT OF EXCHANGE-TRADED DERIVATIVES

Derivatives have probably been around for as long as people have been trading with one another. Forward contracting dates back at least to the 12th century, and may well have been around before then. Merchants entered into contracts with one another for future delivery of specified amount of commodities at specified price. A primary motivation for pre-arranging a buyer or seller for a stock of commodities in early forward contracts was to lessen the possibility that large swings would inhibit marketing the commodity after a harvest. The following factors have been driving the growth of financial derivatives:

Increased volatility in asset prices in financial markets,

Increased integration of national financial markets with the international markets,

Marked improvement in communication facilities and sharp decline in their costs,

Development of more sophisticated risk management tools, providing economic agents a wider choice of risk management strategies, and

Innovations in the derivatives markets, which optimally combine the risks and returns over a large number of financial assets leading to higher returns, have reduced risk as well as transactions costs as compared to individual financial assets.

1.6 EXCHANGE-TRADED VS. OTC DERIVATIVES MARKETS

The OTC derivatives markets have witnessed rather sharp growth over the last few years, which have accompanied the modernization of commercial and investment banking and globalization of financial activities. The recent developments in information technology have contributed to a great extent to these developments. While both exchange-traded and OTC derivative contracts offer many benefits, the former have rigid structures compared to the latter. It has been widely discussed that the highly leveraged institutions and their OTC derivative positions were the main cause of turbulence in financial markets in 1998. These episodes of turbulence revealed the risks posed to market stability originating in features of OTC derivative instruments and markets. The OTC derivatives markets have the following features compared to exchange-traded derivatives:

1.6.1 The management of counter-party (credit) risk is decentralized and located within individual institutions.

1.6.2 There are no formal centralized limits on individual positions, leverage, or margining.

1.6.3 There are no formal rules for risk and burden-sharing.

1.6.4 There are no formal rules or mechanisms for ensuring market stability and integrity, and for Safeguarding the collective interests of market participants, and

1.6.5 The OTC contracts are generally not regulated by a regulatory authority and the exchange's self regulatory organization, although they are affected indirectly by national legal systems, banking supervision and market surveillance.

Some of the features of OTC derivatives markets embody risks to financial market stability. The following features of OTC derivatives markets can give rise to instability in institutions, markets, and the international financial system:

The dynamic nature of gross credit exposures; Information asymmetries; the effects of OTC derivative activities on available aggregate credit; the high concentration of OTC derivative activities in major institutions; and the central role of OTC derivatives markets in the global financial system.

Instability arises when shocks, such as counter-party credit events and sharp movements in asset prices that underlie derivative contracts occur, which significantly alter the perceptions of current and potential future credit exposures. When asset prices change rapidly, the size and configuration of counter-party exposures can become unsustainably large and provoke a rapid unwinding of positions. There has been some progress in addressing these risks and perceptions. However, the progress has been limited in implementing

reforms in risk management, including counterparty, liquidity and operational risks, and OTC derivatives markets continue to pose a threat to international financial stability. The problem is more acute as heavy reliance on OTC derivatives creates the possibility of systemic financial events, which fall outside the more formal clearing house structures. Moreover, those who provide OTC derivative products, hedge their risks through the use of exchange traded derivatives. In view of the inherent risks associated with OTC derivatives, and their dependence on exchange traded derivatives, Indian law considers them illegal.

1.7 GLOBAL DERIVATIVES MARKETS

Early forward contracts in the US addressed merchants' concerns about ensuring that there were buyers and sellers for commodities. However "credit risk" remained a serious problem. To deal with this problem, a group of Chicago businessmen formed the **Chicago Board of Trade** (CBOT) in 1848. The primary intention of the CBOT was to provide a centralized location known in advance for buyers and sellers to negotiate forward contracts. In 1865, the CBOT went one step further and listed the first "exchange traded" derivatives contract in the US; these contracts were called "futures contracts". In 1919, Chicago Butter and Egg Board, a spin-off of CBOT, was reorganized to allow futures trading. Its name was changed to **Chicago Mercantile Exchange** (CME). The CBOT and the CME remain the two largest organized futures exchanges, indeed the two largest "financial" exchanges of any kind in the world today. The first stock index futures contract was traded at **Kansas**

City Board of Trade. Currently the most popular stock index futures contract in the world is based on S&P 500 index, traded on Chicago Mercantile Exchange. During the mid eighties, financial futures became the most active derivative instruments generating volumes many times more than the commodity futures. Index futures, futures on T-bills and Euro-Dollar futures are the three most popular futures contracts traded today. Other popular international exchanges that trade derivatives are LIFFE in England, DTB in Germany, SGX in Singapore, TIFFE in Japan, MATIF in France, Eurex etc.

Derivative products initially emerged as hedging devices against fluctuations in commodity prices, and commodity-linked derivatives remained the sole form of such products for almost three hundred years. Financial derivatives came into spotlight in the post-1970 period due to growing instability in the financial markets. However, since their emergence, these products have become very popular and by 1990s, they accounted for about two-thirds of total transactions in derivative products. In recent years, the market for financial derivatives has grown tremendously in terms of variety of instruments available, their complexity and also turnover. In the class of equity derivatives the world over, futures and options on stock indices have gained more popularity than on individual stocks, especially among institutional investors, who are major users of index-linked derivatives. Even small investors find these useful due to high correlation of the popular indexes with various portfolios and ease of use. The lower costs associated with index

derivatives vis–a–vis derivative products based on individual securities is another reason for their growing use.

In the present scenario, as per the FIA Annual Volume Survey the global overall futures and options contract volume was up nearly 18.91% in 2006. The individual futures and options contract volume registered a growth of 30.85% and 10.79% respectively, in the year 2006.

Table 1.1

Year wise trend of derivatives trading (in terms of contracts)

(millions)

Year	US Exchanges	Non-US Exchanges	Global
1992	550.39	387.83	938.22
1993	523.36	538.36	1,061.72
1994	807.87	779.83	1,587.70
1995	776.64	905.99	1,682.63
1996	793.63	975.34	1,768.97
1997	905.16	1,025.07	1,930.23
1998	1,033.20	1,142.65	2,175.81
1999	1,100.86	1,301.98	2,405.84
2000	1,313.65	1,675.80	2,989.45
2001	1,578.62	2,768.70	4,347.32
2002	1,844.90	4,372.38	6,217.28
2003	2,172.52	5,990.22	8,162.54
2004	2,795.21	6,069.50	8,864.71
2005	3,525.00	6,448.67	9,973.67
2006	4,573.26	7,286.00	11,859.26

Source: Futures Industry Magazine, March/April 2007.

Looking at the individual sectors, growth has been fairly strong across the board. The trading in foreign currency/index has grown by 43.59% in 2006, followed by Energies which registered growth of 37.78%.

Table 1.2

Global Futures and Options Volume

(in million)

GLOBAL	2006	2005	(%) Change
Equity Indices	4,453.95	4,080.33	9.16
Interest Rate	3,193.44	2,536.77	25.89
Individual Equities	2,876.49	2,356.87	22.05
Energies	385.97	280.13	37.78
Agricultural	486.37	378.90	28.37
Metals	218.68	171.06	27.84
Currency	240.05	167.19	43.59
Others	4.31	2.59	66.69
Total Volume	11,859.27	9,973.82	18.90

Source: Futures Industry Magazine, March/April 2007.

The details for the top 20 contracts for the year 2006 are presented in (Table 1.3). KOSPI 200 options led with more than 2.41 billion contracts in 2006 followed by Euro-Dollar Futures of CME. The TIIE 28 Futures MexDer which had witnessed a huge decline of 51.55% in 2005 skipped up its position to number 5 in 2006 witnessing the highest percentage increase of 164.61%. 10-Year T-Note Futures, CBOT and 5 Year T-Note Futures, CBOT stepped down by 3 ranks from their 04th and 11th position respectively.

NSE, too, has been making huge strides by moving upwards in the global ranking. NSE ranked first (1st) in the single stock future category (Table 1.4)

in the year 2006. NSE was ranked 15th in the global futures and options volume in 2006 (Table 1.5). In the top 40 Futures Exchanges of the World, NSE stands at the 8th position in 2006 (Table 1.6).

Table 1.3

Top 20 Contracts for the year 2006

(in millions - net of individual equities)

		Volume			
Rank	Contract	2006	2005	Change	% Change
1	Kospi 200 Options, Korea Exchange	2,414.42	2,535.20	(120.78)	(4.76)
2	Eurodollar Futures, CME	502.08	410.36	91.72	22.35
3	Euro-Bund Futures, Eurex	319.89	299.29	20.60	6.88
4	Eurodollar Options, CME	268.96	188.00	80.96	43.06
5	TIIE 28-Day Interbank Rate Futures, Mexder	264.16	99.83	164.33	164.61
6	E-mini S&P 500 Index Futures, CME	257.96	207.10	50.86	24.56
7	10-Year T-Note Futures, CBOT	255.57	215.12	40.45	18.80
8	DJ Euro Stoxx 50 Futures, Eurex	213.51	139.98	73.53	52.53
9	Euribor Futures, Euronext. Life	202.09	166.68	35.41	21.24
10	Euro-Bobl Futures, Eurex	167.31	158.26	9.05	5.72
11	Euro-Schatz Futures, Eurex	165.32	141.23	24.09	17.06
12	1-Day Interbank Deposit Futures, BM&F	161.65	121.25	40.40	33.32
13	DJ Euro Stoxx 50 Options, Eurex	150.05	90.81	59.24	65.24
14	5 Year T-Note Futures, CBOT	124.87	121.91	2.96	2.43

15	S&P 500 Index Options, CBOE	104.31	71.80	32.51	45.28
16	Taifex Options, Taifex	96.93	80.10	16.83	21.01
17	30-Year T-Bond Futures, CBOT	93.75	86.93	6.82	7.85
18	Sterling Futures, Euronext.liffe	83.00	68.03	14.97	22.00
19	E-mini Nasdaq 100 Futures, CME	79.94	72.45	7.49	10.34
20	TA-25 Index Options, TASE	75.49	63.10	12.39	19.64

Source: FI Futures Industry, March/April 2007. The monthly magazine of the FIA.

Table 1.4

Futures on Individual Equities (Stock Futures)

(Number of Contracts)

Exchange	2005	2006	% Change
National Stock Exchange of India	68,911,754	100,285,737	45.53
JSE South Africa	24,469,988	69,671,751	184.72
Eurex *	77,802	35,589,089	---
Euronext.LIFFE	12,158,093	29,515,726	142.77
MEFF	18,813,689	21,229,811	12.84

**Single stock futures were introduced for trading in October 2005 at Eurex*
Source: WFE 2006 Annual Report and Statistics.

Table 1.5

Global Futures and Options Volume

Rank		Exchange	Volume (No. of Contracts)	
2006	2005		2006	2005
1	1	Korea Exchange	2,474,593,261	2,593,088,445
2	2	Eurex	1,526,751,902	1,248,748,152
3	3	Chicago Mercantile Exchange	1,403,264,034	1,090,351,711
4	5	Chicago Board of Trade	805,884,413	674,651,393
5	4	Euronext.liffe	730,303,126	757,926,860
6	6	Chicago Board of Options Exchange	674,735,348	468,249,301
7	7	International Securities Exchange	591,961,518	448,695,669
8	8	Sao Paul Stock Exchange (Bovespa)	287,518,574	268,620,460
9	11	Bolsa de Mercadorias & Futuros	283,570,241	199,446,464
10	9	New York Mercantile Exchange	276,152,326	204,610,365
11	15	Mexican Derivatives Exchange	275,217,670	108,177,276
12	12	Philadelphia Stock Exchange	273,093,003	162,618,812
13	10	American Stock Exchange	197,045,745	201,763,980
14	13	NYSE Arca Pacific Exchange	196,586,356	144,780,498
15	14	National Stock Exchange of India	194,488,403	131,651,692
16	16	OMX Exchanges	123,167,736	103,509,936
17	17	Dalian Commodity Exchange	117,681,038	99,174,714
18	18	Taiwan Futures Exchange	114,603,379	92,659,768

19	24	JSE Securities Exchange South Africa	105,047,524	51,318,175
20	20	Boston Options Exchange	94,390,602	78,202,185
21	26	ICE Futures (Formerly IPE)	92,721,050	42,055,085
22	19	London Metal Exchange	86,940,189	78,628,852
23	21	Tel-Aviv Stock Exchange	83,047,982	70,088,945
24	22	Sydney Futures Exchange	78,120,106	63,324,966
25	23	The Tokyo Commodity Exchange	63,686,701	61,814,289
26	25	Osaka Securities Exchange	60,387,375	44,172,264
27	29	Shanghai Futures Exchange	58,106,001	33,789,754
28	*	National Commodity & Derivatives Exchange (India) NCDE	53,278,108	51,547,081
29	27	MEFF (Spain)	46,973,668	40,217,657
30	31	Zhengzhou Commodity Exchange	46,298,117	28,472,570
31	*	Multi Commodity Exchange of India	45,634,210	20,490,881
32	28	New York Board of Trade	44,667,169	37,945,585
33	35	Hong Kong Exchanges & Clearing	42,905,915	25,523,007
34	30	Montreal Exchange	40,540,837	28,685,391
35	32	Singapore Exchange	36,597,743	26,026,128
36	40	Tokyo Financial Exchange	35,485,461	11,098,338
37	33	Italian Derivatives Market	31,606,263	25,870,521
38	36	Tokyo Stock Exchange	29,227,556	24,349,760
39	37	Australian Stock Exchange	22,452,328	23,587,690
40	34	Tokyo Grain Exchange	19,133,509	25,600,339
41	39	Mercado a Termino de	18,212,072	13,415,449

		Roasario		
42	41	Budapest Stock Exchange	14,682,929	8,973,631
43	42	Oslo Stock Exchange	13,156,960	6,200,067
44	38	Central Japan Commodity Exchange	9,019,416	21,949,566
45	44	One Chicago	7,922,465	5,528,046
46	*	Turkish Derivatives Exchange	6,848,087	1,832,871
47	43	Warsaw Stock Exchange	6,714,205	5,587,515
48	45	Kansas City Board of Trade	5,287,190	3,953,536
49	46	Malaysia Derivatives Exchange Berhad	4,161,024	2,459,745
50	48	Winnipeg Commodity Exchange	2,896,536	2,076,630
51	52	New Zealand Futures Exchange	1,826,027	986,073
52	50	Minneapolis Grain Exchange	1,655,034	1,422,386
53	51	Veinna stock Exchange	1,311,543	1,045,306
54	49	Osaka Mercantile Exchange	616,272	1,602,257
55	57	CBOE Futures Exchange	478,424	177,632
56	53	Kansai Commodities Exchange	318,483	1,828,750
57	58	Mercado a Termino de Buenos Aires	147,145	135,736
58	47	US Futures Exchange (Eurex US)	135,803	2,200,384

Source: FI Futures Industry, March/April 2007. The monthly magazine of the FIA.
Includes Stockholm, Helsinki and Copenhagen markets.
*** New additions in 2006*

Table 1.6

Top 40 Futures Exchanges (Volume figures do not include options on futures)

(Volume in Number of Contracts)

Rank		Exchange	Volume		% Change
2006	2005		2006	2005	
1	1	Chicago Mercantile Exchange	1,101,712,533	883,118,526	24.75
2	2	Eurex	960,631,763	784,896,954	22.39
3	3	Chicago Board of Trade	678,262,052	561,145,938	20.87
4	4	Euronext LIFFE	430,037,682	343,829,658	25.07
5	8	Mexican Derivatives Exchange	274,651,676	107,989,126	154.33
6	5	Brazillian Mercantile and Futures Exchange	258,466,105	187,850,634	37.59
7	6	New York Mercantile Exchange	216,252,995	166,607,470	29.80
8	7	National Stock Exchange of India	170,571,964	116,286,968	46.68
9	9	Dalian Commodity Exchange (China)	117,681,038	99,174,714	18.66
10	14	ICE Futures (U.K)	92,582,921	41,936,609	120.77
11	15	JSE Securities Exchange South Africa	87,036,273	36,456,767	138.74
12	10	London Metal Exchange	78,527,839	70,444,665	11.47
13	12	Sydney Futures Exchange	74,204,335	60,091,807	23.48
14	11	The Tokyo Commodity Exchange	63,672,011	61,780,446	3.06

15	13	Korea Exchange	60,169,114	57,883,098	3.95
16	17	Shanghai Futures Exchange	58,106,001	33,789,754	71.96
17	**	National Commodity & Derivatives Exchange (India)	53,278,108	51,547,081	3.36
18	19	Zhengzhou Commodity Exchange (China)	46,298,117	28,472,570	62.61
19	**	Multi Commodity Exchange of India	45,634,210	20,490,881	122.70
20	16	OMX Group *	45,039,885	34,142,225	31.92
21	20	Singapore Exchanges	36,201,370	25,867,661	39.95
22	18	New York Board of Trade	32,746,692	29,013,416	12.87
23	29	Tokyo Financial Exchange	31,508,764	11,057,134	184.96
24	26	Osaka Securities Exchange	31,170,354	18,070,352	72.49
25	22	MEFF (Spain)	29,037,068	24,894,965	16.64
26	25	Montreal Exchange	27,578,059	18,240,633	51.19
27	23	Tokyo Stock Exchange	26,957,702	22,630,719	19.12
28	27	Hong Kong Exchanges & Clearing	19,863,299	13,433,386	47.87
29	21	Tokyo Grain Exchange	19,106,247	25,573,238	-25.29
30	28	Mercado a Termino de Rosario (Argentina)	18,053,184	13,051,248	38.33
31	31	Taiwan Futures Exchange	14,006,287	10,107,749	38.57
32	32	Budapest Stock Exchange	13,656,165	8,913,470	53.21

33	30	Italian Derivatives Market	12,729,596	10,832,975	17.51
34	24	Central Japan Commodity Exchange	9,019,416	21,949,566	-58.91
35	33	One Chicago	7,922,465	5,528,046	43.31
36	**	Turkish Derivatives Exchange	6,848,087	1,832,871	273.63
37	34	Warsaw Stock Exchange	6,386,377	5,378,517	18.74
38	37	Oslo Stock Exchange	6,044,271	2,359,161	156.20
39	35	Kansas City Board of Trade	4,771,711	3,690,025	29.31
40	36	Malaysia Derivatives Exchange	4,161,024	2,459,745	69.16

Source: FI Futures Industry, March/April 2007. The monthly magazine of the FIA.
Includes Stockholm, Helsinki and Copenhagen markets.
** New additions in 2006

1.8 DERIVATIVES MARKET IN INDIA

1.8.1 Approval for derivatives trading

The first step towards introduction of derivatives trading in India was the promulgation of the Securities Laws (Amendment) Ordinance, 1995, which withdrew the prohibition on options in securities. The market for derivatives, however, did not take off, as there was no regulatory framework to govern trading of derivatives. SEBI set up a 24–member committee under the Chairmanship of Dr. L. C. Gupta on November 18, 1996 to develop appropriate regulatory framework for derivatives trading in India. The committee submitted its report on March 17, 1998 prescribing necessary pre–conditions for introduction of derivatives trading in India. The committee

recommended that derivatives should be declared as 'securities' so that regulatory framework applicable to trading of 'securities' could also govern trading of securities. SEBI also set up a group in June 1998 under the Chairmanship of Prof. J. R. Varma, to recommend measures for risk containment in derivatives market in India. The report, which was submitted in October 1998, worked out the operational details of margining system, methodology for charging initial margins, broker net worth, deposit requirement and real–time monitoring requirements. The SCRA was amended in December 1999 to include derivatives within the ambit of 'securities' and the regulatory framework was developed for governing derivatives trading. The act also made it clear that derivatives shall be legal and valid only if such contracts are traded on a recognized stock exchange, thus precluding OTC derivatives. The government also rescinded in March 2000, the three–decade old notification, which prohibited forward trading in securities. Derivatives trading commenced in India in June 2000 after SEBI granted the final approval to this effect in May 2000. SEBI permitted the derivative segments of two stock exchanges, NSE and BSE, and their clearing house/corporation to commence trading and settlement in approved derivatives contracts. To begin with, SEBI approved trading in index futures contracts based on S&P CNX Nifty and BSE–30 (Sensex) index. This was followed by approval for trading in options based on these two indexes and options on individual securities. The trading in index options commenced in June 2001 and the trading in options on individual securities commenced in July 2001. Futures contracts on

individual stocks were launched in November 2001. Trading and settlement in derivative contracts is done in accordance with the rules, byelaws, and regulations of the respective exchanges and their clearing house/corporation duly approved by SEBI and notified in the official gazette.

1.8.2 Derivatives market at NSE

The derivatives trading on the exchange commenced with S&P CNX Nifty Index futures on June 12, 2000. The trading in index options commenced on June 4, 2001 and trading in options on individual securities commenced on July 2, 2001. Single stock futures were launched on November 9, 2001. The index futures and options contract on NSE are based on S&P CNX Nifty Index. Currently, the futures contracts have a maximum of 3-month expiration cycles. Three contracts are available for trading, with 1 month, 2 months and 3 months expiry. A new contract is introduced on the next trading day following the expiry of the near month contract.

1.8.3 Trading mechanism

The futures and options trading system of NSE, called NEAT-F&O trading system, provides a fully automated screen–based trading for Nifty futures & options and stock futures & options on a nationwide basis and an online monitoring and surveillance mechanism. It supports an anonymous order driven market which provides complete transparency of trading operations and operates on strict price–time priority. It is similar to that of trading of equities in the Cash Market (CM) segment. The NEAT-F&O trading system is accessed by two types of users. The Trading Members(TM) have access to

functions such as order entry, order matching, order and trade management. It provides tremendous flexibility to users in terms of kinds of orders that can be placed on the system. Various conditions like Good-till-Day, Good-till-Cancelled, Good-till-Date, Immediate or Cancel, Limit/Market price, Stop loss, etc. can be built into an order. The Clearing Members (CM) use the trader workstation for the purpose of monitoring the trading member(s) for whom they clear the trades. Additionally, they can enter and set limits to positions, which a trading member can take.

1.8.4 Membership criteria

NSE admits members on its derivatives segment in accordance with the rules and regulations of the exchange and the norms specified by SEBI. NSE follows 2–tier membership structure stipulated by SEBI to enable wider participation. Those interested in taking membership on F&O segment are required to take membership of CM and F&O segment or CM, WDM and F&O segment. Trading and clearing members are admitted separately. Essentially, a clearing member (CM) does clearing for all his trading members (TMs), undertakes risk management and performs actual settlement. There are three types of CMs:

Self Clearing Member: A SCM clears and settles trades executed by him only either on his own account or on account of his clients.

Trading Member Clearing Member: TM–CM is a CM who is also a TM. TM–CM may clear and settle his own proprietary trades and client's trades as well as clear and settle for other TMs.

Professional Clearing Member PCM is a CM who is not a TM. Typically, banks or custodians could become a PCM and clear and settle for TMs.

Table 1.7

Business growth of futures and options market

Month/Year	NSE			BSE			
	No. of Contracts Traded	Turnover(Rs. mn.)	Turnover (US $ Million)	No. of Contracts Traded	Turnover (Rs.mn.)	Turnover (US $ Million)	No. of Contracts Traded
2003-04	56,886,776	21,306,492	491,046	382,258	116,198	2,678	57,269,03
2004-05	77,017,185	25,470,526	582,183	531,719	170,743	3,903	77,548,90
2005-06	157,619,271	48,242,504	1,081,428	203	88	2	157,619,4
2006-07	216,883,573	73,562,714	1,687,605	1,781,670	590,070	13,537	218,665,2

Source : NSE & SEBI

1.8.5 Turnover

The trading volume on NSE's derivatives market has seen a steady increase since the launch of the first derivatives contract, i.e. index futures in June 2000. Table 1.7 gives the value of contracts traded on the NSE and BSE from 2003-04 to 2006-07. The average daily turnover at NSE now exceeds a 40,000 crore. A total of 41,96,873 contracts with a total turnover of Rs.1,01,926 crore was traded during 2001-2002. Although trading activity and turnover in the futures and options segment has grown substantially in the recent past, it is still considered as a growing market and not a fully mature market. The breadth (in terms of number of contracts available for trading in the market) and the depth (in terms of the turnover in individual contracts) have still not reached such proportions so as to call the markets mature. This is because almost 70% of the contracts available for trade in the Futures and options market are not liquid.

The detailed contract specifications followed by the National Stock Exchange is given in Table 1.8.

Table 1.8

Contract specification of Futures and Options contract on NSE

Parameter	Index Futures	Index Options	Futures on Individual Securities	Options on Individual Securities	Mini Index Futures	Mini Index Options	Long Term Index Options
Underlying	6 Indices	6 Indices	267 securities	267 securities	S&P CNX Nifty	S&P CNX Nifty	S&P CNX Nifty
Security Descriptor:							
Instrument	FUTIDX	OPTIDX	FUTSTK	OPTSTK	FUTIDX	OPTIDX	OPTIDX
Underlying Symbol	Symbol of Underlying Index	Symbol of Underlying Index	Symbol of Underlying Security	Symbol of Underlying Security	MINIFTY	MINIFTY	NIFTY
Expiry Date	DD-MMM-YYYY	DD-MMM-YYYY	DD-MMM-YYYY	DD-MMM-YYYY	DD-MMM-YYYY	DD-MMM-YYYY	DD-MMM-YYYY
Option Type	-	CE / PE	-	CA / PA	-	CE / PE	CE / PE
Strike Price	-	Strike Price	-	Strike Price	-	Strike Price	Strike Price
Trading Cycle	3 month trading cycle - the near month (one), the next month (two) and the far month (three)						Three quarterly expiries (March, June, Sept & Dec cycle) and next 5 half yearly expiries (Jun, Dec cycle)
Expiry Day	Last Thursday of the expiry month. If the last Thursday is a trading holiday, then the expiry day is the previous trading day.						
Strike Price Intervals	-	Depending on underlying price	-	Depending on underlying price	-	Depending on underlying price	Depending on underlying price
Permitted Lot Size	Underlying specific	Underlying specific	Underlying specific	Underlying specific	20	20	Underlying specific
Price Steps	Rs.0.05	Rs.0.05	Rs.0.05	Rs.0.05	Rs.0.05	Rs.0.05	Rs.0.05
Price Bands	Operating range of 10% of the base price	Upper Operating Range +99% of base price or Rs.20, whichever is higher; Lower Operating Range Rs. 0.05	Operating range of 20% of the base price	Upper Operating Range +99% of base price or Rs.20, whichever is higher; Lower Operating Range Rs. 0.05	Operating range of 10% of the base price	Upper Operating Range +99% of base price or Rs.20, whichever is higher; Lower Operating Range Rs. 0.05	Upper Operating Range +99% of base price or Rs.20, whichever is higher; Lower Operating Range Rs. 0.05

Source: nseindia.com

1.8.6 Clearing and settlement

NSCCL undertakes clearing and settlement of all deals executed on the NSEs F&O segment. It acts as legal counterparty to all deals on the F&O segment and guarantees settlement.

All futures and options contracts are cash settled, i.e. through exchange of cash. The underlying for index futures/options of the Nifty index cannot be delivered. These contracts, therefore, have to be settled in cash. Futures and options on individual securities can be delivered as in the spot market. However, it has been currently mandated that stock options and futures would also be cash settled. The settlement amount for a CM is netted across all their TMs/clients in respect of MTM, premium and final exercise settlement. For the purpose of settlement, all CMs are required to open a separate bank account with NSCCL designated clearing banks for F&O segment.

1.8.7 Risk management system

The salient features of risk containment measures on the F&O segment are:

Anybody interested in taking membership of F&O segment is required to take membership of "CM and F&O" or "CM, WDM and F&O". An existing member of CM segment can also take membership of F&O segment. The details of the eligibility criteria for membership of F&O segment are given in the chapter on regulations in this book.

NSCCL charges an upfront initial margin for all the open positions of a CM up to client level. It follows the VaR based margining system through

SPAN system. NSCCL computes the initial margin percentage for each Nifty index futures contract on a daily basis and informs the CMs. The CM in turn collects the initial margin from the TMs and their respective clients. NSCCL's on-line position monitoring system monitors a CM's open positions on a real-time basis. Limits are set for each CM based on his base capital and additional capital deposited with NSCCL. The on-line position monitoring system generates alerts whenever a CM reaches a position limit set up by NSCCL. NSCCL monitors the CMs and TMs for mark to market value violation and for contract-wise position limit violation.

CMs are provided with a trading terminal for the purpose of monitoring the open positions of all the TMs clearing and settling through them. A CM may set exposure limits for a TM clearing and settling through him. NSCCL assists the CM to monitor the intra-day exposure limits set up by a CM and whenever a TM exceeds the limits, it withdraws the trading facility provided to such TM.

A separate Settlement Guarantee Fund for this segment has been created out of the capital deposited by the members with NSCCL.

1.9 FUTURES AND OPTIONS MARKETS

In recent years, derivatives have become increasingly important in the field of finance. While futures and options are now actively traded on many exchanges, forward contracts are popular on the OTC market. Here these derivative contracts are explained in detail.

1.9.1 Forward contracts

A forward contract is an agreement to buy or sell an asset on a specified date for a specified price. One of the parties to the contract assumes a long position and agrees to buy the underlying asset on a certain specified future date for a certain specified price. The other party assumes a short position and agrees to sell the asset on the same date for the same price. Other contract details like delivery date, price and quantity are negotiated bilaterally by the parties to the contract. The forward contracts are normally traded outside the exchanges.

The salient 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.
- On the expiration date, the contract has to be settled by delivery of the asset.

If the party wishes to reverse the contract, it has to compulsorily go to the same counterparty, which often results in high prices being charged.

However forward contracts in certain markets have become very standardized, as in the case of foreign exchange, thereby reducing transaction costs and increasing transactions volume. This process of standardization reaches its limit in the organized futures market. Forward contracts are very useful in hedging and speculation. The classic hedging

application would be that of an exporter who expects to receive payment in dollars three months later. He is exposed to the risk of exchange rate fluctuations. By using the currency forward market to sell dollars forward, he can lock on to a rate today and reduce his uncertainty. Similarly an importer who is required to make a payment in dollars two months hence can reduce his exposure to exchange rate fluctuations by buying dollars forward.

If a speculator has information or analysis, which forecasts an upturn in a price, then he can go long on the forward market instead of the cash market. The speculator would go long on the forward, wait for the price to rise, and then take a reversing transaction to book profits. Speculators may well be required to deposit a margin upfront. However, this is generally a relatively small proportion of the value of the assets underlying the forward contract. The use of forward markets here supplies leverage to the speculator.

1.9.2 Limitations of forward markets

Forward markets world-wide are afflicted by several problems:

Lack of centralization of trading,

Illiquidity, and

Counterparty risk

In the first two of these, the basic problem is that of too much flexibility and generality. The forward market is like a real estate market in that any two consenting adults can form contracts against each other. This often makes them design terms of the deal which are very convenient in that

specific situation, but makes the contracts non-tradable. Counterparty risk arises from the possibility of default by any one party to the transaction. When one of the two sides to the transaction declares bankruptcy, the other suffers. Even when forward markets trade standardized contracts, and hence avoid the problem of illiquidity, still the counterparty risk remains a very serious issue.

1.9.3 Introduction to futures

Futures markets were designed to solve the problems that exist in forward markets. A futures contract is an agreement between two parties to buy or sell an asset at a certain time in the future at a certain price. But unlike forward contracts, the futures contracts are standardized and exchange traded. To facilitate liquidity in the futures contracts, the exchange specifies certain standard features of the contract. It is a standardized contract with standard underlying instrument, a standard quantity and quality of the underlying instrument that can be delivered, (or which can be used for reference purposes in settlement) and a standard timing of such settlement. A futures contract may be offset prior to maturity by entering into an equal and opposite transaction. More than 99% of futures transactions are offset this way.

The standardized items in a futures contract are:

Quantity of the underlying

Quality of the underlying

The date and the month of delivery

The units of price quotation and minimum price change

Location of settlement

1.9.4 Distinction between futures and forwards contracts

Forward contracts are often confused with futures contracts. The confusion is primarily because both serve essentially the same economic functions of allocating risk in the presence of future price uncertainty. However futures are a significant improvement over the forward contracts as they eliminate counterparty risk and offer more liquidity. Table 1.9 lists the distinction between the two.

Table 1.9

Distinction between futures and forwards

Futures	Forwards
Trade on an organized exchange	OTC in nature
Standardized contract terms	Customised contract terms
hence more liquid	hence less liquid
Requires margin payments	No margin payment
Follows daily settlement	Settlement happens at end of period

1.9.5 Futures terminology

Spot price: The price at which an asset trades in the spot market.

Futures price: The price at which the futures contract trades in the futures market.

Contract cycle: The period over which a contract trades. The index futures contracts on the NSE have one-month, two-months and three-months expiry cycles which expire on the last Thursday of the month. Thus a January expiration contract expires on the last Thursday of January and a February expiration contract ceases trading on the last Thursday of February. On the Friday following the last Thursday, a new contract having a three-month expiry is introduced for trading.

Expiry date: It is the date specified in the futures contract. This is the last day on which the contract will be traded, at the end of which it will cease to exist.

Contract size: The amount of asset that has to be delivered under one contract. For instance, the contract size on NSE's futures market is 50 Nifties.

Basis: In the context of financial futures, basis can be defined as the futures price minus the spot price. There will be a different basis for each delivery month for each contract. In a normal market, basis will be positive. This reflects that futures prices normally exceed spot prices.

Cost of carry: The relationship between futures prices and spot prices can be summarized in terms of what is known as the cost of carry. This

measures the storage cost plus the interest that is paid to finance the asset less the income earned on the asset.

Initial margin: The amount that must be deposited in the margin account at the time a futures contract is first entered into is known as initial margin.

Marking-to-market: In the futures market, at the end of each trading day, the margin account is adjusted to reflect the investor's gain or loss depending upon the futures closing price. This is called marking–to–market.

Maintenance margin: This is somewhat lower than the initial margin. This is set to ensure that the balance in the margin account never becomes negative. If the balance in the margin account falls below the maintenance margin, the investor receives a margin call and is expected to top up the margin account to the initial margin level before trading commences on the next day.

1.9.6 Introduction to options

The next derivative product traded on the NSE, namely options. Options are fundamentally different from forward and futures contracts. An option gives the holder of the option the right to do something. The holder does not have to exercise this right. In contrast, in a forward or futures contract, the two parties have committed themselves to doing something. Whereas it costs nothing (except margin requirements) to enter into a futures contract, the purchase of an option requires an up–front payment.

1.9.7 Option terminology

Index options: These options have the index as the underlying. Some options are European while others are American. Like index futures contracts, index options contracts are also cash settled

Stock options: Stock options are options on individual stocks. Options currently trade on 267 stocks in the National Stock Exchange. A contract gives the holder the right to buy or sell shares at the specified price.

Buyer of an option: The buyer of an option is the one who by paying the option premium buys the right but not the obligation to exercise his option on the seller/writer.

Writer of an option: The writer of a call/put option is the one who receives the option premium and is thereby obliged to sell/buy the asset if the buyer exercises on him.

There are two basic types of options, call options and put options.

Call option: A call option gives the holder the right but not the obligation to buy an asset by a certain date for a certain price.

Put option: A put option gives the holder the right but not the obligation to sell an asset by a certain date for a certain price.

Option price: Option price is the price which the option buyer pays to the option seller. It is also referred to as the option premium.

Expiration date: The date specified in the options contract is known as the expiration date, the exercise date, the strike date or the maturity.

Strike price: The price specified in the options contract is known as the strike price or the exercise price.

American options: American options are options that can be exercised at any time up to the expiration date. Most exchange-traded options are American. In India all Single stock options are American Options.

European options: European options are options that can be exercised only on the expiration date itself. European options are easier to analyze than American options, and properties of an American option are frequently deduced from those of its European counterpart. In India all the index options are European options.

In-the-money option: An in-the-money (ITM) option is an option that would lead to a positive cash flow to the holder if it were exercised immediately. A call option on the index is said to be in-the-money when the current index stands at a level higher than the strike price (i.e. spot price > strike price). If the index is much higher than the strike price, the call is said to be deep ITM. In the case of a put, the put is ITM if the index is below the strike price.

At-the-money option: An at-the-money (ATM) option is an option that would lead to zero cash flow if it were exercised immediately. An option on the index is at-the-money when the current index equals the strike price (i.e. spot price = strike price).

Out-of-the-money option: An out-of-the-money (OTM) option is an option that would lead to a negative cash flow if it were exercised immediately. A call option on the index is out-of-the-money when the current index stands at a level which is less than the strike price (i.e. spot price < strike price). If the index is much lower than the strike price, the call is said to be deep

OTM. In the case of a put, the put is OTM if the index is above the strike price.

Intrinsic value of an option: The option premium can be broken down into two components – intrinsic value and time value. The intrinsic value of a call is the amount the option is ITM, if it is ITM. If the call is OTM, its intrinsic value is zero. Putting it another way, the intrinsic value of a call is Max $[0,(S_t-K)]$, which means the intrinsic value of a call is the greater of 0 or $(S_t - K)$. Similarly, the intrinsic value of a put is Max$[0, (K-S_t)]$, i.e. the greater of 0 or $(K-S_t)$. K is the strike price and S_t is the spot price.

Time value of an option: The time value of an option is the difference between its premium and its intrinsic value. Both calls and puts have time value. An option that is OTM or ATM has only time value. Usually, the maximum time value exists when the option is ATM. The longer the time to expiration, the greater is an option's time value, all else equal. At expiration, an option should have no time value.

An interesting question to ask at this stage is - when would one use options instead of futures? Options are different from futures in several interesting senses. At a practical level, the option buyer faces an interesting situation. He pays for the option in full at the time it is purchased. After this, he only has an upside. There is no possibility of the options position generating any further losses to him (other than the funds already paid for the option). This is different from futures, which is free to enter into, but can generate very large losses. This characteristic makes options attractive to many

occasional market participants, who cannot put in the time to closely monitor their futures positions.

Buying put options is similar to buying insurance. To buy a put option on Nifty is to buy insurance which reimburses the full extent to which Nifty drops below the strike price of the put option. This is attractive to many people, and to mutual funds creating "guaranteed return products".

Table 1.10

Distinction between futures and options

Futures	Options
Exchange traded, with novation	Same as futures.
Exchange defines the product	Same as futures.
Price is zero, strike price moves	Strike price is fixed, price moves.
Price is zero	Price is always positive.
Linear payoff	Nonlinear payoff.
Both long and short at risk	Only short at risk.

The Nifty index fund industry finds it very useful to make a bundle of a Nifty index fund and a Nifty put option to create a new kind of a Nifty index fund, which gives the investor protection against extreme drops in Nifty. Selling put options is selling insurance, so anyone who feels like earning revenues by selling insurance can set himself up to do so on the index options market. More generally, options offer "nonlinear payoffs" whereas futures only have "linear payoffs". By combining futures and

options, a wide variety of innovative and useful payoff structures can be created.

1.9.8 Index derivatives

Index derivatives are derivative contracts which derive their value from an underlying index. The two most popular index derivatives are index futures and index options. Index derivatives have become very popular worldwide. In his report, Dr. L. C. Gupta attributes the popularity of index derivatives to the advantages they offer.

Institutional and large equity-holders need portfolio-hedging facility. Index–derivatives are more suited to them and more cost–effective than derivatives based on individual stocks. Pension funds in the US are known to use stock index futures for risk hedging purposes. Index derivatives offer ease of use for hedging any portfolio irrespective of its composition. Stock index is difficult to manipulate as compared to individual stock prices, more so in India, and the possibility of cornering is reduced. This is partly because an individual stock has a limited supply, which can be cornered. Stock index, being an average, is much less volatile than individual stock prices. This implies much lower capital adequacy and margin requirements. Index derivatives are cash settled, and hence do not suffer from settlement delays and problems related to bad delivery, forged/fake certificates.

The L. C. Gupta committee suggested a phased introduction of derivative products in the following order:

1.9.8.1 Index futures

1.9.8.2 Index options

1.9.8.3 Options on individual stocks

1.9.9 Requirements for an index derivatives market, as suggested by the Committee were:

Index: The choice of an index is an important factor in determining the extent to which the index derivative can be used for hedging, speculation and arbitrage. A well diversified, liquid index ensures that hedgers and speculators will not be vulnerable to individual or industry risk. This led to the construction of Nifty and introduction of Nifty based derivatives.

Clearing corporation settlement guarantee: The clearing corporation eliminates counterparty risk on futures markets. The clearing corporation interposes itself into every transaction, buying from the seller and selling to the buyer. This insulates a participant from credit risk of another. This led to the establishment of National Securities Clearing Corporation Limited which interposes itself into every transaction and becomes the counterparty for all derivatives transactions.

Strong surveillance mechanism: Derivatives trading brings a whole class of leveraged positions in the economy. Hence, the need to have strong surveillance on the market both at the exchange level as well as at the regulator level. This led to the setting up of SPAN based surveillance mechanism on the exchanges.

Education and certification: The need for education and certification in the derivatives market can never be overemphasized. A critical element of financial sector reforms is the development of a pool of human resources with strong skills and expertise to provide quality intermediation to market participants. This recommendation led to the setting up of the National Certification for Financial Markets and its certification modules.

With the entire above infrastructure in place, trading of index futures and index options commenced at NSE in June 2000 and June 2001 respectively.

1.10 MEANINGS OF TERMS USED

Arbitrage: The simultaneous purchase of one asset against the sale of the same or equivalent asset in two different markets to create a riskless profit due to price discrepancies.

Beta: A measure of responsiveness of a security or portfolio to movements in the stock market as a whole. It measures systematic risk.

Broker: A person who acts as an agent for others in buying and selling futures contracts in return for a commission.

Carrying charges: The total cost of carrying an asset forwards in time, including storage, insurance and financing costs.

Clearing house: An organisation connected with futures exchange through which all contracts are reconciled, settled, guaranteed and later either offset or fulfilled through delivery or cash settlement. Its function is to manage the margin and delivery systems, as well as to guarantee performance of exchange traded contracts.

Close: The time period at the end of the trading session during which that day's settlement price is determined.

Contract: The standard unit of trading for futures markets.

Contract specification: The standard terms of the futures contract to be traded. e.g. size of the contract, tick size, settlement and margining methodology, trading times, delivery procedures.

Cost of carry: The cost of holding a stock of the underlying e g the costs of storing, insuring and financing the asset.

Counterparty: The other party (buyer or seller) to a transaction.

Delivery: The transfer of ownership of an actual financial instrument, or final cash payment in lieu thereof, in settlement of a futures contract under the specific terms and procedures established by the exchange.

Expiration: The date that any futures contract (or option) ceases to exist

Far contract: The future that is furthest from its delivery month i. e. has the longest maturity. (In this text it is the three month contract)

Futures contract: A legal, transferable standardized contract that represents an agreement to buy or sell a quantity of a standardized asset at a predetermined delivery date. This is an exchange traded product.

Hedging: The purchase or sale of futures contracts to offset possible changes in the value of assets or cost of liabilities currently held, or expected to be held at some future date.

Index option: An option written on a stock index.

Initial Margin: The 'good faith' deposit of the cash or securities which a user of futures market must make with his or her broker when purchasing or selling futures contracts, as a guarantee of contract fulfilment

Margin: A deposit of funds to provide collateral for an investment position.

Market capitalization: This is calculated by multiplying the number of a company's shares issued by the share price

Marking to the market: The daily revaluation of open positions to reflect profits and losses based on closing prices at the end of the trading day.

Mutual fund: This is a type investment company that sells its shares (called units) to the public and uses the proceeds to invest in other companies.

Near contract: The future that is nearest to its delivery month i.e. has the shortest maturity. (In this text it is the one-month contract)

Open interest: The cumulative number of either long or short contracts which have been initiated on an exchange, and have not been offset.

Open positions: Contracts which have been initiated and are not yet offset by a subsequent sale of purchase, or by making or taking delivery.

Over-the-counter(OTC) market: A market where dealing does not take place at an organized exchange.

Physical delivery: Settlement of a futures contract by the supply or receipt of the asset underlying the contract.

Roll over: Liquidation for a futures position, and the establishment of a similar position in a more distant delivery month. This is also called a

switch. When a hedger switches their futures position to a more distant delivery month this can be called 'rolling the hedge forwards'.

SEBI Securities and Exchange Board of India: The regulatory body for all participants in the securities and derivatives markets in India.

SEC: Securities and Exchange Commission. A federal agency charged with the regulation of all US equity and options markets

Settlement: The process by which clearing members close positions.

Settlement price: The price which the clearing house uses to determine the daily variation margin payments. It may differ from the price of the last transaction

Spot price: A derivation of 'on the spot' usually referring to the cash market price of a financial instrument available for immediate delivery.

VaR: Value at Risk. A risk management methodology, which attempts to measure the maximum loss possible on a particular position, with a specified level of certainty or confidence.

Volatility: A market is volatile when it is prices fluctuate a lot. Academics often choose to measure the volatility of a variable by its variance.

Volume: The number of transactions in a futures contract during a specified period of time.

Zero-sum game: This is when the gains (losses) of the long positions are exactly equal to the losses (gains) of the short positions. This is true for the market as a whole for all futures products.

CHAPTER 2

RESEARCH METHODOLOGY

This chapter describes the methodology adopted in conducting the study. The chapter also lists out the literature reviewed during the research process and presents a summary of the literature reviewed. The need and relevance of the study is elaborated, the objectives of the study are established, hypotheses are drawn and the methodology adopted to test the hypotheses is explained along with the scope and limitations of the study.

2 RESEARCH METHODOLOGY

2.1 LITERATURE REVIEW

Sharon Jose (2005): This article explains in detail, the complete theoretical framework of index futures. It also discusses the growth and trends in the index futures market. The complexities involved in the trading mechanism of such products are also discussed at length. In essence, the article captures the pros and cons involved in index futures and their application.

G. P. Samanta and Kaushik Bhattacharya suggest that, Empirical evidence for the developed economies suggests that the information on the spread between E/P ratio at the stock market and a measure of interest rate is sometimes useful in predicting stock market movements. In case of emerging markets like India, the issue has, however, not received adequate attention. Their paper employs several statistical and econometric tools (viz., correlation analysis, regression analysis, Granger's causality test and measures of out-of-sample forecast performance) for rigorously assessing the usefulness of spread in explaining stock market return in India. They also attempt to examine the possibility of formulating profitable business/trading strategy using spread for varying degrees of transaction cost. Empirical results reveal that though spread seems to have reasonably strong causal influence on return and the causal model helps achieving forecasts slightly better than the random walk model, the usefulness of spread in formulating a profitable business strategy is not clear. The paper finds that the performances of different strategies vis-à-vis a simple buy-

and-hold strategy would crucially depend on several factors like the choice of interest rate, choice of trading period and choice of threshold for determining extreme values of spread. The paper also reveals that the profitability of a spread based trading strategy would crucially depend on the extent of transaction cost. In this context, however, it is interesting to note that a spread based strategy in many occasions yielded higher returns than that of the buy-and-hold strategy, especially when transaction cost was low.

Richard Heaney (1995): here the author tries to explain the volatility in the all ordinaries index of the Australian index with the help of the cost of carry model. He uses the 90-day bank accepted bills as the benchmark interest rate. The conclusion is that there are other factors like dividends, taxes and the cost of carry itself that have an effect on the volatility of the all ordinaries share index.

Don M Chance (2003): this article explains in detail the relationship between forward and futures prices. Empirical data are examined and demonstrate the difficulty in accurately measuring the price differential of spot and futures markets. The authors conduct a test using the Heath-Jarrow-Morton Model to yield arbitrage-free futures prices. They use a data set consisting of daily LIBOR spot rates of from one to twelve months for about 3500 days over the period of 1987-2000, the difference between Eurodollar forward and futures prices is found to be much smaller than had been previously thought. The difference is negative as it should be but very close to zero. Further tests reveal that more accurate estimates of

volatility give even smaller differences but that it is not difficult to obtain satisfactory estimates of volatility for purposes of examining this issue.

K Chan, KC Chan GA Karolyi: They examine the intraday relationship between returns and returns volatility in the stock index and stock index futures markets. Their results indicate a strong inter-market dependence in the volatility of the cash and futures returns. The authors opine that, price innovations that originate in either the stock or futures markets can predict the future volatility in the other market. They show that this relationship persists even during periods in which the dependence in the returns themselves appears to weaken. The findings are robust to controlling for potential market frictions such as asynchronous trading in the stock index. The results have implications for understanding the pattern of information flows between the two markets.

Antonios Antoniou, Gioia Pescetto, Antonis Violaris(2003): This paper addresses the important relationship between stock index and stock index futures markets in an international context. The authors argue that, by simply examining the spot-futures relationship within a single country as most of the extant literature does and thus ignoring possible market interdependencies between countries, the dynamics of price adjustments may be mis-specified and thus findings misleading. The main contribution of the paper is to improve the understanding of pricing relationship between spot and futures markets in the light of international market interdependencies. Using a multivariate VAR-EGARCH methodology, the paper investigates stock index and stock index futures market

interdependence that is, lead-lag relationships and volatility interactions between the stock and futures markets of three main European countries, namely France, Germany and the UK. In addition, the paper explicitly accounts for potential asymmetries that may exist in the volatility transmission mechanism between these markets. The main conclusions of the paper imply that investors need to account for market interactions across countries to fully and correctly exploit the potential for hedging and diversification.

John Paul Broussard, G Geoffrey Booth, Otto Loistl (1998): Compares the trading efficiency of electronic and open outcry futures markets. The authors argue that the difference between the German DAX (floor) and FDAX (electronic) markets is due to asset type, not due to information processing speed. The article describes the German trading environment, comparing trading data from 1992 to 1994. It shows that the returns for DAX are positively skewed and for FDAX negatively skewed and more volatile. From regression and Granger causality tests, the authors establish a feedback relationship between the two markets, in which the spot market is slower to digest information than the futures market. They point out that the dominant DAX stocks are also traded electronically, so the means of trade is not the cause of the difference.

Donald Lien; Li Yang (2004): In this study, the authors investigate the daily relationships between returns on individual stocks and their corresponding futures contracts in Australian, Hong Kong, and United Kingdom markets. They find that, at the beginning of the life of a futures

market, autocorrelation of futures returns is similar to that of individual stock returns. As the market becomes mature, the autocorrelation of futures returns behaves differently from the autocorrelation of stock returns. Through the linkage between return autocorrelations and trading volume, they find that a larger trading volume depresses the return autocorrelation and shrinks the differences of return autocorrelation between stock and its futures. In addition, futures trading volume has more significant impact on the patterns of return autocorrelations than the stock trading volume. The effect is non-linear in the sense that it is much more prominent during high futures trading periods. Summary of these findings suggests that the difference of return autocorrelations between an individual stock and its futures contract is due to low trading activities of futures.

Nupur Hetamsaria; Saikat Sovan Deb (2004): The exchange traded index futures were launched in India in June 2000. Subsequently, other derivative products like the index options, stock options, stock futures, were launched. Derivative products are turning more and more popular day by day. NIFTY futures are scaling new heights and breaking records daily, in terms of volumes. The impact that the derivatives market has on the underlying spot market remains an issue debated again and again, with arguments both in favour and against them. This study aims to study the impact of the introduction of stock index futures on the volatility of the Indian spot markets. The issues addressed in this paper are: Firstly, does the introduction of stock index futures reduce stock market volatility?

Secondly, if there is a reduction in the volatility of the stock market post futures, are there no other reasons that could have caused such a reduction? And thirdly, if the futures effect is confirmed, is the effect immediate or delayed? The amended GARCH model is used to study the above objectives. The results obtained show that the results remain consistent with the studies for other emerging markets, like Malaysia and Italy. That is, the introduction of futures results in a reduction in stock market volatility. Also, apart from the introduction of stock index options in June 2001, there are no other factors that had caused this reduction. However, the authors found that the futures effect is delayed on NSE.

Robert F. Engle, Kevin Sheppard (2001): The authors have developed the theoretical and empirical properties of a new class of multivariate GARCH models capable of estimating large time-varying covariance matrices, Dynamic Conditional Correlation Multivariate GARCH. They show that the problem of multivariate conditional variance estimation can be simplified by estimating uni-variate GARCH models for each asset, and then, using transformed residuals resulting from the first stage, estimating a conditional correlation estimator. The standard errors for the first stage parameters remain consistent, and only the standard errors for the correlation parameters need be modified. They use the model to estimate the conditional covariance of up to 100 assets using S&P 500 Sector Indices and Dow Jones Industrial Average stocks, and conduct specification tests of the estimator using an industry standard benchmark for volatility models. The authors claim that, this new estimator

demonstrates very strong performance especially considering ease of implementation of the estimator.

Robert F. Engle and Joe Lange (1997): The paper proposes a new measure of market liquidity, VNET, which directly measures the depth of the market. VNET is constructed from the excess volume of buys or sells during a market event defined by a price movement. As this measure varies over time, it can be forecast and explained. Using NYSE TORQ data, it is found that market depth varies positively but less than proportionally with past volume and negatively with the number of transactions. Both findings suggest that over the day high volumes are associated with an influx of informed traders and reduce market liquidity. The timing of events plays an intimate role in the analysis. High expected volatility as measured by the ACD model of Engle and Russell (1997) reduces expected liquidity. Finally, market depth is smaller when the one-sided trading volume is transacted in a shorter than expected time, providing an estimate of the value of patience.

Robert F. Engle and Andrew J. Patton (2001): Here the authors suggest that, A volatility model must be able to forecast volatility; this is the central requirement in almost all financial applications. In this paper they outline some stylized facts about volatility that should be incorporated in a model; pronounced persistence and mean reversion, asymmetry such that the sign of an innovation also affects volatility and the possibility of exogenous or pre-determined variables influencing volatility. They use data on the Dow Jones Industrial index to illustrate these stylized facts, and the ability of GARCH-

type models to capture these features. They conclude with some challenges for future research in this area.

Robert Engle (2000): Time varying correlations are often estimated with Multivariate GARCH models that are linear in squares and cross products of returns. A new class of multivariate models called dynamic conditional correlation (DCC) models is proposed in this paper. These have the flexibility of uni-variate GARCH models coupled with parsimonious parametric models for the correlations. They are not linear but can often be estimated very simply with uni-variate or two step methods based on the likelihood function. It is shown that they perform well in a variety of situations and give sensible empirical results.

Robert Engle (2001): in this article the author explains clearly the use of ARCH and GARCH models and their practical applications in applied econometrics. He takes an example from the Dow Jones and a few portfolio examples with empirical data to drive home the point of applicability of ARCH and GARCH models. The article is concludes That analysis of ARCH and GARCH models and their many extensions provides a statistical stage on which many theories of asset pricing and portfolio analysis can be exhibited and tested.

Dr. Premalata Shenbagaraman: The objective of this study was to assess the impact of introducing index futures and options contracts on the volatility of the underlying stock index in India. This paper explores the impact of the introduction of derivative trading on cash market volatility using data on stock index futures and options contracts traded on the S & P

CNX NIFTY (India). The results suggest that futures and options trading have not led to a change in the volatility of the underlying stock index, but the nature of volatility seems to have changed post-futures. The author also examines whether greater futures trading activity (volume and open interest) is associated with greater spot market volatility. No evidence is found of any link between trading activity variables in the futures market and spot market volatility. The results of this study are especially important to stock exchange officials and regulators in designing trading mechanisms and contract specifications for derivative contracts, thereby enhancing their value as risk management tools

Annastiina Silvennoinen, Timo Terasvirta (2007): This article contains a review of multivariate GARCH models. Most common GARCH models are presented and their properties considered. This also includes nonparametric and semi-parametric models. Existing specification and misspecification tests are discussed. Finally, there is an empirical example in which several multivariate GARCH models are fitted to the same data set and the results compared.

Christos Floros Dimitrios V. Vougas (2007): This paper examines the lead-lag relationship between futures and spot markets in Greece. For both available stock index futures contracts (FTSE/ASE-20 and FTSE/ASE Mid 40) of the Athens Derivatives Exchange (ADEX), they employ a Bivariate GARCH model to explain price discovery of futures market over the crisis period 1999 to 2001. Empirical results confirm that futures market plays a price discovery role, implying that futures prices contain useful

information about spot prices (in line with similar findings in the literature). These findings are helpful to financial managers and traders dealing with Greek stock index futures.

Ken Johnston and Elton Scott (2000): This study investigates the extent of the contribution of the original GARCH model to our understanding of the stochastic process underlying exchange rate price changes, and examines if the movement of current research to GARCH type models exclusively is warranted. GARCH(1,1) parameters are calculated on a yearly basis and used to standardize the exchange rate price change data. Frequency distributions and statistical tests indicate that independence still exists after standardization. This indicates that GARCH type models alone are inadequate since all are similar in form, and would have difficulty in accounting for such independence. It could be argued that the poor performance of the GARCH model is due to the models incorrect assumption of a normal distribution. This argument is tested by comparing the GARCH standardized data with mean -variance standardized data, which makes no assumptions about the distributional form. Results of likelihood ratio tests, question the significance of conditional volatility, in explaining exchange rate price changes. Curiously there are cases where GARCH e2(t-1) parameters are significant when tests for first-order heteroskedasticity are not significant; this suggests that the model may be misspecified. Overall, results indicate that although previous research finds that volatility clustering plays a role in determining the stochastic process,

it is not the dominate factor. This study questions the contribution of the GARCH type models.

Shalini Bhatia: In this article the author applies the Co-Integration approach to study the long run relationship between S&P CNX NIFTY futures and spot index and the Error Correction Model to examine the short-term adjustment process, using high frequency data, the study finds that, price discovery happens in both, the futures and the spot market. However the S&P CNX NIFTY Futures Index is more efficient than the S&P CNX NIFTY Index and leads the spot index by 10 to 25 minutes. Such a finding is consistent with similar studies in U.S and U.K markets.

Kedar nath Mukherjee and R. K. Mishra: By using intraday data from April to September 2004, The authors attempt to investigate the possible lead-lag relationship, both in terms of return and volatility, among the NIFTY spot index and index futures market in India and also to explore the possible changes (if any) in such relationship around the release of different types of information. The results suggests that though there is a strong contemporaneous and bi-directional relationship among the returns in the spot and futures market, the spot market has been found to play comparatively stronger leading role in disseminating information available to the market, and therefore said to be more efficient. Apart from this, there is also interdependence (in both direction) and therefore more or less symmetric spillovers among the stock return volatility in the spot and futures market. The results relating to the informational effect on the lead-lag relationship exhibit that though the leading role of the futures market

wouldn't strengthen even for major market-wide information releases, the role of the futures market in the matter of price discovery tends to weakens and sometime disappear after the release of major firm-specific announcements.

Ajay Pande: In this study, the author uses three-years' high-frequency data set of five-minutes returns to construct measures of realized volatility with which some of the extreme-value estimators proposed in the literature and the traditional estimators are compared. Based on five criteria used to evaluate the bias, efficiency and predictive power, the author finds that almost all the extreme-value estimators are free of bias and perform well compared to their traditional counterparts for the S&P CNX NIFTY stock-index and the 10 constituent stocks studied. He also finds that the extreme-value estimators are 2-5 times more efficient and have better predictive power. With the exception of the Parkinson estimator for the index, all are unbiased. Even though specific estimators perform well for a particular asset, all the estimators perform well enough to justify their use when compared with the traditional estimators. The efficiency gains are however, marginal in case of relatively illiquid stocks.

Dr.(Ms.) M. Thenmozhi: The purpose of the study is to examine if there is any change in the volatility of NIFTY index due to the introduction of NIFTY futures and whether movements in the futures price provide predictive information regarding subsequent movements in the index prices. The study shows that inception of futures trading has reduced the volatility of spot index returns. The information flow is higher in the post

futures period resulting in decline in spot index volatility in the post futures period. The lead lag analysis shows that futures have little or no memory effect and infrequent trading is virtually absent in futures market. The study also shows that futures market transmits information to cash market and futures market is faster than spot market in processing information. The futures returns lead the spot index returns by one day and this relationship is robust. It is also shown that the cash index returns do not lead the futures returns. The advent of stock index futures and options has profoundly changed the nature of trading on stock exchanges. The concern over how trading in futures contracts affects the spot market for underlying assets has been an interesting subject for investors, market makers, academicians, exchanges and regulators alike. These markets offer investors flexibility in altering the composition of their portfolios and in timing their transactions. Futures markets also provide opportunities to hedge the risks involved with holding diversified equity portfolios. As a consequence, significant portion of cash market equity transactions are tied to futures and options market activity. In the Indian context, derivatives were mainly introduced with a view to curb the increasing volatility of the asset prices in financial markets; bring about sophisticated risk management tools leading to higher returns by reducing risk and transaction costs as compared to individual financial assets. However, it is yet to be known if the introduction of stock index futures has served the purpose claimed by the regulators. The launch of derivative products has significantly altered the movement of the share prices in the spot market.

The spot and futures market prices are linked by arbitrage, i.e., participants liquidating positions in one market and taking comparable positions at better prices in another market, or choosing to acquire positions in the market with the most favourable prices. If, for example, the observed futures price is above (below) the theoretical futures price, arbitrageurs sell (buy) futures and buy (sell) the underlying security, driving down (up) the price of the futures and driving up (down) the prices of security. This raises important questions about the effect that index derivatives have on volatility of the spot market. While there is still disagreement as to whether futures trading increases or decreases the volatility of spot prices, the question is still an empirical one. However, if one market reacts faster to information, and the other market is slow to react, a lead-lag relation is observed. The lead-lag relation between price movements of stock index futures and the underlying cash market illustrates how fast one market reflects new information relative to the other, and how well the two markets are linked. Hence, this study attempts to examine the lead – lag relationship between the futures and the underlying spot market.

Edwards (1988): tries to gather evidence to verify the fact that stock index futures trading has de-stabilised the spot market in the long run. Using variance ratio F tests from June 1973 to May 1987, Edwards concludes that the introduction of futures trading has not induced a change in the volatility in the long run. He observes that there is some evidence of futures-induced short-run volatility, particularly on futures contract

expiration days, but this volatility does not appear to carry over to longer periods of time.

Harris (1989): observes increased volatility after the introduction of index futures by comparing daily return volatilities during the pre-futures (1975-1982) and post-futures (1982-1987) between S&P 500 and a non S&P 500 group of stocks controlling for differences in firm attributes (beta, price-level, size and trading frequency). He notes that increase in volatility is a common phenomenon in different markets and index futures by themselves may not bear the sole responsibility. He points out other index-related instruments and developments such as growth in index funds and increase in foreign ownership of equity as possible explanations of higher volatility in stock markets.

Ross (1989): demonstrates that, under conditions of no arbitrage, variance of price change must be equal to the variance of information flow. This implies that the volatility of the asset price will increase as the rate of information flow increases. If this is not the case, arbitrage opportunities will be available. It follows, therefore, that if futures increase the flow of information, then in absence of arbitrage opportunities the volatility of the spot price must change.

Herbst et. al., (1990): document expiration day volatility of the stock index futures and the "special" Friday opening. Volatility is measured by the standard deviation of returns. It is seen that there is a fall in the triple witching hour due to change in settlement procedure from the third Friday to preceding Thursday.

Hodgson et. al., (1991): study the impact of All Ordinaries Share Index (AOI) futures on the Associated Australian Stock Exchanges over the All Ordinaries Share Index. The study spans for a period of six years from 1981 to 1987. Standard deviation of daily and weekly returns is estimated to measure the change in volatilities of the underlying index. The results indicate that the introduction of futures and options trading has not affected the long-term volatility, which reinforces the findings of the previous U.S. studies. However, there was a problem of confounding variables such as floating of Australian dollar in late 1983, deregulation of stock exchanges, foreign bank ownership and mutual fund investment rules during 1984.

Kalok Chan et.al., (1991): estimate the intraday relationship between returns and returns volatility in the stock index and stock index futures. The study covers both S&P500 and Major Market Index futures. The intraday patterns of volatility are estimated using autocorrelation and cross correlation patterns of the intraday returns. Bivariate GARCH model is used to estimate the volatility. Results indicate a strong inter-market dependence in the volatility of the cash and futures returns. It is also shown that the intraday volatility patterns that originate either in stock or futures market demonstrate predictability in the other market.

Bessembinder and Seguin (1992): examine whether greater futures trading activity (volume and open interest) is associated with greater equity volatility. Their findings are consistent with the theories predicting that active futures markets enhance the liquidity and depth of the equity

markets. They provide additional evidence suggesting that active futures markets are associated with decreased rather than increased volatility.

Herbst et.al., (1992): examine the informational role of the end-of-day returns in the stock index futures for the period 1982 to 1988. Volatility is estimated from the standard deviation of the returns. It is shown that the end of day return volatility is positively correlated to the next day's spot returns.

Kamara et.al., (1992): observe the stability of S&P 500 index returns with the introduction of S&P 500 index futures. They also assess the change in the volatility of S&P 500 index due to the introduction of futures trading for the period 1976 to 1987. The changes in the volatilities are examined using parametric and nonparametric tests. The variance ratio F-tests used by Edwards (1988 a,b) are sensitive to the underlying assumption of normally distributed stock returns. Apart from F-tests, Kolmogorov-Smirnov two-sample test and Wilcoxon Rank sum test are used to find out if the dispersion is significantly high in the post-futures period. The results show that the daily returns volatility is higher in the post futures period while the monthly returns remain unchanged. He concludes that increase in volatility of daily return in the post-futures period is necessarily not related to the inception of futures trading.

James. T.W., (1993): study the impact of price discovery by futures market on the cash market volatility. The study is conducted using Garbade and Silber model to estimate the price discovery function of the futures market. The results affirm that futures market is beneficial with

respect to cash market as it offers better efficiency, liquidity and also lowers the long-term volatility of the spot market.

Jegadeesh and Subrahmanyam (1993): compare the spread in NYSE before and after the introduction of futures on S&P 500 index as volatility can also be measured in terms of individual stock bid-ask spread. They find that average spread has increased subsequent to the introduction of futures trading. When they repeat their test by controlling for factors like price, return variance, and volume of trade, they still find higher spreads during the post-futures period. Overall results of Jegadeesh and Subrahmanyam (1993) suggest that introduction of index futures did not reduce spreads in the spot market, and there is weak evidence that spreads might have increased in the post futures period.

Hong Choi et.al., (1994): examine the impact of futures trading on the volatility and liquidity (as measured by bid-ask spread) of the spot market. Intraday data of S&P 500 and Major Market Index is used for a period of one year. The results indicate that the average intraday day bid-ask spread in post Major Market Index futures has increased while there is no significant change in the volatility. The trading volume has registered a rise in both S&P 500 and Major Market Index. Information asymmetry also has posted an increase due the introduction of futures trading.

Hung-Gay Fung et.al., (1994): examine the dependency in intra-day (minute-to-minute) stock index futures for the period 1987 - 1988. The dependency of intraday futures price is estimated using various models such Auto Regressive Fractionally Integrated Moving Average, Re-scaled

range test, Variance ratio test and Autocorrelation functions. It is shown that futures price do not appear to have long-term memory and that the price changes in futures market are not a random walk.

Darrat et.al., (1995): examine if futures trading activity has caused stock price volatility. The study is conducted on S&P 500 index futures for a period of 1982 - 1991. The study also examines the influence of macro-economic variables such as inflation, term structure rates on the volatility of the S&P 500 stock returns. Granger causality tests are applied to assess the impact on stock price volatility due to futures trading and other relevant macro-economic variables. The results indicate that the futures trading have not caused any jump volatility (occasional and sudden extreme changes in stock prices). Term structure rates and OTC index have caused the stock price volatility while, inflation and risk premium have not influenced the volatility of stock prices.

Antoniou and Holmes (1995): examined the relationship between information and volatility in FTSE-100 index in the U.K. using GARCH technique. Although they find that introduction of FTSE-100 index futures has changed volatility in the spot market, they attribute this to better and faster dissemination of information flow due to trading in stock index futures.

Gregory et. al., examine (1996): how volatility of S&P 500 index futures affects the S&P 500 index volatility. The study also examines the effect of good and bad news on the spot market volatility. The change in the correlation between the index and futures before and after October 1987

crash is also examined. Volatility is estimated by EGARCH model. It is shown that the bad news increases the volatility than the good news and the degree of asymmetry is much higher for the futures market. The correlation between the S&P 500 index futures and S&P500 index declined during the October 1987 crash. Butterworth investigates the effect of futures trading in the FTSE Mid 250 index on the underlying spot market using symmetric and asymmetric GARCH methods. The results reported for the Mid 250 index indicate that while the existence of futures trading had made little impact on the underlying level of volatility, as measured by the standard deviation, it has altered significantly the structure of the spot market volatility. The two most likely explanations for changes in volatility of stock returns are microeconomic and macroeconomic factors. Harris (1989) investigates the former and Kamara (1992) investigates the latter. Harris notes that increase in volatility is a common phenomenon in different markets and index futures by themselves may not bear the sole responsibility. He points out other index related instruments and developments such as growth in index funds and increase in foreign ownership of equity as possible explanations of higher volatility in stock markets. Kamara (1992) examines the influence of innovations in the rate of productive activity, unanticipated changes in the default risk premium, unanticipated changes in discount rate, unanticipated price level changes and changes in expected inflation on the volatility for the pre-future and post-future period. The results indicate that the increase in volatility in the post futures period cannot be completely attributed to

the introduction of futures trading. It is seen that the results on the effect of index futures on the underlying spot market volatility are mixed. One view is that derivative securities increase volatility in the spot market caused by more highly-levered and speculative participants in the futures market. The introduction of stock index futures cause an increase in volatility in the short run, while there is no significant change in volatility in the long-run (Edwards 1988). This is because futures markets result in uninformed (irrational) speculators trading in both futures and cash markets, shocking prices in search of short-term gains. Hodgson and Nicholls (1991) quote that increased market volatility may increase real interest rates and the cost of capital, leading to a reduction in the value of investments and loss of confidence in the market. In turn, this can lead to a flow of capital away from equity markets. Secondly, with increased volatility, regulatory bodies may interfere in markets to enact further regulations. While these regulations are certainly costly and may or may not reduce stock price volatility; However, another view is that derivative markets reduce spot volatility; by providing low cost-contingent strategies, enabling investors to minimize portfolio risk by transferring speculators from spot markets to futures markets. The low margins, low transaction costs and the standardized contracts and trading conditions attract risk-taking speculators to futures. Hence, futures have a stabilizing influence as it adds more informed traders to the cash market, making it more liquid and, therefore, less volatile. It is seen that increased spot volatility from futures markets may not be undesirable if induced by objective new information.

In general, the quicker and more accurate prices reflect new information, the more efficient should be the allocation of resources.

Kapil Gupta and Balwinder Singh: Their study investigates the price discovery and hedging efficiency of NIFTY and all those stock futures whose trading started on 9th November 2001 and are continuously traded till 30th June 2006. The study observes information asymmetry in both futures and cash market and significant Jarque-Bera test rejects the hypothesis that returns in both markets follow normal distribution. Both futures and cash market returns are found to be integrated of order 1, which implies that strong long-run relationship exists between two markets and these results are strongly supported by predictable and stationary basis. Presence of information asymmetry and co-integration implies that both markets are inefficient in weak form. Moreover, Granger causality and Vector Autoregression (VAR) results provides significant evidence that futures market leads cash market, which implies that futures market is an efficient price discovery vehicle. On the basis of price discovery efficiency of the futures market, hedge ratio through EGARCH (1,1) and VAR (based on Error correction Methodology) have been estimated, which suggests that efficient price discovery of futures market provides good opportunities for the traders to hedge their market risk because hedging through futures (except for RELIANCE) help the traders to reduce portfolio variance by approximately 90% and even more in some cases.

It is seen from the literature that the volatility of the spot market is compared before and after introduction of futures and also tested for

variations in volatility due to flow of market information. The impact of information content on the underlying markets is tested and is found to have strong correlation with the volatility of the underlying markets. Besides, standard deviations of daily returns, bid-ask spreads for all stocks, GARCH models have been used as a measure for volatility. GARCH models have been used when the data spans over a long time period to accommodate heteroskedasticity in the returns. In the event of short run analysis of time series of data, standard deviation of daily returns have been used as a measure of volatility.

The literature surveyed weighs highly on the analysis and behavior of futures prices with respect to the spot prices and also uses advanced techniques like GARCH, ARCH ARIMA, Co-integration, etc. to empirically prove or disprove their hypothesis. In case of lead lag relationships between spot and futures prices there are enough research articles which prove that futures prices lead the spot prices in the international context. In the Indian context research is contradictory. When one article claims that futures prices lead the spot prices other articles prove it otherwise.

2.2 NEED AND RELEVANCE OF THE STUDY

After going through the prima facie literature available a need was felt to find out the main concerns in valuations of futures markets in India. It was also felt that not enough literature is available in the realm of futures markets and valuations of single stock futures as well as index futures in the Indian context. This study would help in enhancing the knowledge base of the academic community regarding valuations of single stock futures and Index futures. It would also help investors, arbitrageurs and speculators to form their strategies of participating in the derivatives market and devise better hedging strategies.

There is a popular belief that the prices in the spot market are influenced by the futures market as players in the futures market are more suave and smart. Another belief in the market is that the cost of carry is nothing but the risk free rate of return. The market participants also popularly believe that change in open interest has a bearing on the direction of the price in the contracts. This study envisages testing these assumptions. The results would either confirm and reinforce the belief system in the market or raise doubts on the effect of these parameters with the direction of the market.

The researcher here thinks that since futures contracts were introduced recently and the market for futures and options is not yet well developed in terms of depth of the market, with nearly half of the volumes in the Futures and options markets coming from NIFTY itself and a lot of single stock futures not having continuous trading and having high impact cost it was thought that the course of research should point towards a more

fundamental aspect of the cost of carry relationship and not pursue the lead lag relationships between spot and futures markets.

2.3 OBJECTIVES

2.3.1 To examine the relations between the overnight MIBOR (the risk free rate) and the cost of carry in the futures market on single stock and the index futures.

2.3.2 To understand the behaviour of the futures prices of single stock futures and index futures vis-à-vis the cost of carry.

2.3.3 To understand the behaviour of the futures prices of single stock futures and index futures vis-à-vis open interest.

2.4 HYPOTHESES

The above objectives lead us to the following hypotheses

2.4.1 There is strong and positive correlation between the risk free rate of return (represented by MIBOR) and the cost of carry for single stock futures.

2.4.2 There is a strong and positive correlation between the risk free rate of return (represented by MIBOR) and the cost of carry for NIFTY futures

2.4.3 There is a strong and positive correlation between the change in risk free rate of return (represented by MIBOR) and the change in the cost of carry for single stock futures.

2.4.4 There is a strong and positive correlation between the change in risk free rate of return (represented by MIBOR) and the change in cost of carry for NIFTY futures.

2.4.5 There is a strong and positive correlation between the change in futures price and the change in cost of carry in single stock futures

2.4.6 There is a strong and positive correlation between the change in NIFTY futures and the change in cost of carry in NIFTY futures.

2.4.7 There is a strong and positive correlation between the change in open interest and change in futures price in single stock futures

2.4.8 There is a strong and positive correlation between the change in open interest and NIFTY futures.

2.5 METHODOLOGY

2.5.1 **Period of Study:** The period of study is defined as July 2002 to June 2006, which covers the early years in the introduction of futures in the Indian markets and then the developmental phase in the futures market in India. It is also large enough to enable reaching to meaningful conclusions.

2.5.1.1 **Sample size:** Seventeen liquid stocks were selected on a random basis from the universe of the S&P CNX NIFTY along with the NIFTY itself. The futures prices for the months of the contract expiring in July 2002 to June 2006 were considered for computing the cost of carry in the stock on a daily basis.

The data collected for the seventeen stocks and NIFTY consisted of 48 files each for each stock. Each file contained the OPEN, HIGH, LOW, CLOSE, Last Traded Price, Settlement Price, Number of Contracts Traded, open interest and Change in Open Interest for the specified Contract. The data was available on an average for about 90 days per contract, from the day of introduction of the contract to the expiry of the contract. It was observed that these contracts were traded thinly until they became near-month contracts. Therefore only the data pertaining to the

near month contracts was selected and a single data set of near month contract prices was prepared for each of these stocks. The data for the day of expiry was omitted and data for the next contract was included for the day of contract expiry as the cost of carry is expected to be zero on the contract expiry date for a specific contract.

The stocks selected were:

Table 2.1

List of the companies selected for analysis

Company Name	**Industry**	**Symbol**
Associated Cement Companies Ltd.	Cement and cement products	ACC
Bajaj Auto Ltd.	Automobiles - 2 and 3 wheelers	BAJAJAUTO
Bharti Airtel Ltd.	Telecommunication – services	BHARTIAIRTEL
Bharat Heavy Electricals Ltd.	Electrical equipment	BHEL
Cipla Ltd.	Pharmaceuticals	CIPLA
GAIL (India) Ltd.	Gas	GAIL
Housing Development Finance Corporation Ltd.	Finance – housing	HDFC
Hero Honda Motors Ltd.	Automobiles - 2 and 3 wheelers	HEROHONDA
Infosys Technologies Ltd.	Computers – software	INFOSYSTCH
I T C Ltd.	Cigarettes	ITC

National Aluminium Co. Ltd.	Aluminium	NATIONALUM
Reliance Industries Ltd.	Refineries	RELIANCE
State Bank of India	Banks	SBIN
Tata Motors Ltd.	Automobiles - 4 wheelers	TATAMOTORS
Tata Steel Ltd.	Steel and steel products	TATASTEEL
Tata Tea Ltd.	Tea and coffee	TATATEA
Nifty	-	NIFTY

The Time series of the MIBOR was also collected for the same period from the web sites of Clearing Corporation of India. The interbank money market and the stock markets have a few differences in terms of their working days. The interbank money market is open for six days in a week and the stock markets are open five days in a week. Apart from this the bank holidays are sometimes different from holidays in the stock markets. Inevitably, stock markets are always closed when banks are closed but banks have more holidays than stock markets and thus are closed for more days than stock markets. Given these differences in the working times of the banks and the stock markets, the matching of data from money markets and stock markets was an issue to be resolved. The days on which banks were closed when the stock markets were open the MIBOR rate of the previous working day was considered as the current rate. All the data for MIBOR that was available when the stock markets were closed was deleted and the data of futures prices, spot prices and MIBOR was matched with the dates. Thus data was consolidated date wise.

2.6 SCOPE AND LIMITATIONS OF THE STUDY

The study is restricted to the most liquid stocks which are part of the NSE's Index NIFTY and they are selected in such a way that they represent different industries / sectors. The study takes one aspect of the futures valuation, which is the cost of carry model and one data analysis approach the correlation approach. Therefore the inherent limitations of the cost of carry model and correlation also apply to the research work.

Trading in NIFTY futures was started in June 2000 and trading in single stock futures started in November 2001, this research work takes into account data from July 2002 to June 2006 therefore the data from the market is in the nascent stages of futures trading in Indian Stock markets. As of July 2002 only 31 individual stocks were traded in the futures and options segment of NSE and by June 2006 the number of single stock futures permitted had grown to 118 stocks. The total number of stocks traded in the National Stock Exchange being 936 in July 2006, the number of stocks where futures were allowed up to June 2006 works out to 12.6% of the listed stocks. From these statistics it is evident that the Futures and Options segment in the Indian stock markets is still in the developing mode. Thus a study conducted before a market matures may not be entirely applicable when the market matures.

The choice of MIBOR also puts some limitations on the study. MIBOR (Mumbai Inter Bank Offer Rate) was considered as a benchmark risk free return as this is a market determined rate and is robust enough to be considered as a benchmark. The limitation though is that the unorganized

part of the Indian economy is bigger than the organized part and MIBOR would represent the organized benchmark. Whereas investors would look for a benchmark in the unorganized economy and unorganized economy would not be able to provide a "benchmark rate" for analysis. Therefore the choice of MIBOR is the closest one could get to reality on the ground and that has been considered as the benchmark.

After the conclusion of this study as the market develops and matures and more of the unorganized economy starts becoming the part of the organized economy there is scope of further research in using advanced techniques to determine the lead-lag relationships between spot and future prices and other such research approaches in the valuation of futures in Indian stock markets.

CHAPTER 3

RELATIONSHIP BETWEEN COST OF CARRY AND MIBOR

This chapter is an attempt to establish a relationship between the cost of carry and the risk free rate of return represented by MIBOR. Here the objectives are to find out whether a change in the risk free rate of return as represented by MIBOR results in a corresponding change in the cost of carry for the particular contract. The reasoning behind the thinking is that if the investors take into account the risk free rate of return as a benchmark rate while taking investment / trading decisions then a change in the benchmark rate should result in a corresponding change in the cost of carry.

3. RELATIONSHIP BETWEEN COST OF CARRY AND MIBOR

3.1 THE COST OF CARRY MODEL

The cost of carry model is the classical model which defines the relationship between the spot price and the futures price. The cost of carry model assumes that the price of a futures contract is nothing but the price of the underlying asset in the spot market plus the cost of carrying the asset for the period of the futures contract. The following paragraphs will explain, describe and derive the cost of carry model.

A general principle that pervades the pricing of all financial assets is that of arbitrage. The principle of arbitrage states that: *any two assets have identical characteristics trade at the same price.* If this were not the case, selling the higher priced asset and buying the lower priced asset can make a risk-free profit. This is often referred to the **law of one price**.

The methods of pricing futures can be divided into two groups. The first method relates to so-called **carryable assets**. These are assets that can be purchased in the spot market at the same time as the futures contract is entered into and held (**carried**) for the duration of the contract; examples include currencies, bonds, equities, equity indices and commodities that have already been produced. The second group of contracts relates to **non-carryable asset**; i.e., Assets that cannot be carried, simply because they do not exist at the time the futures contract is entered into. Indeed, some will only come into existence on the date that coincides with the end of the futures contract' life. An example is an interest rate future where the underlying asset is the interest rate on a three-month deposit that

commences its life at the end of the future's life. Some types of non-carryable asset will come into existence at some time during the life of the future, but by their very nature cannot be stored. Examples are insurance premium rates and marine freight rates, both of which are the variable underlying some future contracts.

3.1.1 The cash-and-carry arbitrage

When the underlying asset is a financial asset, it is reasonable to assume that investors in the asset hold it only to make a financial gain in return for bearing the associated risk. Thus, in such circumstances, ***the fair price of the future is that price at which arbitrage between the underlying asset and the derivative just breaks even, there is no profit and no loss.*** If the derivative is overvalued, the arbitragers will sell it, buy the underlying asset with borrowed funds and deliver the underlying asset into the derivatives contract. On the other hand, if the derivative is cheap, the arbitragers will buy it and sell short the underlying asset against it. The short sale will be satisfied when the arbitrager receives the underlying asset under the derivatives contract and delivers it into the short sale. Such arbitrage transactions are known as **cash and carry arbitrage.**

Futures contracts provide for delivery of the underlying asset at the future date (T). Whether the arbitrager uses own funds or borrowed funds for acquiring the asset on that date (t) both the strategies result in holding the underlying asset at the future rate; thus, both must have the same price today other wise arbitrage profits would be possible. Assuming that the assets does not earn any income nor incur storage costs and r is the

appropriate rate of interest for the period T - t, which represents the life of the futures contract, the arbitrage free futures price will be

$$F_t = P_t(1 + r_T)^{(T-t)} \quad (3.1)$$

Where

F_t is the price of the Futures contract on date t

P_t is the price of the underlying asset on date t

r is the appropriate interest rate for the period (T – t)

The Above formula assumes a compound interest charge. But in Stock markets where the stock prices (prices of underlying assets) change every moment, a continuous compounding method is more useful and apt to the circumstances.

Therefore the equation for ascertaining the futures price becomes:

$$F_t = P_t e^{(T-t)} \quad (3.2)$$

Where

F_t is the price of the Futures contract on date t

P_t is the price of the underlying asset on date t

r is the appropriate interest rate per annum for the period (T – t)

This leads us to a new generalization that is: The price of the Futures contract is equal to the present price of the underlying asset plus the cost of carrying the asset for the period (T-t) this can be represented as:

$$F_t = P_t + C \quad (3.3)$$

Where C is the net cost of carry. The net cost of carry will take into account not only the cost of funds borrowed to purchase the asset, but also the storage costs (i.e. custody charges) and any other income flowing from

the asset during the life of the future. If storage costs, borrowing costs and income accrue at the same time, the whole net cost of carry can be treated as an annual rate and if continuous compounding is assumed then the equation 3.3 would become

$$F_t = P_t e^{C(T-t)} \qquad (3.4)$$

Where C= **cost of carry** is expressed as a rate and quoted in decimals.

3.1.2 Mumbai Inter Bank Offer Rate (MIBOR)

Mumbai Inter Bank Offer Rate (MIBOR) is the most widely accepted and used benchmark reference rate in India. It is being disseminated by National Stock Exchange from 1998. MIBOR finds its use in the Interest Rate Swaps. Banks, Finance Companies and Financial Institutions have issued MIBOR linked securities / deposits / papers. MIBOR gives an overnight clean reference rate and generally tracks the call market. The basic design behind the said rate is the polling methodology; rates are polled from the traders over phone as to what rate they would quote to borrow or lend Rs.500 million in the overnight call money market. Thirty three banks and primary dealers are polled on daily basis at 9.30AM for overnight rate and at 11.30AM for term rates. The average rate with lowest standard deviation is taken as the reference rate for the market. However, a boot strapping is used if there are sufficient rates polled in order to derive multiple average rates with their respective standard deviations. NSEIL disseminates 4 MIBOR/MIBID rates daily: overnight, 14-day, 1-month and 3-month. Overnight benchmark is the most popular of the MIBID/MIBOR rates as overnight market is the most active market in

money markets. In this study the 14-day MIBOR is considered as an average rate as the one-month futures contracts are considered for the study and since the one-month future contracts have the days to expiry reducing every day and the average days to maturity of 15 days is taken as the reference days and thus the 14-day MIBOR was found suitable for consideration as the benchmark reference rate while valuing futures contracts and using it as the risk free rate of return in the cost of carry equation.

3.1.3 The relationship between the cost of carry and risk free rate of return

Generally whenever the cost of carry models used, the risk free rate of return is considered as a representative of the cost of carry and fair futures price is calculated by substituting C in equation 3.4 with the risk free rate of return. This raises a few questions:

Is risk free rate of return the true representative of cost of carry? The term representative is used here because intuitively the cost of carry would contain volatility and the expectation of the price that the underlying would attain at the expiry of the contract.

Does the cost of carry change in relation to the change in risk free rate of return? The relationship between cost of carry and risk free rate of return would entail a change in cost of carry proportional to the change in risk free rate of return, if the other variables like volatility and directional expectation of the price of the underlying asset.

This is an attempt to answer these questions.

3.2 METHODOLOGY

The methodology followed to answer these questions is as follows

3.2.1 RESEARCH PROBLEM:

"To find out the relationship between the cost of carry of the future prices of stocks on the National Stock Exchange and the MIBOR (Mumbai Inter Bank Offer Rate) rates."

3.2.2 OBJECTIVES:

3.2.2.1 To understand the relation between the cost of carry on individual stocks to the MIBOR

3.2.2.2 To understand the relation between the cost of carry on the NIFTY to the MIBOR

3.2.3 HYPOTHESES

The above objectives lead us to the following hypotheses

3.2.3.1 There is strong and positive correlation between the risk free rate of return (represented by MIBOR) and the cost of carry for single stock futures.

3.2.3.2 There is a strong and positive correlation between the risk free rate of return (represented by MIBOR) and the cost of carry for nifty futures.

3.2.3.3 There is a strong and positive correlation between the change in risk free rate of return (represented by MIBOR) and the change in the cost of carry for single stock futures.

3.2.3.4 There is a strong and positive correlation between the change in risk free rate of return (represented by MIBOR) and the change in cost of carry for nifty futures.

To test the above hypotheses the following methodology was adopted:

3.3 DATA COLLECTION

3.3.1 Sixteen liquid stocks were selected from diverse industries belonging to the universe of the S&P CNX NIFTY along with the NIFTY itself. The futures prices for the months of the contract expiring in July 2002 to June 2006 were considered for computing the cost of carry in the stock on a daily basis.

3.3.2 The data collected for the seventeen stocks and Nifty consisted of 48 files each for each stock. Each file contained the OPEN, HIGH, LOW, CLOSE, Last Traded Price, Settlement Price, Number of Contracts Traded, open interest and Change in Open Interest for the specified Contract. The data was available on an average for about 90 days per contract, from the day of introduction of the contract to the expiry of the contract. It was observed that these contracts were traded thinly until they became near-month contracts. Therefore only the data pertaining to the near month contracts was selected and a single data set of near month contract prices was prepared for each of these stocks. The data for the day of expiry was omitted and data for the next contract was included for the day of contract expiry as the cost of carry is expected to be zero on the contract expiry date for a specific contract.

The stocks selected were:

Table 3.1

List of the companies selected for analysis

Company Name	Industry	Symbol
Associated Cement Companies Ltd.	Cement and cement products	ACC
Bajaj Auto Ltd.	Automobiles - 2 and 3 wheelers	BAJAJAUTO
Bharti Airtel Ltd.	Telecommunication – services	BHARTIAIRTEL
Bharat Heavy Electricals Ltd.	Electrical equipment	BHEL
Cipla Ltd.	Pharmaceuticals	CIPLA
GAIL (India) Ltd.	Gas	GAIL
Housing Development Finance Corporation Ltd.	Finance – housing	HDFC
Hero Honda Motors Ltd.	Automobiles - 2 and 3 wheelers	HEROHONDA
Infosys Technologies Ltd.	Computers – software	INFOSYSTCH
I T C Ltd.	Cigarettes	ITC
National Aluminium Co. Ltd.	Aluminium	NATIONALUM

Reliance Industries Ltd.	Refineries	RELIANCE
State Bank of India	Banks	SBIN
Tata Motors Ltd.	Automobiles - 4 wheelers	TATAMOTORS
Tata Steel Ltd.	Steel and steel products	TATASTEEL
Tata Tea Ltd.	Tea and coffee	TATATEA
Nifty	-	NIFTY

3.3.3 The Time series of the 14- day MIBOR was also collected for the same period from the NSE website.

3.4 LIMITATIONS OF THE STUDY

3.4.1 The study is limited to the 17 stocks selected for a period of June 2002 June 2006. The underlying dynamics of the economy were changing fast and the popularity of futures trading were just picking up in these years and therefore this study would at best describe the phase of evolution of futures market in India.

3.4.2 The study aims to find out whether cost-of-carry and the MIBOR exhibit a strong correlation. The MIBOR is used as the benchmark for the purpose. It inherently assumes that the stock prices are dictated on the basis of cost of money alone and does not take into account any of the political, economical upheavals happening in the country during the period. Thus the basic assumption that the liquidity in the economy and the cost of Funds discount all the external happenings in the economy.

3.5 DATA CONSOLIDATION

3.5.1 The futures Price data collected from the NSE website (www.nseindia.com) was available in the form of contract wise price volume data for the specific contract. The data for the above said stocks and the nifty was downloaded from the NSE website. Data for each stock was contained in a contract-wise file making it upto 48 files per stock. These 48 excel files were further pruned to one month or near month contract data and then merged into a single data set containing the one month or near month contract price data for the period of 28 June 2002 to 29 June 2006.

3.5.2 The data for MIBOR was also included in the same sheet for comparison purpose. As the Banking system works six days a week and the stock markets are open for five days in a week it was found that the data for Saturdays was redundant and was omitted for the purpose of consolidation of data. Another thing observed was that the bank holidays are sometimes different from the stock market holidays and on such occasions the MIBOR data for the previous day was considered for the days when the banking system was closed and the stock markets were open.

3.5.3 The spot prices for all the stocks for the period from 28 June 2002 to 29 june 2006 were downloaded from the NSE website and placed alongside the futures data for the purpose of consolidation.

3.5.4 Thus each data set had the following fields: SYMBOL, EXPIRY DATA, DATE OF TRADE, DAYS TO EXPIRY, FUTURES CLOSE, SPOT CLOSE and MIBOR.

3.6 DATA ANALYSIS

3.6.1 Correlation

In probability theory and statistics, **correlation**, (often measured as a **correlation coefficient**), indicates the strength and direction of a linear relationship between two random variables. In general statistical usage, *correlation* or co-relation refers to the departure of two variables from independence. In this broad sense there are several coefficients, measuring the degree of correlation, adapted to the nature of data.

A number of different coefficients are used for different situations. The best known is the Pearson product-moment correlation coefficient, which is obtained by dividing the covariance of the two variables by the product of their standard deviations.

There is a measure of linear correlation. The population parameter is denoted by the Greek letter rho and the sample statistic is denoted by the roman letter r and is given by the following equation.

$$r = \frac{\sum xy - \frac{(\sum x)(\sum y)}{n}}{\sqrt{\left(\sum x^2 - \frac{(\sum x)^2}{n}\right)\left(\sum y^2 - \frac{(\sum y)^2}{n}\right)}} \qquad (3.5)$$

Where x and y are random variables that represent the entities between which a relationship of dependency is being estimated. No formal distinction of one of the variables being independent and the other as dependent is made since presence of correlation does not indicate any kind of causal relationship between the two variables (entities).

Some properties of r:

r only measures the strength of a linear relationship. There are other kinds of relationships besides linear.

r is always between -1 and 1 inclusive. -1 means perfect negative linear correlation and +1 means perfect positive linear correlation

r has the same sign as the slope of the regression (best fit) line

r does not change if the scale on either variable is changed. r has a Student's t distribution

In our analyses we denote the risk free rate of return represented by MIBOR as x and cost of carry as y. In the next step we consider change in risk free rate of return represented by change in MIBOR as x and change in COC is denoted as y.

3.6.2 Determination of Change in COC

Recall equation (3.4)

$F_t = P_t e^{C(T-t)}$

Where C= cost of carry is expressed as a rate and quoted in decimals.

After some mathematical manipulations we have

$$C = \left[\frac{1}{(T-t)}\right] * \ln\left(\frac{F_t}{P_t}\right) \qquad (3.6)$$

Thus for every spot and futures value we calculate the value for COC as $C_1, C_2, C_3, \ldots\ldots C_i$ and we have the difference between the COCs' as

$$\Delta C = \frac{C_i - C_{i-1}}{C_{i-1}} \qquad (3.7)$$

And $y = \Delta C$

3.6.3 Determination of change in MIBOR

The data collected for is in the form $M_1, M_2, M_3, \ldots\ldots M_i$

We find change in MIBOR as

$$\Delta M = \frac{M_i - M_{i-1}}{M_{i-1}} \qquad (3.8)$$

And $x = \Delta M$

3.6.4 Procedure

For each of the stocks we have x as MIBOR and y as COC. We determine coefficient of correlation r using equation (3.5). We determine change in MIBOR (x) as given by equation (3.8) for each of the stocks selected. We determine change in COC (y) as given by equation (3.7) for each of the stocks selected. We determine coefficient of correlation r using equation (3.5)

These steps lead us to the correlation coefficient of MIBOR with the cost of carry for each of the stocks selected.

3.7 FINDINGS

3.7.1 Associated Cement Companies:

The movement of Cost of Carry of ACC futures contracts and the MIBOR for the period of 28th June 2002 to 28th June 2006 was studied o observe the changes in the cost of carry when the MIBOR changed.

Table 3.2

Correlation between Cost of Carry and MIBOR for ACC

Correlation Between Change in MIBOR and Change in Cost of Carry	-0.0283
Correlation between MIBOR and Cost of Carry	-0.03149

The Correlation between the MIBOR and the Cost of Carry was -0.0315 Indicating that the MIBOR has a negative correlation with the Cost of Carry for the futures contract of ACC. This can be interpreted that the movement of cost of carry cannot be explained with the movement of MIBOR.

If Cost of Carry and MIBOR are not correlated positively there is a case for probing the correlation between the change in MIBOR and change in Cost of Carry. The Correlation between the change in MIBOR and the change in cost of carry for ACC was -0.0283 Indicating that the change in MIBOR had a negative correlation with the change in cost of carry for the futures contract of ACC. This can also be interpreted that the change in cost of carry cannot be explained by the change in MIBOR.

3.7.2 Bajaj Auto Limited:

The movement of Cost of Carry of Bajaj Auto futures contracts and the MIBOR for the period of 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the cost of carry when the MIBOR changed.

Table 3.3

Correlation between Cost of Carry and MIBOR for Bajaj auto Limited

Correlation between MIBOR and Cost of Carry	0.058170909
Correlation Between Change in MIBOR and Change in Cost of Carry	0.009714492

The Correlation between MIBOR and Cost of Carry was 0.0581, indicating that Cost of Carry for Bajaj Auto futures contracts can be explained by the MIBOR to the extent of 5.81%.

The Correlation between change in MIBOR and change in Cost of Carry was 0.00971, indicating that 0.97% of the change in cost of carry can be explained by the change in MIBOR. This also shows that the relation between the change in Cost of Carry and MIBOR is negligible.

3.7.3 Bharti Airtel Limited

The movement of Cost of Carry of Bharti Airtel futures contracts and the MIBOR for the period of 20th April 2005 to 28th June 2006 was studied using correlation to observe the changes in the cost of carry when the MIBOR changed. The period of study is truncated as futures contracts in Bharti Airtel were introduced only in the month of April 2005.

Table 3.4

Correlation between Cost of Carry and MIBOR for Bharti Airtel

Correlation between MIBOR and Cost of Carry	0.04961
Correlation Between Change in MIBOR and Change in Cost of Carry	-0.00453

The Correlation between the MIBOR and Cost of Carry for the futures contracts of Bharti Airtel Limited was 0.04961 indicating that 4.961% of the Cost of Carry can be explained with MIBOR or in other words the cost of carry is dependant upon the MIBOR to the extent of its correlation with the latter, in this case it is 4.961%.

The correlation of change in cost of carry and the change MIBOR is negative at -0.00453 meaning that the changes in these values occur in opposite directions to the extent of their correlation of 0.453%. This also means that the relation between the cost of carry for futures contracts of Bharti Airtel and MIBOR is negligible as it is nearly zero.

3.7.4 Bharat Heavy Electricals Limited (BHEL)

The movement of Cost of Carry of BHEL futures contracts and the MIBOR for the period of 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the cost of carry when the MIBOR changed.

Table 3.5

Correlation between Cost of Carry and MIBOR for BHEL

Correlation between MIBOR and Cost of Carry	0.006373
Correlation Between Change in MIBOR and Change in Cost of Carry	-0.00941

The correlation between the cost of carry and the MIBOR was 0.006373 indicating that though there is a positive correlation it is so negligible that it tends to zero. Only 0.6% of the cost of carry can be explained by the MIBOR.

The correlation between the change in cost of carry and change in MIBOR was -0.00941 indicating that the change in cost of carry and the change in MIBOR have a negative correlation and therefore exhibit diverse behaviour. Since the correlation coefficient is -0.9% the relation between the change in cost of carry and the MIBOR is negligible and it can be said that they have no relation whatsoever.

3.7.5 Cipla Limited

The movement of Cost of Carry of Cipla futures contracts and the MIBOR for the period of 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the cost of carry when the MIBOR changed.

Table 3.6

Correlation between Cost of Carry and MIBOR for CIPLA

Correlation between MIBOR and Cost of Carry	0.001663
Correlation Between Change in MIBOR and Change in Cost of Carry	-0.13818

The correlation between the cost of carry of futures contracts of Cipla and the MIBOR was 0.001663 indicating that though positive, the correlation between the two was negligible and the two variables, the cost of carry of Cipla futures and the MIBOR are not correlated and therefore one variable cannot be explained by the other.

The change in cost of carry of Cipla futures and the change in MIBOR was -0.13818 indicating that the they were negatively correlated to the extent of 13%. Since the variables were negatively correlated with correlation coefficient being only -0.13 it can be concluded that the relationship is not significant.

3.7.6 Gas Authority of India Limited (GAIL)

The movement of Cost of Carry of GAIL futures contracts and the MIBOR for the period of 20th September 2003 to 28th June 2006 was studied using correlation to observe the changes in the cost of carry when the MIBOR changed. The period of study is truncated as the futures contracts in GAIL were introduced in September 2003.

Table 3.7

Correlation between Cost of Carry and MIBOR for GAIL

Correlation between MIBOR and Cost of Carry	-0.0493
Correlation Between Change in MIBOR and Change in Cost of Carry	0.018818

The correlation between the cost of carry of the futures contracts of GAIL and the MIBOR during the study period was -0.0493 indicating that these two variables were negatively correlated to the extent of 4.93%. This suggests that there is a negative relation between the two variables.

The correlation coefficient between the change in cost of carry of GAIL futures and the change in MIBOR was 0.0188 indicating that 1.8% of the change in cost of carry can be explained by the change in MIBOR and the rest is either random or there are some other factors responsible.

3.7.7 Housing Development Finance Corporation (HDFC)

The movement of Cost of Carry of HDFC futures contracts and the MIBOR for the period of 28th June 2002 to 28th June 2006 was studied to observe the changes in the cost of carry when the MIBOR changed.

Table 3.8

Correlation between Cost of Carry and MIBOR for HDFC

Correlation between MIBOR and Cost of Carry	0.041601
Correlation Between Change in MIBOR and Change in Cost of Carry	0.025933

The correlation between the cost of carry of the futures contracts of HDFC and the MIBOR was 0.0416 suggesting that 4.16% of the behaviour of cost of carry can be explained with the MIBOR.

The correlation between the change in cost of carry of futures contracts of HDFC and change in MIBOR was 0.0259 suggesting that 2.59% change in cost of carry can be explained with the change in MIBOR. Since the value of the correlation coefficients are low it can be stated that neither the cost of carry nor the change in cost of carry for the HDFC futures have a strong relationship with the MIBOR and change in MIBOR.

3.7.8 Hero Honda Motors Limited (Hero Honda)

The movement of Cost of Carry of Hero Honda futures contracts and the MIBOR for the period of 27th February 2003 to 28th June 2006 was studied using correlation to observe the changes in the cost of carry when the MIBOR changed. Futures contracts in Hero Honda were introduced in February 2003, hence the date of start of the data is 27th February 2003, the first day of trading in the March 2003 contract.

Table 3.9

Correlation between Cost of Carry and MIBOR for Hero Honda

Correlation between MIBOR and Cost of Carry	0.149516
Correlation Between Change in MIBOR and Change in Cost of Carry	-0.03482

The correlation between the cost of carry of Hero Honda futures contracts and the MIBOR was 0.1495 indicating that the cost of carry can be explained by the MIBOR to an extent of 15%. This positive correlation in the variables shows that the cost of carry in Hero Honda futures contracts has a relation to the risk free rate of return represented by MIBOR.

The correlation between the change in cost of carry in the futures contracts of Hero Honda and the change in MIBOR was -0.0348 indicating that both the variables were negatively correlated. As the correlation is small the relationship between the two variables is independent of each other.

3.7.9 Infosys Technologies Limited (Infosys)

The movement of Cost of Carry of Infosys futures contracts and the MIBOR for the period of 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the cost of carry when the MIBOR changed.

Table 3.10

Correlation between Cost of Carry and MIBOR for Infosys

Correlation between MIBOR and Cost of Carry	0.059507
Correlation Between Change in MIBOR and Change in Cost of Carry	0.008258

The correlation between the cost of carry of Infosys futures contracts and MIBOR was 0.595 which indicates that the cost of carry is positively correlated to MIBOR and 5% of the level of cost of carry can be explained by MIBOR.

The correlation between the change in cost of carry and change in MIBOR was 0.0825 which indicates that the only 0.82% of the change in cost of carry can be explained by the change in MIBOR. This leads us to conclude that the the change in MIBOR and change in cost of carry are independent of each other.

3.7.10 ITC Limited (ITC)

The movement of Cost of Carry of ITC futures contracts and the MIBOR for the period of 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the cost of carry when the MIBOR changed.

Table 3.11

Correlation between Cost of Carry and MIBOR for ITC

Correlation between MIBOR and Cost of Carry	0.016169
Correlation Between Change in MIBOR and Change in Cost of Carry	-0.05093

The correlation between the cost of carry in futures contracts of ITC and MIBOR was 0.0161 which indicates that the cost of carry and MIBOR are independent of each other as the correlation is near zero.

The correlation between the change in cost of carry and change in MIBOR was -0.05093 which indicates that change in cost of carry in ITC futures contracts is negatively correlated with MIBOR to an extent of 5%.

3.7.11 National Aluminium (NALCO)

The movement of Cost of Carry of NALCO futures contracts and the MIBOR for the period of 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the cost of carry when the MIBOR changed.

Table 3.12

Correlation between Cost of Carry and MIBOR for NALCO

Correlation between MIBOR and Cost of Carry	-0.12552
Correlation Between Change in MIBOR and Change in Cost of Carry	0.036412

The correlation between the cost of carry in futures contracts of NALCO and MIBOR was -0.1255 indicating a negative correlation between the cost of carry and MIBOR.

The correlation between the change in cost of carry in futures contracts of NALCO and change in MIBOR was 0.0364 which indicates that the change cost of carry in NALCO futures can be explained to the extent of 3.64% with the change in MIBOR, leading us to conclude that the relation between the change in cost of carry in NALCO futures with the change in MIBOR is weak.

3.7.12 Reliance Industries Limited

The movement of Cost of Carry of Reliance futures contracts and the MIBOR for the period of 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the cost of carry when the MIBOR changed.

Table 3.13

Correlation between Cost of Carry and MIBOR for Reliance

Correlation between MIBOR and Cost of Carry	0.030813
Correlation Between Change in MIBOR and Change in Cost of Carry	-0.03141

The correlation between the cost of carry in futures contracts of Reliance and MIBOR was 0.0308 indicating that only 3% of the movement of cost of carry can be explained with the MIBOR or the representative risk free rate of return.

The correlation between the change in cost of carry and the change in MIBOR was -0.0314 indicating that the change in cost of carry in futures contracts of Reliance are negatively correlated to the change in MIBOR. This leads us to a conclusion that the change in cost of carry is not related to the change in MIBOR.

3.7.13 State Bank of India Limited (SBI)

The movement of Cost of Carry of SBI futures contracts and the MIBOR for the period of 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the cost of carry when the MIBOR changed.

Table 3.14

Correlation between Cost of Carry and MIBOR for SBI

Correlation between MIBOR and Cost of Carry	0.063503
Correlation Between Change in MIBOR and Change in Cost of Carry	-0.01624

The correlation between cost of carry of SBI futures contracts and MIBOR was 0.0635 indicating that the movement of cost of carry can be explained by the movement of MIBOR to the extent of 6.35% only. This also suggests that the two variable do not have a strong correlation.

The correlation between the change in cost of carry and change in MIBOR was -0.0162 indicating that the change in cost of carry cannot be explained with the change in MIBOR as the correlation is tending to zero.

3.7.14 Tata Motors Limited

The movement of Cost of Carry of Tata motors futures contracts and the MIBOR for the period of 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the cost of carry when the MIBOR changed.

Table 3.15

Correlation between Cost of Carry and MIBOR for Tata Motors

Correlation between MIBOR and Cost of Carry	-0.02975
Correlation Between Change in MIBOR and Change in Cost of Carry	-0.01902

The correlation between the cost of carry of Tata motors and MIBOR was -0.02975 indicating a very weak correlation amongst the variables. This leads us to the conclusion that the movement in cost of carry of Tata motors futures contracts cannot be explained with the movement of MIBOR and they are not related.

The correlation between the change in cost of carry of Tata motors futures contracts and the change in MIBOR was -0.01902 indicating that the change in cost of carry of futures contracts are not related to the change in MIBOR and they do not follow each other.

3.7.15 Tata Power Limited

The movement of Cost of Carry of Tata power futures contracts and the MIBOR for the period of 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the cost of carry when the MIBOR changed.

Table 3.16

Correlation between Cost of Carry and MIBOR for Tata Power

Correlation between MIBOR and Cost of Carry	-0.09896
Correlation Between Change in MIBOR and Change in Cost of Carry	-0.00693

The correlation between the cost of carry of Tata power futures contracts and the MIBOR was -0.09896 which indicates that there is a negative correlation between the cost of carry and MIBOR to the extent of 9.89% which seems significant looking at the past experience of sub 5% readings in other stock futures. This also proves that the cost of carry has no significant relation to the MIBOR because of low correlation.

The correlation between the change in cost of carry and the change in MIBOR was -0.00693 which indicates that the correlation between the variables is nearing zero leading us to a conclusion that the change in cost of carry and change in MIBOR are not correlated at all.

3.7.16 Tata Steel Limited

The movement of Cost of Carry of Tata Steel futures contracts and the MIBOR for the period of 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the cost of carry when the MIBOR changed.

Table 3.17

Correlation between Cost of Carry and MIBOR for Tata Steel

Correlation between MIBOR and Cost of Carry	0.028647
Correlation Between Change in MIBOR and Change in Cost of Carry	-0.01965

The correlation between cost of carry in futures contracts of Tata steel and MIBOR was 0.0286 indicating that only 2.86% of the movement of cost of carry can be explained by the movement of MIBOR. This low correlation suggests that cost of carry of futures contracts of Tata steel and MIBOR are independent of each other.

The correlation between the change in cost of carry of Tata steel futures contracts and MIBOR was -0.01965 which indicates that the change in cost of carry for Tata steel futures contract and change are independent of each other.

3.7.16 Tata Tea Limited

The movement of Cost of Carry of Tata Tea futures contracts and the MIBOR for the period of 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the cost of carry when the MIBOR changed.

Table 3.18

Correlation between Cost of Carry and MIBOR for Tata Tea

Correlation between MIBOR and Cost of Carry	0.068404
Correlation Between Change in MIBOR and Change in Cost of Carry	0.040847

The correlation between cost of carry of futures contracts in Tata Tea and MIBOR was 0.0684 which indicates that only 6.8% of the movement in cost of carry can be explained by the movement of MIBOR.

The correlation between the change in cost of carry of futures contracts in Tata Tea and change in MIBOR was 0.0408 which indicates that only 4.08% of the change in cost of carry is explained by the change in MIBOR leading us to the conclusion that the change in cost of carry and change in MIBOR are independent of each other

3.7.17 NIFTY

The movement of Cost of Carry of NIFTY futures contracts and the MIBOR for the period of 28th June 2002 to 28th June 2006 was studied to observe the changes in the cost of carry when the MIBOR changed.

Table 3.19

Correlation between Cost of Carry and MIBOR for NIFTY

Correlation between MIBOR and Cost of Carry	0.006844
Correlation Between Change in MIBOR and Change in Cost of Carry	-0.04949

The study of the correlation between the futures contracts of NIFTY and MIBOR also shows the same picture witnessed by the single stock futures contracts. The correlation between the cost of carry in NIFTY futures and MIBOR was 0.00604 indicating that the cost of carry in NIFTY futures and the MIBOR are independent of each other.

The correlation between the change in cost of carry and change in MIBOR was -0.04949 indicating a very low dependence of each of the variables on each other movements. This leads us to the conclusions that the cost of carry and MIBOR are independent of each other.

Table 3.20

Correlation between change in MIBOR and change in Cost of Carry

Table of Correlation between Change in MIBOR and Change in COC	
Company	**D MIBOR and D COC**
ACC	-0.0315
Bajaj Auto	0.0097
Bharti Airtel	-0.0045
BHEL	-0.0094
Cipla	-0.1382
Gail	0.0188
HDFC	0.0259
Hero Honda	-0.0348
Infosys	0.0083
ITC	-0.0509
NALCO	-0.0364
Reliance	-0.0314
SBI	-0.0162
Tata Motors	-0.0190
Tata Power	-0.0069
Tata Steel	-0.0197
Tata tea	0.0408
NIFTY	-0.0495

Chart 3.1

Correlation between Change in MIBOR and Change in Cost of Carry

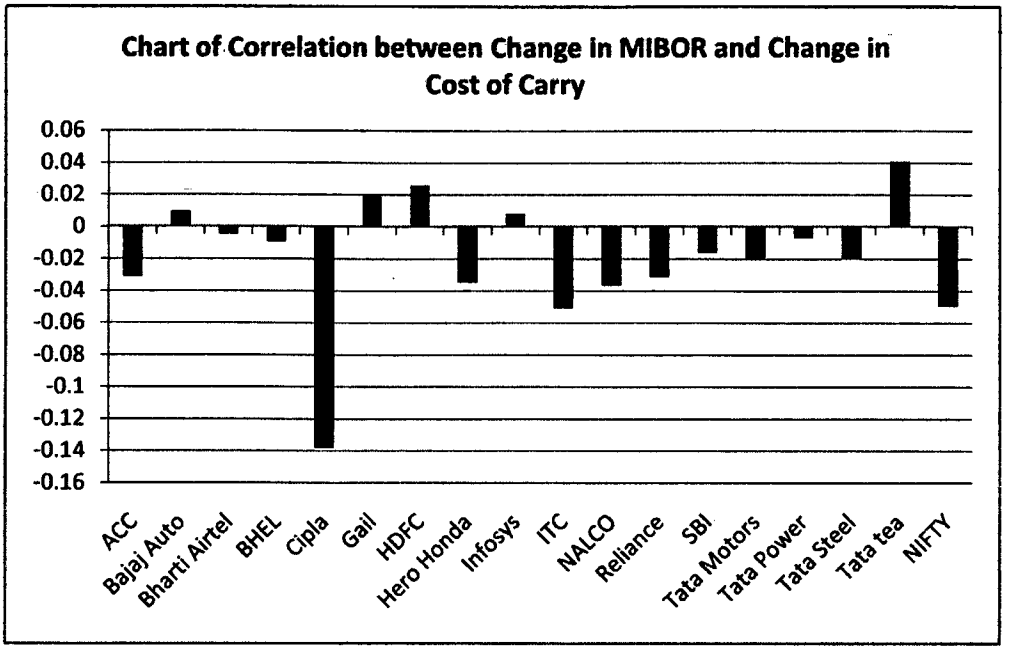


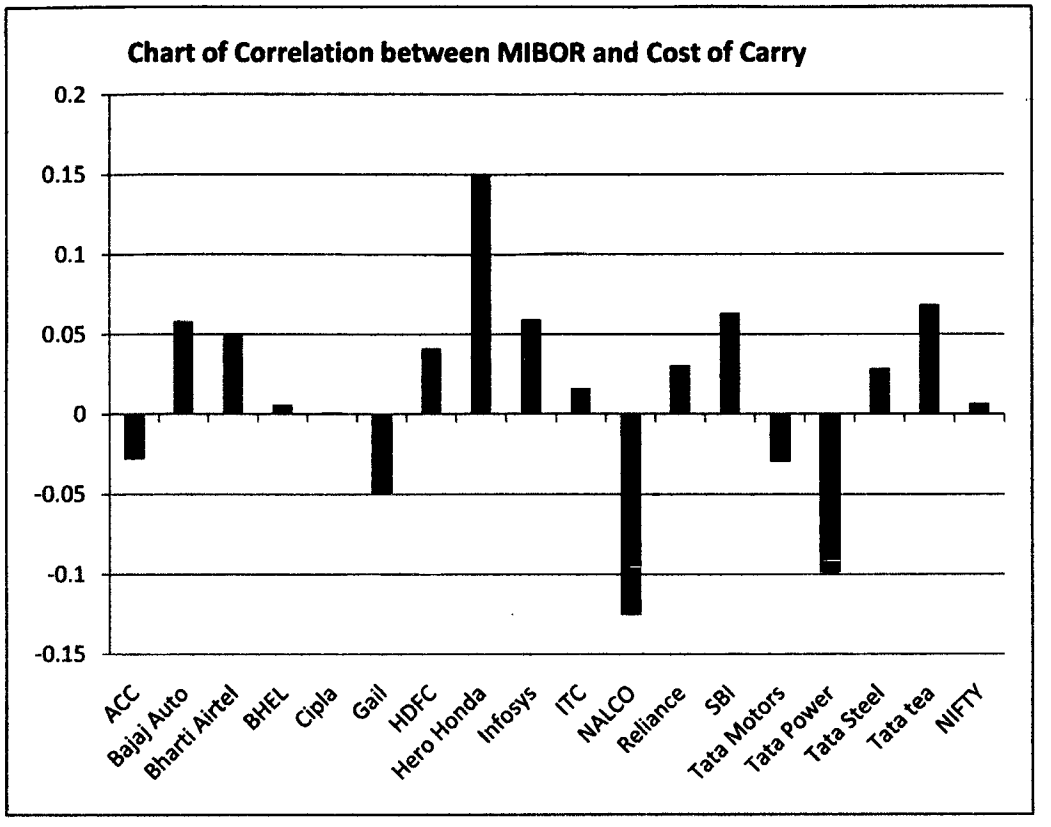
Table 3.21

Table of Correlation between MIBOR and Cost of Carry

Table of Correlation between MIBOR and Cost of Carry	
Company	**MIBOR and COC**
ACC	-0.0283
Bajaj Auto	0.0581
Bharti Airtel	0.0496
BHEL	0.0064
Cipla	0.0017
Gail	-0.0493
HDFC	0.0416
Hero Honda	0.1495
Infosys	0.0595
ITC	0.0162
NALCO	-0.1255
Reliance	0.0308
SBI	0.0635
Tata Motors	-0.0298
Tata Power	-0.0990
Tata Steel	0.0286
Tata tea	0.0684
NIFTY	0.0068

Chart 3.2

Chart of correlation between MIBOR and Cost of Carry



3.8 CONCLUSIONS

The above chart 3.1 and the data in Table 3.18 show that the correlation between the change in cost of carry and the change in MIBOR is between +0.05 and -0.15 suggesting that the correlation is spread around zero meaning that change in cost of carry does not have any correlation with the change in MIBOR which happens to be the benchmark interest rates as far as the commercial short term money market is concerned. This leads us to think that the investors do not look up to the MIBOR as their cost of funds nor do they consider that MIBOR is the right bench mark as far as the interest rate and cost of money scenario is considered.

When we look at the table of the correlation between MIBOR and Cost of Carry we get a similar picture. The same has been illustrated in Chart 3.2 and Table 3.19. Here too the charts and the table show that the correlation is between 0.16 and -0.16 suggesting that on an average the correlation rallies around zero meaning that the cost of carry and the MIBOR do not suggest any correlation amongst them and changes in one may not result in the change of other.

Hypothesis 1. *There is strong and positive correlation between the risk free rate of return (represented by MIBOR) and the cost of carry for single stock futures.* Stands rejected as the correlation is not strong, nor uniformly positive.

Hypothesis 2. *There is a strong and positive correlation between the risk free rate of return (represented by MIBOR) and the cost of carry for nifty futures.* Stands rejected as the correlation is nearing zero.

Hypothesis 3. *There is a strong and positive correlation between the change in risk free rate of return (represented by MIBOR) and the change in the cost of carry for single stock futures.* Stands rejected as the correlation hovers around zero.

Hypothesis 4. *There is a strong and positive correlation between the change in risk free rate of return (represented by MIBOR) and the change in cost of carry for nifty futures.* Stands rejected as the correlation is nearly zero.

This leads us to believe that the Indian investors are not looking at MIBOR as a benchmark at all and rely on some other rate as the bench mark

interest rate. Another argument can be that MIBOR is just a bench mark rate, but the cost of carry not only includes the interest cost but also the risk involved because of the volatility of the stock, the index and the market as a whole.

This leads us to suggest that the C in the cost of carry model given in equation 3.4 would contain volatility also as a determinant of cost of carry. Thus we conclude that the cost of carry cannot be assumed to be the risk free rate and a component of risk in the form of volatility has to be inducted into the model to make it complete.

CHAPTER 4

RELATIONSHIP BETWEEN FUTURES PRICE AND OPEN INTEREST

This chapter probes the relationship between the price of the futures contract in the derivatives market with the open interest in that futures contract. The objective is to examine the popular presumption that the change in open interest leads to a change in the price behaviour of the futures contract. The change in prices of futures contracts of sixteen stocks and NIFTY are used to find out the correlation between the change in futures price and the change in open interest in these contracts to prove or disprove the existence of a relationship between the futures price and the open interest.

4. RELATIONSHIP BETWEEN FUTURES PRICE AND OPEN INTEREST

Participants in the stock markets believe that the amount of open interest in a particular contract has a bearing on the behaviour of the price of the contract. This popular perception is put to test in the following research by correlating the change in open interest in stock futures with the change in the futures prices.

Empirical data has been collected from bhav copies published by the National Stock Exchange, India and then the data is subjected to correlation analysis to find out the significance of these parameters. The daily price data and open interest data is collected for sixteen stocks and the index (NIFTY) for a period of 4 years. The correlation between the change in futures price and the change in open interest is calculated for near month contracts of these seventeen futures contracts.

4.1 THEORETICAL BACKGROUND

Futures: Futures contracts are exchange-traded agreements to buy or sell a given quantity of a particular asset/ stock for delivery at a specified future date but at a price agreed today.

A look at the definition raises two questions in the mind. They are:

a. What are the determinants of the price of the futures contract?

b. How do we go about determining the fair price of the contract?

When a futures contract is traded it creates a contract between a seller of the contract and the buyer of the contract. This also means that the buyer and the seller have a contract open in the market or they have an open

position in the market. These open positions can be closed by way of expiry of the contract or by closing out a position in the market. Open interest is defined as the number of contracts existing in a futures market that have not yet been closed out. It is reported as the number of outstanding contracts at the end of a trading day. Open interest increases from zero when a contract is first listed for trading, falling back to zero on the maturity date of the underlying contract when trading ceases. The number of open positions in the market is measured in terms of open interest thus, the open interest in a contract tells us about the popularity of the said contract in the market. Futures markets differ from equity markets in many respects. One specific element of difference has to do with open interest, as there is no directly comparable measure in equity markets. In the latter, there are a number of outstanding shares that may be traded, in which case the trading volume captures the number of shares traded by market participants. Of specific note is the fact that trading volume does not affect the number of outstanding shares, which is determined by a policy decision of the corporate board, thus increasing or decreasing infrequently.

In the futures markets, however, there is no set number of outstanding contracts to be traded. Contracts come into existence simply by two parties who are interested in buying and selling a contract. There is no direct, link between trading volume and open interest, which are effectively stock and flow measures of activity, respectively. For any given trading volume, the open interest for a contract may rise, fall, or remain unchanged.

Let us see, what happens when open interest rises. If two new traders (not already holding positions in the market) come to the market, one buying (going long) and the other selling (going short) a single contract, their trading activity will result in a trading volume of one contract, and it will increase open interest by one contract. If a new trader comes to the market and goes long, this activity will result in a trading volume of one contract, but there will be no change in open interest if the contract purchased had previously been owned by some other trader who has decided to close an existing position and this activity will resemble that observed in equity markets. Finally, let us see how does the open interest fall. If two traders who are already in the market (one long and the other short) close their respective positions against one another, it will result in a trading volume of one contract and a decrease in open interest of one contract. In this case, the long trader closes the position by going short, and the short trader closes by going long. In each case, the observed trading volume is one regardless of the effect on open interest. Therefore, the observation of a trade does not tell us whether or not open interest has increased, decreased, or remained unchanged. It is therefore necessary to include observations on open interest directly to be able to determine whether or not this trading activity variable influences the volatility of futures prices separately from trading volume.

Participants in the stock markets believe that the amount of open interest in a particular contract has a bearing on the behaviour of the price of the contract. This popular perception is put to test in the following research by

correlating the change in open interest in stock futures with the change in the futures prices.

Research in this area has shown some interesting results, Christos Floros examines the relation between price and open interest in the Greek stock index futures market. The focus is on GARCH effects and the long–run information role of open interest. The results show that current open interest helps in explaining GARCH effects, while a negative impact on returns is reported. Furthermore, evidence from the co integration tests shows that there is a long–run relation between open interest and futures price. This suggests that one can use the information of open interest to predict futures prices in the long run. Sandeep Srivastava (2003) examines the role of open interest and trading volume, from the stock option market in determining the price of underlying shares in cash market. The study provides deterministic parameters that can be used by the uninformed investors to predict the price of underlying shares using stock options market data and formulate the profitable trading strategies based on it. Harrison Hong (2001) has developed a dynamic, equilibrium model of a futures market to study optimal hedging and the term structure of open interest and futures prices. The model predicts that in markets with substantial and mean reverting convenience yield shocks (e.g. energy futures), open interest is evenly distributed among contracts of different maturities. In markets where these shocks are persistent (e.g. metal futures), open interest is concentrated in near-to-maturity futures. The model generates additional implications regarding how the term structure

of futures price volatility and the futures risk premium depend on the nature of convenience yield shocks. Ronald D. Ripple and Imad A. Moosa (2007) have examined the determinants of the volatility of crude oil futures prices using an intra-day range-based measure of volatility. The contract-by-contract analysis reveals that trading volume and open interest have a significant impact on volatility and that they dominate the Samuelson-maturity effect. While the results support earlier findings of positive and significant role for trading volume, they also show the importance of open interest as a determinant of volatility. The results of the full-period time series analysis also demonstrate the significant role played by open interest in the determination of futures price volatility and further confirm the importance of trading volume.

4.2 RESEARCH PROBLEM AND DEFINITION:

"To find out the relationship between the changes in future prices of stocks and change in open interest on the National Stock Exchange"

4.2.1 Objectives:

4.2.1.1 To understand the relation between the changes in Open Interest in individual futures contracts to the change in price of futures contract.

4.2.1.2 To understand the relation between the change in the price of NIFTY to the change in Open Interest in Nifty Futures contract.

4.2.2 Hypotheses

4.2.2.1 There is a strong and positive correlation between the change in open interest and change in futures price in single stock futures

4.2.2.2 There is a strong and positive correlation between the change in open interest and nifty futures.

4.3 METHOD OF STUDY

4.3.1 Data Collection

Sixteen liquid stocks were selected on a random basis from the universe of the S&P CNX NIFTY along with the NIFTY itself. The futures prices for the months of the contract expiring in July 2002 to June 2006 were considered for computing the cost of carry in the stock on a daily basis.

The data collected for the sixteen stocks and Nifty consisted of 48 files each for each stock. Each file contained the OPEN, HIGH, LOW, CLOSE, Last Traded Price, Settlement Price, Number of Contracts Traded, open interest and Change in Open Interest for the specified Contract. The data was available on an average for about 90 days per contract, from the day of introduction of the contract to the expiry of the contract. It was observed that these contracts were traded thinly until they became near-month contracts. Therefore only the data pertaining to the near month contracts was selected and a single data set of near month contract prices was prepared for each of these stocks. The data for the day of expiry was omitted and data for the next contract was included for the day of contract expiry as the cost of carry is expected to be zero on the contract expiry date for a specific contract.

The stocks selected were:

Table 4.1

List of the companies selected for analysis

Company Name	Industry	Symbol
Associated Cement Companies Ltd.	Cement and cement products	ACC
Bajaj Auto Ltd.	Automobiles - 2 and 3 wheelers	BAJAJAUTO
Bharti Airtel Ltd.	Telecommunication – services	BHARTIAIRTEL
Bharat Heavy Electricals Ltd.	Electrical equipment	BHEL
Cipla Ltd.	Pharmaceuticals	CIPLA
GAIL (India) Ltd.	Gas	GAIL
Housing Development Finance Corporation Ltd.	Finance – housing	HDFC
Hero Honda Motors Ltd.	Automobiles - 2 and 3 wheelers	HEROHONDA
Infosys Technologies Ltd.	Computers – software	INFOSYSTCH
I T C Ltd.	Cigarettes	ITC
National Aluminium Co. Ltd.	Aluminium	NATIONALUM
Reliance Industries Ltd.	Refineries	RELIANCE
State Bank of India	Banks	SBIN
Tata Motors Ltd.	Automobiles - 4 wheelers	TATAMOTORS
Tata Steel Ltd.	Steel and steel products	TATASTEEL
Tata Tea Ltd.	Tea and coffee	TATATEA
Nifty	-	NIFTY

The time series of the open interest of the single stock futures of all the stocks and NIFTY were downloaded and collected for the purpose of analysis. Only the near month futures were considered for analysis, because it was found that the stock futures and NIFTY futures picked up volumes only when they became near month futures. When these contracts are two-month or three-month futures contracts the volume was found to be negligible. The open interest was found to have been picked up whenever the contract became a near month contract. Therefore only the near month contracts (or One-month contracts) and their open interest was considered for calculations

4.3.2 Limitations of the study:

4.3.2.1 The study is limited to the 17 futures contracts selected for a period of June 2002 June 2006. The underlying dynamics of the economy were changing fast and the popularity of futures trading were just picking up in these years and therefore this study would at best describe the phase of evolution of futures market in India.

4.3.2.2 The study aims to find out whether open interest and the change in open interest in a stock futures contract and index contract have any effect on the change in the prices of the contract. There are not many articles written on this subject available in the public domain so this attempt is only to prove a point. The popular market premise is being tested with limited period data of Indian markets.

4.3.3 Data Consolidation:

The futures Price data collected from the NSE website (www.nseindia.com) was available in the form of contract wise price volume data for the specific contract. The data for the above said stocks and the nifty was downloaded from the NSE website. Data for each stock was contained in a contract-wise file making it upto 48 files per stock. These 48 files were further pruned to one month or near month contract data and then merged into a single data set containing the one month or near month contract price data for the period of 28 June 2002 to 29 June 2006.

The spot prices for all the stocks for the period from 28 June 2002 to 29 June 2006 were downloaded from the NSE website and placed alongside the futures data for the purpose of consolidation.

Thus each data set had the following fields: SYMBOL, EXPIRY DATA, DATE OF TRADE, DAYS TO EXPIRY, FUTURES CLOSE, SPOT CLOSE and OPEN INTEREST.

4.4 DATA ANALYSIS

4.4.1 Correlation

In determining the correlation we use the measure of linear correlation. The population parameter is denoted by the Greek letter rho and the sample statistic is denoted by the roman letter r and is given by the equation mentioned in chapter 3 as eq. (3.1) In our analysis when x denotes change in OPEN INTEREST, y denotes change in FUTURES PRICE.

Determination of Change in FUTURES PRICE

The Change in futures price is found by using the following simple equation

$$\Delta F = \frac{F_t - F_{t-1}}{F_{t-1}} \qquad (4.1)$$

Where

ΔF is the change in futures price.

F_t is the closing futures price of the day.

F_{t-1} is the closing futures price of the previous day.

Determination of change in OPEN INTEREST

The change in open interest is found by using the following simple equation

$$\Delta OI = \frac{OI_t - OI_{t-1}}{OI_{t-1}} \qquad (4.2)$$

Where

ΔOI is the change in Open Interest

OI_t is the open interest for the day

OI_{t-1} is the Open Interest for the previous day

4.5 PROCEDURE

4.5.1 We determine change in Open Interest (x) as given by equation (4.2) for each of the stocks selected.

4.5.2 We determine change in Futures Price (y) as given by equation (4.1) for each of the stocks selected.

4.5.3 For each of the stocks we have x as change in Open Interest and y as change in Futures price

4.5.4 We determine coefficient of correlation r using equation (3.1)

4.6 FINDINGS:

4.6.1 Associated Cement Companies (ACC)

The behaviour of the futures price and the open interest in the futures contract of ACC for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed.

Table 4.2

Correlation between the change futures price and change in Open Interest for ACC

Correlation between the change in futures price and change in Open Interest	0.083087

The correlation between the change in futures price and the change in open interest for the period under study was found to be 0.083087 indicating that only 8.3% of the change in futures price can be explained by the change in Open Interest in the futures contract of ACC. This indicated that the change in futures price and the change in open interest have a low correlation with each other and changes in one variable cannot be fully or partially explained by the changes in the other variable.

4.6.2 Bajaj Auto Limited (Bajaj Auto)

The behaviour of the futures price and the open interest in the futures contract of Bajaj Auto for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed.

Table 4.3

Correlation between the change futures price and change in Open Interest for Bajaj Auto

Correlation between the change in futures price and change in Open Interest	-0.0481

The correlation between the change in futures price for futures contracts of Bajaj Auto and the change in open interest was -0.0481 indicating that the variables are negatively correlated to the extent of 4.81%. This also brings us to the conclusion that the change in futures price and change in open interest in Bajaj Auto futures contracts are not related ot each other and one cannot be explained by the behaviour of the other statistically as their correlation coefficient is very low at -0.0481.

4.6.3 Bharti Airtel Limited (Bharti)

The behaviour of the futures price and the open interest in the futures contract of Bharti for the period 20th April 2005 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed. The period of study is truncated as futures contracts in Bharti Airtel were introduced only in the month of April 2005.

Table 4.4

Correlation between the change futures price and change in Open Interest for Bharti

Correlation between the change in futures price and change in Open Interest	-0.0598

The correlation between the change in prices of the futures contracts in Bharti and the change in open interest in the same contract was -0.0598 indicating that the changes in the prices of futures contracts cannot be explained by the change in the open interest in the futures contract as there is a negative correlations and that too of a very small magnitude. This leads us to the conclusion that change in futures have no relation to the change in open interest in these futures contracts.

4.6.4 Bharat Heavy Electricals Limited (BHEL)

The behaviour of the futures price and the open interest in the futures contract of BHEL for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed.

Table 4.5

Correlation between the change futures price and change in Open Interest for BHEL

Correlation between the change in futures price and change in Open Interest	0.0323

The correlation between the change in price of the futures contract of BHEL and the change in Open interest in the near month contract of BHEL was 0.0323 indicating that only 3.23% of the change in the price of the futures contract can be explained by the change in open interest in the futures contracts of BHEL. That would also mean that the change in price of futures contracts of BHEL has no relation to the change in Open interest in the futures contracts of BHEL.

4.6.5 Cipla Limited (Cipla)

The behaviour of the futures price and the open interest in the futures contract of Cipla for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed.

Table 4.6

Correlation between the change futures price and change in Open Interest for Cipla

Correlation between the change in futures price and change in Open Interest	-0.234

The correlation between the change in price of the futures contract and the change in Open Interest was -0.234 indicating a negative correlation between the two variables. This negative correlation would mean that the changes in futures price of Cipla do not have a relation with the changes in the Open Interest in Cipla Futures contracts and the change in one cannot be explained by the change in other.

4.6.6 Gas Authority of India Limited (GAIL)

The behaviour of the futures price and the open interest in the futures contract of GAIL for the period 20th September 2003 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed. The Dates are truncated as the futures contracts in GAIL were introduced in September 2003.

Table 4.7

Correlation between the change futures price and change in Open Interest for GAIL

Correlation between the change in futures price and change in Open Interest	0.00142

The Correlation between the change in prices of the futures contract of GAIL and the change in open interest was 0.00142 indicating that only 0.14% of the change in futures prices of GAIL can be explained by the changes in Open interest in Gail futures contracts. This leads us to a conclusion that the change in futures prices of GAIL and the change in Open interest in Gail contracts are not independent of each other.

4.6.7 Housing Development Finance Corporation Limited (HDFC)

The behaviour of the futures price and the open interest in the futures contract of HDFC for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed.

Table 4.8

Correlation between the change futures price and change in Open Interest for HDFC

Correlation between the change in futures price and change in Open Interest	-0.1534

The correlation between change in HDFC futures contract prices and change in open interest in the near month contracts for HDFC futures was -0.1534 indicating that the change in futures prices for HDFC cannot be explained by the change in Open Interest in the HDFC futures contracts. This leads us to conclude that HDFC futures contracts' prices and the open interest in the HDFC futures contracts are independent of each other.

4.6.8 Hero Honda Limited (Hero Honda)

The behaviour of the futures price and the open interest in the futures contract of Hero Honda for the period 27th February 2003 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed. Futures contracts in Hero Honda were introduced in February 2003 hence the date of start of the data is 27th February 2003 which happens to be the first day of trading in the March 2003 contract.

Table 4.9

Correlation between the change futures price and change in Open Interest for Hero Honda

Correlation between the change in futures price and change in Open Interest	-0.13167

The correlation between the change in futures price of Hero Honda and the change in open interest in futures contracts of Hero Honda was -0.13167, which means that the two variables are independent of each other and they do not have a strong and positive correlation.

4.6.9 Infosys Technologies Limited (Infosys)

The behaviour of the futures price and the open interest in the futures contract of Infosys for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed.

Table 4.10

Correlation between the change futures price and change in Open Interest for Infosys

Correlation between the change in futures price and change in Open Interest	-0.11383

The Correlation between the change in futures price of Infosys and the change in Open Interest was -0.11383 which indicates that the change in futures prices and the change in Open interest are independent of each other and they do not have a strong positive correlation amongst them.

4.6.10 ITC Limited (ITC)

The behaviour of the futures price and the open interest in the futures contract of ITC for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed.

Table 4.11

Correlation between the change futures price and change in Open Interest for ITC

Correlation between the change in futures price and change in Open Interest	-0.01054

The correlation between the change in futures prices of ITC near month contracts and the change in Open interest for the same contracts was -0.01054 indicating that the change in open interest and the change in prices of futures contracts are independent of each other and they do not have a strong and positive correlation amongst each other.

4.6.11 National Aluminium Company Limited (NALCO)

The behaviour of the futures price and the open interest in the futures contract of NALCO for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed.

Table 4.12

Correlation between the change futures price and change in Open Interest for NALCO

Correlation between the change in futures price and change in Open Interest	-0.00277

The correlation between the change in futures price and the change in Open interest was -0.00277, which means that the change in futures price and the change in open interest are independent of each other and they do not have a strong and positive correlation.

4.6.12 Reliance Industries Limited (Reliance)

The behaviour of the futures price and the open interest in the futures contract of Reliance for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed.

Table 4.13

Correlation between the change futures price and change in Open Interest for Reliance

Correlation between the change in futures price and change in Open Interest	0.05911

The correlation between the change in price of futures contracts of Reliance and the change in Open interest was 0.05911 indicating that 5.9% of the change in futures price of Reliance can be explained by the change in the Open interest of Reliance futures contracts. This leads us to conclude that there is no strong correlation between the change in futures price and the Open Interest in these contracts.

4.6.13 State Bank of India Limited (SBI)

The behaviour of the futures price and the open interest in the futures contract of SBI for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed.

Table 4.14

Correlation between the change futures price and change in Open Interest for SBI

Correlation between the change in futures price and change in Open Interest	0.1806

Correlation between the change in futures price of SBI and the change in Open Interest in SBI futures contracts was 0.1806 indicating that 18.06% of the change in futures prices of SBI could be explained by the change in Open interest. This leads us to conclude that there is a weak-positive correlation between the change in futures price and the change in Open Interest in the SBI futures contracts.

4.6.14 Tata Motors Limited (Tata Motors)

The behaviour of the futures price and the open interest in the futures contract of Tata Motors for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed.

Table 4.15

Correlation between the change futures price and change in Open Interest for Tata Motors

Correlation between the change in futures price and change in Open Interest	0.04476

The correlation between the change in futures prices of Tata Motors and the change in open interest was 0.04476 indicating that only 4.47% of the change in futures prices could be attributed to the change in open interest. Thus leading us to the conclusion that the change in prices of Tata Motors futures contracts and the change in Open interest are not strongly correlated and they are independent of each other.

4.6.15 Tata Power Limited (Tata Power)

The behaviour of the futures price and the open interest in the futures contract of Tata Power for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed.

Table 4.16

Correlation between the change futures price and change in Open Interest for Tata Power

Correlation between the change in futures price and change in Open Interest	0.05067

The Correlation between the change in futures contracts in Tata Power and the change in Open interest in the Tata power futures contracts was 0.05067 indicating that only 5.06% of the change in futures prices of Tata Power can be explained by the changes in the Open interest of these contracts. This leads us to conclude that there is no strong and positive correlation between the two variables. The change in futures prices and change in Open interest are independent of each other.

4.6.16 Tata Steel Limited (Tata Steel)

The behaviour of the futures price and the open interest in the futures contract of Tata Steel for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed.

Table 4.17

Correlation between the change futures price and change in Open Interest for Tata Steel

Correlation between the change in futures price and change in Open Interest	0.0170

The Correlation between the change in futures price and the change in Open interest was 0.0170 indicating that the change in futures price and the change in open interest are independent of each other and they do not have a strong correlation between each other.

4.6.17 Tata Tea Limited (Tata Tea)

The behaviour of the futures price and the open interest in the futures contract of Tata Tea for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed.

Table 4.18

Correlation between the change futures price and change in Open Interest for Tata Tea

Correlation between the change in futures price and change in Open Interest	0.15176

The Correlation between the change in futures prices and the change in Open Interest was 0.15176 indicating that 15.18% of the change in futures price can be explained by the change in open interest in Tata tea futures. This leads us to conclude that there is a weak correlation between the change in futures price and the change in open interest.

4.6.18 S&P CNX Nifty (Nifty)

The behaviour of the futures price and the open interest in the futures contract of NIFTY for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Open interest changed.

Table 4.19

Correlation between the change futures price and change in Open Interest for NIFTY

Correlation between the change in futures price and change in Open Interest	-0.0611

In the case of NIFTY, which is the most liquid of all the futures contracts, the change in open interest and change in futures price have a correlation of -0.0611, which suggests that the change in futures price changes independent of the change in open interest in the NIFTY contract. This also suggests that the change in futures prices of Nifty and the change in Open Interest do not have a strong and positive correlation meaning that we do not need to monitor changes in open interest to predict/ foretell/ expect changes in prices of futures contracts of the NIFTY.

Table 4.20

Correlation between the change in futures price and change in Open Interest

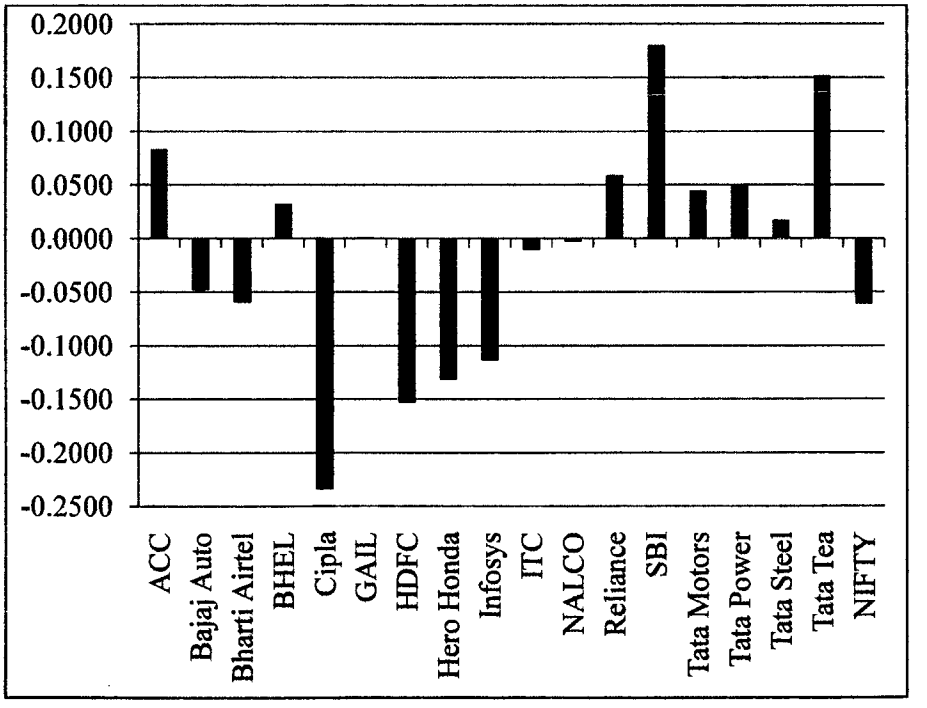
Correlation between Change in Futures Price and Change in Open Interest	
Company	**Correlation**
ACC	0.0831
Bajaj Auto	-0.0481
Bharti Airtel	-0.0598
BHEL	0.0323
Cipla	-0.2344
GAIL	0.0014
HDFC	-0.1534
Hero Honda	-0.1317
Infosys	-0.1138
ITC	-0.0105
NALCO	-0.0028
Reliance	0.0591
SBI	0.1806
Tata Motors	0.0448
Tata Power	0.0507
Tata Steel	0.0170
Tata Tea	0.1518
NIFTY	-0.0611

The Table 4.20 is depicted in the form of a chart to pictorially describe the correlations of the change in future prices of different futures contracts with the change in Open Interest in those contracts. This chart shows that the overall correlation of nearing ZERO meaning that the change in

Futures prices and change in Open Interest are independent of each other. Thus we can conclude that the Open Interest would only indicate the liquidity in the particular futures contract and it does not contain any directional information due to the increase or decrease in the open interest in that particular contract.

Chart 4.1

Correlation Between Change in Futures Price and Change in Open Interest



4.7 Conclusions:

The above chart 4.1 and the data in Table 4.20 show that the correlation between the change in Futures Price and the change in Open Interest is between +0.18 and -0.23 and The correlation between the change in open interest in the NIFTY futures contract and the change in the futures price

of the NIFTY futures is -0.0611 suggesting that the correlation is spread around zero meaning that change in Futures Price does not have any correlation with the change in Open Interest.

Hypothesis 1. *There is a strong and positive correlation between the change in open interest and change in futures price in single stock future.* The hypothesis stands rejected as the correlations hovers around ZERO

Hypothesis 2. *There is a strong and positive correlation between the change in open interest and nifty futures.* The hypothesis stands rejected as the correlation coefficient is nearly ZERO.

This relationship or the absence of it suggests that change in open interest in futures contracts is just a phenomenon of the trading volume and it in no way has some directional information. We can conclude from this analysis that open interest changes as and when the number of open positions increase or decrease in a given contract and it has no bearing over the direction of the market. Thus we can also say that a change in open interest will not lead to a change in futures price in any direction. A corollary of the conclusion is that open interest is a measure of liquidity in the futures contract and not a fore bearer of the price direction of the futures contract.

CHAPTER 5

RELATIONSHIP BETWEEN THE FUTURES PRICE AND COST OF CARRY

The cost of carry model was used in the third chapter and the relationship between the cost of carry and the risk free return (represented by MIBOR) was explored. In this chapter the relationship between change in cost of carry and the change in futures price is tested using correlation as the tool for analysis. The rationale behind it is the popular perception that a change in cost of carry leads to a change in the futures price. This premise is being tested here in this chapter.

5. RELATION BETWEEN THE FUTURES PRICE AND COST OF CARRY

The cost of carry model as enunciated in chapter 3 is a classical model of valuation of futures. The model is a relationship between the spot prices, the futures price and the cost of carry. We use this model as a basis for the validating the relationship between the cost of carry and the price of futures contracts in the Indian stock markets.

5.1 THE COST OF CARRY MODEL

The cost of carry model as explained in section 3.2 is used to validate the relationship between the cost of carry and the futures price. Recall the equation 3.4 which defines the relation between the futures price and the cost of carry.

$$F_t = P_t e^{C(T-t)} \qquad (3.4)$$

F = Futures price of the contract

P = Spot price of the contract

e = 2.7181

T = Date of expiry of the contract

t = Date of the contract price

C = Cost of carry

The above equation defines a straight forward relation between the cost of carry and the futures price. Since we have the data on the futures prices and

spot prices of the selected underlying assets we could easily calculate the cost of carry for every day for every contract.

— After calculating the cost of carry, does this cost of carry have any significant relation with the futures price of the contracts? If the cost of carry goes increases, does the futures price also increase? Does the change in cost of carry bring about a corresponding change in the futures price? These are the questions that are attempted to be answered in the following paragraphs.

5.2 RESEARCH PROBLEM

"To find out the relationship between the change in cost of carry of the future prices of stocks on the National Stock Exchange and the change in futures price"

5.2.1 OBJECTIVES

5.2.1.1 To understand the behaviour of the futures prices of single stock futures vis-à-vis the cost of carry

5.2.1.2 To understand the behaviour of the futures prices of NIFTY futures vis-à-vis the cost of carry.

5.2.2 HYPOTHESES

5.2.2.1 There is a strong and positive correlation between the change in futures price and the change in cost of carry in single stock futures

5.2.2.2 There is a strong and positive correlation between the change in NIFTY futures and the change in cost of carry in NIFTY futures.

5.3 METHOD OF STUDY

5.3.1 Data Collection:

Sixteen liquid stocks were selected on a random basis from the universe of the S&P CNX NIFTY along with the NIFTY itself. The futures prices for the months of the contract expiring in July 2002 to June 2006 were considered for computing the cost of carry in the stock on a daily basis.

The data collected for the sixteen stocks and NIFTY consisted of 48 files each for each stock. Each file contained the OPEN, HIGH, LOW, CLOSE, Last Traded Price, Settlement Price, Number of Contracts Traded, open interest and Change in Open Interest for the specified Contract. The data was available on an average for about 90 days per contract, from the day of introduction of the contract to the expiry of the contract. It was observed that these contracts were traded thinly until they became near-month contracts. Therefore only the data pertaining to the near month contracts was selected and a single data set of near month contract prices was prepared for each of these stocks. The data for the day of expiry was omitted and data for the next contract was included for the day of contract expiry as the cost of carry is expected to be zero on the contract expiry date for a specific contract.

The stocks selected were:

Table 5.1

List of the companies selected for analysis

Company Name	Industry	Symbol
Associated Cement Companies Ltd.	Cement and cement products	ACC
Bajaj Auto Ltd.	Automobiles - 2 and 3 wheelers	BAJAJAUTO
Bharti Airtel Ltd.	Telecommunication – services	BHARTIAIRTEL
Bharat Heavy Electricals Ltd.	Electrical equipment	BHEL
Cipla Ltd.	Pharmaceuticals	CIPLA
GAIL (India) Ltd.	Gas	GAIL
Housing Development Finance Corporation Ltd.	Finance – housing	HDFC
Hero Honda Motors Ltd.	Automobiles - 2 and 3 wheelers	HEROHONDA
Infosys Technologies Ltd.	Computers – software	INFOSYSTCH
I T C Ltd.	Cigarettes	ITC
National Aluminium Co. Ltd.	Aluminium	NATIONALUM
Reliance Industries Ltd.	Refineries	RELIANCE
State Bank of India	Banks	SBIN
Tata Motors Ltd.	Automobiles - 4 wheelers	TATAMOTORS
Tata Steel Ltd.	Steel and steel products	TATASTEEL
Tata Tea Ltd.	Tea and coffee	TATATEA
NIFTY	-	NIFTY

The time series of the open interest of the single stock futures of all the stocks and NIFTY were downloaded and collected for the purpose of analysis. Only the near month futures were considered for analysis, because it was found that the stock futures and NIFTY futures picked up volumes only when they became near month futures. When these contracts are two month or far month futures contracts the volume was found to be negligible. The open interest was found to have been picked up whenever the contract became a near month contract. Therefore only the near month contracts and their open interest was considered for calculations

5.4 LIMITATIONS

5.4.1 The study is limited to the 17 futures contracts selected for a period of June 2002 June 2006. The underlying dynamics of the economy were changing fast and the popularity of futures trading were just picking up in these years and therefore this study would at best describe the phase of evolution of futures market in India.

5.4.2 The study aims to find out whether cost of carry and the change in change in cost of carry in a stock futures contract and index contract have any effect on the change in the prices of the contract. Since the cost of carry equation is a proven theory and has been the cornerstone of all the research on futures contracts and derivatives in general it is not an attempt to prove or disprove a theory. This is attempt to find out how much truth is there in the market

perception that futures prices behave according to the behaviour of the cost of carry.

5.5 DATA COLLECTION AND CONSOLIDATION:

5.5.1 The futures Price data collected from the NSE website (www.nseindia.com) was available in the form of contract wise price volume data for the specific contract. The data for the above said stocks and the NIFTY was downloaded from the NSE website. Data for each stock was contained in a contract-wise file making it upto 48 files per stock. These 48 files were further pruned to one month or near month contract data and then merged into a single data set containing the one month or near month contract price data for the period of 28 June 2002 to 29 June 2006.

5.5.2 The spot prices for all the stocks for the period from 28 June 2002 to 29 june 2006 were downloaded from the NSE website and placed alongside the futures data for the purpose of consolidation.

5.5.3 Thus each data set had the following fields: SYMBOL, EXPIRY DATA, DATE OF TRADE, DAYS TO EXPIRY, FUTURES CLOSE, SPOT CLOSE and OPEN INTEREST.

5.6 DATA ANALYSIS

5.6.1 Correlation

In determining the correlation we use the measure of linear correlation. The population parameter is denoted by the Greek letter rho and the sample statistic is denoted by the roman letter r and is given by the equation

mentioned in chapter 3 as eq. (3.1) In our analysis when x denotes change in COST OF CARRY, y denotes change in FUTURES PRICE.

5.6.2 Determination of Change in FUTURES PRICE

The Change in futures price is found by using the following simple equation

$$\Delta F = \frac{F_t - F_{t-1}}{F_{t-1}} \qquad (5.1)$$

Where

ΔF is the change in futures price.

F_t is the closing futures price of the day.

F_{t-1} is the closing futures price of the previous day.

5.6.3 Determination of change in COST OF CARRY

The change in open interest is found by using the following simple equation

$$\Delta C = \frac{C_t - C_{t-1}}{C_{t-1}} \qquad (5.2)$$

Where

ΔC is the change in Cost of Carry

C_t is the Cost of Carry for the day

C_{t-1} is the Cost of Carry for the previous day

5.7 PROCEDURE

5.7.1 We determine change in Cost of Carry (x) as given by equation (5.2) for each of the stocks selected.

5.7.2 We determine change in Futures Price (y) as given by equation (5.1) for each of the stocks selected.

5.7.3 For each of the stocks we have x as change in Cost of Carry and y as change in Futures price

5.7.4 We determine coefficient of correlation r using equation (3.1) (from Chapter 3)

5.8 FINDINGS

5.8.1 Associated Cement Companies (ACC)

The behaviour of the futures price and the Cost of Carry in the futures contract of ACC for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed.

Table 5.2

Correlation between the change futures price and change in Cost of Carry for ACC

Correlation between the change in futures price and change in Cost of Carry	0.0323

The correlation between the change in futures price and the change in cost of carry was 0.0323 indicating that only 3.23% of the change in futures price can be explained by the change in cost of carry. This leads us to the conclusion that the change in futures price and the change in cost of carry have a very weak correlation and they are independent of each other.

5.8.2 Bajaj Auto Limited (Bajaj Auto)

The behaviour of the futures price and the Cost of Carry in the futures contract of Bajaj Auto for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed.

Table 5.3

Correlation between the change futures price and change in Cost of Carry for Bajaj Auto

Correlation between the change in futures price and change in Cost of Carry	-0.0189

The correlation between the change in cost of carry and the change in futures price for Bajaj auto one month contracts was -0.0189 indicating that the change in cost of carry and the change in futures price of Bajaj Auto have a weak correlation and therefore the changes in one are independent of the other.

5.8.3 Bharti Airtel Limited (Bharti)

The behaviour of the futures price and the Cost of Carry in the futures contract of Bharti for the period 20th April 2005 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed. The futures contracts in Bharti Airtel were introduced in the month of April 2005 only and therefore the data available is for only 14 months.

Table 5.4

Correlation between the change futures price and change in Cost of Carry for Bharti

Correlation between the change in futures price and change in Cost of Carry	-0.05683

The correlation between the change in cost of carry and the change in prices of futures contracts in Bharti was -0.05683 indicating that the change in cost of carry and the change in the price of futures contracts in Bharti have a weak correlation and therefore each of the variables are independent of each other.

5.8.4 Bharat Heavy Electricals Limited (BHEL)

The behaviour of the futures price and the Cost of Carry in the futures contract of BHEL for the period 28th June 2002 to 28th June 2006 was studied to observe the changes in the futures price when the Cost of Carry changed.

Table 5.5

Correlation between the change futures price and change in Cost of Carry for BHEL

Correlation between the change in futures price and change in Cost of Carry	-0.07403

The correlation between the change in cost of carry and the change in price of the futures contracts in BHEL was -0.07403 indicating that the change in cost of carry and the change in prices of futures prices in BHEL have a weak correlation with each other and therefore the change in them are independent of each other.

5.8.5 CIPLA (CIPLA)

The behaviour of the futures price and the Cost of Carry in the futures contract of CIPLA for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed.

Table 5.6

Correlation between the change futures price and change in Cost of Carry for CIPLA

Correlation between the change in futures price and change in Cost of Carry	-0.00765

The correlation between the change in cost of carry and the change in price of the futures contracts was -0.00765 indicating that the change in cost of carry and the change in price of futures contracts in CIPLA are weakly correlated and therefore it can be concluded that these variables are independent of each other.

5.8.6 Gas Authority of India Limited (GAIL)

The behaviour of the futures price and the Cost of Carry in the futures contract of GAIL for the period 26th Sep 2003 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed. The futures contracts in GAIL were introduced on 26th September 2003, thus the data was available from September 2003 to June 2006.

Table 5.7

Correlation between the change futures price and change in Cost of Carry for GAIL

Correlation between the change in futures price and change in Cost of Carry	-0.01169

The correlation between the change in cost of carry and the change in prices of futures contracts in GAIL was -0.01169 indicating that the change in cost of carry and the change in futures price in GAIL futures are weakly correlated and therefore they are independent of each other. This also means that a change in futures price cannot be explained by the change in cost of carry in these contracts.

5.8.7 Housing Development Finance Corporation Limited (HDFC)

The behaviour of the futures price and the Cost of Carry in the futures contract of HDFC for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed.

Table 5.8

Correlation between the change futures price and change in Cost of Carry for HDFC

Correlation between the change in futures price and change in Cost of Carry	-0.1534

The correlation between the change in cost of carry and the change in futures price of one month future contracts in HDFC was -0.1534 indicating that the change in cost of carry and the change in futures price have a weak negative correlation. This leads us to conclude that the change in cost of carry and the change in futures prices are independent of each other and a change in one cannot be attributed to the change in another.

5.8.8 Hero Honda Motors Limited (Hero Honda)

The behaviour of the futures price and the Cost of Carry in the futures contract of Hero Honda for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed.

Table 5.9

Correlation between the change futures price and change in Cost of Carry for Hero Honda

Correlation between the change in futures price and change in Cost of Carry	-0.13167

The correlation between the change in cost of carry and the change in futures price in Hero Honda futures was -0.13167 indicating that the change in cost of carry and the change in futures prices for Hero Honda futures contracts have weak negative correlation and therefore the variables are independent of each other.

5.8.9 Infosys Technologies Limited (Infosys)

The behaviour of the futures price and the Cost of Carry in the futures contract of Infosys for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed.

Table 5.10

Correlation between the change futures price and change in Cost of Carry for Infosys

Correlation between the change in futures price and change in Cost of Carry	0.0658

The correlation between the change in cost of carry and the change in price of futures contracts in Infosys was 0.0658 indicating that only 6.58% of the change in futures price can be explained by the change in cost of carry. This leads us to a conclusion that there is a weak correlation between the change in cost of carry and the change in futures price.

5.8.10 ITC Limited (ITC)

The behaviour of the futures price and the Cost of Carry in the futures contract of ITC for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed.

Table 5.11

Correlation between the change futures price and change in Cost of Carry for ITC

Correlation between the change in futures price and change in Cost of Carry	-0.0259

The correlation between the change in cost of carry and the change in the price of futures contracts in ITC was -0.0259 indicating that the change in cost of carry and the change in futures contracts price have negative correlation and are independent of each other.

5.8.11 National Aluminium Company Limited (NALCO)

The behaviour of the futures price and the Cost of Carry in the futures contract of NALCO for the period 31st January 2003 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed. The futures contracts in NALCO were introduced on 13st January 2003: The data is available for the period from January 2003 to June 2006.

Table 5.12

Correlation between the change futures price and change in Cost of Carry for NALCO

Correlation between the change in futures price and change in Cost of Carry	-0.1075

The correlation between the change in cost of carry and the change in futures price of NALCO was -0.1075 indicating, that the change in cost of carry and the change in futures price have a negative correlation. This leads us to a conclusion that they are independent of each other and the behaviour of one cannot be explained by the behaviour of other.

5.8.12 Reliance Industries Limited (Reliance)

The behaviour of the futures price and the Cost of Carry in the futures contract of Reliance for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed.

Table 5.13

Correlation between the change futures price and change in Cost of Carry for Reliance

Correlation between the change in futures price and change in Cost of Carry	0.02778

The correlation between the change in a cost of carry and change in futures price of Reliance was 0.02778. This indicates that only 2.7% of the change in futures price of Reliance can be explained by the change in the cost of carry. This leads us to conclude that the change in cost of carry and the change in futures price are independent of each other.

5.8.13 State Bank of India (SBI)

The behaviour of the futures price and the Cost of Carry in the futures contract of SBI for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed.

Table 5.14

Correlation between the change futures price and change in Cost of Carry for SBI

Correlation between the change in futures price and change in Cost of Carry	-0.06515

The correlation between the change in cost of carry and the change in the price of futures contracts in SBI was -0.06515 indicating that the two variables are negatively weakly correlated. This leads us to conclude that a change in futures price cannot be explained by the cost of carry in the futures price.

5.8.14 Tata Motors Limited (Tata Motors)

The behaviour of the futures price and the Cost of Carry in the futures contract of Tata Motors for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed.

Table 5.15

Correlation between the change futures price and change in Cost of Carry for Tata Motors

Correlation between the change in futures price and change in Cost of Carry	-0.03045

The correlation between the change in cost of carry and the change in futures price in Tata Motors was -0.03045 indicating that the change in cost of carry and the change in futures price are weakly correlated thus, a change in one cannot be explained by the change in other. This leads us to conclude that the change in cost of carry and the change in futures price are independent of each other.

5.8.15 Tata Power Limited (Tata Power)

The behaviour of the futures price and the Cost of Carry in the futures contract of Tata Power for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed.

Table 5.16

Correlation between the change futures price and change in Cost of Carry for Tata Power

Correlation between the change in futures price and change in Cost of Carry	0.04806

The correlation between the change in cost of carry and the change in futures price in Tata Power was 0.04806 indicating that the change in cost of carry and the change in futures price are very weakly correlated. This leads us to the conclusion that the change in futures price and the change in cost of carry are independent of each other.

5.8.16 Tata Steel Limited (Tata Steel)

The behaviour of the futures price and the Cost of Carry in the futures contract of Tata Steel for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed.

Table 5.17

Correlation between the change futures price and change in Cost of Carry for Tata Steel

Correlation between the change in futures price and change in Cost of Carry	0.03017

The correlation between the change in cost of carry and the change in futures price of Tata Steel was 0.3017 indicating that the change in cost of carry and the change in futures price have a weak correlation. This leads us to conclude that the change in futures price of Tata steel cannot be explained by the change in cost of carry of Tata Steel futures and both are independent of each other.

5.8.17 Tata Tea Limited (Tata Tea)

The behaviour of the futures price and the Cost of Carry in the futures contract of Tata Tea for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed.

Table 5.18

Correlation between the change futures price and change in Cost of Carry for Tata Tea

Correlation between the change in futures price and change in Cost of Carry	0.06869

The correlation between the change in cost of carry and the change in futures price in Tata Tea futures contracts was 0.06869 indicating that the change in cost of carry and change in futures price are weakly correlated and a change in one cannot be attributed to the change in the other. This leads us to conclude that the change in cost of carry and change in futures price are independent of each other.

5.8.18 S & P CNX NIFTY (NIFTY)

The behaviour of the futures price and the Cost of Carry in the futures contract of NIFTY for the period 28th June 2002 to 28th June 2006 was studied using correlation to observe the changes in the futures price when the Cost of Carry changed.

Table 5.19

Correlation between the change futures price and change in Cost of Carry for NIFTY

Correlation between the change in futures price and change in Cost of Carry	0.0311

The correlation between the change in cost of carry and the change in futures price in NIFTY was 0.0311 indicating that the change in cost of carry and the change in futures price in the NIFTY have a weak correlation. This leads us to conclude that the change in cost of carry and the change in futures price are independent of each other.

Table 5.20

Correlation between the change in futures price and the change in cost of carry

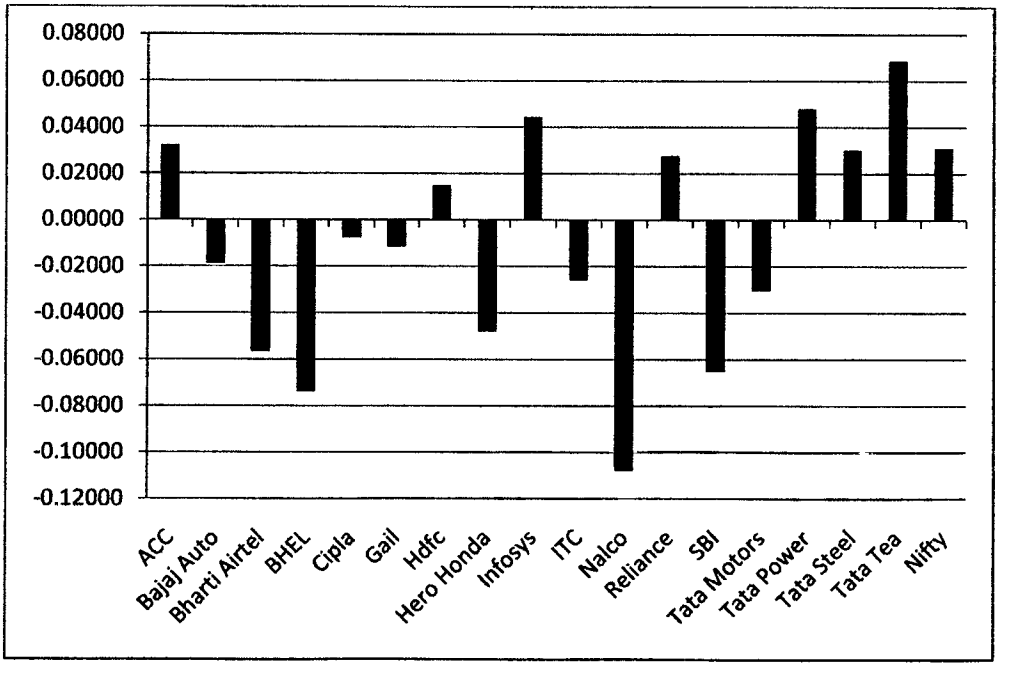
Correlation between Change in Futures Price and change in Cost of Carry	
Name of Company	Correlation
ACC	0.03231
Bajaj Auto	-0.01891
Bharti Airtel	-0.05683
BHEL	-0.07403
Cipla	-0.00765
Gail	-0.01169
HDFC	0.015114
Hero Honda	-0.047970
Infosys	0.044636
ITC	-0.025900
Nalco	-0.107954
Reliance	0.027795
SBI	-0.065147
Tata Motors	-0.030452
Tata Power	0.048062
Tata Steel	0.030173
Tata Tea	0.068696
NIFTY	0.031105

The Table 5.20 depicts the distribution of the correlation between the change in cost of carry and the change in futures price and it can be observed from the

table that the correlation coefficient hovers around ZERO. This leads us to the conclusion that the change in futures price cannot be explained by the change in cost of carry at all. This also means that popular conception that futures prices vary with the change in cost of carry is a misconception. The chart below describes the distribution of correlation.

Chart 5.1

Correlation between the change in cost of carry and the change in futures price.



5.9 CONCLUSION

It is clear from the chart 5.1 and the table 5.20 that the correlation between the change in cost of carry and the change in futures price of the futures contracts selected as sample from the universe of the NIFTY constituents has a range of -0.1079 for NALCO and 0.0687 for Tata Tea futures. This leads us to conclude that the variables are not related to each other and they are independent of each other.

Hypothesis 1: *There is a strong and positive correlation between the change in futures price and the change in cost of carry in single stock futures.* The hypothesis is rejected as the correlation coefficient hovers around ZERO.

Hypothesis 2: *There is a strong and positive correlation between the change in NIFTY futures and the change in cost of carry in NIFTY futures.* The hypothesis is rejected as the correlation coefficient hovers around ZERO.

This relationship or the absence of it suggests that the change in cost of carry does not dictate any change in the futures prices. This also means that the cost of carry does not have any directional information. We can conclude from this analysis that cost of carry changes as and when the cost of money increases or decreases in the economy and it has no bearing over the direction of the market. Thus we can also say that a change in cost of carry will not lead to a change in futures price in any direction.

CHAPTER 6

SUMMARY OF FINDINGS AND SCOPE FOR FURTHER RESEARCH

This chapter gives the summary of the findings of the research work carried out. The objectives leading to the hypotheses and their results are all put in one place. The chapter also summarises the theoretical background. Later it is followed by the scope for further research.

6. SUMMARY OF FINDINGS AND SCOPE FOR FURTHER RESEARCH

The introduction of derivatives trading in the Indian stock markets has brought about a sea change in the workings of the Indian stock markets. The turnover in the markets has increased steadily and price discovery has become more transparent. Derivatives have been defined as instruments that derive value from the underlying security. Out of the different kinds of derivatives the focus of this research work is on the futures contracts. The central theme of this research work is the validation of the cost of carry model. The cost of carry model described the equation 3.2

$$F_t = P_t e^{(T-t)} \qquad (3.2)$$

Where

F_t is the price of the Futures contract on date t

P_t is the price of the underlying asset on date t

r is the appropriate interest rate per annum for the period (T – t)

This leads us to a new generalization that is: The price of the Futures contract is equal to the present price of the underlying asset plus the cost of carrying the asset for the period (T-t) this can be represented as: (as in chapter 3 equation 3.3)

$$F_t = P_t + C \qquad (3.3)$$

Where C is the net cost of carry. The net cost of carry will take into account not only the cost of funds borrowed to purchase the asset, but also the storage costs (i.e. custody charges) and any other income flowing from the asset during the life of the future. If storage costs, borrowing costs and income

accrue at the same time, the whole net cost of carry can be treated as an annual rate and if continuous compounding is assumed then the equation 3.3 would become (as in chapter 3 equation 3.4)

$$F_t = P_t e^{C(T-t)} \qquad (3.4)$$

Where C= **cost of carry** is expressed as a rate and quoted in decimals.

The motive behind the research is to find empirical evidence that the cost of carry relation holds good for the Indian markets.

This objective of research has been divided into three objectives

6.1 NEED AND RELEVANCE OF THE STUDY

After going through the prima facie literature available a need was felt to find out the main concerns in valuations of futures markets in India. It was also felt that not enough literature is available in the realm of futures markets and valuations of single stock futures as well as index futures in the Indian context. This study would help in enhancing the knowledge base of the academic community regarding valuations of single stock futures and Index futures. It would also help investors, arbitrageurs and speculators to form their strategies of participating in the derivatives market and devise better hedging strategies.

There is a popular belief that the prices in the spot market are influenced by the futures market as players in the futures market are more suave and smart. Another belief in the market is that the cost of carry is nothing but the risk free rate of return. The market participants also popularly believe that change in open interest has a bearing on the direction of the price in the contracts. This study envisages testing these assumptions. The results would either confirm

and reinforce the belief system in the market or raise doubts on the effect of these parameters with the direction of the market.

6.2 OBJECTIVES

Objectives of the Study

6.2.1 To examine the relations between the overnight MIBOR (the risk free rate) and the cost of carry in the futures market on single stock and the index futures.

6.2.2 To understand the behaviour of the futures prices vis-à-vis the cost of carry

6.2.3 To understand the behaviour of the futures prices vis-à-vis open interest

6.3 HYPOTHESES

The above objectives lead us to the following hypotheses

6.3.1 There is strong and positive correlation between the risk free rate of return (represented by MIBOR) and the cost of carry for single stock futures.

6.3.2 There is a strong and positive correlation between the risk free rate of return (represented by MIBOR) and the cost of carry for NIFTY futures.

6.3.3 There is a strong and positive correlation between the change in risk free rate of return (represented by MIBOR) and the change in the cost of carry for single stock futures.

6.3.4 There is a strong and positive correlation between the change in risk free rate of return (represented by MIBOR) and the change in cost of carry for NIFTY futures.

6.3.5 There is a strong and positive correlation between the change in futures price and the change in cost of carry in single stock futures.

6.3.6 There is a strong and positive correlation between the change in NIFTY futures and the change in cost of carry in NIFTY futures.

6.3.7 There is a strong and positive correlation between the change in open interest and change in futures price in single stock futures.

6.3.8 There is a strong and positive correlation between the change in open interest and NIFTY futures.

6.4 METHODOLOGY

6.4.1 **Period of Study:** The period of study is defined as 2002 to 2006, which covers the early years in the introduction of futures in the Indian markets and then the developmental phase in the futures market in India. It is also large enough to enable reaching to meaningful conclusions.

6.4.2 **Sample size:** Seventeen liquid stocks were selected on a random basis from the universe of the S&P CNX NIFTY along with the NIFTY itself. The futures prices for the months of the contract expiring in July 2002 to June 2006 were considered for computing the cost of carry in the stock on a daily basis.

The data collected for the seventeen stocks and NIFTY consisted of 48 files each for each stock. Each file contained the OPEN, HIGH, LOW, CLOSE, Last Traded Price, Settlement Price, Number of Contracts Traded, open interest and Change in Open Interest for the specified Contract. The data was available on an average for about 90 days per contract, from the day of introduction of the contract to the expiry of the contract. It was observed that these contracts were traded thinly until they became near-month contracts. Therefore only the data pertaining to the near month contracts was selected

and a single data set of near month contract prices was prepared for each of these stocks. The data for the day of expiry was omitted and data for the next contract was included for the day of contract expiry as the cost of carry is expected to be zero on the contract expiry date for a specific contract.

The stocks selected were:

Table 6.1

List of the companies selected for analysis

Company Name	Industry	Symbol
Associated Cement Companies Ltd.	Cement and cement products	ACC
Bajaj Auto Ltd.	Automobiles - 2 and 3 wheelers	BAJAJAUTO
Bharti Airtel Ltd.	Telecommunication – services	BHARTIAIRTEL
Bharat Heavy Electricals Ltd.	Electrical equipment	BHEL
Cipla Ltd.	Pharmaceuticals	CIPLA
GAIL (India) Ltd.	Gas	GAIL
Housing Development Finance Corporation Ltd.	Finance – housing	HDFC
Hero Honda Motors Ltd.	Automobiles - 2 and 3 wheelers	HEROHONDA
Infosys Technologies Ltd.	Computers – software	INFOSYSTCH
I T C Ltd.	Cigarettes	ITC
National Aluminium Co. Ltd.	Aluminium	NATIONALUM
Reliance Industries Ltd.	Refineries	RELIANCE
State Bank of India	Banks	SBIN
Tata Motors Ltd.	Automobiles - 4 wheelers	TATAMOTORS
Tata Steel Ltd.	Steel and steel products	TATASTEEL
Tata Tea Ltd.	Tea and coffee	TATATEA
NIFTY	-	NIFTY

6.4.3 The Time series of the 14- day MIBOR was also collected for the same period from the NSE website.

6.4.4 **Source of Data:** The elements of the data for the study were drawn from the NSE website. And the web site of Clearing Corporation of India. Some of the data was also be drawn from various sources like CMIE PROWESS, RBI Bulletin, RBI Website, Securities Trading Corporation of India Website.

6.5 DATA ANALYSIS AND MAJOR FINDINGS

6.5.1 *Relationship between cost of carry and the risk free rate of return:*

The analysed data threw up an interesting aspect that the cost of carry and the risk free rate of return (represented by MIBOR) are neither strongly correlated nor do they have a positive or negative correlation. The correlation between the change in cost of carry and the change in MIBOR is between +0.05 and -0.15 suggesting that the correlation is spread around zero meaning that change in cost of carry does not have any correlation with the change in MIBOR which happens to be the benchmark interest rates as far as the commercial short term money market is concerned. This leads us to think that the investors do not look up to the MIBOR as their cost of funds nor do they consider that MIBOR is the right bench mark as far as the interest rate and cost of money scenario is considered.

When we look at the table of the correlation between MIBOR and Cost of Carry we get a similar picture. The same has been illustrated in Chart 3.2 and Table 3.19. Here too the charts and the table show that the correlation is between 0.16 and -0.16 suggesting that on an average the correlation rallies around zero meaning that the cost of carry and the MIBOR do not suggest any

correlation amongst them and changes in one may not result in the change of other.

Hypothesis: *There is strong and positive correlation between the risk free rate of return (represented by MIBOR) and the cost of carry for single stock futures.* Stands rejected as the correlation is not strong, nor uniformly positive.

Hypothesis: *There is a strong and positive correlation between the risk free rate of return (represented by MIBOR) and the cost of carry for NIFTY futures.* Stands rejected as the correlation is nearing zero.

Hypothesis: *There is a strong and positive correlation between the change in risk free rate of return (represented by MIBOR) and the change in the cost of carry for single stock futures.* Stands rejected as the correlation hovers around zero.

Hypothesis: *There is a strong and positive correlation between the change in risk free rate of return (represented by MIBOR) and the change in cost of carry for NIFTY futures.* Stands rejected as the correlation is nearly zero.

This leads us to believe that the Indian investors are not looking at MIBOR as a benchmark at all and rely on some other rate as the bench mark interest rate. Another argument can be that MIBOR is just a bench mark rate, but the cost of carry not only includes the interest cost but also the risk involved because of the volatility of the stock, the index and the market as a whole.

This leads us to suggest that the C in the cost of carry model given in equation 3.4 would contain volatility also as a determinant of cost of carry. Thus we conclude that the cost of carry cannot be assumed to be the risk free rate and

a component of risk in the form of volatility has to be inducted into the model to make it complete.

This goes on to suggest that investors do not look upon the risk free rate of return as a benchmark at all and the investors assumed rate of return is completely different from the prevailing risk free rates of return in the organized market or the banking industry. The corollary of this is that the investors' benchmark rates must be the opportunity cost of their money of their cost of individual capital.

6.5.2 ***Relationship between the Futures Price and Open Interest:***

There is a popular belief that the change in the open interest in a particular stock futures contract or an index contract would trigger off an immediate reaction in the price of the stock. This belief stands nullified by the study. The study shows that the change in futures prices and change in open interest do not have a strong correlation suggesting that these two variables are independent of each other.

The chart 4.1 and the data in Table 4.20 show that the correlation between the change in Futures Price and the change in Open Interest is between +0.18 and -0.23 and The correlation between the change in open interest in the NIFTY futures contract and the change in the futures price of the NIFTY futures is -0.0611 suggesting that the correlation is spread around zero meaning that change in Futures Price does not have any correlation with the change in Open Interest.

Hypothesis: There is a strong and positive correlation between the change in open interest and change in futures price in single stock future. The hypothesis stands rejected as the correlations hovers around ZERO

Hypothesis: There is a strong and positive correlation between the change in open interest and NIFTY futures. The hypothesis stands rejected as the correlation coefficient is nearly ZERO.

This relationship or the absence of it suggests that change in open interest in futures contracts is just a phenomenon of the trading volume and it in no way has some directional information. We can conclude from this analysis that open interest changes as and when the number of open positions increase or decrease in a given contract and it has no bearing over the direction of the market. Thus we can also say that a change in open interest will not lead to a change in futures price in any direction. A corollary of the conclusion is that open interest is a measure of liquidity in the futures contract and not a fore bearer of the price direction of the futures contract.

6.5.3 *Relationship between the cost of carry and the Futures price*

Contrary to popular perception that the futures price change when the cost of carry changes, the data suggests that change in cost of carry and change in futures prices are independent of each other and there may be many more variables like economic and company specific news, volatility of the stocks and others variable which determine the change in the futures prices of the stocks. The same phenomenon is observed in the relationship between the cost of carry and the NIFTY futures also.

It is clear from the chart 5.1 and the table 5.20 that the correlation between the change in cost of carry and the change in futures price of the futures contracts selected as sample from the universe of the NIFTY constituents has a range of -0.1079 for NALCO and 0.0687 for Tata Tea futures. This leads us to conclude that the variables are not related to each other and they are independent of each other.

Hypothesis: *There is a strong and positive correlation between the change in futures price and the change in cost of carry in single stock futures.* The hypothesis is rejected as the correlation coefficient hovers around ZERO.

Hypothesis: *There is a strong and positive correlation between the change in NIFTY futures and the change in cost of carry in NIFTY futures.* The hypothesis is rejected as the correlation coefficient hovers around ZERO.

This relationship or the absence of it suggests that the change in cost of carry does not dictate any change in the futures prices. This also means that the cost of carry does not have any directional information. We can conclude from this analysis that cost of carry changes as and when the cost of money increases or decreases in the economy and it has no bearing over the direction of the market. Thus we can also say that a change in cost of carry will not lead to a change in futures price in any direction.

6.6 SCOPE FOR FURTHER RESEARCH

- As the futures market is still growing in India. The number of stocks permitted into the futures and options markets is increasing periodically and probably in the next three years more contracts will be available for trading and thus the markets will be deeper and broader. Then it would be advisable to probe further

6.7.1 The relationship between the spot prices and futures prices using intraday prices data by using statistical methods to ascertain the lead lag relationships between the two variables.

6.7.2 The relationship between open interest, cost of carry, volatility, delivery volumes and other parameters with the change in futures prices and the spot prices. The relationships can be explored using statistical models and a model can be fitted using an inter-disciplinary approach.

6.7.3 Exploration of other parameters with the change in futures prices and the spot prices. As there seem to be many more variables involved in the price discovery mechanism it would be worthwhile to probe further and explore other probable parameters which would describe the change in futures price with respect to the change in spot prices.

6.7.4 Finally, since all the variables mutually interact with each other at the same time a relationship needs to be drawn using all the variables. This calls for a massive interdisciplinary research to build a model to define the relationships amongst all the variables.

The study is an attempt to understand the relationship between the cost of carry and the risk free rate of return, the relationship between the change in cost of carry and the change in risk free rate of return, the relationship between the change in futures price and the change in cost of carry and the relationship between the change in open interest and the change in futures price. This research work has thrown up interesting results about these relationships. We find that the change in futures prices cannot be explained by the change in open interest and the change in cost of carry. We also find that the investors do not consider that the risk free rate of return is as the cost of carry and there is no relation between the change in cost of carry and the change in risk free rate of return.

LIST OF ABBREVIATIONS

ABC Additional Base Capital

BMC Base Minimum Capital

BSE Bombay Stock Exchange

CBOT: Chicago Board of Trade

CDSL Central Depositories Services Ltd.

CM Capital Market

CME: Chicago Mercantile Exchange

Co. Company

DCA Department of Company Affairs

DEA Department of Economic Affairs

DP Depository Participant

DPG Dominant Promoter Group

DQ Disclosed Quantity

DvP Delivery versus Payment

F&O Futures and Options

FI Financial Institution

FIA: Futures Industry Association

FII Foreign Institutional Investors

FTP File Transfer Protocol

IOC Immediate or Cancel

IPF Investor Protection Fund

ISIN International Securities Identification Number

KOSPI: Korea Composite Stock Price Index

LEAPs : Long Term Equity Anticipation Securities

LIFFE: London International Financial Futures and Options Exchange

LTP Last Trade Price

MATIF: Marché à Terme International de France

MBP Market By Price

MexDer: the Mexican Derivatives Exchange

MTM Mark To Market

NCFM NSE's Certification in Financial Markets

NEAT National Exchange for Automated Trading

NSCCL National Securities Clearing Corporation Limited

NSCCL National Securities Clearing Corporation Ltd.

NSDL National Securities Depository Ltd.

NSE National Stock Exchange

NSE: National Stock Exchange

OTC : Over The Counter

OTC Over The Counter

RBI Reserve Bank of India

RDM Retail Debt Market

S&P: Standard and Poor

SAT Securities Appellate Tribunal

SBTS Screen Based Trading System

SC(R)A : Securities Contract Regulation Act 1956

SC(R)A Securities Contracts (Regulation) Act, 1956

SC(R)R Securities Contracts (Regulation) Rules, 1957

SEBI Securities and Exchange Board of India

SGF Settlement Guarantee Fund

SGX: Singapore Exchange

SRO Self Regulatory Organisation

T+2 Second day from the trading day

TIIE: Tasa de Interés Interbancaria de Equilibrio (Mexican Interbank Interest rate)

TM Trading Member

T-Note: Treasury Note of Federal Reserve

UTI Unit Trust of India

VaR Value at Risk

VSAT Very Small Aperture Terminal

WDM Wholesale Debt Market

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APPENDIX A								
Sample Data of Correlation between Cost of Carry and MIBOR for NIFTY								
	correl Mibor and COC			0.0068				
	correl D MIBOR and D COC			-0.0495				
Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
25-Jul-02	28-Jun-02	27	1062.25	1057.8	6.98	0.0560		
25-Jul-02	01-Jul-02	24	1072.45	1068.95	6.91	0.0490	-0.0100	-0.1240
25-Jul-02	02-Jul-02	23	1068.3	1068.05	6.99	0.0037	0.0116	-0.9253
25-Jul-02	03-Jul-02	22	1072.25	1069.9	6.98	0.0359	-0.0014	8.8007
25-Jul-02	04-Jul-02	21	1070.95	1070.55	6.94	0.0064	-0.0057	-0.8216
25-Jul-02	05-Jul-02	20	1073.8	1073.85	6.83	-0.0008	-0.0159	-1.1309
25-Jul-02	08-Jul-02	17	1080.85	1082.05	6.73	-0.0235	-0.0146	27.0362
25-Jul-02	09-Jul-02	16	1078.4	1080.3	6.74	-0.0396	0.0015	0.6856
25-Jul-02	10-Jul-02	15	1072.45	1071.7	6.63	0.0168	-0.0163	-1.4239
25-Jul-02	11-Jul-02	14	1060.55	1056.6	6.60	0.0960	-0.0045	4.7148
25-Jul-02	12-Jul-02	13	1062.45	1058.25	6.62	0.1097	0.0030	0.1432
25-Jul-02	15-Jul-02	10	1049.6	1048	6.76	0.0549	0.0211	-0.4993
25-Jul-02	16-Jul-02	9	1039.15	1035.95	6.70	0.1234	-0.0089	1.2463
25-Jul-02	17-Jul-02	8	1035.15	1032.55	6.73	0.1132	0.0045	-0.0827
25-Jul-02	18-Jul-02	7	1042.8	1041.3	6.67	0.0740	-0.0089	-0.3458
25-Jul-02	19-Jul-02	6	1036.2	1035.9	6.67	0.0174	0.0000	-0.7653
25-Jul-02	22-Jul-02	3	1016.4	1012	6.57	0.5206	-0.0150	28.9653
25-Jul-02	23-Jul-02	2	1022.65	1021.9	6.46	0.1321	-0.0167	-0.7463
25-Jul-02	24-Jul-02	1	1008.05	1004.05	6.47	1.4313	0.0015	9.8387
29-Aug-02	25-Jul-02	35	1009.75	1001.55	6.42	0.0839	-0.0077	-0.9414
29-Aug-02	26-Jul-02	34	983.75	973.5	6.43	0.1109	0.0016	0.3223
29-Aug-02	29-Jul-02	31	975.25	971.65	6.45	0.0429	0.0031	-0.6127
29-Aug-02	30-Jul-02	30	963.4	960.65	6.47	0.0343	0.0031	-0.2013
29-Aug-02	31-Jul-02	29	965.4	958.9	6.42	0.0839	-0.0077	1.4448
29-Aug-02	01-Aug-02	28	960.05	957.7	6.46	0.0315	0.0062	-0.6243
29-Aug-02	02-Aug-02	27	957	954.75	6.48	0.0314	0.0031	-0.0040
29-Aug-02	05-Aug-02	24	967.2	963.25	6.39	0.0614	-0.0139	0.9559
29-Aug-02	06-Aug-02	23	969.6	966.65	6.42	0.0477	0.0047	-0.2230
29-Aug-02	07-Aug-02	22	972.65	969.1	6.30	0.0598	-0.0187	0.2545
29-Aug-02	08-Aug-02	21	955.9	953.55	6.34	0.0422	0.0063	-0.2948
29-Aug-02	09-Aug-02	20	966.7	961.95	6.35	0.0887	0.0016	1.1012
29-Aug-02	12-Aug-02	17	970.85	969.85	6.39	0.0218	0.0063	-0.7539
29-Aug-02	13-Aug-02	16	974.75	976.05	6.35	-0.0300	-0.0063	-2.3741
29-Aug-02	14-Aug-02	15	969.75	969.65	6.39	0.0025	0.0063	-1.0825
29-Aug-02	16-Aug-02	13	979.05	979.25	6.37	-0.0057	-0.0031	-3.2854
29-Aug-02	19-Aug-02	10	980.4	979.85	6.37	0.0202	0.0000	-4.5714
29-Aug-02	20-Aug-02	9	987.75	988.55	6.39	-0.0324	0.0031	-2.6030
29-Aug-02	21-Aug-02	8	988.95	988.45	6.31	0.0228	-0.0125	-1.7027
29-Aug-02	22-Aug-02	7	985.55	985.7	6.32	-0.0078	0.0016	-1.3439
29-Aug-02	23-Aug-02	6	995.05	995.2	6.33	-0.0090	0.0016	0.1555

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
29-Aug-02	26-Aug-02	3	998.3	998.85	6.30	-0.0661	-0.0047	6.3080
29-Aug-02	27-Aug-02	2	986.95	987.7	6.30	-0.1367	0.0000	1.0688
29-Aug-02	28-Aug-02	1	984	985.7	6.25	-0.6214	-0.0079	3.5447
26-Sep-02	29-Aug-02	28	983.45	987.25	6.37	-0.0496	0.0192	-0.9202
26-Sep-02	30-Aug-02	27	1002.15	1010.6	6.32	-0.1120	-0.0078	1.2579
26-Sep-02	02-Sep-02	24	1007.9	1013.5	6.28	-0.0831	-0.0063	-0.2576
26-Sep-02	03-Sep-02	23	997.5	1001.1	6.25	-0.0564	-0.0048	-0.3215
26-Sep-02	04-Sep-02	22	1001.8	1006.95	6.25	-0.0839	0.0000	0.4880
26-Sep-02	05-Sep-02	21	1001.35	1008.6	6.32	-0.1237	0.0112	0.4739
26-Sep-02	06-Sep-02	20	992.1	995.2	6.30	-0.0562	-0.0032	-0.5459
26-Sep-02	09-Sep-02	17	984.7	998.55	6.39	-0.2958	0.0143	4.2670
26-Sep-02	11-Sep-02	15	991.5	998.85	6.26	-0.1773	-0.0203	-0.4007
26-Sep-02	12-Sep-02	14	994	1001.65	6.23	-0.1971	-0.0048	0.1122
26-Sep-02	13-Sep-02	13	984.7	992	6.23	-0.2045	0.0000	0.0375
26-Sep-02	16-Sep-02	10	979.35	985.75	6.23	-0.2345	0.0000	0.1465
26-Sep-02	17-Sep-02	9	989.8	994.9	6.26	-0.2056	0.0048	-0.1233
26-Sep-02	18-Sep-02	8	978.45	983.6	6.29	-0.2362	0.0048	0.1491
26-Sep-02	19-Sep-02	7	974.35	976.05	6.29	-0.0897	0.0000	-0.6205
26-Sep-02	20-Sep-02	6	971.3	969.6	6.26	0.1051	-0.0048	-2.1724
26-Sep-02	23-Sep-02	3	965.9	970.3	6.26	-0.5454	0.0000	-6.1890
26-Sep-02	24-Sep-02	2	962.75	966.2	6.27	-0.6439	0.0016	0.1806
26-Sep-02	25-Sep-02	1	969.25	970.05	6.26	-0.2970	-0.0016	-0.5387
31-Oct-02	26-Sep-02	35	963.35	969.9	6.26	-0.0697	0.0000	-0.7653
31-Oct-02	27-Sep-02	34	968.3	976.45	6.24	-0.0887	-0.0032	0.2733
31-Oct-02	30-Sep-02	31	957.75	963.15	6.32	-0.0653	0.0128	-0.2643
31-Oct-02	01-Oct-02	30	955.6	955.2	6.28	0.0050	-0.0063	-1.0769
31-Oct-02	03-Oct-02	28	952.4	948.2	6.27	0.0568	-0.0016	10.3104
31-Oct-02	04-Oct-02	27	948.9	948.2	6.32	0.0098	0.0080	-0.8268
31-Oct-02	07-Oct-02	24	958.8	954.75	6.24	0.0635	-0.0127	5.4530
31-Oct-02	08-Oct-02	23	963.3	960.8	6.24	0.0407	0.0000	-0.3594
31-Oct-02	09-Oct-02	22	955.35	954.75	6.20	0.0103	-0.0064	-0.7473
31-Oct-02	10-Oct-02	21	958.05	958.45	6.26	-0.0072	0.0097	-1.6961
31-Oct-02	11-Oct-02	20	969.65	971.05	6.23	-0.0260	-0.0048	2.6292
31-Oct-02	14-Oct-02	17	969.6	972.45	6.22	-0.0622	-0.0016	1.3933
31-Oct-02	16-Oct-02	15	972.65	973.6	6.20	-0.0234	-0.0032	-0.6230
31-Oct-02	17-Oct-02	14	975.85	973.3	6.21	0.0673	0.0016	-3.8717
31-Oct-02	18-Oct-02	13	972.15	971.65	6.23	0.0142	0.0032	-0.7883
31-Oct-02	21-Oct-02	10	968.15	967.35	6.23	0.0298	0.0000	1.0889
31-Oct-02	22-Oct-02	9	962.9	962.5	6.23	0.0166	0.0000	-0.4415
31-Oct-02	23-Oct-02	8	957.85	957.35	6.19	0.0235	-0.0064	0.4137
31-Oct-02	24-Oct-02	7	949.6	946.9	6.21	0.1464	0.0032	5.2323
31-Oct-02	25-Oct-02	6	935.9	932.2	6.18	0.2377	-0.0048	0.6231
31-Oct-02	28-Oct-02	3	927.7	922.7	6.20	0.6485	0.0032	1.7286
31-Oct-02	29-Oct-02	2	937.5	936.9	6.23	0.1152	0.0048	-0.8223

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
31-Oct-02	30-Oct-02	1	938.4	937.75	5.95	0.2494	-0.0449	1.1646
28-Nov-02	31-Oct-02	28	952	951.4	5.87	0.0081	-0.0134	-0.9675
28-Nov-02	01-Nov-02	27	952.55	951.45	5.93	0.0154	0.0102	0.9006
28-Nov-02	04-Nov-02	24	963.45	962.1	5.91	0.0210	-0.0034	0.3652
28-Nov-02	05-Nov-02	23	962.85	962.3	5.92	0.0089	0.0017	-0.5748
28-Nov-02	07-Nov-02	21	960.65	960.7	5.88	-0.0009	-0.0068	-1.0998
28-Nov-02	08-Nov-02	20	958.85	956.95	5.91	0.0357	0.0051	-41.0156
28-Nov-02	11-Nov-02	17	955.55	954.05	5.98	0.0333	0.0118	-0.0682
28-Nov-02	12-Nov-02	16	961.75	959.85	6.01	0.0445	0.0050	0.3374
28-Nov-02	13-Nov-02	15	960.3	962.65	6.00	-0.0587	-0.0017	-2.3184
28-Nov-02	14-Nov-02	14	970.65	971.9	5.99	-0.0331	-0.0017	-0.4358
28-Nov-02	15-Nov-02	13	988.75	990.35	5.90	-0.0448	-0.0150	0.3530
28-Nov-02	18-Nov-02	10	993.5	996.85	5.93	-0.1212	0.0051	1.7065
28-Nov-02	20-Nov-02	8	996.95	1001.6	5.89	-0.2094	-0.0067	0.7280
28-Nov-02	21-Nov-02	7	1002.75	1008.75	5.91	-0.3068	0.0034	0.4652
28-Nov-02	22-Nov-02	6	1014.7	1020.15	5.86	-0.3214	-0.0085	0.0476
28-Nov-02	25-Nov-02	3	1021.25	1026.2	5.86	-0.5802	0.0000	0.8053
28-Nov-02	26-Nov-02	2	1032.85	1036.15	5.83	-0.5742	-0.0051	-0.0104
28-Nov-02	27-Nov-02	1	1028.45	1031.1	5.88	-0.9264	0.0086	0.6134
26-Dec-02	28-Nov-02	28	1039.65	1049.7	5.82	-0.1237	-0.0102	-0.8665
26-Dec-02	29-Nov-02	27	1045.75	1050.15	5.83	-0.0560	0.0017	-0.5474
26-Dec-02	02-Dec-02	24	1066.45	1067.9	5.85	-0.0204	0.0034	-0.6359
26-Dec-02	03-Dec-02	23	1056.95	1055	5.82	0.0289	-0.0051	-2.4182
26-Dec-02	04-Dec-02	22	1042.65	1036.4	5.85	0.0984	0.0052	2.4039
26-Dec-02	05-Dec-02	21	1052.7	1045.95	5.77	0.1103	-0.0137	0.1209
26-Dec-02	06-Dec-02	20	1076.15	1069.8	5.82	0.1065	0.0087	-0.0340
26-Dec-02	09-Dec-02	17	1065.75	1058.65	5.81	0.1415	-0.0017	0.3288
26-Dec-02	10-Dec-02	16	1069.4	1063.7	5.83	0.1202	0.0034	-0.1505
26-Dec-02	11-Dec-02	15	1069.55	1069.75	5.82	-0.0045	-0.0017	-1.0373
26-Dec-02	12-Dec-02	14	1071.95	1077	5.81	-0.1209	-0.0017	25.9321
26-Dec-02	13-Dec-02	13	1085.8	1086.2	5.80	-0.0102	-0.0017	-0.9156
26-Dec-02	16-Dec-02	10	1074.25	1078.45	5.80	-0.1405	0.0000	12.7724
26-Dec-02	17-Dec-02	9	1070.55	1073.25	5.81	-0.1008	0.0017	-0.2827
26-Dec-02	18-Dec-02	8	1072.45	1077.95	5.85	-0.2302	0.0069	1.2846
26-Dec-02	19-Dec-02	7	1073.6	1076	5.82	-0.1148	-0.0051	-0.5011
26-Dec-02	20-Dec-02	6	1078.35	1079.3	5.78	-0.0528	-0.0069	-0.5399
26-Dec-02	23-Dec-02	3	1075.35	1076	5.81	-0.0725	0.0052	0.3724
26-Dec-02	24-Dec-02	2	1087.85	1085	5.88	0.4722	0.0120	-7.5118
30-Jan-03	26-Dec-02	35	1093.15	1094.8	5.87	-0.0155	-0.0017	-1.0329
30-Jan-03	27-Dec-02	34	1098.8	1098.4	5.87	0.0039	0.0000	-1.2485
30-Jan-03	30-Dec-02	31	1092.8	1091.95	5.96	0.0090	0.0153	1.3439
30-Jan-03	31-Dec-02	30	1092.1	1093.5	5.90	-0.0154	-0.0101	-2.7013
30-Jan-03	01-Jan-03	29	1102.6	1100.15	5.89	0.0276	-0.0017	-2.7963
30-Jan-03	02-Jan-03	28	1095.1	1093.05	5.88	0.0241	-0.0017	-0.1276

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
30-Jan-03	03-Jan-03	27	1091.6	1089.6	5.85	0.0245	-0.0051	0.0150
30-Jan-03	06-Jan-03	24	1084.75	1084.35	5.82	0.0055	-0.0051	-0.7737
30-Jan-03	07-Jan-03	23	1082.2	1081.8	5.80	0.0058	-0.0034	0.0459
30-Jan-03	08-Jan-03	22	1092.05	1089.35	5.82	0.0405	0.0034	6.0005
30-Jan-03	09-Jan-03	21	1100.7	1097.35	5.81	0.0523	-0.0017	0.2900
30-Jan-03	10-Jan-03	20	1085.55	1080.25	5.78	0.0881	-0.0052	0.6859
30-Jan-03	13-Jan-03	17	1079.65	1073.75	5.80	0.1160	0.0035	0.3172
30-Jan-03	14-Jan-03	16	1082.8	1078.95	5.78	0.0801	-0.0034	-0.3094
30-Jan-03	15-Jan-03	15	1085.85	1085	5.77	0.0188	-0.0017	-0.7655
30-Jan-03	16-Jan-03	14	1087.4	1088.35	5.80	-0.0225	0.0052	-2.1948
30-Jan-03	17-Jan-03	13	1086.75	1086.5	5.83	0.0064	0.0052	-1.2837
30-Jan-03	20-Jan-03	10	1077.3	1076.35	5.85	0.0318	0.0034	3.9850
30-Jan-03	21-Jan-03	9	1078.45	1077.9	5.98	0.0204	0.0222	-0.3575
30-Jan-03	22-Jan-03	8	1081	1082.9	5.94	-0.0790	-0.0067	-4.8728
30-Jan-03	23-Jan-03	7	1071.85	1070.9	5.96	0.0456	0.0034	-1.5771
30-Jan-03	24-Jan-03	6	1060	1056.05	5.98	0.2240	0.0034	3.9121
30-Jan-03	27-Jan-03	3	1043.1	1037.65	5.88	0.6286	-0.0167	1.8063
30-Jan-03	28-Jan-03	2	1050.75	1046.2	5.86	0.7811	-0.0034	0.2426
30-Jan-03	29-Jan-03	1	1038.85	1037.2	5.87	0.5722	0.0017	-0.2674
27-Feb-03	30-Jan-03	28	1042.1	1034.6	5.91	0.0929	0.0068	-0.8377
27-Feb-03	31-Jan-03	27	1045.5	1041.85	6.04	0.0466	0.0220	-0.4979
27-Feb-03	03-Feb-03	24	1057.35	1055.3	6.01	0.0291	-0.0050	-0.3757
27-Feb-03	04-Feb-03	23	1052.55	1054.8	5.90	-0.0334	-0.0183	-2.1482
27-Feb-03	05-Feb-03	22	1047.65	1047.4	5.89	0.0039	-0.0017	-1.1168
27-Feb-03	06-Feb-03	21	1064.3	1063.6	5.87	0.0113	-0.0034	1.8880
27-Feb-03	07-Feb-03	20	1058.1	1057.5	5.89	0.0102	0.0034	-0.0948
27-Feb-03	10-Feb-03	17	1049.85	1048.6	5.91	0.0252	0.0034	1.4710
27-Feb-03	11-Feb-03	16	1050.15	1048	5.90	0.0461	-0.0017	0.8278
27-Feb-03	12-Feb-03	15	1047.05	1044.45	5.91	0.0597	0.0017	0.2940
27-Feb-03	14-Feb-03	13	1040.45	1036	5.94	0.1187	0.0051	0.9892
27-Feb-03	17-Feb-03	10	1063.65	1058.2	5.93	0.1849	-0.0017	0.5581
27-Feb-03	18-Feb-03	9	1062.05	1059.3	5.89	0.1037	-0.0067	-0.4392
27-Feb-03	19-Feb-03	8	1068.6	1064.3	5.91	0.1814	0.0034	0.7496
27-Feb-03	20-Feb-03	7	1069.05	1065.6	5.90	0.1662	-0.0017	-0.0838
27-Feb-03	21-Feb-03	6	1069.3	1066.15	5.92	0.1770	0.0034	0.0648
27-Feb-03	24-Feb-03	3	1073.15	1070.15	5.93	0.3359	0.0017	0.8978
27-Feb-03	25-Feb-03	2	1058.95	1055.55	5.98	0.5789	0.0084	0.7232
27-Feb-03	26-Feb-03	1	1052.05	1049.65	6.01	0.8222	0.0050	0.4204
27-Mar-03	27-Feb-03	28	1061.1	1052.95	5.98	0.0991	-0.0050	-0.8794
27-Mar-03	28-Feb-03	27	1070.5	1063.4	6.13	0.0887	0.0251	-0.1050
27-Mar-03	03-Mar-03	24	1064.9	1058.85	6.04	0.0855	-0.0147	-0.0368
27-Mar-03	04-Mar-03	23	1053.9	1046.6	5.90	0.1088	-0.0232	0.2730
27-Mar-03	05-Mar-03	22	1045.35	1040.7	5.92	0.0730	0.0034	-0.3294
27-Mar-03	06-Mar-03	21	1034.9	1031.25	5.88	0.0606	-0.0068	-0.1698

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
27-Mar-03	07-Mar-03	20	1023.45	1017.1	5.88	0.1120	0.0000	0.8496
27-Mar-03	10-Mar-03	17	1007.2	1006.7	6.04	0.0105	0.0272	-0.9061
27-Mar-03	11-Mar-03	16	1015.65	1014.55	6.03	0.0244	-0.0017	1.3187
27-Mar-03	12-Mar-03	15	1003.95	1001.7	6.06	0.0538	0.0050	1.2085
27-Mar-03	13-Mar-03	14	1003.05	999.65	6.09	0.0873	0.0050	0.6214
27-Mar-03	17-Mar-03	10	994.05	993	6.09	0.0380	0.0000	-0.5642
27-Mar-03	19-Mar-03	8	1004.2	1003.9	6.13	0.0134	0.0066	-0.6466
27-Mar-03	20-Mar-03	7	1021.8	1025.25	6.18	-0.1734	0.0082	-13.8928
27-Mar-03	21-Mar-03	6	1029.35	1030.55	6.12	-0.0699	-0.0097	-0.5967
27-Mar-03	22-Mar-03	5	1036.7	1037.15	6.34	-0.0312	0.0359	-0.5530
27-Mar-03	24-Mar-03	3	1012.2	1013.9	6.49	-0.2014	0.0237	5.4447
27-Mar-03	25-Mar-03	2	1012.05	1011.3	6.45	0.1334	-0.0062	-1.6627
27-Mar-03	26-Mar-03	1	1015.75	1013.85	6.27	0.6740	-0.0279	4.0511
24-Apr-03	27-Mar-03	28	1003.9	1002.7	6.42	0.0154	0.0239	-0.9772
24-Apr-03	28-Mar-03	27	1001.1	1000.6	6.46	0.0067	0.0062	-0.5668
24-Apr-03	31-Mar-03	24	980.5	978.2	6.37	0.0352	-0.0139	4.2886
24-Apr-03	01-Apr-03	23	982.2	984.3	6.37	-0.0334	0.0000	-1.9490
24-Apr-03	02-Apr-03	22	998.85	999.4	6.37	-0.0090	0.0000	-0.7305
24-Apr-03	03-Apr-03	21	1006.35	1009.15	5.97	-0.0476	-0.0628	4.2877
24-Apr-03	04-Apr-03	20	1014.8	1016.95	6.01	-0.0381	0.0067	-0.2002
24-Apr-03	07-Apr-03	17	1028.65	1031.5	5.83	-0.0586	-0.0300	0.5380
24-Apr-03	08-Apr-03	16	1016.25	1018.1	5.83	-0.0409	0.0000	-0.3016
24-Apr-03	09-Apr-03	15	1006.15	1004.85	5.79	0.0310	-0.0069	-1.7583
24-Apr-03	10-Apr-03	14	973.65	962.2	5.70	0.3042	-0.0155	8.8033
24-Apr-03	11-Apr-03	13	959.8	949.8	5.70	0.2900	0.0000	-0.0465
24-Apr-03	15-Apr-03	9	953.6	951.2	5.63	0.1008	-0.0123	-0.6525
24-Apr-03	16-Apr-03	8	958.6	958.65	5.58	-0.0023	-0.0089	-1.0233
24-Apr-03	17-Apr-03	7	941.05	940.7	5.61	0.0191	0.0054	-9.1509
24-Apr-03	21-Apr-03	3	947.65	947.2	5.48	0.0570	-0.0232	1.9793
24-Apr-03	22-Apr-03	2	944.25	943.5	5.63	0.1430	0.0274	1.5094
24-Apr-03	23-Apr-03	1	934.05	934.2	5.62	-0.0578	-0.0018	-1.4042
29-May-03	24-Apr-03	35	934.55	929.7	5.55	0.0535	-0.0125	-1.9258
29-May-03	25-Apr-03	34	929.15	924.3	5.59	0.0554	0.0072	0.0354
29-May-03	28-Apr-03	31	934.25	929.5	5.51	0.0592	-0.0143	0.0682
29-May-03	29-Apr-03	30	930.3	932.3	5.52	-0.0258	0.0018	-1.4354
29-May-03	30-Apr-03	29	930.65	934.05	5.51	-0.0453	-0.0018	0.7566
29-May-03	02-May-03	27	938.05	938.3	5.41	-0.0036	-0.0181	-0.9215
29-May-03	05-May-03	24	945.85	945.4	5.54	0.0071	0.0240	-3.0090
29-May-03	06-May-03	23	949.6	951.85	5.51	-0.0370	-0.0054	-6.1894
29-May-03	07-May-03	22	947	950.15	5.48	-0.0543	-0.0054	0.4670
29-May-03	08-May-03	21	937.15	941.55	5.58	-0.0803	0.0182	0.4777
29-May-03	09-May-03	20	934.65	937.85	5.56	-0.0615	-0.0036	-0.2338
29-May-03	12-May-03	17	932.95	936	5.55	-0.0691	-0.0018	0.1235
29-May-03	13-May-03	16	944.2	944.25	5.62	-0.0012	0.0126	-0.9828

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
29-May-03	14-May-03	15	951.9	952.15	5.56	-0.0063	-0.0107	4.2896
29-May-03	15-May-03	14	959.8	959.85	5.56	-0.0013	0.0000	-0.7875
29-May-03	16-May-03	13	970.5	973.1	5.45	-0.0741	-0.0198	54.3100
29-May-03	19-May-03	10	965.25	966.55	5.48	-0.0485	0.0055	-0.3460
29-May-03	20-May-03	9	971.35	971.55	5.40	-0.0082	-0.0146	-0.8300
29-May-03	21-May-03	8	964.6	968	5.40	-0.1583	0.0000	18.2269
29-May-03	22-May-03	7	962.65	963.25	5.36	-0.0320	-0.0074	-0.7976
29-May-03	23-May-03	6	969.6	967.9	5.39	0.1053	0.0056	-4.2858
29-May-03	26-May-03	3	984.6	982.45	5.39	0.2623	0.0000	1.4914
29-May-03	27-May-03	2	974.8	976.85	5.37	-0.3781	-0.0037	-2.4415
29-May-03	28-May-03	1	989.2	990.8	5.38	-0.5818	0.0019	0.5386
26-Jun-03	29-May-03	28	996.5	1002.6	5.34	-0.0785	-0.0074	-0.8651
26-Jun-03	30-May-03	27	999.35	1006.8	5.33	-0.0990	-0.0019	0.2621
26-Jun-03	02-Jun-03	24	1009.2	1015.15	5.35	-0.0882	0.0038	-0.1096
26-Jun-03	03-Jun-03	23	1003.7	1010.65	5.35	-0.1080	0.0000	0.2249
26-Jun-03	04-Jun-03	22	1018.4	1021.05	5.30	-0.0425	-0.0093	-0.6063
26-Jun-03	05-Jun-03	21	1027.8	1035.05	5.34	-0.1205	0.0075	1.8336
26-Jun-03	06-Jun-03	20	1039.2	1046.4	5.31	-0.1243	-0.0056	0.0314
26-Jun-03	09-Jun-03	17	1042	1052.1	5.29	-0.2043	-0.0038	0.6436
26-Jun-03	10-Jun-03	16	1031	1037.8	5.26	-0.1479	-0.0057	-0.2759
26-Jun-03	11-Jun-03	15	1039.35	1044.1	5.27	-0.1094	0.0019	-0.2601
26-Jun-03	12-Jun-03	14	1044.05	1051.3	5.25	-0.1779	-0.0038	0.6261
26-Jun-03	13-Jun-03	13	1045.65	1056.2	5.27	-0.2780	0.0038	0.5623
26-Jun-03	16-Jun-03	10	1040.3	1051.8	5.29	-0.3958	0.0038	0.4237
26-Jun-03	17-Jun-03	9	1070.8	1081.95	5.29	-0.4144	0.0000	0.0469
26-Jun-03	18-Jun-03	8	1074.75	1086.75	5.30	-0.4997	0.0019	0.2059
26-Jun-03	19-Jun-03	7	1080.85	1092.55	5.29	-0.5537	-0.0019	0.1082
26-Jun-03	20-Jun-03	6	1096.05	1100.25	5.33	-0.2295	0.0076	-0.5856
26-Jun-03	23-Jun-03	3	1085.55	1089.2	5.30	-0.4028	-0.0056	0.7553
26-Jun-03	24-Jun-03	2	1086.75	1085.35	5.30	0.2320	0.0000	-1.5760
26-Jun-03	25-Jun-03	1	1111.55	1106.65	5.38	1.5905	0.0151	5.8545
31-Jul-03	26-Jun-03	35	1104.4	1116.35	5.28	-0.1107	-0.0186	-1.0696
31-Jul-03	27-Jun-03	34	1113.5	1125.55	5.27	-0.1140	-0.0019	0.0295
31-Jul-03	30-Jun-03	31	1123.6	1134.15	5.30	-0.1085	0.0057	-0.0477
31-Jul-03	01-Jul-03	30	1121.2	1130.7	5.30	-0.1012	0.0000	-0.0671
31-Jul-03	02-Jul-03	29	1130.75	1133.8	5.26	-0.0334	-0.0075	-0.6697
31-Jul-03	03-Jul-03	28	1137.75	1144.65	5.24	-0.0777	-0.0038	1.3248
31-Jul-03	04-Jul-03	27	1136.7	1138.45	5.24	-0.0205	0.0000	-0.7361
31-Jul-03	07-Jul-03	24	1140.6	1140.55	5.28	0.0007	0.0076	-1.0321
31-Jul-03	08-Jul-03	23	1140.5	1145.9	5.27	-0.0739	-0.0019	-113.4371
31-Jul-03	09-Jul-03	22	1133.75	1141.05	5.26	-0.1050	-0.0019	0.4205
31-Jul-03	10-Jul-03	21	1159.9	1162.35	5.29	-0.0362	0.0057	-0.6556
31-Jul-03	11-Jul-03	20	1158.2	1161.65	5.28	-0.0535	-0.0019	0.4801
31-Jul-03	14-Jul-03	17	1171.55	1171.5	5.29	0.0009	0.0019	-1.0169

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
31-Jul-03	15-Jul-03	16	1158.2	1159.85	5.27	-0.0320	-0.0038	-36.4407
31-Jul-03	16-Jul-03	15	1173.3	1168.75	5.30	0.0933	0.0057	-3.9113
31-Jul-03	17-Jul-03	14	1154.75	1152	5.27	0.0613	-0.0057	-0.3425
31-Jul-03	18-Jul-03	13	1144.1	1140	5.29	0.0994	0.0038	0.6215
31-Jul-03	21-Jul-03	10	1118.75	1115.8	5.25	0.0951	-0.0076	-0.0439
31-Jul-03	22-Jul-03	9	1112.9	1109.2	5.26	0.1332	0.0019	0.4014
31-Jul-03	23-Jul-03	8	1118.1	1119.05	5.26	-0.0382	0.0000	-1.2869
31-Jul-03	24-Jul-03	7	1137.05	1139.45	5.28	-0.1084	0.0038	1.8373
31-Jul-03	25-Jul-03	6	1163.85	1162.75	5.26	0.0567	-0.0038	-1.5232
31-Jul-03	28-Jul-03	3	1168.65	1169.2	5.24	-0.0565	-0.0038	-1.9952
31-Jul-03	29-Jul-03	2	1179.25	1174.75	5.22	0.6882	-0.0038	-13.1885
31-Jul-03	30-Jul-03	1	1183.65	1183	5.22	0.1977	0.0000	-0.7127
28-Aug-03	31-Jul-03	28	1181.35	1185.85	5.23	-0.0489	0.0019	-1.2472
28-Aug-03	01-Aug-03	27	1186.95	1195.75	5.28	-0.0985	0.0096	1.0148
28-Aug-03	04-Aug-03	24	1196.7	1203.6	5.28	-0.0862	0.0000	-0.1244
28-Aug-03	05-Aug-03	23	1179.85	1184.45	5.23	-0.0609	-0.0095	-0.2938
28-Aug-03	06-Aug-03	22	1165.25	1171.05	5.25	-0.0812	0.0038	0.3340
28-Aug-03	07-Aug-03	21	1191.9	1196.95	5.23	-0.0725	-0.0038	-0.1079
28-Aug-03	08-Aug-03	20	1215.95	1222.65	5.26	-0.0989	0.0057	0.3647
28-Aug-03	11-Aug-03	17	1224.3	1232.85	5.23	-0.1474	-0.0057	0.4900
28-Aug-03	12-Aug-03	16	1224.75	1234.75	5.26	-0.1830	0.0057	0.2415
28-Aug-03	13-Aug-03	15	1242.3	1246.9	5.26	-0.0887	0.0000	-0.5152
28-Aug-03	14-Aug-03	14	1242.25	1247.75	5.20	-0.1136	-0.0114	0.2806
28-Aug-03	18-Aug-03	10	1274.35	1281.4	5.17	-0.1986	-0.0058	0.7484
28-Aug-03	19-Aug-03	9	1274.7	1277.7	5.19	-0.0940	0.0039	-0.5266
28-Aug-03	20-Aug-03	8	1287.8	1287.4	5.19	0.0140	0.0000	-1.1487
28-Aug-03	21-Aug-03	7	1303.3	1300.95	5.18	0.0928	-0.0019	5.6394
28-Aug-03	22-Aug-03	6	1312.35	1311.15	5.17	0.0549	-0.0019	-0.4086
28-Aug-03	25-Aug-03	3	1273.5	1271.1	4.91	0.2264	-0.0503	3.1240
28-Aug-03	26-Aug-03	2	1326	1318.2	4.73	1.0619	-0.0367	3.6914
28-Aug-03	27-Aug-03	1	1344.3	1340.3	4.77	1.0728	0.0085	0.0102
25-Sep-03	28-Aug-03	28	1334.3	1341.05	4.80	-0.0649	0.0063	-1.0605
25-Sep-03	29-Aug-03	27	1358.8	1356.55	4.75	0.0221	-0.0104	-1.3406
25-Sep-03	01-Sep-03	24	1372.25	1375.95	4.74	-0.0404	-0.0021	-2.8279
25-Sep-03	02-Sep-03	23	1385.25	1385.45	4.75	-0.0023	0.0021	-0.9441
25-Sep-03	03-Sep-03	22	1359.65	1359.35	4.69	0.0036	-0.0126	-2.5980
25-Sep-03	04-Sep-03	21	1370.9	1372.7	4.73	-0.0225	0.0085	-7.2294
25-Sep-03	05-Sep-03	20	1401.6	1398.4	4.75	0.0411	0.0042	-2.8291
25-Sep-03	08-Sep-03	17	1422.7	1417.35	4.72	0.0798	-0.0063	0.9392
25-Sep-03	09-Sep-03	16	1409.5	1407.05	4.73	0.0391	0.0021	-0.5094
25-Sep-03	10-Sep-03	15	1416.4	1409.55	4.75	0.1164	0.0042	1.9724
25-Sep-03	11-Sep-03	14	1414.15	1403.15	4.75	0.2008	0.0000	0.7258
25-Sep-03	12-Sep-03	13	1379.9	1372.1	4.74	0.1570	-0.0021	-0.2182
25-Sep-03	15-Sep-03	10	1339.85	1329.25	4.72	0.2859	-0.0042	0.8215

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
25-Sep-03	16-Sep-03	9	1369.35	1357.95	4.75	0.3344	0.0064	0.1695
25-Sep-03	17-Sep-03	8	1343.5	1341.6	4.77	0.0637	0.0042	-0.8096
25-Sep-03	18-Sep-03	7	1302.15	1302.35	4.75	-0.0079	-0.0042	-1.1240
25-Sep-03	19-Sep-03	6	1323.75	1322.15	4.72	0.0726	-0.0063	-10.1873
25-Sep-03	22-Sep-03	3	1299.65	1302.9	4.77	-0.2997	0.0106	-5.1302
25-Sep-03	23-Sep-03	2	1330.85	1328.2	4.83	0.3588	0.0126	-2.1971
25-Sep-03	24-Sep-03	1	1371.9	1372.05	4.80	-0.0394	-0.0062	-1.1097
30-Oct-03	25-Sep-03	35	1361.05	1357.2	4.77	0.0291	-0.0063	-1.7403
30-Oct-03	26-Sep-03	34	1390.65	1386.95	4.77	0.0282	0.0000	-0.0318
30-Oct-03	29-Sep-03	31	1405.15	1399.95	4.73	0.0431	-0.0084	0.5263
30-Oct-03	30-Sep-03	30	1418.25	1417.1	4.73	0.0097	0.0000	-0.7739
30-Oct-03	01-Oct-03	29	1422.45	1420.85	4.74	0.0140	0.0021	0.4353
30-Oct-03	03-Oct-03	27	1447.2	1449.3	4.74	-0.0193	0.0000	-2.3838
30-Oct-03	06-Oct-03	24	1482.25	1478.9	4.72	0.0339	-0.0042	-2.7555
30-Oct-03	07-Oct-03	23	1475.2	1477.85	4.71	-0.0281	-0.0021	-1.8277
30-Oct-03	08-Oct-03	22	1479.6	1478.6	4.72	0.0111	0.0021	-1.3938
30-Oct-03	09-Oct-03	21	1506.5	1502.1	4.69	0.0501	-0.0064	3.5323
30-Oct-03	10-Oct-03	20	1528.05	1523.1	4.68	0.0584	-0.0021	0.1648
30-Oct-03	13-Oct-03	17	1551.7	1546.75	4.70	0.0677	0.0043	0.1585
30-Oct-03	14-Oct-03	16	1520.05	1520.8	4.70	-0.0111	0.0000	-1.1640
30-Oct-03	15-Oct-03	15	1541.75	1537	4.72	0.0741	0.0043	-7.6724
30-Oct-03	16-Oct-03	14	1562.05	1555.7	4.69	0.1047	-0.0064	0.4144
30-Oct-03	17-Oct-03	13	1570.85	1569.45	4.72	0.0247	0.0064	-0.7643
30-Oct-03	20-Oct-03	10	1541.4	1542.7	4.72	-0.0303	0.0000	-2.2291
30-Oct-03	21-Oct-03	9	1510.7	1506.5	4.72	0.1114	0.0000	-4.6693
30-Oct-03	22-Oct-03	8	1497.65	1494.1	4.71	0.1068	-0.0021	-0.0410
30-Oct-03	23-Oct-03	7	1475.35	1470.45	4.72	0.1711	0.0021	0.6021
30-Oct-03	24-Oct-03	6	1516.2	1506.05	4.73	0.4030	0.0021	1.3555
30-Oct-03	25-Oct-03	5	1524.45	1521.95	4.73	0.1182	0.0000	-0.7068
30-Oct-03	27-Oct-03	3	1484.85	1485.3	4.75	-0.0364	0.0042	-1.3077
30-Oct-03	28-Oct-03	2	1480.55	1481.75	4.81	-0.1458	0.0126	3.0106
30-Oct-03	29-Oct-03	1	1503.1	1498.45	5.15	1.1154	0.0707	-8.6487
27-Nov-03	30-Oct-03	28	1525.45	1516.85	5.07	0.0727	-0.0155	-0.9348
27-Nov-03	31-Oct-03	27	1559.45	1555.9	5.02	0.0304	-0.0099	-0.5820
27-Nov-03	03-Nov-03	24	1609	1601.65	4.89	0.0687	-0.0259	1.2601
27-Nov-03	04-Nov-03	23	1619.4	1618.7	4.97	0.0068	0.0164	-0.9015
27-Nov-03	05-Nov-03	22	1609.9	1609.15	4.88	0.0076	-0.0181	0.1268
27-Nov-03	06-Nov-03	21	1617.7	1612.2	4.80	0.0584	-0.0164	6.6567
27-Nov-03	07-Nov-03	20	1597.7	1592.05	4.76	0.0638	-0.0083	0.0922
27-Nov-03	10-Nov-03	17	1605.1	1594.5	4.78	0.1403	0.0042	1.2004
27-Nov-03	11-Nov-03	16	1602.25	1601.15	4.82	0.0155	0.0084	-0.8899
27-Nov-03	12-Nov-03	15	1611.3	1603.8	4.78	0.1120	-0.0083	6.2463
27-Nov-03	13-Nov-03	14	1587.05	1579.95	4.77	0.1153	-0.0021	0.0297
27-Nov-03	14-Nov-03	13	1558.25	1550.45	4.78	0.1390	0.0021	0.2053

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
27-Nov-03	15-Nov-03	12	1567.65	1562.8	4.76	0.0930	-0.0042	-0.3311
27-Nov-03	17-Nov-03	10	1590.85	1579.9	4.76	0.2486	0.0000	1.6749
27-Nov-03	18-Nov-03	9	1571.55	1564.4	4.69	0.1824	-0.0147	-0.2664
27-Nov-03	19-Nov-03	8	1545.85	1540.6	4.71	0.1531	0.0043	-0.1607
27-Nov-03	20-Nov-03	7	1526.35	1522.3	4.71	0.1366	0.0000	-0.1074
27-Nov-03	21-Nov-03	6	1546.8	1540.7	4.70	0.2371	-0.0021	0.7351
27-Nov-03	24-Nov-03	3	1544.9	1543.9	4.72	0.0777	0.0043	-0.6723
27-Nov-03	25-Nov-03	2	1571.85	1568.65	4.70	0.3668	-0.0042	3.7210
24-Dec-03	27-Nov-03	27	1604.8	1598.35	4.68	0.0537	-0.0043	-0.8536
24-Dec-03	28-Nov-03	26	1619.95	1615.25	4.72	0.0402	0.0085	-0.2508
24-Dec-03	01-Dec-03	23	1662.25	1657.65	4.70	0.0434	-0.0042	0.0782
24-Dec-03	02-Dec-03	22	1659.8	1658.5	4.71	0.0128	0.0021	-0.7044
24-Dec-03	03-Dec-03	21	1672.7	1670.5	4.67	0.0226	-0.0085	0.7597
24-Dec-03	04-Dec-03	20	1678.85	1675.2	4.69	0.0392	0.0043	0.7364
24-Dec-03	05-Dec-03	19	1649.6	1645.8	4.69	0.0437	0.0000	0.1154
24-Dec-03	08-Dec-03	16	1651.2	1646.25	4.75	0.0676	0.0128	0.5459
24-Dec-03	09-Dec-03	15	1680.8	1675.85	4.72	0.0708	-0.0063	0.0479
24-Dec-03	10-Dec-03	14	1682.1	1686.9	4.65	-0.0733	-0.0148	-2.0352
24-Dec-03	11-Dec-03	13	1691.5	1695.4	4.71	-0.0638	0.0129	-0.1296
24-Dec-03	12-Dec-03	12	1697.9	1698.9	4.69	-0.0177	-0.0042	-0.7230
24-Dec-03	15-Dec-03	9	1723.2	1723.95	4.70	-0.0174	0.0021	-0.0146
24-Dec-03	16-Dec-03	8	1726.1	1736.25	4.68	-0.2638	-0.0043	14.1582
24-Dec-03	17-Dec-03	7	1722.05	1733.25	4.69	-0.3334	0.0021	0.2637
24-Dec-03	18-Dec-03	6	1746.85	1756.1	4.68	-0.3169	-0.0021	-0.0496
24-Dec-03	19-Dec-03	5	1772	1778.55	4.73	-0.2656	0.0107	-0.1617
24-Dec-03	22-Dec-03	2	1786.8	1789.15	4.68	-0.2366	-0.0106	-0.1094
24-Dec-03	23-Dec-03	1	1780.3	1780.35	4.65	-0.0101	-0.0064	-0.9573
29-Jan-04	24-Dec-03	36	1802.4	1808.7	4.65	-0.0349	0.0000	2.4511
29-Jan-04	26-Dec-03	34	1837.1	1837.05	4.63	0.0003	-0.0043	-1.0083
29-Jan-04	29-Dec-03	31	1877.85	1874.05	4.65	0.0235	0.0043	80.6275
29-Jan-04	30-Dec-03	30	1879.25	1873.25	4.66	0.0384	0.0022	0.6313
29-Jan-04	31-Dec-03	29	1888.3	1879.75	4.72	0.0563	0.0129	0.4681
29-Jan-04	01-Jan-04	28	1925.3	1912.25	4.70	0.0874	-0.0042	0.5522
29-Jan-04	02-Jan-04	27	1950.8	1946.05	4.70	0.0325	0.0000	-0.6283
29-Jan-04	05-Jan-04	24	1957.15	1955	4.72	0.0165	0.0043	-0.4928
29-Jan-04	06-Jan-04	23	1922.95	1926.7	4.72	-0.0305	0.0000	-2.8496
29-Jan-04	07-Jan-04	22	1927.2	1916.75	4.74	0.0890	0.0042	-3.9177
29-Jan-04	08-Jan-04	21	1982.6	1968.55	4.72	0.1219	-0.0042	0.3703
29-Jan-04	09-Jan-04	20	1983.35	1971.9	4.73	0.1042	0.0021	-0.1452
29-Jan-04	12-Jan-04	17	1953.55	1945.6	4.73	0.0864	0.0000	-0.1714
29-Jan-04	13-Jan-04	16	1983.05	1963.6	4.74	0.2218	0.0021	1.5682
29-Jan-04	14-Jan-04	15	1992.35	1982.15	4.72	0.1232	-0.0042	-0.4445
29-Jan-04	15-Jan-04	14	1951.5	1944.45	4.71	0.0931	-0.0021	-0.2445
29-Jan-04	16-Jan-04	13	1908.5	1900.65	4.71	0.1141	0.0000	0.2265

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
29-Jan-04	19-Jan-04	10	1946.85	1935.35	4.71	0.2133	0.0000	0.8686
29-Jan-04	20-Jan-04	9	1890.6	1893.25	4.71	-0.0560	0.0000	-1.2627
29-Jan-04	21-Jan-04	8	1835.55	1824.6	4.70	0.2693	-0.0021	-5.8057
29-Jan-04	22-Jan-04	7	1787	1770.5	4.70	0.4771	0.0000	0.7718
29-Jan-04	23-Jan-04	6	1864.6	1847.55	4.71	0.5512	0.0021	0.1553
29-Jan-04	27-Jan-04	2	1911.9	1904.7	4.72	0.6791	0.0021	0.2322
29-Jan-04	28-Jan-04	1	1866.4	1863.1	4.73	0.6371	0.0021	-0.0619
26-Feb-04	29-Jan-04	28	1868.1	1843.6	4.73	0.1697	0.0000	-0.7336
26-Feb-04	30-Jan-04	27	1814.85	1809.75	4.76	0.0375	0.0063	-0.7789
26-Feb-04	03-Feb-04	23	1772.5	1769	4.74	0.0309	-0.0042	-0.1755
26-Feb-04	04-Feb-04	22	1825.95	1822.2	4.75	0.0336	0.0021	0.0874
26-Feb-04	05-Feb-04	21	1795.95	1804.5	4.72	-0.0814	-0.0063	-3.4202
26-Feb-04	06-Feb-04	20	1834.7	1833.65	4.74	0.0103	0.0042	-1.1266
26-Feb-04	09-Feb-04	17	1883.35	1880.7	4.74	0.0298	0.0000	1.8937
26-Feb-04	10-Feb-04	16	1876.2	1880.75	4.74	-0.0545	0.0000	-2.8277
26-Feb-04	11-Feb-04	15	1897.2	1891.5	4.75	0.0722	0.0021	-2.3251
26-Feb-04	12-Feb-04	14	1889.95	1885.3	4.79	0.0633	0.0084	-0.1228
26-Feb-04	13-Feb-04	13	1916.95	1913.6	4.75	0.0484	-0.0084	-0.2354
26-Feb-04	16-Feb-04	10	1917.6	1913.55	4.75	0.0761	0.0000	0.5714
26-Feb-04	17-Feb-04	9	1927.15	1920.1	4.75	0.1466	0.0000	0.9261
26-Feb-04	18-Feb-04	8	1920.2	1916.45	4.75	0.0880	0.0000	-0.3999
26-Feb-04	19-Feb-04	7	1858.95	1858.3	4.74	0.0180	-0.0021	-0.7955
26-Feb-04	20-Feb-04	6	1853.2	1852.65	4.76	0.0178	0.0042	-0.0098
26-Feb-04	23-Feb-04	3	1810.3	1808.2	4.75	0.1393	-0.0021	6.8207
26-Feb-04	24-Feb-04	2	1822.95	1821.35	4.75	0.1581	0.0000	0.1348
26-Feb-04	25-Feb-04	1	1788.7	1786.8	4.75	0.3826	0.0000	1.4207
25-Mar-04	26-Feb-04	28	1775.75	1765.8	4.75	0.0722	0.0000	-0.8112
25-Mar-04	27-Feb-04	27	1804.8	1800.3	4.73	0.0333	-0.0042	-0.5393
25-Mar-04	01-Mar-04	24	1848	1852.7	4.75	-0.0381	0.0042	-2.1446
25-Mar-04	03-Mar-04	22	1856.8	1860.4	4.77	-0.0317	0.0042	-0.1681
25-Mar-04	04-Mar-04	21	1835.8	1843.85	4.79	-0.0750	0.0042	1.3665
25-Mar-04	05-Mar-04	20	1874.75	1867.7	4.79	0.0678	0.0000	-1.9041
25-Mar-04	08-Mar-04	17	1885.6	1885.25	4.78	0.0039	-0.0021	-0.9420
25-Mar-04	09-Mar-04	16	1862	1866.05	4.85	-0.0489	0.0146	-13.4358
25-Mar-04	10-Mar-04	15	1838.9	1844.35	4.84	-0.0710	-0.0021	0.4529
25-Mar-04	11-Mar-04	14	1803.1	1805.4	4.80	-0.0328	-0.0083	-0.5385
25-Mar-04	12-Mar-04	13	1812.45	1812.2	4.86	0.0038	0.0125	-1.1165
25-Mar-04	15-Mar-04	10	1759	1763.4	4.83	-0.0899	-0.0062	-24.5442
25-Mar-04	16-Mar-04	9	1745.65	1749.35	4.85	-0.0847	0.0041	-0.0583
25-Mar-04	17-Mar-04	8	1751.85	1749.85	4.86	0.0514	0.0021	-1.6069
25-Mar-04	18-Mar-04	7	1717.3	1716.65	4.84	0.0195	-0.0041	-0.6212
25-Mar-04	19-Mar-04	6	1727.25	1725.1	4.83	0.0747	-0.0021	2.8384
25-Mar-04	22-Mar-04	3	1687.45	1685	4.85	0.1744	0.0041	1.3331
25-Mar-04	23-Mar-04	2	1696.55	1696.4	4.79	0.0159	-0.0124	-0.9087

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
25-Mar-04	24-Mar-04	1	1694.05	1692.1	4.80	0.4146	0.0021	25.0522
29-Apr-04	25-Mar-04	35	1712.65	1704.45	4.84	0.0494	0.0083	-0.8809
29-Apr-04	26-Mar-04	34	1747.25	1747.5	4.83	-0.0015	-0.0021	-1.0307
29-Apr-04	29-Mar-04	31	1764.65	1762.05	4.78	0.0171	-0.0104	-12.3031
29-Apr-04	30-Mar-04	30	1744.4	1750.15	4.78	-0.0395	0.0000	-3.3063
29-Apr-04	31-Mar-04	29	1765.55	1771.9	4.82	-0.0446	0.0084	0.1286
29-Apr-04	01-Apr-04	28	1811.1	1819.65	4.82	-0.0606	0.0000	0.3587
29-Apr-04	02-Apr-04	27	1831.55	1841.1	4.77	-0.0693	-0.0104	0.1451
29-Apr-04	05-Apr-04	24	1855.9	1856.6	4.80	-0.0057	0.0063	-0.9184
29-Apr-04	06-Apr-04	23	1855.8	1851.15	4.81	0.0393	0.0021	-7.9421
29-Apr-04	07-Apr-04	22	1848.9	1848.7	4.78	0.0018	-0.0062	-0.9549
29-Apr-04	08-Apr-04	21	1859.45	1853.55	4.76	0.0545	-0.0042	29.7766
29-Apr-04	12-Apr-04	17	1839.75	1838.2	4.73	0.0178	-0.0063	-0.6724
29-Apr-04	13-Apr-04	16	1881.45	1878.45	4.73	0.0359	0.0000	1.0116
29-Apr-04	15-Apr-04	14	1860.55	1861.95	4.69	-0.0193	-0.0085	-1.5387
29-Apr-04	16-Apr-04	13	1865.8	1868.95	4.65	-0.0467	-0.0085	1.4151
29-Apr-04	17-Apr-04	12	1864.05	1868.1	4.65	-0.0651	0.0000	0.3938
29-Apr-04	19-Apr-04	10	1835.65	1844.05	4.69	-0.1644	0.0086	1.5244
29-Apr-04	20-Apr-04	9	1841.05	1844.25	4.68	-0.0695	-0.0021	-0.5774
29-Apr-04	21-Apr-04	8	1871.45	1873.35	4.65	-0.0457	-0.0064	-0.3426
29-Apr-04	22-Apr-04	7	1889.85	1889.55	4.63	0.0082	-0.0043	-1.1788
29-Apr-04	23-Apr-04	6	1891.5	1892.45	4.64	-0.0301	0.0022	-4.6900
29-Apr-04	27-Apr-04	2	1818	1817.25	4.64	0.0743	0.0000	-3.4653
29-Apr-04	28-Apr-04	1	1816.1	1816.55	4.65	-0.0892	0.0022	-2.2009
27-May-04	29-Apr-04	28	1802.75	1808.95	4.63	-0.0441	-0.0043	-0.5051
27-May-04	30-Apr-04	27	1783.35	1796.1	4.65	-0.0950	0.0043	1.1518
27-May-04	03-May-04	24	1755.25	1766.7	4.64	-0.0975	-0.0022	0.0268
27-May-04	04-May-04	23	1782.8	1793.1	4.64	-0.0902	0.0000	-0.0755
27-May-04	05-May-04	22	1800.25	1809.9	4.62	-0.0875	-0.0043	-0.0298
27-May-04	06-May-04	21	1821.85	1832.8	4.65	-0.1027	0.0065	0.1743
27-May-04	07-May-04	20	1786.75	1804.45	4.63	-0.1774	-0.0043	0.7273
27-May-04	10-May-04	17	1747.15	1769.1	4.63	-0.2644	0.0000	0.4901
27-May-04	11-May-04	16	1677.9	1699.45	4.63	-0.2871	0.0000	0.0860
27-May-04	12-May-04	15	1694.9	1711.1	4.63	-0.2283	0.0000	-0.2049
27-May-04	13-May-04	14	1697.75	1717.5	4.63	-0.2974	0.0000	0.3027
27-May-04	14-May-04	13	1573.45	1582.4	4.62	-0.1571	-0.0022	-0.4719
27-May-04	17-May-04	10	1337.35	1388.75	4.62	-1.3577	0.0000	7.6439
27-May-04	18-May-04	9	1472	1503.95	4.61	-0.8589	-0.0022	-0.3674
27-May-04	19-May-04	8	1547.4	1567.85	4.66	-0.5908	0.0108	-0.3121
27-May-04	20-May-04	7	1510.75	1543.85	4.63	-1.1146	-0.0064	0.8866
27-May-04	21-May-04	6	1549.55	1560.2	4.61	-0.4110	-0.0043	-0.6313
27-May-04	24-May-04	3	1598.8	1608.85	4.65	-0.7520	0.0087	0.8297
27-May-04	25-May-04	2	1601.4	1606.7	4.62	-0.5947	-0.0065	-0.2091
27-May-04	26-May-04	1	1594.45	1598.8	4.62	-0.9808	0.0000	0.6491

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
24-Jun-04	27-May-04	28	1552.75	1586.4	4.66	-0.2757	0.0087	-0.7190
24-Jun-04	28-May-04	27	1482.4	1508.75	4.63	-0.2349	-0.0064	-0.1478
24-Jun-04	31-May-04	24	1464.15	1483.6	4.64	-0.1980	0.0022	-0.1574
24-Jun-04	01-Jun-04	23	1483.35	1507.9	4.64	-0.2569	0.0000	0.2979
24-Jun-04	02-Jun-04	22	1516.6	1535.2	4.64	-0.1995	0.0000	-0.2236
24-Jun-04	03-Jun-04	21	1467.85	1495.1	4.65	-0.3153	0.0022	0.5809
24-Jun-04	04-Jun-04	20	1503.5	1521.1	4.63	-0.2095	-0.0043	-0.3357
24-Jun-04	07-Jun-04	17	1519.45	1542.55	4.62	-0.3195	-0.0022	0.5253
24-Jun-04	08-Jun-04	16	1531.3	1550.55	4.60	-0.2811	-0.0043	-0.1203
24-Jun-04	09-Jun-04	15	1529	1548.3	4.64	-0.3010	0.0087	0.0710
24-Jun-04	10-Jun-04	14	1528.25	1544.75	4.66	-0.2761	0.0043	-0.0827
24-Jun-04	11-Jun-04	13	1490.7	1508.45	4.63	-0.3278	-0.0064	0.1870
24-Jun-04	14-Jun-04	10	1466.95	1481.35	4.63	-0.3517	0.0000	0.0728
24-Jun-04	15-Jun-04	9	1491.05	1501	4.63	-0.2660	0.0000	-0.2435
24-Jun-04	16-Jun-04	8	1485.15	1494.75	4.60	-0.2899	-0.0065	0.0899
24-Jun-04	17-Jun-04	7	1509.3	1512.05	4.62	-0.0936	0.0043	-0.6771
24-Jun-04	18-Jun-04	6	1484.7	1491.2	4.62	-0.2621	0.0000	1.7997
24-Jun-04	21-Jun-04	3	1475.85	1482	4.66	-0.4990	0.0087	0.9039
24-Jun-04	22-Jun-04	2	1475.95	1474.7	4.66	0.1525	0.0000	-1.3056
24-Jun-04	23-Jun-04	1	1447.5	1446.1	4.65	0.3484	-0.0021	1.2842
29-Jul-04	24-Jun-04	35	1451	1470.75	4.65	-0.1391	0.0000	-1.3992
29-Jul-04	25-Jun-04	34	1467	1488.5	4.61	-0.1541	-0.0086	0.1078
29-Jul-04	28-Jun-04	31	1496	1514.35	4.62	-0.1416	0.0022	-0.0810
29-Jul-04	29-Jun-04	30	1500.5	1518.3	4.62	-0.1415	0.0000	-0.0004
29-Jul-04	30-Jun-04	29	1484.9	1505.6	4.61	-0.1719	-0.0022	0.2144
29-Jul-04	01-Jul-04	28	1523.1	1537.2	4.64	-0.1185	0.0065	-0.3106
29-Jul-04	02-Jul-04	27	1524.7	1537.5	4.62	-0.1115	-0.0043	-0.0592
29-Jul-04	05-Jul-04	24	1513.55	1526.85	4.63	-0.1312	0.0022	0.1773
29-Jul-04	06-Jul-04	23	1548.7	1558.25	4.62	-0.0962	-0.0022	-0.2668
29-Jul-04	07-Jul-04	22	1554	1566.8	4.59	-0.1342	-0.0065	0.3950
29-Jul-04	08-Jul-04	21	1499.4	1518.15	4.60	-0.2130	0.0022	0.5871
29-Jul-04	09-Jul-04	20	1537.65	1553.2	4.68	-0.1811	0.0174	-0.1499
29-Jul-04	12-Jul-04	17	1542.8	1556.95	4.65	-0.1933	-0.0064	0.0675
29-Jul-04	13-Jul-04	16	1524.75	1539.3	4.65	-0.2137	0.0000	0.1053
29-Jul-04	14-Jul-04	15	1509.85	1522.75	4.64	-0.2042	-0.0022	-0.0445
29-Jul-04	15-Jul-04	14	1528.7	1539.4	4.65	-0.1794	0.0022	-0.1216
29-Jul-04	16-Jul-04	13	1548.45	1558.8	4.65	-0.1845	0.0000	0.0286
29-Jul-04	19-Jul-04	10	1559.4	1571.6	4.66	-0.2806	0.0022	0.5207
29-Jul-04	20-Jul-04	9	1551.65	1566.1	4.68	-0.3708	0.0043	0.3216
29-Jul-04	21-Jul-04	8	1576.65	1581.4	4.66	-0.1354	-0.0043	-0.6349
29-Jul-04	22-Jul-04	7	1587.45	1598.1	4.67	-0.3439	0.0021	1.5403
29-Jul-04	23-Jul-04	6	1595.2	1601.6	4.64	-0.2402	-0.0064	-0.3014
29-Jul-04	26-Jul-04	3	1612.2	1618	4.67	-0.4309	0.0065	0.7938
29-Jul-04	27-Jul-04	2	1597.45	1600.75	4.68	-0.3715	0.0021	-0.1380

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
29-Jul-04	28-Jul-04	1	1593.45	1594.15	4.67	-0.1581	-0.0021	-0.5743
26-Aug-04	29-Jul-04	28	1604.45	1618.7	4.67	-0.1137	0.0000	-0.2810
26-Aug-04	30-Jul-04	27	1622.95	1632.3	4.67	-0.0766	0.0000	-0.3263
26-Aug-04	02-Aug-04	24	1633.6	1639.05	4.67	-0.0500	0.0000	-0.3477
26-Aug-04	03-Aug-04	23	1625.35	1630.6	4.66	-0.0505	-0.0021	0.0103
26-Aug-04	04-Aug-04	22	1621.55	1626.55	4.68	-0.0504	0.0043	-0.0019
26-Aug-04	05-Aug-04	21	1656.8	1654.95	4.68	0.0192	0.0000	-1.3802
26-Aug-04	06-Aug-04	20	1633.35	1633.4	4.67	-0.0006	-0.0021	-1.0288
26-Aug-04	09-Aug-04	17	1644.3	1642.6	4.69	0.0219	0.0043	-40.7548
26-Aug-04	10-Aug-04	16	1649.15	1652.15	4.68	-0.0409	-0.0021	-2.8668
26-Aug-04	11-Aug-04	15	1617	1621.6	4.69	-0.0682	0.0021	0.6672
26-Aug-04	12-Aug-04	14	1606.35	1607.2	4.80	-0.0136	0.0235	-0.8005
26-Aug-04	13-Aug-04	13	1598	1598.2	4.76	-0.0035	-0.0083	-0.7452
26-Aug-04	16-Aug-04	10	1598.85	1599.15	4.74	-0.0068	-0.0042	0.9489
26-Aug-04	17-Aug-04	9	1601.5	1604.35	4.78	-0.0711	0.0084	9.5297
26-Aug-04	18-Aug-04	8	1580	1581.8	4.78	-0.0512	0.0000	-0.2796
26-Aug-04	19-Aug-04	7	1606.85	1609.2	4.76	-0.0752	-0.0042	0.4669
26-Aug-04	20-Aug-04	6	1586.15	1590.35	4.76	-0.1587	0.0000	1.1111
26-Aug-04	23-Aug-04	3	1579.7	1578.2	4.75	0.1140	-0.0021	-1.7185
26-Aug-04	24-Aug-04	2	1593.9	1591.6	4.79	0.2599	0.0084	1.2801
26-Aug-04	25-Aug-04	1	1599.1	1595.7	4.78	0.7662	-0.0021	1.9479
30-Sep-04	26-Aug-04	35	1606.3	1610.75	4.75	-0.0285	-0.0063	-1.0371
30-Sep-04	27-Aug-04	34	1600.4	1609	4.74	-0.0567	-0.0021	0.9942
30-Sep-04	30-Aug-04	31	1621.65	1628.45	4.78	-0.0486	0.0084	-0.1436
30-Sep-04	31-Aug-04	30	1627	1631.75	4.76	-0.0350	-0.0042	-0.2801
30-Sep-04	01-Sep-04	29	1627.9	1635.45	4.76	-0.0574	0.0000	0.6420
30-Sep-04	02-Sep-04	28	1625.3	1629.3	4.77	-0.0316	0.0021	-0.4498
30-Sep-04	03-Sep-04	27	1629.85	1634.1	4.75	-0.0347	-0.0042	0.0987
30-Sep-04	06-Sep-04	24	1638.5	1644	4.76	-0.0503	0.0021	0.4477
30-Sep-04	07-Sep-04	23	1644.3	1650.15	4.78	-0.0556	0.0042	0.1059
30-Sep-04	08-Sep-04	22	1650.15	1656.25	4.78	-0.0604	0.0000	0.0862
30-Sep-04	09-Sep-04	21	1643.7	1649	4.76	-0.0552	-0.0042	-0.0860
30-Sep-04	10-Sep-04	20	1664.1	1668.75	4.79	-0.0502	0.0063	-0.0899
30-Sep-04	13-Sep-04	17	1666.05	1675.2	4.73	-0.1160	-0.0125	1.3092
30-Sep-04	14-Sep-04	16	1677	1685.55	4.79	-0.1144	0.0127	-0.0135
30-Sep-04	15-Sep-04	15	1673.4	1683.2	4.79	-0.1401	0.0000	0.2248
30-Sep-04	16-Sep-04	14	1697.1	1705.7	4.79	-0.1300	0.0000	-0.0725
30-Sep-04	17-Sep-04	13	1729.75	1733.65	4.78	-0.0624	-0.0021	-0.5202
30-Sep-04	20-Sep-04	10	1726.3	1728.8	4.78	-0.0521	0.0000	-0.1647
30-Sep-04	21-Sep-04	9	1748.65	1750.2	4.80	-0.0354	0.0042	-0.3197
30-Sep-04	22-Sep-04	8	1752.25	1753.9	4.80	-0.0424	0.0000	0.1951
30-Sep-04	23-Sep-04	7	1726.4	1726.15	4.78	0.0074	-0.0042	-1.1758
30-Sep-04	24-Sep-04	6	1721.25	1722.5	4.81	-0.0436	0.0063	-6.8482
30-Sep-04	27-Sep-04	3	1718	1717.5	4.78	0.0349	-0.0062	-1.8019

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
30-Sep-04	28-Sep-04	2	1702.65	1700.25	4.81	0.2539	0.0063	6.2690
30-Sep-04	29-Sep-04	1	1730.65	1727.95	4.81	0.5621	0.0000	1.2138
28-Oct-04	30-Sep-04	28	1741.65	1745.5	4.81	-0.0284	0.0000	-1.0505
28-Oct-04	01-Oct-04	27	1778.8	1775.15	4.80	0.0274	-0.0021	-1.9647
28-Oct-04	04-Oct-04	24	1804.25	1805.65	4.81	-0.0116	0.0021	-1.4248
28-Oct-04	05-Oct-04	23	1812.35	1812.45	4.85	-0.0009	0.0083	-0.9258
28-Oct-04	06-Oct-04	22	1793.1	1794.9	4.83	-0.0164	-0.0041	18.0112
28-Oct-04	07-Oct-04	21	1815.5	1815.7	4.84	-0.0019	0.0021	-0.8850
28-Oct-04	08-Oct-04	20	1817.65	1820.2	4.83	-0.0252	-0.0021	12.3630
28-Oct-04	09-Oct-04	19	1815.45	1817.8	4.80	-0.0245	-0.0062	-0.0287
28-Oct-04	11-Oct-04	17	1805.55	1807.75	4.83	-0.0258	0.0063	0.0521
28-Oct-04	12-Oct-04	16	1785.8	1786.9	4.82	-0.0139	-0.0021	-0.4627
28-Oct-04	14-Oct-04	14	1798.25	1794.75	4.82	0.0501	0.0000	-4.6158
28-Oct-04	15-Oct-04	13	1791.35	1795	4.82	-0.0564	0.0000	-2.1252
28-Oct-04	18-Oct-04	10	1785.15	1786	4.79	-0.0171	-0.0062	-0.6960
28-Oct-04	19-Oct-04	9	1809.65	1808.4	4.82	0.0276	0.0063	-2.6128
28-Oct-04	20-Oct-04	8	1790	1790.05	4.89	-0.0013	0.0145	-1.0455
28-Oct-04	21-Oct-04	7	1783.15	1779.75	4.94	0.0982	0.0102	-79.0884
28-Oct-04	25-Oct-04	3	1758.1	1757.25	4.97	0.0580	0.0061	-0.4088
28-Oct-04	26-Oct-04	2	1782.9	1781.05	4.88	0.1869	-0.0181	2.2202
28-Oct-04	27-Oct-04	1	1784.5	1783.85	5.00	0.1312	0.0246	-0.2982
25-Nov-04	28-Oct-04	28	1801.75	1800.1	5.08	0.0118	0.0160	-0.9102
25-Nov-04	29-Oct-04	27	1785.25	1786.9	5.09	-0.0123	0.0020	-2.0457
25-Nov-04	01-Nov-04	24	1794.85	1797.75	5.11	-0.0242	0.0039	0.9660
25-Nov-04	02-Nov-04	23	1812.65	1813.7	5.13	-0.0091	0.0039	-0.6257
25-Nov-04	03-Nov-04	22	1839.5	1837.4	5.22	0.0187	0.0175	-3.0622
25-Nov-04	04-Nov-04	21	1836.7	1834.85	5.36	0.0173	0.0268	-0.0758
25-Nov-04	05-Nov-04	20	1856.8	1852.3	5.51	0.0437	0.0280	1.5282
25-Nov-04	08-Nov-04	17	1862.05	1862.8	5.73	-0.0085	0.0399	-1.1952
25-Nov-04	09-Nov-04	16	1858.1	1858.75	5.74	-0.0079	0.0017	-0.0772
25-Nov-04	10-Nov-04	15	1878.2	1876.1	5.79	0.0268	0.0087	-4.4118
25-Nov-04	11-Nov-04	14	1875.4	1870.55	5.82	0.0666	0.0052	1.4800
25-Nov-04	12-Nov-04	13	1874.05	1872.95	5.77	0.0163	-0.0086	-0.7558
25-Nov-04	16-Nov-04	9	1879.85	1879	5.82	0.0181	0.0087	0.1126
25-Nov-04	17-Nov-04	8	1886.2	1888.65	5.87	-0.0584	0.0086	-4.2289
25-Nov-04	18-Nov-04	7	1894.9	1892.05	5.88	0.0774	0.0017	-2.3252
25-Nov-04	19-Nov-04	6	1871.3	1872.35	5.79	-0.0337	-0.0153	-1.4348
25-Nov-04	22-Nov-04	3	1875.65	1873.35	5.85	0.1472	0.0104	-5.3747
25-Nov-04	23-Nov-04	2	1892.15	1892.6	5.77	-0.0428	-0.0137	-1.2907
25-Nov-04	24-Nov-04	1	1906.15	1904.05	5.50	0.3968	-0.0468	-10.2710
30-Dec-04	25-Nov-04	35	1896.6	1901.05	5.46	-0.0241	-0.0073	-1.0607
30-Dec-04	29-Nov-04	31	1941.4	1939.65	5.45	0.0105	-0.0018	-1.4345
30-Dec-04	30-Nov-04	30	1955	1958.8	5.39	-0.0233	-0.0110	-3.2250
30-Dec-04	01-Dec-04	29	1962.5	1962.05	5.35	0.0028	-0.0074	-1.1222

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
30-Dec-04	02-Dec-04	28	1994.85	1999	5.42	-0.0267	0.0131	-10.3859
30-Dec-04	03-Dec-04	27	1997.35	1996.2	5.40	0.0077	-0.0037	-1.2874
30-Dec-04	06-Dec-04	24	1993.2	1993.15	5.41	0.0004	0.0019	-0.9510
30-Dec-04	07-Dec-04	23	1993.05	1992.7	5.41	0.0027	0.0000	6.3054
30-Dec-04	08-Dec-04	22	1979.75	1977.95	5.43	0.0149	0.0037	4.4147
30-Dec-04	09-Dec-04	21	1994.95	1989.95	5.36	0.0430	-0.0129	1.8902
30-Dec-04	10-Dec-04	20	1967.2	1969	5.42	-0.0165	0.0112	-1.3827
30-Dec-04	13-Dec-04	17	1982.75	1985.35	5.45	-0.0278	0.0055	0.6857
30-Dec-04	14-Dec-04	16	2004.05	2006.8	5.44	-0.0309	-0.0018	0.1118
30-Dec-04	15-Dec-04	15	2025.25	2028.7	5.45	-0.0408	0.0018	0.3240
30-Dec-04	16-Dec-04	14	2029.75	2033.2	5.48	-0.0437	0.0055	0.0691
30-Dec-04	17-Dec-04	13	2009.3	2012.1	5.44	-0.0386	-0.0073	-0.1169
30-Dec-04	20-Dec-04	10	2025.5	2026.85	5.65	-0.0240	0.0386	-0.3780
30-Dec-04	21-Dec-04	9	2042.2	2044.65	5.56	-0.0480	-0.0159	0.9994
30-Dec-04	22-Dec-04	8	2028.35	2035.35	5.76	-0.1550	0.0360	2.2326
30-Dec-04	23-Dec-04	7	2039.05	2045.15	5.74	-0.1536	-0.0035	-0.0091
30-Dec-04	24-Dec-04	6	2058.75	2062.7	5.67	-0.1150	-0.0122	-0.2514
30-Dec-04	27-Dec-04	3	2061.3	2062.6	5.71	-0.0757	0.0071	-0.3422
30-Dec-04	28-Dec-04	2	2077.55	2071.35	5.63	0.5380	-0.0140	-8.1107
30-Dec-04	29-Dec-04	1	2073.3	2069.6	5.72	0.6430	0.0160	0.1953
27-Jan-05	30-Dec-04	28	2064.1	2059.8	5.66	0.0268	-0.0105	-0.9583
27-Jan-05	31-Dec-04	27	2087.2	2080.5	5.48	0.0429	-0.0318	0.5989
27-Jan-05	03-Jan-05	24	2118.7	2115	5.42	0.0262	-0.0109	-0.3884
27-Jan-05	04-Jan-05	23	2108.85	2103.75	5.35	0.0379	-0.0129	0.4455
27-Jan-05	05-Jan-05	22	2033.75	2032.2	5.40	0.0125	0.0093	-0.6708
27-Jan-05	06-Jan-05	21	1998.5	1998.35	5.30	0.0013	-0.0185	-0.8969
27-Jan-05	07-Jan-05	20	2019.8	2015.5	5.29	0.0384	-0.0019	28.8132
27-Jan-05	10-Jan-05	17	1976.95	1982	5.32	-0.0540	0.0057	-2.4083
27-Jan-05	11-Jan-05	16	1953.7	1952.05	5.33	0.0190	0.0019	-1.3519
27-Jan-05	12-Jan-05	15	1916.05	1913.6	5.35	0.0307	0.0038	0.6153
27-Jan-05	13-Jan-05	14	1950.25	1954.55	5.31	-0.0566	-0.0075	-2.8443
27-Jan-05	14-Jan-05	13	1926.35	1931.1	5.30	-0.0682	-0.0019	0.2042
27-Jan-05	17-Jan-05	10	1934.8	1932.9	5.34	0.0354	0.0075	-1.5186
27-Jan-05	18-Jan-05	9	1928	1934.05	5.30	-0.1253	-0.0075	-4.5432
27-Jan-05	19-Jan-05	8	1923.95	1926.65	5.33	-0.0631	0.0057	-0.4964
27-Jan-05	20-Jan-05	7	1925.5	1925.3	5.33	0.0053	0.0000	-1.0847
27-Jan-05	24-Jan-05	3	1910.05	1909	5.26	0.0660	-0.0131	11.3518
27-Jan-05	25-Jan-05	2	1935.85	1931.85	5.26	0.3723	0.0000	4.6424
24-Feb-05	27-Jan-05	28	1962.75	1955	5.29	0.0509	0.0057	-0.8634
24-Feb-05	28-Jan-05	27	2005.6	2008.3	5.30	-0.0179	0.0019	-1.3526
24-Feb-05	31-Jan-05	24	2057.3	2057.6	5.30	-0.0022	0.0000	-0.8781
24-Feb-05	01-Feb-05	23	2054.8	2059.85	5.31	-0.0384	0.0019	16.5663
24-Feb-05	02-Feb-05	22	2052.25	2052.2	5.35	0.0004	0.0075	-1.0104
24-Feb-05	03-Feb-05	21	2086.3	2079.45	5.36	0.0564	0.0019	140.4120

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
24-Feb-05	04-Feb-05	20	2083.9	2077.95	5.30	0.0515	-0.0112	-0.0871
24-Feb-05	07-Feb-05	17	2060.3	2055.1	5.37	0.0535	0.0132	0.0398
24-Feb-05	08-Feb-05	16	2059.4	2055.15	5.38	0.0465	0.0019	-0.1314
24-Feb-05	09-Feb-05	15	2079.65	2070	5.38	0.1116	0.0000	1.4015
24-Feb-05	10-Feb-05	14	2071	2063.35	5.37	0.0952	-0.0019	-0.1475
24-Feb-05	11-Feb-05	13	2093.7	2082.05	5.36	0.1545	-0.0019	0.6238
24-Feb-05	14-Feb-05	10	2102.3	2098.25	5.41	0.0694	0.0093	-0.5507
24-Feb-05	15-Feb-05	9	2098.05	2089.95	5.34	0.1547	-0.0129	1.2289
24-Feb-05	16-Feb-05	8	2072.85	2068.8	5.43	0.0880	0.0169	-0.4312
24-Feb-05	17-Feb-05	7	2066.85	2061.9	5.48	0.1233	0.0092	0.4012
24-Feb-05	18-Feb-05	6	2057.15	2055.55	5.50	0.0467	0.0036	-0.6214
24-Feb-05	21-Feb-05	3	2044.15	2043.2	5.39	0.0558	-0.0200	0.1949
24-Feb-05	22-Feb-05	2	2064.1	2058.4	5.40	0.4978	0.0019	7.9233
24-Feb-05	23-Feb-05	1	2054.85	2057.1	5.43	-0.3940	0.0056	-1.7915
31-Mar-05	24-Feb-05	35	2065.3	2055.3	5.52	0.0499	0.0166	-1.1267
31-Mar-05	25-Feb-05	34	2056.2	2060.9	5.40	-0.0242	-0.0217	-1.4842
31-Mar-05	28-Feb-05	31	2111.65	2103.25	5.51	0.0463	0.0204	-2.9147
31-Mar-05	01-Mar-05	30	2082.6	2084.4	5.47	-0.0104	-0.0073	-1.2240
31-Mar-05	02-Mar-05	29	2091.1	2093.25	5.41	-0.0128	-0.0110	0.2305
31-Mar-05	03-Mar-05	28	2130.6	2128.85	5.50	0.0106	0.0166	-1.8282
31-Mar-05	04-Mar-05	27	2144.5	2148.15	5.48	-0.0227	-0.0036	-3.1462
31-Mar-05	07-Mar-05	24	2151.3	2160.1	5.50	-0.0612	0.0036	1.7005
31-Mar-05	08-Mar-05	23	2159.95	2168.95	5.50	-0.0651	0.0000	0.0629
31-Mar-05	09-Mar-05	22	2152.35	2160.8	5.53	-0.0641	0.0055	-0.0149
31-Mar-05	10-Mar-05	21	2157	2167.4	5.41	-0.0825	-0.0217	0.2860
31-Mar-05	11-Mar-05	20	2147.55	2154	5.41	-0.0540	0.0000	-0.3453
31-Mar-05	14-Mar-05	17	2138.95	2146.35	5.36	-0.0731	-0.0092	0.3549
31-Mar-05	15-Mar-05	16	2120.85	2128.95	5.51	-0.0858	0.0280	0.1727
31-Mar-05	16-Mar-05	15	2120.15	2125.55	5.47	-0.0611	-0.0073	-0.2882
31-Mar-05	17-Mar-05	14	2101.3	2098.5	5.37	0.0343	-0.0183	-1.5616
31-Mar-05	18-Mar-05	13	2113.65	2109.15	5.40	0.0590	0.0056	0.7213
31-Mar-05	21-Mar-05	10	2095.95	2096.6	5.38	-0.0112	-0.0037	-1.1891
31-Mar-05	22-Mar-05	9	2061.85	2061.6	5.29	0.0049	-0.0167	-1.4345
31-Mar-05	23-Mar-05	8	2021.9	2026.4	5.46	-0.1000	0.0321	-21.6259
31-Mar-05	24-Mar-05	7	2016.05	2015.4	5.61	0.0166	0.0275	-1.1658
31-Mar-05	28-Mar-05	3	2037.9	2029.45	5.64	0.4986	0.0053	29.0656
31-Mar-05	29-Mar-05	2	1986.55	1983.85	5.50	0.2448	-0.0248	-0.5090
31-Mar-05	30-Mar-05	1	1996.95	1993.7	5.64	0.5864	0.0255	1.3952
28-Apr-05	31-Mar-05	28	2028.95	2035.65	5.63	-0.0424	-0.0018	-1.0723
28-Apr-05	01-Apr-05	27	2060.9	2067.65	5.63	-0.0436	0.0000	0.0286
28-Apr-05	04-Apr-05	24	2048.8	2063.4	5.58	-0.1065	-0.0089	1.4430
28-Apr-05	05-Apr-05	23	2034.45	2052.55	5.52	-0.1386	-0.0108	0.3016
28-Apr-05	06-Apr-05	22	2053.05	2069.3	5.49	-0.1290	-0.0054	-0.0695
28-Apr-05	07-Apr-05	21	2039.95	2052.85	5.51	-0.1081	0.0036	-0.1623

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
28-Apr-05	08-Apr-05	20	2021.3	2031.2	5.46	-0.0879	-0.0091	-0.1862
28-Apr-05	11-Apr-05	17	2001.7	2008.2	5.45	-0.0687	-0.0018	-0.2194
28-Apr-05	12-Apr-05	16	2021.3	2024.95	5.49	-0.0406	0.0073	-0.4087
28-Apr-05	13-Apr-05	15	2019.15	2025.45	5.46	-0.0748	-0.0055	0.8418
28-Apr-05	15-Apr-05	13	1940.05	1956.3	5.51	-0.2310	0.0092	2.0894
28-Apr-05	18-Apr-05	10	1911.4	1927.8	5.52	-0.3076	0.0018	0.3315
28-Apr-05	19-Apr-05	9	1891.2	1909.4	5.38	-0.3831	-0.0254	0.2456
28-Apr-05	20-Apr-05	8	1927	1929.7	5.47	-0.0630	0.0167	-0.8355
28-Apr-05	21-Apr-05	7	1940.8	1948.55	5.48	-0.2050	0.0018	2.2529
28-Apr-05	22-Apr-05	6	1950.95	1967.35	5.46	-0.5023	-0.0036	1.4506
28-Apr-05	25-Apr-05	3	1956.6	1970.95	5.44	-0.8769	-0.0037	0.7459
28-Apr-05	26-Apr-05	2	1949.95	1957.1	5.37	-0.6588	-0.0129	-0.2487
28-Apr-05	27-Apr-05	1	1929.55	1935.4	5.37	-1.0898	0.0000	0.6542
26-May-05	28-Apr-05	28	1914	1941.3	5.43	-0.1821	0.0112	-0.8329
26-May-05	29-Apr-05	27	1881.85	1902.5	5.55	-0.1455	0.0221	-0.2009
26-May-05	02-May-05	24	1907.35	1916.75	5.56	-0.0737	0.0018	-0.4932
26-May-05	03-May-05	23	1903.05	1920.7	5.59	-0.1445	0.0054	0.9595
26-May-05	04-May-05	22	1931.5	1942.6	5.64	-0.0938	0.0089	-0.3511
26-May-05	05-May-05	21	1949.2	1963.3	5.59	-0.1236	-0.0089	0.3177
26-May-05	06-May-05	20	1967.9	1977.5	5.56	-0.0876	-0.0054	-0.2911
26-May-05	09-May-05	17	1986.15	2000.75	5.58	-0.1551	0.0036	0.7706
26-May-05	10-May-05	16	1971.1	1994.3	5.59	-0.2633	0.0018	0.6975
26-May-05	11-May-05	15	1971.35	1985.95	5.59	-0.1771	0.0000	-0.3274
26-May-05	12-May-05	14	1979.15	1993.15	5.53	-0.1813	-0.0107	0.0235
26-May-05	13-May-05	13	1976.6	1988.3	5.56	-0.1634	0.0054	-0.0983
26-May-05	16-May-05	10	2002.4	2012.6	5.56	-0.1829	0.0000	0.1192
26-May-05	17-May-05	9	1974.65	1990.8	5.56	-0.3258	0.0000	0.7812
26-May-05	18-May-05	8	1967.2	1982.75	5.52	-0.3543	-0.0072	0.0875
26-May-05	19-May-05	7	1978.25	1990.85	5.49	-0.3265	-0.0054	-0.0784
26-May-05	20-May-05	6	1987.7	1992.4	5.48	-0.1417	-0.0018	-0.5660
26-May-05	23-May-05	3	2010.15	2013.9	5.58	-0.2237	0.0182	0.5783
26-May-05	24-May-05	2	2026.1	2028.6	5.55	-0.2220	-0.0054	-0.0076
26-May-05	25-May-05	1	2037.35	2043.85	5.53	-1.1467	-0.0036	4.1662
30-Jun-05	26-May-05	35	2036.5	2074.7	5.46	-0.1911	-0.0127	-0.8333
30-Jun-05	27-May-05	34	2047.45	2076.4	5.54	-0.1487	0.0147	-0.2223
30-Jun-05	30-May-05	31	2042.2	2072.4	5.54	-0.1705	0.0000	0.1467
30-Jun-05	31-May-05	30	2063	2087.55	5.51	-0.1420	-0.0054	-0.1673
30-Jun-05	01-Jun-05	29	2061.1	2087.55	5.53	-0.1583	0.0036	0.1151
30-Jun-05	02-Jun-05	28	2038.1	2064.65	5.51	-0.1664	-0.0036	0.0513
30-Jun-05	03-Jun-05	27	2075.85	2094.25	5.45	-0.1177	-0.0109	-0.2929
30-Jun-05	04-Jun-05	26	2067.3	2092.35	5.49	-0.1668	0.0073	0.4173
30-Jun-05	06-Jun-05	24	2072.35	2092.8	5.49	-0.1473	0.0000	-0.1168
30-Jun-05	07-Jun-05	23	2082.9	2098.15	5.53	-0.1142	0.0073	-0.2248
30-Jun-05	08-Jun-05	22	2094.35	2112.4	5.48	-0.1404	-0.0090	0.2298

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
30-Jun-05	09-Jun-05	21	2082.1	2103.2	5.52	-0.1729	0.0073	0.2309
30-Jun-05	10-Jun-05	20	2071.55	2090.6	5.52	-0.1648	0.0000	-0.0467
30-Jun-05	13-Jun-05	17	2082.6	2102.75	5.49	-0.2039	-0.0054	0.2375
30-Jun-05	14-Jun-05	16	2094.65	2112.35	5.52	-0.1893	0.0055	-0.0715
30-Jun-05	15-Jun-05	15	2110.35	2128.65	5.47	-0.2072	-0.0091	0.0945
30-Jun-05	16-Jun-05	14	2100.45	2123.7	5.46	-0.2831	-0.0018	0.3660
30-Jun-05	17-Jun-05	13	2108.2	2123.4	5.51	-0.1989	0.0092	-0.2972
30-Jun-05	20-Jun-05	10	2117.95	2144.35	5.51	-0.4460	0.0000	1.2417
30-Jun-05	21-Jun-05	9	2148.55	2170	5.51	-0.3974	0.0000	-0.1090
30-Jun-05	22-Jun-05	8	2164.85	2187.35	5.52	-0.4653	0.0018	0.1709
30-Jun-05	23-Jun-05	7	2168.3	2183.85	5.49	-0.3675	-0.0054	-0.2102
30-Jun-05	24-Jun-05	6	2178.5	2194.35	5.48	-0.4350	-0.0018	0.1835
30-Jun-05	27-Jun-05	3	2180.65	2199.8	5.50	-1.0492	0.0036	1.4122
30-Jun-05	28-Jun-05	2	2167.2	2169.85	5.64	-0.2200	0.0255	-0.7904
30-Jun-05	29-Jun-05	1	2195.15	2191.65	5.61	0.5745	-0.0053	-3.6116
28-Jul-05	30-Jun-05	28	2192.65	2220.6	5.63	-0.1629	0.0036	-1.2835
28-Jul-05	01-Jul-05	27	2206.85	2211.9	5.62	-0.0305	-0.0018	-0.8129
28-Jul-05	04-Jul-05	24	2223.9	2230.65	5.71	-0.0455	0.0160	0.4916
28-Jul-05	05-Jul-05	23	2196.95	2210.75	5.69	-0.0980	-0.0035	1.1560
28-Jul-05	06-Jul-05	22	2223.45	2228.2	5.67	-0.0349	-0.0035	-0.6437
28-Jul-05	07-Jul-05	21	2164.8	2179.4	5.64	-0.1152	-0.0053	2.2997
28-Jul-05	08-Jul-05	20	2188.55	2196.2	5.64	-0.0628	0.0000	-0.4549
28-Jul-05	11-Jul-05	17	2209.15	2218.85	5.64	-0.0928	0.0000	0.4772
28-Jul-05	12-Jul-05	16	2214.45	2220.8	5.65	-0.0644	0.0018	-0.3056
28-Jul-05	13-Jul-05	15	2191.9	2204.05	5.66	-0.1327	0.0018	1.0592
28-Jul-05	14-Jul-05	14	2171.9	2185.1	5.61	-0.1558	-0.0088	0.1744
28-Jul-05	15-Jul-05	13	2202.95	2212.55	5.59	-0.1204	-0.0036	-0.2272
28-Jul-05	18-Jul-05	10	2234.7	2234	5.62	0.0113	0.0054	-1.0937
28-Jul-05	19-Jul-05	9	2236.3	2237.3	5.56	-0.0179	-0.0107	-2.5856
28-Jul-05	20-Jul-05	8	2238.4	2241.9	5.56	-0.0703	0.0000	2.9316
28-Jul-05	21-Jul-05	7	2226.6	2230.5	5.58	-0.0900	0.0036	0.2801
28-Jul-05	22-Jul-05	6	2265.75	2265.6	5.56	0.0040	-0.0036	-1.0441
28-Jul-05	25-Jul-05	3	2286.1	2291.75	5.58	-0.2962	0.0036	-75.5682
28-Jul-05	26-Jul-05	2	2299.3	2303.15	5.60	-0.3011	0.0036	0.0167
28-Jul-05	27-Jul-05	1	2320.15	2319.1	5.60	0.1630	0.0000	-1.5411
25-Aug-05	29-Jul-05	27	2300.7	2312.3	5.50	-0.0671	-0.0179	-1.4115
25-Aug-05	01-Aug-05	24	2310	2318.05	5.54	-0.0522	0.0073	-0.2218
25-Aug-05	02-Aug-05	23	2349.85	2353.65	5.55	-0.0253	0.0018	-0.5153
25-Aug-05	03-Aug-05	22	2341.1	2357	5.54	-0.1108	-0.0018	3.3794
25-Aug-05	04-Aug-05	21	2357.75	2367.8	5.54	-0.0729	0.0000	-0.3417
25-Aug-05	05-Aug-05	20	2349.85	2361.2	5.54	-0.0867	0.0000	0.1895
25-Aug-05	08-Aug-05	17	2315.5	2324.4	5.53	-0.0812	-0.0018	-0.0633
25-Aug-05	09-Aug-05	16	2305.35	2318.7	5.56	-0.1299	0.0054	0.5992
25-Aug-05	10-Aug-05	15	2359.95	2360.15	5.54	-0.0020	-0.0036	-0.9843

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
25-Aug-05	11-Aug-05	14	2380.9	2380.95	5.51	-0.0005	-0.0054	-0.7345
25-Aug-05	12-Aug-05	13	2360.45	2361.55	5.47	-0.0129	-0.0073	22.8923
25-Aug-05	16-Aug-05	9	2364.55	2369.8	5.54	-0.0887	0.0128	5.8760
25-Aug-05	17-Aug-05	8	2404.6	2403.15	5.54	0.0271	0.0000	-1.3060
25-Aug-05	18-Aug-05	7	2382.85	2388.45	5.56	-0.1207	0.0036	-5.4475
25-Aug-05	19-Aug-05	6	2384.8	2383.45	5.50	0.0340	-0.0108	-1.2814
25-Aug-05	22-Aug-05	3	2365.55	2367.85	5.54	-0.1166	0.0073	-4.4325
25-Aug-05	23-Aug-05	2	2326.95	2326.1	5.52	0.0658	-0.0036	-1.5639
25-Aug-05	24-Aug-05	1	2323.15	2322.5	5.54	0.1007	0.0036	0.5318
29-Sep-05	25-Aug-05	35	2327.35	2354.55	5.46	-0.1195	-0.0144	-2.1864
29-Sep-05	26-Aug-05	34	2335.55	2357.05	5.49	-0.0970	0.0055	-0.1882
29-Sep-05	29-Aug-05	31	2309.45	2337.65	5.50	-0.1409	0.0018	0.4527
29-Sep-05	30-Aug-05	30	2349.9	2367.75	5.46	-0.0908	-0.0073	-0.3557
29-Sep-05	31-Aug-05	29	2364.75	2384.65	5.51	-0.1040	0.0092	0.1456
29-Sep-05	01-Sep-05	28	2390.25	2405.75	5.51	-0.0831	0.0000	-0.2011
29-Sep-05	02-Sep-05	27	2408	2415.8	5.50	-0.0431	-0.0018	-0.4811
29-Sep-05	05-Sep-05	24	2412.85	2422.95	5.48	-0.0627	-0.0036	0.4531
29-Sep-05	06-Sep-05	23	2422.8	2428.65	5.52	-0.0377	0.0073	-0.3976
29-Sep-05	08-Sep-05	21	2445.75	2454.45	5.50	-0.0609	-0.0036	0.6126
29-Sep-05	09-Sep-05	20	2442.95	2455.45	5.52	-0.0919	0.0036	0.5092
29-Sep-05	12-Sep-05	17	2477.1	2484.15	5.55	-0.0602	0.0054	-0.3449
29-Sep-05	13-Sep-05	16	2486.3	2500.35	5.52	-0.1268	-0.0054	1.1067
29-Sep-05	14-Sep-05	15	2483.25	2492.45	5.48	-0.0888	-0.0072	-0.3000
29-Sep-05	15-Sep-05	14	2516.15	2523.95	5.51	-0.0796	0.0055	-0.1032
29-Sep-05	16-Sep-05	13	2541.1	2552.35	5.50	-0.1223	-0.0018	0.5370
29-Sep-05	19-Sep-05	10	2560.95	2567.1	5.59	-0.0863	0.0164	-0.2941
29-Sep-05	20-Sep-05	9	2562.45	2578	5.56	-0.2420	-0.0054	1.8026
29-Sep-05	21-Sep-05	8	2558.85	2567.3	5.57	-0.1484	0.0018	-0.3870
29-Sep-05	22-Sep-05	7	2474.85	2476.5	5.58	-0.0343	0.0018	-0.7690
29-Sep-05	23-Sep-05	6	2474.05	2477.75	5.61	-0.0897	0.0054	1.6159
29-Sep-05	26-Sep-05	3	2559.9	2557.35	5.58	0.1196	-0.0053	-2.3338
29-Sep-05	27-Sep-05	2	2577.6	2574.85	5.55	0.1921	-0.0054	0.6066
29-Sep-05	28-Sep-05	1	2601.8	2598.05	5.60	0.5192	0.0090	1.7024
27-Oct-05	29-Sep-05	28	2607.7	2611.2	5.55	-0.0172	-0.0089	-1.0332
27-Oct-05	30-Sep-05	27	2593	2601.4	5.73	-0.0431	0.0324	1.5006
27-Oct-05	03-Oct-05	24	2627.2	2630.05	5.54	-0.0163	-0.0332	-0.6229
27-Oct-05	04-Oct-05	23	2661.8	2663.35	5.53	-0.0091	-0.0018	-0.4397
27-Oct-05	05-Oct-05	22	2644.8	2644.4	5.56	0.0025	0.0054	-1.2716
27-Oct-05	06-Oct-05	21	2567.45	2579.15	5.55	-0.0779	-0.0018	-32.4920
27-Oct-05	07-Oct-05	20	2567.7	2574.05	5.55	-0.0445	0.0000	-0.4296
27-Oct-05	10-Oct-05	17	2562.5	2566.85	5.56	-0.0359	0.0018	-0.1921
27-Oct-05	11-Oct-05	16	2587.1	2589.55	5.51	-0.0213	-0.0090	-0.4070
27-Oct-05	13-Oct-05	14	2534.2	2537.3	5.52	-0.0314	0.0018	0.4760
27-Oct-05	14-Oct-05	13	2486.5	2484.4	5.57	0.0234	0.0091	-1.7443

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
27-Oct-05	17-Oct-05	10	2485.5	2485.15	5.53	0.0051	-0.0072	-0.7833
27-Oct-05	18-Oct-05	9	2460.95	2468.2	5.57	-0.1177	0.0072	-24.2097
27-Oct-05	19-Oct-05	8	2406.15	2412.45	5.56	-0.1177	-0.0018	0.0000
27-Oct-05	20-Oct-05	7	2393.8	2395.45	5.59	-0.0354	0.0054	-0.6988
27-Oct-05	21-Oct-05	6	2445.5	2443.75	5.59	0.0430	0.0000	-2.2121
27-Oct-05	24-Oct-05	3	2394.05	2394.85	5.57	-0.0401	-0.0036	-1.9334
27-Oct-05	25-Oct-05	2	2417.65	2418.2	5.56	-0.0409	-0.0018	0.0212
27-Oct-05	26-Oct-05	1	2413.65	2408.5	5.75	0.7690	0.0342	-19.7805
24-Nov-05	27-Oct-05	28	2348.45	2352.9	5.77	-0.0243	0.0035	-1.0317
24-Nov-05	28-Oct-05	27	2297.3	2316.05	5.69	-0.1084	-0.0139	3.4529
24-Nov-05	31-Oct-05	24	2359.65	2370.95	5.65	-0.0717	-0.0070	-0.3388
24-Nov-05	01-Nov-05	23	2371.65	2386.75	5.65	-0.0993	0.0000	0.3862
24-Nov-05	02-Nov-05	22	2409.55	2419.05	5.74	-0.0644	0.0159	-0.3518
24-Nov-05	07-Nov-05	17	2449.35	2461.6	5.81	-0.1056	0.0122	0.6407
24-Nov-05	08-Nov-05	16	2477.3	2492.65	5.86	-0.1390	0.0086	0.3156
24-Nov-05	09-Nov-05	15	2480.75	2489.1	5.94	-0.0806	0.0137	-0.4198
24-Nov-05	10-Nov-05	14	2489.95	2500.7	5.95	-0.1108	0.0017	0.3736
24-Nov-05	11-Nov-05	13	2548.1	2548.65	5.99	-0.0060	0.0067	-0.9460
24-Nov-05	14-Nov-05	10	2559	2558.7	6.12	0.0042	0.0217	-1.7062
24-Nov-05	16-Nov-05	8	2584.45	2582.75	6.13	0.0296	0.0016	6.0155
24-Nov-05	17-Nov-05	7	2609.55	2603.95	6.20	0.1105	0.0114	2.7313
24-Nov-05	18-Nov-05	6	2624.2	2620.05	6.13	0.0950	-0.0113	-0.1405
24-Nov-05	21-Nov-05	3	2606.65	2602.5	6.10	0.1912	-0.0049	1.0135
24-Nov-05	22-Nov-05	2	2572.35	2572.85	6.03	-0.0350	-0.0115	-1.1830
24-Nov-05	23-Nov-05	1	2614.65	2608.6	5.95	0.8340	-0.0133	-24.8384
29-Dec-05	24-Nov-05	35	2640.35	2635	5.96	0.0209	0.0017	-0.9750
29-Dec-05	25-Nov-05	34	2668.15	2664.3	5.89	0.0153	-0.0117	-0.2671
29-Dec-05	26-Nov-05	33	2687.55	2683.45	5.90	0.0167	0.0017	0.0893
29-Dec-05	28-Nov-05	31	2721.25	2712	5.91	0.0395	0.0017	1.3741
29-Dec-05	29-Nov-05	30	2704.6	2698.3	5.92	0.0280	0.0017	-0.2923
29-Dec-05	30-Nov-05	29	2649.65	2652.25	5.98	-0.0122	0.0101	-1.4351
29-Dec-05	01-Dec-05	28	2706.55	2698.95	6.03	0.0362	0.0084	-3.9695
29-Dec-05	02-Dec-05	27	2702.1	2697.95	5.93	0.0205	-0.0166	-0.4332
29-Dec-05	05-Dec-05	24	2659.95	2660.5	5.97	-0.0031	0.0067	-1.1513
29-Dec-05	06-Dec-05	23	2653.35	2662.3	6.01	-0.0527	0.0067	15.9956
29-Dec-05	07-Dec-05	22	2688.3	2693	6.01	-0.0286	0.0000	-0.4577
29-Dec-05	08-Dec-05	21	2694.8	2706.7	6.03	-0.0755	0.0033	1.6426
29-Dec-05	09-Dec-05	20	2751.8	2756.45	6.03	-0.0304	0.0000	-0.5977
29-Dec-05	12-Dec-05	17	2769.35	2776.2	6.09	-0.0523	0.0100	0.7214
29-Dec-05	13-Dec-05	16	2803.75	2812.3	6.11	-0.0685	0.0033	0.3095
29-Dec-05	14-Dec-05	15	2801.4	2804.55	6.11	-0.0270	0.0000	-0.6063
29-Dec-05	15-Dec-05	14	2767.7	2778.55	6.09	-0.1006	-0.0033	2.7302
29-Dec-05	16-Dec-05	13	2811.9	2810.15	6.14	0.0172	0.0082	-1.1714
29-Dec-05	19-Dec-05	10	2842.8	2842.6	6.23	0.0025	0.0147	-0.8531

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
29-Dec-05	20-Dec-05	9	2824.5	2826.2	6.30	-0.0241	0.0112	-10.5024
29-Dec-05	21-Dec-05	8	2818.1	2822.9	6.16	-0.0766	-0.0222	2.1819
29-Dec-05	22-Dec-05	7	2830.65	2835.25	6.30	-0.0835	0.0227	0.0904
29-Dec-05	23-Dec-05	6	2791.2	2804.85	6.30	-0.2927	0.0000	2.5052
29-Dec-05	26-Dec-05	3	2738.7	2749.6	6.39	-0.4767	0.0143	0.6284
29-Dec-05	27-Dec-05	2	2808.85	2805.9	6.63	0.1891	0.0376	-1.3968
29-Dec-05	28-Dec-05	1	2796.95	2794.05	6.66	0.3735	0.0045	0.9745
25-Jan-06	29-Dec-05	27	2807	2821.95	6.77	-0.0708	0.0165	-1.1896
25-Jan-06	30-Dec-05	26	2820.8	2836.55	6.81	-0.0771	0.0059	0.0885
25-Jan-06	02-Jan-06	23	2819.7	2835.95	6.67	-0.0899	-0.0206	0.1667
25-Jan-06	03-Jan-06	22	2868.85	2883.35	6.51	-0.0825	-0.0240	-0.0828
25-Jan-06	04-Jan-06	21	2890.1	2904.4	6.38	-0.0846	-0.0200	0.0256
25-Jan-06	05-Jan-06	20	2883.9	2899.85	6.43	-0.0993	0.0078	0.1733
25-Jan-06	06-Jan-06	19	2895.65	2914	6.43	-0.1197	0.0000	0.2056
25-Jan-06	09-Jan-06	16	2893.45	2910.1	6.48	-0.1291	0.0078	0.0786
25-Jan-06	10-Jan-06	15	2857.3	2870.8	6.69	-0.1131	0.0324	-0.1237
25-Jan-06	12-Jan-06	13	2831.4	2850.7	6.99	-0.1881	0.0448	0.6629
25-Jan-06	13-Jan-06	12	2823.65	2850.55	7.02	-0.2844	0.0043	0.5120
25-Jan-06	16-Jan-06	9	2821.15	2833.1	7.10	-0.1691	0.0114	-0.4056
25-Jan-06	17-Jan-06	8	2801.85	2829.1	7.04	-0.4355	-0.0085	1.5760
25-Jan-06	18-Jan-06	7	2797	2809.2	6.96	-0.2238	-0.0114	-0.4861
25-Jan-06	19-Jan-06	6	2869.25	2870.85	6.90	-0.0334	-0.0086	-0.8506
25-Jan-06	20-Jan-06	5	2897.55	2900.95	6.97	-0.0844	0.0101	1.5243
25-Jan-06	23-Jan-06	2	2881.65	2884.05	6.91	-0.1499	-0.0086	0.7747
25-Jan-06	24-Jan-06	1	2906.25	2908	6.98	-0.2167	0.0101	0.4462
23-Feb-06	25-Jan-06	29	2922.25	2940.35	7.34	-0.0767	0.0516	-0.6463
23-Feb-06	27-Jan-06	27	2978.55	2982.75	7.48	-0.0188	0.0191	-0.7549
23-Feb-06	30-Jan-06	24	2972.35	2974.5	7.50	-0.0108	0.0027	-0.4227
23-Feb-06	31-Jan-06	23	3002.25	3001.1	7.53	0.0060	0.0040	-1.5529
23-Feb-06	01-Feb-06	22	2963.05	2971.55	7.48	-0.0469	-0.0066	-8.8168
23-Feb-06	02-Feb-06	21	2956.45	2967.45	7.36	-0.0637	-0.0160	0.3582
23-Feb-06	03-Feb-06	20	2921.8	2940.6	7.40	-0.1154	0.0054	0.8134
23-Feb-06	06-Feb-06	17	2991.55	3000.45	7.46	-0.0629	0.0081	-0.4551
23-Feb-06	07-Feb-06	16	3004.15	3020.1	7.43	-0.1191	-0.0040	0.8940
23-Feb-06	08-Feb-06	15	2992.95	3008.95	7.45	-0.1280	0.0027	0.0740
23-Feb-06	10-Feb-06	13	3021.1	3027.55	7.48	-0.0591	0.0040	-0.5385
23-Feb-06	13-Feb-06	10	3028.2	3041.15	7.35	-0.1536	-0.0174	1.6012
23-Feb-06	14-Feb-06	9	3009.15	3017.55	7.39	-0.1115	0.0054	-0.2742
23-Feb-06	15-Feb-06	8	3017.15	3022.2	7.39	-0.0753	0.0000	-0.3251
23-Feb-06	16-Feb-06	7	3013.85	3021.6	7.31	-0.1321	-0.0108	0.7550
23-Feb-06	17-Feb-06	6	2978.4	2981.5	7.39	-0.0624	0.0109	-0.5274
23-Feb-06	20-Feb-06	3	3010.1	3005.85	7.32	0.1695	-0.0095	-3.7164
23-Feb-06	21-Feb-06	2	3039.45	3035.5	7.39	0.2341	0.0096	0.3806
23-Feb-06	22-Feb-06	1	3056.85	3050.8	7.39	0.7132	0.0000	2.0469

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
30-Mar-06	23-Feb-06	35	3054.2	3062.1	7.40	-0.0266	0.0014	-1.0373
30-Mar-06	24-Feb-06	34	3044.1	3050.05	7.39	-0.0207	-0.0014	-0.2219
30-Mar-06	27-Feb-06	31	3055.15	3067.45	7.42	-0.0467	0.0041	1.2567
30-Mar-06	28-Feb-06	30	3071.05	3074.7	7.31	-0.0143	-0.0148	-0.6945
30-Mar-06	01-Mar-06	29	3101.75	3123.1	7.32	-0.0852	0.0014	4.9741
30-Mar-06	02-Mar-06	28	3134.55	3150.7	7.50	-0.0661	0.0246	-0.2241
30-Mar-06	03-Mar-06	27	3137.6	3147.35	7.45	-0.0414	-0.0067	-0.3739
30-Mar-06	06-Mar-06	24	3185.45	3190.4	7.65	-0.0233	0.0268	-0.4370
30-Mar-06	07-Mar-06	23	3167.35	3182.8	7.61	-0.0762	-0.0052	2.2701
30-Mar-06	08-Mar-06	22	3082.65	3116.7	7.70	-0.1798	0.0118	1.3601
30-Mar-06	09-Mar-06	21	3113.85	3129.1	7.73	-0.0838	0.0039	-0.5341
30-Mar-06	10-Mar-06	20	3166.45	3183.9	7.69	-0.0989	-0.0052	0.1812
30-Mar-06	13-Mar-06	17	3180.85	3202.65	7.78	-0.1446	0.0117	0.4621
30-Mar-06	14-Mar-06	16	3171.9	3195.35	7.86	-0.1657	0.0103	0.1458
30-Mar-06	16-Mar-06	14	3205	3226.6	7.91	-0.1727	0.0064	0.0422
30-Mar-06	17-Mar-06	13	3213.95	3234.05	7.95	-0.1726	0.0051	-0.0004
30-Mar-06	20-Mar-06	10	3251.7	3265.65	7.92	-0.1541	-0.0038	-0.1074
30-Mar-06	21-Mar-06	9	3241.95	3262.3	8.03	-0.2503	0.0139	0.6241
30-Mar-06	22-Mar-06	8	3227.25	3240.15	7.98	-0.1795	-0.0062	-0.2828
30-Mar-06	23-Mar-06	7	3239.25	3247.15	8.33	-0.1253	0.0439	-0.3022
30-Mar-06	24-Mar-06	6	3279.9	3279.8	8.29	0.0018	-0.0048	-1.0146
30-Mar-06	27-Mar-06	3	3326.45	3321.65	8.24	0.1733	-0.0060	93.7235
30-Mar-06	28-Mar-06	2	3332.4	3325	8.20	0.4002	-0.0049	1.3093
30-Mar-06	29-Mar-06	1	3364.9	3354.2	8.34	1.1466	0.0171	1.8653
27-Apr-06	30-Mar-06	28	3394.05	3418.95	8.34	-0.0940	0.0000	-1.0820
27-Apr-06	31-Mar-06	27	3403.6	3402.55	8.24	0.0041	-0.0120	-1.0438
27-Apr-06	03-Apr-06	24	3474	3473.3	8.18	0.0030	-0.0073	-0.2652
27-Apr-06	04-Apr-06	23	3489.7	3483.15	7.90	0.0294	-0.0342	8.7282
27-Apr-06	05-Apr-06	22	3510.2	3510.9	7.58	-0.0033	-0.0405	-1.1110
27-Apr-06	07-Apr-06	20	3458.15	3454.8	7.20	0.0174	-0.0501	-6.3466
27-Apr-06	10-Apr-06	17	3488.55	3478.45	7.20	0.0614	0.0000	2.5195
27-Apr-06	12-Apr-06	15	3387	3380	6.98	0.0497	-0.0306	-0.1913
27-Apr-06	13-Apr-06	14	3348.5	3345.5	6.80	0.0230	-0.0258	-0.5358
27-Apr-06	17-Apr-06	10	3424.65	3425.15	6.66	-0.0053	-0.0206	-1.2280
27-Apr-06	18-Apr-06	9	3524.05	3518.1	6.64	0.0676	-0.0030	-13.8611
27-Apr-06	19-Apr-06	8	3546.65	3535.85	6.61	0.1372	-0.0045	1.0304
27-Apr-06	20-Apr-06	7	3581.8	3573.5	6.59	0.1193	-0.0030	-0.1306
27-Apr-06	21-Apr-06	6	3583.9	3573.05	6.48	0.1819	-0.0167	0.5247
27-Apr-06	24-Apr-06	3	3556.5	3548.9	6.42	0.2567	-0.0093	0.4111
27-Apr-06	25-Apr-06	2	3465.5	3462.65	6.35	0.1481	-0.0109	-0.4231
27-Apr-06	26-Apr-06	1	3579.45	3555.75	6.40	2.3915	0.0079	15.1490
25-May-06	27-Apr-06	28	3502.05	3508.1	6.46	-0.0222	0.0094	-1.0093
25-May-06	28-Apr-06	27	3497.6	3508.35	6.39	-0.0409	-0.0108	0.8438
25-May-06	29-Apr-06	26	3545.4	3557.6	6.45	-0.0476	0.0094	0.1624

Expiry	Date	DTE	FClose	Spot Close	MIBOR	COC	D Mibor	D COC
25-May-06	02-May-06	23	3595	3605.45	6.43	-0.0454	-0.0031	-0.0448
25-May-06	03-May-06	22	3612.4	3634.25	6.45	-0.0987	0.0031	1.1720
25-May-06	04-May-06	21	3627.4	3648.4	6.46	-0.0990	0.0016	0.0028
25-May-06	05-May-06	20	3644.1	3663.95	6.41	-0.0978	-0.0077	-0.0119
25-May-06	08-May-06	17	3685.85	3693.15	6.51	-0.0419	0.0156	-0.5715
25-May-06	09-May-06	16	3712.95	3720.55	6.49	-0.0460	-0.0031	0.0981
25-May-06	10-May-06	15	3745.4	3754.25	6.52	-0.0566	0.0046	0.2311
25-May-06	11-May-06	14	3692.9	3701.05	6.44	-0.0567	-0.0123	0.0008
25-May-06	12-May-06	13	3633	3650.05	6.47	-0.1297	0.0047	1.2873
25-May-06	15-May-06	10	3462.05	3502.95	6.34	-0.4228	-0.0201	2.2609
25-May-06	16-May-06	9	3520.3	3523.3	6.31	-0.0341	-0.0047	-0.9194
25-May-06	17-May-06	8	3641.25	3635.1	6.37	0.0761	0.0095	-3.2325
25-May-06	18-May-06	7	3363.85	3388.9	6.39	-0.3816	0.0031	-6.0160
25-May-06	19-May-06	6	3224.35	3246.9	6.34	-0.4182	-0.0078	0.0959
25-May-06	22-May-06	3	3020.9	3081.35	6.38	-2.3776	0.0063	4.6858
25-May-06	23-May-06	2	3190.5	3199.35	6.36	-0.4986	-0.0031	-0.7903
25-May-06	24-May-06	1	3087.25	3115.55	6.42	-3.2850	0.0094	5.5884
29-Jun-06	25-May-06	35	3112.65	3177.7	6.37	-0.2127	-0.0078	-0.9352
29-Jun-06	26-May-06	34	3179.15	3209.6	6.34	-0.1009	-0.0047	-0.5256
29-Jun-06	29-May-06	31	3175	3214.9	6.39	-0.1450	0.0079	0.4369
29-Jun-06	30-May-06	30	3125.35	3185.3	6.36	-0.2280	-0.0047	0.5721
29-Jun-06	31-May-06	29	3032.4	3071.05	6.39	-0.1572	0.0047	-0.3104
29-Jun-06	01-Jun-06	28	2889.9	2962.25	6.33	-0.3179	-0.0094	1.0221
29-Jun-06	02-Jun-06	27	3061.55	3091.35	6.29	-0.1292	-0.0063	-0.5938
29-Jun-06	05-Jun-06	24	2957.3	3016.65	6.33	-0.2981	0.0064	1.3077
29-Jun-06	06-Jun-06	23	2902.8	2937.3	6.34	-0.1849	0.0016	-0.3795
29-Jun-06	07-Jun-06	22	2838.05	2860.45	6.31	-0.1286	-0.0047	-0.3043
29-Jun-06	08-Jun-06	21	2705.6	2724.35	6.32	-0.1184	0.0016	-0.0797
29-Jun-06	09-Jun-06	20	2831.25	2866.3	6.46	-0.2215	0.0222	0.8706
29-Jun-06	12-Jun-06	17	2716	2776.85	6.51	-0.4692	0.0077	1.1186
29-Jun-06	13-Jun-06	16	2629.15	2663.3	6.51	-0.2904	0.0000	-0.3811
29-Jun-06	14-Jun-06	15	2618.25	2632.8	6.49	-0.1330	-0.0031	-0.5420
29-Jun-06	15-Jun-06	14	2786.7	2798.8	6.56	-0.1114	0.0108	-0.1623
29-Jun-06	16-Jun-06	13	2880.75	2890.35	6.50	-0.0921	-0.0091	-0.1731
29-Jun-06	19-Jun-06	10	2909.4	2916.9	6.53	-0.0927	0.0046	0.0060
29-Jun-06	20-Jun-06	9	2839.35	2861.3	6.53	-0.3080	0.0000	2.3235
29-Jun-06	21-Jun-06	8	2912.1	2923.45	6.52	-0.1750	-0.0015	-0.4317
29-Jun-06	22-Jun-06	7	2982.25	2994.75	6.53	-0.2151	0.0015	0.2289
29-Jun-06	23-Jun-06	6	3042.25	3042.7	6.37	-0.0089	-0.0245	-0.9587
29-Jun-06	25-Jun-06	4	3043.9	3050.3	6.55	-0.1890	0.0283	20.3010
29-Jun-06	26-Jun-06	3	2930.6	2943.2	6.55	-0.5148	0.0000	1.7235
29-Jun-06	27-Jun-06	2	2981.1	2982.45	6.61	-0.0815	0.0092	-0.8417
29-Jun-06	28-Jun-06	1	2983.5	2981.1	6.60	0.2897	-0.0015	-4.5549

APPENDIX B							
Sample Data of Correlation between Futures Price and Open Interest for NIFTY							
	correl D FP and D OI			-0.0611			
Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
25-Jul-02	28-Jun-02	27	1062.3	1005000	1057.8		
25-Jul-02	01-Jul-02	24	1072.5	1087400	1068.95	0.0096	0.0820
25-Jul-02	02-Jul-02	23	1068.3	1095600	1068.05	-0.0039	0.0075
25-Jul-02	03-Jul-02	22	1072.3	1164600	1069.9	0.0037	0.0630
25-Jul-02	04-Jul-02	21	1071	1165600	1070.55	-0.0012	0.0009
25-Jul-02	05-Jul-02	20	1073.8	1195400	1073.85	0.0027	0.0256
25-Jul-02	08-Jul-02	17	1080.9	1220600	1082.05	0.0066	0.0211
25-Jul-02	09-Jul-02	16	1078.4	1211400	1080.3	-0.0023	-0.0075
25-Jul-02	10-Jul-02	15	1072.5	1230400	1071.7	-0.0055	0.0157
25-Jul-02	11-Jul-02	14	1060.6	1086200	1056.6	-0.0111	-0.1172
25-Jul-02	12-Jul-02	13	1062.5	1086200	1058.25	0.0018	0.0000
25-Jul-02	15-Jul-02	10	1049.6	1107400	1048	-0.0121	0.0195
25-Jul-02	16-Jul-02	9	1039.2	1088600	1035.95	-0.0100	-0.0170
25-Jul-02	17-Jul-02	8	1035.2	1079600	1032.55	-0.0038	-0.0083
25-Jul-02	18-Jul-02	7	1042.8	1062000	1041.3	0.0074	-0.0163
25-Jul-02	19-Jul-02	6	1036.2	1048000	1035.9	-0.0063	-0.0132
25-Jul-02	22-Jul-02	3	1016.4	1001400	1012	-0.0191	-0.0445
25-Jul-02	23-Jul-02	2	1022.7	826800	1021.9	0.0061	-0.1744
25-Jul-02	24-Jul-02	1	1008.1	668600	1004.05	-0.0143	-0.1913
29-Aug-02	25-Jul-02	35	1009.8	1495000	1001.55	0.0017	1.2360
29-Aug-02	26-Jul-02	34	983.75	1924000	973.5	-0.0257	0.2870
29-Aug-02	29-Jul-02	31	975.25	1951600	971.65	-0.0086	0.0143
29-Aug-02	30-Jul-02	30	963.4	1940000	960.65	-0.0122	-0.0059
29-Aug-02	31-Jul-02	29	965.4	1891800	958.9	0.0021	-0.0248
29-Aug-02	01-Aug-02	28	960.05	1951200	957.7	-0.0055	0.0314
29-Aug-02	02-Aug-02	27	957	1974800	954.75	-0.0032	0.0121
29-Aug-02	05-Aug-02	24	967.2	1945600	963.25	0.0107	-0.0148
29-Aug-02	06-Aug-02	23	969.6	2005000	966.65	0.0025	0.0305
29-Aug-02	07-Aug-02	22	972.65	1911200	969.1	0.0031	-0.0468
29-Aug-02	08-Aug-02	21	955.9	1940000	953.55	-0.0172	0.0151
29-Aug-02	09-Aug-02	20	966.7	2155600	961.95	0.0113	0.1111
29-Aug-02	12-Aug-02	17	970.85	2058600	969.85	0.0043	-0.0450
29-Aug-02	13-Aug-02	16	974.75	1936600	976.05	0.0040	-0.0593
29-Aug-02	14-Aug-02	15	969.75	1885800	969.65	-0.0051	-0.0262
29-Aug-02	16-Aug-02	13	979.05	1803000	979.25	0.0096	-0.0439
29-Aug-02	19-Aug-02	10	980.4	1788400	979.85	0.0014	-0.0081
29-Aug-02	20-Aug-02	9	987.75	1708000	988.55	0.0075	-0.0450
29-Aug-02	21-Aug-02	8	988.95	1630200	988.45	0.0012	-0.0456
29-Aug-02	22-Aug-02	7	985.55	1517000	985.7	-0.0034	-0.0694

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
29-Aug-02	23-Aug-02	6	995.05	1459200	995.2	0.0096	-0.0381
29-Aug-02	26-Aug-02	3	998.3	1307000	998.85	0.0033	-0.1043
29-Aug-02	27-Aug-02	2	986.95	1028600	987.7	-0.0114	-0.2130
29-Aug-02	28-Aug-02	1	984	770400	985.7	-0.0030	-0.2510
26-Sep-02	29-Aug-02	28	983.45	1435200	987.25	-0.0006	0.8629
26-Sep-02	30-Aug-02	27	1002.2	1484800	1010.6	0.0190	0.0346
26-Sep-02	02-Sep-02	24	1007.9	1666000	1013.5	0.0057	0.1220
26-Sep-02	03-Sep-02	23	997.5	1737600	1001.1	-0.0103	0.0430
26-Sep-02	04-Sep-02	22	1001.8	1806600	1006.95	0.0043	0.0397
26-Sep-02	05-Sep-02	21	1001.4	1877400	1008.6	-0.0004	0.0392
26-Sep-02	06-Sep-02	20	992.1	1871000	995.2	-0.0092	-0.0034
26-Sep-02	09-Sep-02	17	984.7	1858800	998.55	-0.0075	-0.0065
26-Sep-02	11-Sep-02	15	991.5	1878600	998.85	0.0069	0.0107
26-Sep-02	12-Sep-02	14	994	1994600	1001.65	0.0025	0.0617
26-Sep-02	13-Sep-02	13	984.7	2079600	992	-0.0094	0.0426
26-Sep-02	16-Sep-02	10	979.35	2118600	985.75	-0.0054	0.0188
26-Sep-02	17-Sep-02	9	989.8	2062600	994.9	0.0107	-0.0264
26-Sep-02	18-Sep-02	8	978.45	2038000	983.6	-0.0115	-0.0119
26-Sep-02	19-Sep-02	7	974.35	1891400	976.05	-0.0042	-0.0719
26-Sep-02	20-Sep-02	6	971.3	1697200	969.6	-0.0031	-0.1027
26-Sep-02	23-Sep-02	3	965.9	1546600	970.3	-0.0056	-0.0887
26-Sep-02	24-Sep-02	2	962.75	1246200	966.2	-0.0033	-0.1942
26-Sep-02	25-Sep-02	1	969.25	895600	970.05	0.0068	-0.2813
31-Oct-02	26-Sep-02	35	963.35	1341800	969.9	-0.0061	0.4982
31-Oct-02	27-Sep-02	34	968.3	1541200	976.45	0.0051	0.1486
31-Oct-02	30-Sep-02	31	957.75	1722000	963.15	-0.0109	0.1173
31-Oct-02	01-Oct-02	30	955.6	1699800	955.2	-0.0022	-0.0129
31-Oct-02	03-Oct-02	28	952.4	1784400	948.2	-0.0033	0.0498
31-Oct-02	04-Oct-02	27	948.9	2102200	948.2	-0.0037	0.1781
31-Oct-02	07-Oct-02	24	958.8	1975600	954.75	0.0104	-0.0602
31-Oct-02	08-Oct-02	23	963.3	1973600	960.8	0.0047	-0.0010
31-Oct-02	09-Oct-02	22	955.35	1831000	954.75	-0.0083	-0.0723
31-Oct-02	10-Oct-02	21	958.05	1825000	958.45	0.0028	-0.0033
31-Oct-02	11-Oct-02	20	969.65	1830000	971.05	0.0121	0.0027
31-Oct-02	14-Oct-02	17	969.6	1810600	972.45	-0.0001	-0.0106
31-Oct-02	16-Oct-02	15	972.65	1850000	973.6	0.0031	0.0218
31-Oct-02	17-Oct-02	14	975.85	1880800	973.3	0.0033	0.0166
31-Oct-02	18-Oct-02	13	972.15	1852000	971.65	-0.0038	-0.0153
31-Oct-02	21-Oct-02	10	968.15	1960000	967.35	-0.0041	0.0583
31-Oct-02	22-Oct-02	9	962.9	2012200	962.5	-0.0054	0.0266
31-Oct-02	23-Oct-02	8	957.85	1979600	957.35	-0.0052	-0.0162
31-Oct-02	24-Oct-02	7	949.6	2093800	946.9	-0.0086	0.0577
31-Oct-02	25-Oct-02	6	935.9	2208200	932.2	-0.0144	0.0546
31-Oct-02	28-Oct-02	3	927.7	2023000	922.7	-0.0088	-0.0839

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
31-Oct-02	29-Oct-02	2	937.5	1605800	936.9	0.0106	-0.2062
31-Oct-02	30-Oct-02	1	938.4	1134000	937.75	0.0010	-0.2938
28-Nov-02	31-Oct-02	28	952	1676000	951.4	0.0145	0.4780
28-Nov-02	01-Nov-02	27	952.55	1836800	951.45	0.0006	0.0959
28-Nov-02	04-Nov-02	24	963.45	1907800	962.1	0.0114	0.0387
28-Nov-02	05-Nov-02	23	962.85	1871600	962.3	-0.0006	-0.0190
28-Nov-02	07-Nov-02	21	960.65	1806400	960.7	-0.0023	-0.0348
28-Nov-02	08-Nov-02	20	958.85	1893000	956.95	-0.0019	0.0479
28-Nov-02	11-Nov-02	17	955.55	2004000	954.05	-0.0034	0.0586
28-Nov-02	12-Nov-02	16	961.75	2059400	959.85	0.0065	0.0276
28-Nov-02	13-Nov-02	15	960.3	2449000	962.65	-0.0015	0.1892
28-Nov-02	14-Nov-02	14	970.65	2261400	971.9	0.0108	-0.0766
28-Nov-02	15-Nov-02	13	988.75	2384800	990.35	0.0186	0.0546
28-Nov-02	18-Nov-02	10	993.5	2535800	996.85	0.0048	0.0633
28-Nov-02	20-Nov-02	8	996.95	2490600	1001.6	0.0035	-0.0178
28-Nov-02	21-Nov-02	7	1002.8	2441800	1008.75	0.0058	-0.0196
28-Nov-02	22-Nov-02	6	1014.7	2371800	1020.15	0.0119	-0.0287
28-Nov-02	25-Nov-02	3	1021.3	2272600	1026.2	0.0065	-0.0418
28-Nov-02	26-Nov-02	2	1032.9	2162000	1036.15	0.0114	-0.0487
28-Nov-02	27-Nov-02	1	1028.5	1983600	1031.1	-0.0043	-0.0825
26-Dec-02	28-Nov-02	28	1039.7	2050800	1049.7	0.0109	0.0339
26-Dec-02	29-Nov-02	27	1045.8	2448600	1050.15	0.0059	0.1940
26-Dec-02	02-Dec-02	24	1066.5	2598600	1067.9	0.0198	0.0613
26-Dec-02	03-Dec-02	23	1057	2453200	1055	-0.0089	-0.0560
26-Dec-02	04-Dec-02	22	1042.7	2175400	1036.4	-0.0135	-0.1132
26-Dec-02	05-Dec-02	21	1052.7	2163800	1045.95	0.0096	-0.0053
26-Dec-02	06-Dec-02	20	1076.2	2190800	1069.8	0.0223	0.0125
26-Dec-02	09-Dec-02	17	1065.8	2079000	1058.65	-0.0097	-0.0510
26-Dec-02	10-Dec-02	16	1069.4	2068200	1063.7	0.0034	-0.0052
26-Dec-02	11-Dec-02	15	1069.6	2392200	1069.75	0.0001	0.1567
26-Dec-02	12-Dec-02	14	1072	2451000	1077	0.0022	0.0246
26-Dec-02	13-Dec-02	13	1085.8	2640000	1086.2	0.0129	0.0771
26-Dec-02	16-Dec-02	10	1074.3	2735200	1078.45	-0.0106	0.0361
26-Dec-02	17-Dec-02	9	1070.6	2633400	1073.25	-0.0034	-0.0372
26-Dec-02	18-Dec-02	8	1072.5	2793000	1077.95	0.0018	0.0606
26-Dec-02	19-Dec-02	7	1073.6	2841000	1076	0.0011	0.0172
26-Dec-02	20-Dec-02	6	1078.4	2803000	1079.3	0.0044	-0.0134
26-Dec-02	23-Dec-02	3	1075.4	2556400	1076	-0.0028	-0.0880
26-Dec-02	24-Dec-02	2	1087.9	2011800	1085	0.0116	-0.2130
30-Jan-03	26-Dec-02	35	1093.2	1700000	1094.8	0.0049	-0.1550
30-Jan-03	27-Dec-02	34	1098.8	1870800	1098.4	0.0052	0.1005
30-Jan-03	30-Dec-02	31	1092.8	1920800	1091.95	-0.0055	0.0267
30-Jan-03	31-Dec-02	30	1092.1	2021200	1093.5	-0.0006	0.0523
30-Jan-03	01-Jan-03	29	1102.6	2045800	1100.15	0.0096	0.0122

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
30-Jan-03	02-Jan-03	28	1095.1	2191800	1093.05	-0.0068	0.0714
30-Jan-03	03-Jan-03	27	1091.6	2240800	1089.6	-0.0032	0.0224
30-Jan-03	06-Jan-03	24	1084.8	2411400	1084.35	-0.0063	0.0761
30-Jan-03	07-Jan-03	23	1082.2	2482400	1081.8	-0.0024	0.0294
30-Jan-03	08-Jan-03	22	1092.1	2417800	1089.35	0.0091	-0.0260
30-Jan-03	09-Jan-03	21	1100.7	2361600	1097.35	0.0079	-0.0232
30-Jan-03	10-Jan-03	20	1085.6	2245400	1080.25	-0.0138	-0.0492
30-Jan-03	13-Jan-03	17	1079.7	2208600	1073.75	-0.0054	-0.0164
30-Jan-03	14-Jan-03	16	1082.8	2167200	1078.95	0.0029	-0.0187
30-Jan-03	15-Jan-03	15	1085.9	2152800	1085	0.0028	-0.0066
30-Jan-03	16-Jan-03	14	1087.4	2121600	1088.35	0.0014	-0.0145
30-Jan-03	17-Jan-03	13	1086.8	2109200	1086.5	-0.0006	-0.0058
30-Jan-03	20-Jan-03	10	1077.3	2170200	1076.35	-0.0087	0.0289
30-Jan-03	21-Jan-03	9	1078.5	2031400	1077.9	0.0011	-0.0640
30-Jan-03	22-Jan-03	8	1081	1990600	1082.9	0.0024	-0.0201
30-Jan-03	23-Jan-03	7	1071.9	1989000	1070.9	-0.0085	-0.0008
30-Jan-03	24-Jan-03	6	1060	1899200	1056.05	-0.0111	-0.0451
30-Jan-03	27-Jan-03	3	1043.1	1671600	1037.65	-0.0159	-0.1198
30-Jan-03	28-Jan-03	2	1050.8	1462800	1046.2	0.0073	-0.1249
30-Jan-03	29-Jan-03	1	1038.9	1227000	1037.2	-0.0113	-0.1612
27-Feb-03	30-Jan-03	28	1042.1	1692600	1034.6	0.0031	0.3795
27-Feb-03	31-Jan-03	27	1045.5	1814600	1041.85	0.0033	0.0721
27-Feb-03	03-Feb-03	24	1057.4	1828000	1055.3	0.0113	0.0074
27-Feb-03	04-Feb-03	23	1052.6	1913200	1054.8	-0.0045	0.0466
27-Feb-03	05-Feb-03	22	1047.7	1877200	1047.4	-0.0047	-0.0188
27-Feb-03	06-Feb-03	21	1064.3	1976000	1063.6	0.0159	0.0526
27-Feb-03	07-Feb-03	20	1058.1	2010600	1057.5	-0.0058	0.0175
27-Feb-03	10-Feb-03	17	1049.9	2005600	1048.6	-0.0078	-0.0025
27-Feb-03	11-Feb-03	16	1050.2	1970600	1048	0.0003	-0.0175
27-Feb-03	12-Feb-03	15	1047.1	1941800	1044.45	-0.0030	-0.0146
27-Feb-03	14-Feb-03	13	1040.5	1976000	1036	-0.0063	0.0176
27-Feb-03	17-Feb-03	10	1063.7	1882200	1058.2	0.0223	-0.0475
27-Feb-03	18-Feb-03	9	1062.1	1911800	1059.3	-0.0015	0.0157
27-Feb-03	19-Feb-03	8	1068.6	1967800	1064.3	0.0062	0.0293
27-Feb-03	20-Feb-03	7	1069.1	1700800	1065.6	0.0004	-0.1357
27-Feb-03	21-Feb-03	6	1069.3	1755800	1066.15	0.0002	0.0323
27-Feb-03	24-Feb-03	3	1073.2	1734200	1070.15	0.0036	-0.0123
27-Feb-03	25-Feb-03	2	1059	1499400	1055.55	-0.0132	-0.1354
27-Feb-03	26-Feb-03	1	1052.1	1310000	1049.65	-0.0065	-0.1263
27-Mar-03	27-Feb-03	28	1061.1	1908200	1052.95	0.0086	0.4566
27-Mar-03	28-Feb-03	27	1070.5	2430000	1063.4	0.0089	0.2735
27-Mar-03	03-Mar-03	24	1064.9	2499600	1058.85	-0.0052	0.0286
27-Mar-03	04-Mar-03	23	1053.9	2657200	1046.6	-0.0103	0.0631
27-Mar-03	05-Mar-03	22	1045.4	2744800	1040.7	-0.0081	0.0330

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
27-Mar-03	06-Mar-03	21	1034.9	2911400	1031.25	-0.0100	0.0607
27-Mar-03	07-Mar-03	20	1023.5	2950200	1017.1	-0.0111	0.0133
27-Mar-03	10-Mar-03	17	1007.2	3309000	1006.7	-0.0159	0.1216
27-Mar-03	11-Mar-03	16	1015.7	3274800	1014.55	0.0084	-0.0103
27-Mar-03	12-Mar-03	15	1004	3156800	1001.7	-0.0115	-0.0360
27-Mar-03	13-Mar-03	14	1003.1	3113800	999.65	-0.0009	-0.0136
27-Mar-03	17-Mar-03	10	994.05	3196400	993	-0.0090	0.0265
27-Mar-03	19-Mar-03	8	1004.2	3010000	1003.9	0.0102	-0.0583
27-Mar-03	20-Mar-03	7	1021.8	2902800	1025.25	0.0175	-0.0356
27-Mar-03	21-Mar-03	6	1029.4	2740200	1030.55	0.0074	-0.0560
27-Mar-03	22-Mar-03	5	1036.7	2755600	1037.15	0.0071	0.0056
27-Mar-03	24-Mar-03	3	1012.2	2421200	1013.9	-0.0236	-0.1214
27-Mar-03	25-Mar-03	2	1012.1	2051800	1011.3	-0.0001	-0.1526
27-Mar-03	26-Mar-03	1	1015.8	1438600	1013.85	0.0037	-0.2989
24-Apr-03	27-Mar-03	28	1003.9	2186800	1002.7	-0.0117	0.5201
24-Apr-03	28-Mar-03	27	1001.1	2244200	1000.6	-0.0028	0.0262
24-Apr-03	31-Mar-03	24	980.5	2399000	978.2	-0.0206	0.0690
24-Apr-03	01-Apr-03	23	982.2	2421400	984.3	0.0017	0.0093
24-Apr-03	02-Apr-03	22	998.85	2375600	999.4	0.0170	-0.0189
24-Apr-03	03-Apr-03	21	1006.4	2388200	1009.15	0.0075	0.0053
24-Apr-03	04-Apr-03	20	1014.8	2352800	1016.95	0.0084	-0.0148
24-Apr-03	07-Apr-03	17	1028.7	2381400	1031.5	0.0136	0.0122
24-Apr-03	08-Apr-03	16	1016.3	2256600	1018.1	-0.0121	-0.0524
24-Apr-03	09-Apr-03	15	1006.2	2325000	1004.85	-0.0099	0.0303
24-Apr-03	10-Apr-03	14	973.65	3212000	962.2	-0.0323	0.3815
24-Apr-03	11-Apr-03	13	959.8	3426800	949.8	-0.0142	0.0669
24-Apr-03	15-Apr-03	9	953.6	3393400	951.2	-0.0065	-0.0097
24-Apr-03	16-Apr-03	8	958.6	3202400	958.65	0.0052	-0.0563
24-Apr-03	17-Apr-03	7	941.05	3392600	940.7	-0.0183	0.0594
24-Apr-03	21-Apr-03	3	947.65	3255000	947.2	0.0070	-0.0406
24-Apr-03	22-Apr-03	2	944.25	2604200	943.5	-0.0036	-0.1999
24-Apr-03	23-Apr-03	1	934.05	2085800	934.2	-0.0108	-0.1991
29-May-03	24-Apr-03	35	934.55	3028000	929.7	0.0005	0.4517
29-May-03	25-Apr-03	34	929.15	3288000	924.3	-0.0058	0.0859
29-May-03	28-Apr-03	31	934.25	3478400	929.5	0.0055	0.0579
29-May-03	29-Apr-03	30	930.3	3571600	932.3	-0.0042	0.0268
29-May-03	30-Apr-03	29	930.65	3482200	934.05	0.0004	-0.0250
29-May-03	02-May-03	27	938.05	3567000	938.3	0.0080	0.0244
29-May-03	05-May-03	24	945.85	3578000	945.4	0.0083	0.0031
29-May-03	06-May-03	23	949.6	3622000	951.85	0.0040	0.0123
29-May-03	07-May-03	22	947	3463400	950.15	-0.0027	-0.0438
29-May-03	08-May-03	21	937.15	3690000	941.55	-0.0104	0.0654
29-May-03	09-May-03	20	934.65	3547400	937.85	-0.0027	-0.0386
29-May-03	12-May-03	17	932.95	3499200	936	-0.0018	-0.0136

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
29-May-03	13-May-03	16	944.2	3368800	944.25	0.0121	-0.0373
29-May-03	14-May-03	15	951.9	3205200	952.15	0.0082	-0.0486
29-May-03	15-May-03	14	959.8	2924800	959.85	0.0083	-0.0875
29-May-03	16-May-03	13	970.5	2778800	973.1	0.0111	-0.0499
29-May-03	19-May-03	10	965.25	2425200	966.55	-0.0054	-0.1272
29-May-03	20-May-03	9	971.35	2492800	971.55	0.0063	0.0279
29-May-03	21-May-03	8	964.6	2447800	968	-0.0069	-0.0181
29-May-03	22-May-03	7	962.65	2410600	963.25	-0.0020	-0.0152
29-May-03	23-May-03	6	969.6	2297000	967.9	0.0072	-0.0471
29-May-03	26-May-03	3	984.6	1996000	982.45	0.0155	-0.1310
29-May-03	27-May-03	2	974.8	1568200	976.85	-0.0100	-0.2143
29-May-03	28-May-03	1	989.2	1445400	990.8	0.0148	-0.0783
26-Jun-03	29-May-03	28	996.5	2005400	1002.6	0.0074	0.3874
26-Jun-03	30-May-03	27	999.35	1950600	1006.8	0.0029	-0.0273
26-Jun-03	02-Jun-03	24	1009.2	1922600	1015.15	0.0099	-0.0144
26-Jun-03	03-Jun-03	23	1003.7	2045400	1010.65	-0.0054	0.0639
26-Jun-03	04-Jun-03	22	1018.4	2154800	1021.05	0.0146	0.0535
26-Jun-03	05-Jun-03	21	1027.8	2429600	1035.05	0.0092	0.1275
26-Jun-03	06-Jun-03	20	1039.2	2632800	1046.4	0.0111	0.0836
26-Jun-03	09-Jun-03	17	1042	2963800	1052.1	0.0027	0.1257
26-Jun-03	10-Jun-03	16	1031	3132400	1037.8	-0.0106	0.0569
26-Jun-03	11-Jun-03	15	1039.4	3116000	1044.1	0.0081	-0.0052
26-Jun-03	12-Jun-03	14	1044.1	3148000	1051.3	0.0045	0.0103
26-Jun-03	13-Jun-03	13	1045.7	3117800	1056.2	0.0015	-0.0096
26-Jun-03	16-Jun-03	10	1040.3	3024000	1051.8	-0.0051	-0.0301
26-Jun-03	17-Jun-03	9	1070.8	3167000	1081.95	0.0293	0.0473
26-Jun-03	18-Jun-03	8	1074.8	3162800	1086.75	0.0037	-0.0013
26-Jun-03	19-Jun-03	7	1080.9	3131200	1092.55	0.0057	-0.0100
26-Jun-03	20-Jun-03	6	1096.1	3286400	1100.25	0.0141	0.0496
26-Jun-03	23-Jun-03	3	1085.6	3142800	1089.2	-0.0096	-0.0437
26-Jun-03	24-Jun-03	2	1086.8	2748200	1085.35	0.0011	-0.1256
26-Jun-03	25-Jun-03	1	1111.6	2141400	1106.65	0.0228	-0.2208
31-Jul-03	26-Jun-03	35	1104.4	2083200	1116.35	-0.0064	-0.0272
31-Jul-03	27-Jun-03	34	1113.5	2768600	1125.55	0.0082	0.3290
31-Jul-03	30-Jun-03	31	1123.6	3129600	1134.15	0.0091	0.1304
31-Jul-03	01-Jul-03	30	1121.2	3635200	1130.7	-0.0021	0.1616
31-Jul-03	02-Jul-03	29	1130.8	3613800	1133.8	0.0085	-0.0059
31-Jul-03	03-Jul-03	28	1137.8	3527200	1144.65	0.0062	-0.0240
31-Jul-03	04-Jul-03	27	1136.7	3599400	1138.45	-0.0009	0.0205
31-Jul-03	07-Jul-03	24	1140.6	3559800	1140.55	0.0034	-0.0110
31-Jul-03	08-Jul-03	23	1140.5	3710000	1145.9	-0.0001	0.0422
31-Jul-03	09-Jul-03	22	1133.8	3627600	1141.05	-0.0059	-0.0222
31-Jul-03	10-Jul-03	21	1159.9	3554400	1162.35	0.0231	-0.0202
31-Jul-03	11-Jul-03	20	1158.2	3632600	1161.65	-0.0015	0.0220

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
31-Jul-03	14-Jul-03	17	1171.6	3638400	1171.5	0.0115	0.0016
31-Jul-03	15-Jul-03	16	1158.2	3780800	1159.85	-0.0114	0.0391
31-Jul-03	16-Jul-03	15	1173.3	3712200	1168.75	0.0130	-0.0181
31-Jul-03	17-Jul-03	14	1154.8	3714000	1152	-0.0158	0.0005
31-Jul-03	18-Jul-03	13	1144.1	3821000	1140	-0.0092	0.0288
31-Jul-03	21-Jul-03	10	1118.8	3692400	1115.8	-0.0222	-0.0337
31-Jul-03	22-Jul-03	9	1112.9	3169600	1109.2	-0.0052	-0.1416
31-Jul-03	23-Jul-03	8	1118.1	2876400	1119.05	0.0047	-0.0925
31-Jul-03	24-Jul-03	7	1137.1	2799800	1139.45	0.0169	-0.0266
31-Jul-03	25-Jul-03	6	1163.9	2804200	1162.75	0.0236	0.0016
31-Jul-03	28-Jul-03	3	1168.7	2622200	1169.2	0.0041	-0.0649
31-Jul-03	29-Jul-03	2	1179.3	2089600	1174.75	0.0091	-0.2031
31-Jul-03	30-Jul-03	1	1183.7	1982400	1183	0.0037	-0.0513
28-Aug-03	31-Jul-03	28	1181.4	2778000	1185.85	-0.0019	0.4013
28-Aug-03	01-Aug-03	27	1187	3072400	1195.75	0.0047	0.1060
28-Aug-03	04-Aug-03	24	1196.7	3386200	1203.6	0.0082	0.1021
28-Aug-03	05-Aug-03	23	1179.9	3596600	1184.45	-0.0141	0.0621
28-Aug-03	06-Aug-03	22	1165.3	4201000	1171.05	-0.0124	0.1680
28-Aug-03	07-Aug-03	21	1191.9	4151400	1196.95	0.0229	-0.0118
28-Aug-03	08-Aug-03	20	1216	4153200	1222.65	0.0202	0.0004
28-Aug-03	11-Aug-03	17	1224.3	4212400	1232.85	0.0069	0.0143
28-Aug-03	12-Aug-03	16	1224.8	4312600	1234.75	0.0004	0.0238
28-Aug-03	13-Aug-03	15	1242.3	4620800	1246.9	0.0143	0.0715
28-Aug-03	14-Aug-03	14	1242.3	4775400	1247.75	0.0000	0.0335
28-Aug-03	18-Aug-03	10	1274.4	5168600	1281.4	0.0258	0.0823
28-Aug-03	19-Aug-03	9	1274.7	4903800	1277.7	0.0003	-0.0512
28-Aug-03	20-Aug-03	8	1287.8	4738600	1287.4	0.0103	-0.0337
28-Aug-03	21-Aug-03	7	1303.3	4320600	1300.95	0.0120	-0.0882
28-Aug-03	22-Aug-03	6	1312.4	4167200	1311.15	0.0069	-0.0355
28-Aug-03	25-Aug-03	3	1273.5	3425400	1271.1	-0.0296	-0.1780
28-Aug-03	26-Aug-03	2	1326	3181000	1318.2	0.0412	-0.0713
28-Aug-03	27-Aug-03	1	1344.3	2498800	1340.3	0.0138	-0.2145
25-Sep-03	28-Aug-03	28	1334.3	3272400	1341.05	-0.0074	0.3096
25-Sep-03	29-Aug-03	27	1358.8	3848000	1356.55	0.0184	0.1759
25-Sep-03	01-Sep-03	24	1372.3	3937200	1375.95	0.0099	0.0232
25-Sep-03	02-Sep-03	23	1385.3	4287800	1385.45	0.0095	0.0890
25-Sep-03	03-Sep-03	22	1359.7	4484600	1359.35	-0.0185	0.0459
25-Sep-03	04-Sep-03	21	1370.9	4415400	1372.7	0.0083	-0.0154
25-Sep-03	05-Sep-03	20	1401.6	4489600	1398.4	0.0224	0.0168
25-Sep-03	08-Sep-03	17	1422.7	4765200	1417.35	0.0151	0.0614
25-Sep-03	09-Sep-03	16	1409.5	5316000	1407.05	-0.0093	0.1156
25-Sep-03	10-Sep-03	15	1416.4	5428400	1409.55	0.0049	0.0211
25-Sep-03	11-Sep-03	14	1414.2	5165800	1403.15	-0.0016	-0.0484
25-Sep-03	12-Sep-03	13	1379.9	5567000	1372.1	-0.0242	0.0777

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
25-Sep-03	15-Sep-03	10	1339.9	5441800	1329.25	-0.0290	-0.0225
25-Sep-03	16-Sep-03	9	1369.4	4886800	1357.95	0.0220	-0.1020
25-Sep-03	17-Sep-03	8	1343.5	4736000	1341.6	-0.0189	-0.0309
25-Sep-03	18-Sep-03	7	1302.2	5003200	1302.35	-0.0308	0.0564
25-Sep-03	19-Sep-03	6	1323.8	4675000	1322.15	0.0166	-0.0656
25-Sep-03	22-Sep-03	3	1299.7	4610600	1302.9	-0.0182	-0.0138
25-Sep-03	23-Sep-03	2	1330.9	3605000	1328.2	0.0240	-0.2181
25-Sep-03	24-Sep-03	1	1371.9	2497800	1372.05	0.0308	-0.3071
30-Oct-03	25-Sep-03	35	1361.1	4111000	1357.2	-0.0079	0.6458
30-Oct-03	26-Sep-03	34	1390.7	4590400	1386.95	0.0217	0.1166
30-Oct-03	29-Sep-03	31	1405.2	4549000	1399.95	0.0104	-0.0090
30-Oct-03	30-Sep-03	30	1418.3	4584400	1417.1	0.0093	0.0078
30-Oct-03	01-Oct-03	29	1422.5	4799200	1420.85	0.0030	0.0469
30-Oct-03	03-Oct-03	27	1447.2	5026800	1449.3	0.0174	0.0474
30-Oct-03	06-Oct-03	24	1482.3	4948600	1478.9	0.0242	-0.0156
30-Oct-03	07-Oct-03	23	1475.2	4777000	1477.85	-0.0048	-0.0347
30-Oct-03	08-Oct-03	22	1479.6	4711000	1478.6	0.0030	-0.0138
30-Oct-03	09-Oct-03	21	1506.5	4803800	1502.1	0.0182	0.0197
30-Oct-03	10-Oct-03	20	1528.1	4985800	1523.1	0.0143	0.0379
30-Oct-03	13-Oct-03	17	1551.7	5449600	1546.75	0.0155	0.0930
30-Oct-03	14-Oct-03	16	1520.1	5011200	1520.8	-0.0204	-0.0804
30-Oct-03	15-Oct-03	15	1541.8	4996800	1537	0.0143	-0.0029
30-Oct-03	16-Oct-03	14	1562.1	5383000	1555.7	0.0132	0.0773
30-Oct-03	17-Oct-03	13	1570.9	5452600	1569.45	0.0056	0.0129
30-Oct-03	20-Oct-03	10	1541.4	5436200	1542.7	-0.0187	-0.0030
30-Oct-03	21-Oct-03	9	1510.7	5269400	1506.5	-0.0199	-0.0307
30-Oct-03	22-Oct-03	8	1497.7	5351000	1494.1	-0.0086	0.0155
30-Oct-03	23-Oct-03	7	1475.4	5713600	1470.45	-0.0149	0.0678
30-Oct-03	24-Oct-03	6	1516.2	5152600	1506.05	0.0277	-0.0982
30-Oct-03	25-Oct-03	5	1524.5	5310800	1521.95	0.0054	0.0307
30-Oct-03	27-Oct-03	3	1484.9	4905200	1485.3	-0.0260	-0.0764
30-Oct-03	28-Oct-03	2	1480.6	4144600	1481.75	-0.0029	-0.1551
30-Oct-03	29-Oct-03	1	1503.1	3037400	1498.45	0.0152	-0.2671
27-Nov-03	30-Oct-03	28	1525.5	4500200	1516.85	0.0149	0.4816
27-Nov-03	31-Oct-03	27	1559.5	5230400	1555.9	0.0223	0.1623
27-Nov-03	03-Nov-03	24	1609	5948200	1601.65	0.0318	0.1372
27-Nov-03	04-Nov-03	23	1619.4	6019600	1618.7	0.0065	0.0120
27-Nov-03	05-Nov-03	22	1609.9	6003600	1609.15	-0.0059	-0.0027
27-Nov-03	06-Nov-03	21	1617.7	6067600	1612.2	0.0048	0.0107
27-Nov-03	07-Nov-03	20	1597.7	5439200	1592.05	-0.0124	-0.1036
27-Nov-03	10-Nov-03	17	1605.1	5677400	1594.5	0.0046	0.0438
27-Nov-03	11-Nov-03	16	1602.3	5827600	1601.15	-0.0018	0.0265
27-Nov-03	12-Nov-03	15	1611.3	5780800	1603.8	0.0056	-0.0080
27-Nov-03	13-Nov-03	14	1587.1	5850200	1579.95	-0.0150	0.0120

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
27-Nov-03	14-Nov-03	13	1558.3	5765400	1550.45	-0.0181	-0.0145
27-Nov-03	15-Nov-03	12	1567.7	5725400	1562.8	0.0060	-0.0069
27-Nov-03	17-Nov-03	10	1590.9	5330600	1579.9	0.0148	-0.0690
27-Nov-03	18-Nov-03	9	1571.6	5304000	1564.4	-0.0121	-0.0050
27-Nov-03	19-Nov-03	8	1545.9	5839400	1540.6	-0.0164	0.1009
27-Nov-03	20-Nov-03	7	1526.4	5795400	1522.3	-0.0126	-0.0075
27-Nov-03	21-Nov-03	6	1546.8	5376400	1540.7	0.0134	-0.0723
27-Nov-03	24-Nov-03	3	1544.9	4397600	1543.9	-0.0012	-0.1821
27-Nov-03	25-Nov-03	2	1571.9	2836600	1568.65	0.0174	-0.3550
24-Dec-03	27-Nov-03	27	1604.8	4508400	1598.35	0.0210	0.5894
24-Dec-03	28-Nov-03	26	1620	5026200	1615.25	0.0094	0.1149
24-Dec-03	01-Dec-03	23	1662.3	5699000	1657.65	0.0261	0.1339
24-Dec-03	02-Dec-03	22	1659.8	5729400	1658.5	-0.0015	0.0053
24-Dec-03	03-Dec-03	21	1672.7	6036600	1670.5	0.0078	0.0536
24-Dec-03	04-Dec-03	20	1678.9	6379000	1675.2	0.0037	0.0567
24-Dec-03	05-Dec-03	19	1649.6	6056000	1645.8	-0.0174	-0.0506
24-Dec-03	08-Dec-03	16	1651.2	6210000	1646.25	0.0010	0.0254
24-Dec-03	09-Dec-03	15	1680.8	6616800	1675.85	0.0179	0.0655
24-Dec-03	10-Dec-03	14	1682.1	7305600	1686.9	0.0008	0.1041
24-Dec-03	11-Dec-03	13	1691.5	7526800	1695.4	0.0056	0.0303
24-Dec-03	12-Dec-03	12	1697.9	7481000	1698.9	0.0038	-0.0061
24-Dec-03	15-Dec-03	9	1723.2	7641800	1723.95	0.0149	0.0215
24-Dec-03	16-Dec-03	8	1726.1	8513400	1736.25	0.0017	0.1141
24-Dec-03	17-Dec-03	7	1722.1	8376800	1733.25	-0.0023	-0.0160
24-Dec-03	18-Dec-03	6	1746.9	8301800	1756.1	0.0144	-0.0090
24-Dec-03	19-Dec-03	5	1772	7823200	1778.55	0.0144	-0.0577
24-Dec-03	22-Dec-03	2	1786.8	6738000	1789.15	0.0084	-0.1387
24-Dec-03	23-Dec-03	1	1780.3	5356000	1780.35	-0.0036	-0.2051
29-Jan-04	24-Dec-03	36	1802.4	6055800	1808.7	0.0124	0.1307
29-Jan-04	26-Dec-03	34	1837.1	6498400	1837.05	0.0193	0.0731
29-Jan-04	29-Dec-03	31	1877.9	6950400	1874.05	0.0222	0.0696
29-Jan-04	30-Dec-03	30	1879.3	6937400	1873.25	0.0007	-0.0019
29-Jan-04	31-Dec-03	29	1888.3	7294000	1879.75	0.0048	0.0514
29-Jan-04	01-Jan-04	28	1925.3	7422600	1912.25	0.0196	0.0176
29-Jan-04	02-Jan-04	27	1950.8	7770000	1946.05	0.0132	0.0468
29-Jan-04	05-Jan-04	24	1957.2	8339000	1955	0.0033	0.0732
29-Jan-04	06-Jan-04	23	1923	8545200	1926.7	-0.0175	0.0247
29-Jan-04	07-Jan-04	22	1927.2	8090600	1916.75	0.0022	-0.0532
29-Jan-04	08-Jan-04	21	1982.6	7965400	1968.55	0.0287	-0.0155
29-Jan-04	09-Jan-04	20	1983.4	7730400	1971.9	0.0004	-0.0295
29-Jan-04	12-Jan-04	17	1953.6	7664400	1945.6	-0.0150	-0.0085
29-Jan-04	13-Jan-04	16	1983.1	7501400	1963.6	0.0151	-0.0213
29-Jan-04	14-Jan-04	15	1992.4	8221800	1982.15	0.0047	0.0960
29-Jan-04	15-Jan-04	14	1951.5	9028000	1944.45	-0.0205	0.0981

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
29-Jan-04	16-Jan-04	13	1908.5	8447400	1900.65	-0.0220	-0.0643
29-Jan-04	19-Jan-04	10	1946.9	8385200	1935.35	0.0201	-0.0074
29-Jan-04	20-Jan-04	9	1890.6	8887200	1893.25	-0.0289	0.0599
29-Jan-04	21-Jan-04	8	1835.6	8250600	1824.6	-0.0291	-0.0716
29-Jan-04	22-Jan-04	7	1787	8026600	1770.5	-0.0264	-0.0271
29-Jan-04	23-Jan-04	6	1864.6	6654400	1847.55	0.0434	-0.1710
29-Jan-04	27-Jan-04	2	1911.9	4266800	1904.7	0.0254	-0.3588
29-Jan-04	28-Jan-04	1	1866.4	3285400	1863.1	-0.0238	-0.2300
26-Feb-04	29-Jan-04	28	1868.1	6752000	1843.6	0.0009	1.0552
26-Feb-04	30-Jan-04	27	1814.9	7381800	1809.75	-0.0285	0.0933
26-Feb-04	03-Feb-04	23	1772.5	7652000	1769	-0.0233	0.0366
26-Feb-04	04-Feb-04	22	1826	7725800	1822.2	0.0302	0.0096
26-Feb-04	05-Feb-04	21	1796	7682800	1804.5	-0.0164	-0.0056
26-Feb-04	06-Feb-04	20	1834.7	6862600	1833.65	0.0216	-0.1068
26-Feb-04	09-Feb-04	17	1883.4	6999800	1880.7	0.0265	0.0200
26-Feb-04	10-Feb-04	16	1876.2	7000400	1880.75	-0.0038	0.0001
26-Feb-04	11-Feb-04	15	1897.2	7258200	1891.5	0.0112	0.0368
26-Feb-04	12-Feb-04	14	1890	7346200	1885.3	-0.0038	0.0121
26-Feb-04	13-Feb-04	13	1917	7088400	1913.6	0.0143	-0.0351
26-Feb-04	16-Feb-04	10	1917.6	7108400	1913.55	0.0003	0.0028
26-Feb-04	17-Feb-04	9	1927.2	7704000	1920.1	0.0050	0.0838
26-Feb-04	18-Feb-04	8	1920.2	7561000	1916.45	-0.0036	-0.0186
26-Feb-04	19-Feb-04	7	1859	8464200	1858.3	-0.0319	0.1195
26-Feb-04	20-Feb-04	6	1853.2	7504600	1852.65	-0.0031	-0.1134
26-Feb-04	23-Feb-04	3	1810.3	6835000	1808.2	-0.0231	-0.0892
26-Feb-04	24-Feb-04	2	1823	5037600	1821.35	0.0070	-0.2630
26-Feb-04	25-Feb-04	1	1788.7	3759800	1786.8	-0.0188	-0.2537
25-Mar-04	26-Feb-04	28	1775.8	7665600	1765.8	-0.0072	1.0388
25-Mar-04	27-Feb-04	27	1804.8	7825400	1800.3	0.0164	0.0208
25-Mar-04	01-Mar-04	24	1848	7370600	1852.7	0.0239	-0.0581
25-Mar-04	03-Mar-04	22	1856.8	8041800	1860.4	0.0048	0.0911
25-Mar-04	04-Mar-04	21	1835.8	8006400	1843.85	-0.0113	-0.0044
25-Mar-04	05-Mar-04	20	1874.8	7954400	1867.7	0.0212	-0.0065
25-Mar-04	08-Mar-04	17	1885.6	7745400	1885.25	0.0058	-0.0263
25-Mar-04	09-Mar-04	16	1862	7771800	1866.05	-0.0125	0.0034
25-Mar-04	10-Mar-04	15	1838.9	8251800	1844.35	-0.0124	0.0618
25-Mar-04	11-Mar-04	14	1803.1	8588000	1805.4	-0.0195	0.0407
25-Mar-04	12-Mar-04	13	1812.5	8448200	1812.2	0.0052	-0.0163
25-Mar-04	15-Mar-04	10	1759	8844400	1763.4	-0.0295	0.0469
25-Mar-04	16-Mar-04	9	1745.7	9670200	1749.35	-0.0076	0.0934
25-Mar-04	17-Mar-04	8	1751.9	9957200	1749.85	0.0036	0.0297
25-Mar-04	18-Mar-04	7	1717.3	10132600	1716.65	-0.0197	0.0176
25-Mar-04	19-Mar-04	6	1727.3	9775600	1725.1	0.0058	-0.0352
25-Mar-04	22-Mar-04	3	1687.5	9143200	1685	-0.0230	-0.0647

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
25-Mar-04	23-Mar-04	2	1696.6	6602600	1696.4	0.0054	-0.2779
25-Mar-04	24-Mar-04	1	1694.1	4445200	1692.1	-0.0015	-0.3268
29-Apr-04	25-Mar-04	35	1712.7	7700800	1704.45	0.0110	0.7324
29-Apr-04	26-Mar-04	34	1747.3	7428600	1747.5	0.0202	-0.0353
29-Apr-04	29-Mar-04	31	1764.7	6951200	1762.05	0.0100	-0.0643
29-Apr-04	30-Mar-04	30	1744.4	6880000	1750.15	-0.0115	-0.0102
29-Apr-04	31-Mar-04	29	1765.6	7162200	1771.9	0.0121	0.0410
29-Apr-04	01-Apr-04	28	1811.1	7760800	1819.65	0.0258	0.0836
29-Apr-04	02-Apr-04	27	1831.6	7365200	1841.1	0.0113	-0.0510
29-Apr-04	05-Apr-04	24	1855.9	6711800	1856.6	0.0133	-0.0887
29-Apr-04	06-Apr-04	23	1855.8	6411800	1851.15	-0.0001	-0.0447
29-Apr-04	07-Apr-04	22	1848.9	6781400	1848.7	-0.0037	0.0576
29-Apr-04	08-Apr-04	21	1859.5	6686600	1853.55	0.0057	-0.0140
29-Apr-04	12-Apr-04	17	1839.8	6807200	1838.2	-0.0106	0.0180
29-Apr-04	13-Apr-04	16	1881.5	7151600	1878.45	0.0227	0.0506
29-Apr-04	15-Apr-04	14	1860.6	7965600	1861.95	-0.0111	0.1138
29-Apr-04	16-Apr-04	13	1865.8	8433000	1868.95	0.0028	0.0587
29-Apr-04	17-Apr-04	12	1864.1	8463200	1868.1	-0.0009	0.0036
29-Apr-04	19-Apr-04	10	1835.7	8504800	1844.05	-0.0152	0.0049
29-Apr-04	20-Apr-04	9	1841.1	8344800	1844.25	0.0029	-0.0188
29-Apr-04	21-Apr-04	8	1871.5	8221400	1873.35	0.0165	-0.0148
29-Apr-04	22-Apr-04	7	1889.9	7777600	1889.55	0.0098	-0.0540
29-Apr-04	23-Apr-04	6	1891.5	7613400	1892.45	0.0009	-0.0211
29-Apr-04	27-Apr-04	2	1818	6080200	1817.25	-0.0389	-0.2014
29-Apr-04	28-Apr-04	1	1816.1	4251800	1816.55	-0.0010	-0.3007
27-May-04	29-Apr-04	28	1802.8	7824800	1808.95	-0.0074	0.8403
27-May-04	30-Apr-04	27	1783.4	8749000	1796.1	-0.0108	0.1181
27-May-04	03-May-04	24	1755.3	9913600	1766.7	-0.0158	0.1331
27-May-04	04-May-04	23	1782.8	9368800	1793.1	0.0157	-0.0550
27-May-04	05-May-04	22	1800.3	9423600	1809.9	0.0098	0.0058
27-May-04	06-May-04	21	1821.9	9611000	1832.8	0.0120	0.0199
27-May-04	07-May-04	20	1786.8	10157400	1804.45	-0.0193	0.0569
27-May-04	10-May-04	17	1747.2	12212400	1769.1	-0.0222	0.2023
27-May-04	11-May-04	16	1677.9	13421000	1699.45	-0.0396	0.0990
27-May-04	12-May-04	15	1694.9	12753600	1711.1	0.0101	-0.0497
27-May-04	13-May-04	14	1697.8	14188400	1717.5	0.0017	0.1125
27-May-04	14-May-04	13	1573.5	14686400	1582.4	-0.0732	0.0351
27-May-04	17-May-04	10	1337.4	13883400	1388.75	-0.1501	-0.0547
27-May-04	18-May-04	9	1472	11807600	1503.95	0.1007	-0.1495
27-May-04	19-May-04	8	1547.4	10230200	1567.85	0.0512	-0.1336
27-May-04	20-May-04	7	1510.8	9598400	1543.85	-0.0237	-0.0618
27-May-04	21-May-04	6	1549.6	8542000	1560.2	0.0257	-0.1101
27-May-04	24-May-04	3	1598.8	7110800	1608.85	0.0318	-0.1675
27-May-04	25-May-04	2	1601.4	5799800	1606.7	0.0016	-0.1844

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
27-May-04	26-May-04	1	1594.5	4636800	1598.8	-0.0043	-0.2005
24-Jun-04	27-May-04	28	1552.8	9320000	1586.4	-0.0262	1.0100
24-Jun-04	28-May-04	27	1482.4	9547400	1508.75	-0.0453	0.0244
24-Jun-04	31-May-04	24	1464.2	10009600	1483.6	-0.0123	0.0484
24-Jun-04	01-Jun-04	23	1483.4	10218800	1507.9	0.0131	0.0209
24-Jun-04	02-Jun-04	22	1516.6	10289400	1535.2	0.0224	0.0069
24-Jun-04	03-Jun-04	21	1467.9	10824600	1495.1	-0.0321	0.0520
24-Jun-04	04-Jun-04	20	1503.5	10719200	1521.1	0.0243	-0.0097
24-Jun-04	07-Jun-04	17	1519.5	10825000	1542.55	0.0106	0.0099
24-Jun-04	08-Jun-04	16	1531.3	11084200	1550.55	0.0078	0.0239
24-Jun-04	09-Jun-04	15	1529	10981000	1548.3	-0.0015	-0.0093
24-Jun-04	10-Jun-04	14	1528.3	11298000	1544.75	-0.0005	0.0289
24-Jun-04	11-Jun-04	13	1490.7	11519200	1508.45	-0.0246	0.0196
24-Jun-04	14-Jun-04	10	1467	11050400	1481.35	-0.0159	-0.0407
24-Jun-04	15-Jun-04	9	1491.1	10910200	1501	0.0164	-0.0127
24-Jun-04	16-Jun-04	8	1485.2	10752200	1494.75	-0.0040	-0.0145
24-Jun-04	17-Jun-04	7	1509.3	10481200	1512.05	0.0163	-0.0252
24-Jun-04	18-Jun-04	6	1484.7	10415200	1491.2	-0.0163	-0.0063
24-Jun-04	21-Jun-04	3	1475.9	8918400	1482	-0.0060	-0.1437
24-Jun-04	22-Jun-04	2	1476	7249600	1474.7	0.0001	-0.1871
24-Jun-04	23-Jun-04	1	1447.5	5685800	1446.1	-0.0193	-0.2157
29-Jul-04	24-Jun-04	35	1451	6967800	1470.75	0.0024	0.2255
29-Jul-04	25-Jun-04	34	1467	7322200	1488.5	0.0110	0.0509
29-Jul-04	28-Jun-04	31	1496	7621800	1514.35	0.0198	0.0409
29-Jul-04	29-Jun-04	30	1500.5	8354000	1518.3	0.0030	0.0961
29-Jul-04	30-Jun-04	29	1484.9	8985000	1505.6	-0.0104	0.0755
29-Jul-04	01-Jul-04	28	1523.1	9380800	1537.2	0.0257	0.0441
29-Jul-04	02-Jul-04	27	1524.7	9269800	1537.5	0.0011	-0.0118
29-Jul-04	05-Jul-04	24	1513.6	9208200	1526.85	-0.0073	-0.0066
29-Jul-04	06-Jul-04	23	1548.7	8905000	1558.25	0.0232	-0.0329
29-Jul-04	07-Jul-04	22	1554	8940000	1566.8	0.0034	0.0039
29-Jul-04	08-Jul-04	21	1499.4	10002800	1518.15	-0.0351	0.1189
29-Jul-04	09-Jul-04	20	1537.7	9838800	1553.2	0.0255	-0.0164
29-Jul-04	12-Jul-04	17	1542.8	10243200	1556.95	0.0033	0.0411
29-Jul-04	13-Jul-04	16	1524.8	10046400	1539.3	-0.0117	-0.0192
29-Jul-04	14-Jul-04	15	1509.9	10365800	1522.75	-0.0098	0.0318
29-Jul-04	15-Jul-04	14	1528.7	10496800	1539.4	0.0125	0.0126
29-Jul-04	16-Jul-04	13	1548.5	10526600	1558.8	0.0129	0.0028
29-Jul-04	19-Jul-04	10	1559.4	10812800	1571.6	0.0071	0.0272
29-Jul-04	20-Jul-04	9	1551.7	10845800	1566.1	-0.0050	0.0031
29-Jul-04	21-Jul-04	8	1576.7	11826400	1581.4	0.0161	0.0904
29-Jul-04	22-Jul-04	7	1587.5	11457200	1598.1	0.0068	-0.0312
29-Jul-04	23-Jul-04	6	1595.2	11199400	1601.6	0.0049	-0.0225
29-Jul-04	26-Jul-04	3	1612.2	9986400	1618	0.0107	-0.1083

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
29-Jul-04	27-Jul-04	2	1597.5	7505400	1600.75	-0.0091	-0.2484
29-Jul-04	28-Jul-04	1	1593.5	5796200	1594.15	-0.0025	-0.2277
26-Aug-04	29-Jul-04	28	1604.5	8618600	1618.7	0.0069	0.4869
26-Aug-04	30-Jul-04	27	1623	9044200	1632.3	0.0115	0.0494
26-Aug-04	02-Aug-04	24	1633.6	9526000	1639.05	0.0066	0.0533
26-Aug-04	03-Aug-04	23	1625.4	9239800	1630.6	-0.0051	-0.0300
26-Aug-04	04-Aug-04	22	1621.6	9999600	1626.55	-0.0023	0.0822
26-Aug-04	05-Aug-04	21	1656.8	9495200	1654.95	0.0217	-0.0504
26-Aug-04	06-Aug-04	20	1633.4	9372200	1633.4	-0.0142	-0.0130
26-Aug-04	09-Aug-04	17	1644.3	9479000	1642.6	0.0067	0.0114
26-Aug-04	10-Aug-04	16	1649.2	9577000	1652.15	0.0029	0.0103
26-Aug-04	11-Aug-04	15	1617	9093000	1621.6	-0.0195	-0.0505
26-Aug-04	12-Aug-04	14	1606.4	8462800	1607.2	-0.0066	-0.0693
26-Aug-04	13-Aug-04	13	1598	9112800	1598.2	-0.0052	0.0768
26-Aug-04	16-Aug-04	10	1598.9	8463200	1599.15	0.0005	-0.0713
26-Aug-04	17-Aug-04	9	1601.5	8927400	1604.35	0.0017	0.0548
26-Aug-04	18-Aug-04	8	1580	9235800	1581.8	-0.0134	0.0345
26-Aug-04	19-Aug-04	7	1606.9	8508400	1609.2	0.0170	-0.0788
26-Aug-04	20-Aug-04	6	1586.2	8219400	1590.35	-0.0129	-0.0340
26-Aug-04	23-Aug-04	3	1579.7	7137200	1578.2	-0.0041	-0.1317
26-Aug-04	24-Aug-04	2	1593.9	5425200	1591.6	0.0090	-0.2399
26-Aug-04	25-Aug-04	1	1599.1	4201400	1595.7	0.0033	-0.2256
30-Sep-04	26-Aug-04	35	1606.3	7572000	1610.75	0.0045	0.8023
30-Sep-04	27-Aug-04	34	1600.4	7649000	1609	-0.0037	0.0102
30-Sep-04	30-Aug-04	31	1621.7	8078800	1628.45	0.0133	0.0562
30-Sep-04	31-Aug-04	30	1627	8162400	1631.75	0.0033	0.0103
30-Sep-04	01-Sep-04	29	1627.9	8047600	1635.45	0.0006	-0.0141
30-Sep-04	02-Sep-04	28	1625.3	8261800	1629.3	-0.0016	0.0266
30-Sep-04	03-Sep-04	27	1629.9	8394200	1634.1	0.0028	0.0160
30-Sep-04	06-Sep-04	24	1638.5	8510800	1644	0.0053	0.0139
30-Sep-04	07-Sep-04	23	1644.3	8847600	1650.15	0.0035	0.0396
30-Sep-04	08-Sep-04	22	1650.2	9657000	1656.25	0.0036	0.0915
30-Sep-04	09-Sep-04	21	1643.7	9882000	1649	-0.0039	0.0233
30-Sep-04	10-Sep-04	20	1664.1	10560200	1668.75	0.0124	0.0686
30-Sep-04	13-Sep-04	17	1666.1	10937200	1675.2	0.0012	0.0357
30-Sep-04	14-Sep-04	16	1677	11417200	1685.55	0.0066	0.0439
30-Sep-04	15-Sep-04	15	1673.4	11590000	1683.2	-0.0021	0.0151
30-Sep-04	16-Sep-04	14	1697.1	12245800	1705.7	0.0142	0.0566
30-Sep-04	17-Sep-04	13	1729.8	11661800	1733.65	0.0192	-0.0477
30-Sep-04	20-Sep-04	10	1726.3	11470200	1728.8	-0.0020	-0.0164
30-Sep-04	21-Sep-04	9	1748.7	11221000	1750.2	0.0129	-0.0217
30-Sep-04	22-Sep-04	8	1752.3	10825000	1753.9	0.0021	-0.0353
30-Sep-04	23-Sep-04	7	1726.4	9531200	1726.15	-0.0148	-0.1195
30-Sep-04	24-Sep-04	6	1721.3	8665400	1722.5	-0.0030	-0.0908

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
30-Sep-04	27-Sep-04	3	1718	7609000	1717.5	-0.0019	-0.1219
30-Sep-04	28-Sep-04	2	1702.7	6547400	1700.25	-0.0089	-0.1395
30-Sep-04	29-Sep-04	1	1730.7	4640600	1727.95	0.0164	-0.2912
28-Oct-04	30-Sep-04	28	1741.7	9897400	1745.5	0.0064	1.1328
28-Oct-04	01-Oct-04	27	1778.8	10041200	1775.15	0.0213	0.0145
28-Oct-04	04-Oct-04	24	1804.3	9854600	1805.65	0.0143	-0.0186
28-Oct-04	05-Oct-04	23	1812.4	10304600	1812.45	0.0045	0.0457
28-Oct-04	06-Oct-04	22	1793.1	10354400	1794.9	-0.0106	0.0048
28-Oct-04	07-Oct-04	21	1815.5	10364800	1815.7	0.0125	0.0010
28-Oct-04	08-Oct-04	20	1817.7	10875800	1820.2	0.0012	0.0493
28-Oct-04	09-Oct-04	19	1815.5	10980600	1817.8	-0.0012	0.0096
28-Oct-04	11-Oct-04	17	1805.6	10923400	1807.75	-0.0055	-0.0052
28-Oct-04	12-Oct-04	16	1785.8	11119000	1786.9	-0.0109	0.0179
28-Oct-04	14-Oct-04	14	1798.3	10883800	1794.75	0.0070	-0.0212
28-Oct-04	15-Oct-04	13	1791.4	11111800	1795	-0.0038	0.0209
28-Oct-04	18-Oct-04	10	1785.2	11294800	1786	-0.0035	0.0165
28-Oct-04	19-Oct-04	9	1809.7	10826400	1808.4	0.0137	-0.0415
28-Oct-04	20-Oct-04	8	1790	10587800	1790.05	-0.0109	-0.0220
28-Oct-04	21-Oct-04	7	1783.2	9904000	1779.75	-0.0038	-0.0646
28-Oct-04	25-Oct-04	3	1758.1	8384400	1757.25	-0.0140	-0.1534
28-Oct-04	26-Oct-04	2	1782.9	6031000	1781.05	0.0141	-0.2807
28-Oct-04	27-Oct-04	1	1784.5	4572800	1783.85	0.0009	-0.2418
25-Nov-04	28-Oct-04	28	1801.8	9745200	1800.1	0.0097	1.1311
25-Nov-04	29-Oct-04	27	1785.3	10205800	1786.9	-0.0092	0.0473
25-Nov-04	01-Nov-04	24	1794.9	10645600	1797.75	0.0054	0.0431
25-Nov-04	02-Nov-04	23	1812.7	10519800	1813.7	0.0099	-0.0118
25-Nov-04	03-Nov-04	22	1839.5	10045800	1837.4	0.0148	-0.0451
25-Nov-04	04-Nov-04	21	1836.7	10001800	1834.85	-0.0015	-0.0044
25-Nov-04	05-Nov-04	20	1856.8	10183400	1852.3	0.0109	0.0182
25-Nov-04	08-Nov-04	17	1862.1	10301400	1862.8	0.0028	0.0116
25-Nov-04	09-Nov-04	16	1858.1	10507400	1858.75	-0.0021	0.0200
25-Nov-04	10-Nov-04	15	1878.2	10593600	1876.1	0.0108	0.0082
25-Nov-04	11-Nov-04	14	1875.4	10652600	1870.55	-0.0015	0.0056
25-Nov-04	12-Nov-04	13	1874.1	10722600	1872.95	-0.0007	0.0066
25-Nov-04	16-Nov-04	9	1879.9	10628000	1879	0.0031	-0.0088
25-Nov-04	17-Nov-04	8	1886.2	10597200	1888.65	0.0034	-0.0029
25-Nov-04	18-Nov-04	7	1894.9	10547800	1892.05	0.0046	-0.0047
25-Nov-04	19-Nov-04	6	1871.3	9712800	1872.35	-0.0125	-0.0792
25-Nov-04	22-Nov-04	3	1875.7	8625000	1873.35	0.0023	-0.1120
25-Nov-04	23-Nov-04	2	1892.2	6867800	1892.6	0.0088	-0.2037
25-Nov-04	24-Nov-04	1	1906.2	6044200	1904.05	0.0074	-0.1199
30-Dec-04	25-Nov-04	35	1896.6	8932800	1901.05	-0.0050	0.4779
30-Dec-04	29-Nov-04	31	1941.4	9548400	1939.65	0.0236	0.0689
30-Dec-04	30-Nov-04	30	1955	9826000	1958.8	0.0070	0.0291

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
30-Dec-04	01-Dec-04	29	1962.5	10131800	1962.05	0.0038	0.0311
30-Dec-04	02-Dec-04	28	1994.9	11333400	1999	0.0165	0.1186
30-Dec-04	03-Dec-04	27	1997.4	11294600	1996.2	0.0013	-0.0034
30-Dec-04	06-Dec-04	24	1993.2	11638000	1993.15	-0.0021	0.0304
30-Dec-04	07-Dec-04	23	1993.1	11837400	1992.7	-0.0001	0.0171
30-Dec-04	08-Dec-04	22	1979.8	11657800	1977.95	-0.0067	-0.0152
30-Dec-04	09-Dec-04	21	1995	11339600	1989.95	0.0077	-0.0273
30-Dec-04	10-Dec-04	20	1967.2	12338800	1969	-0.0139	0.0881
30-Dec-04	13-Dec-04	17	1982.8	11755000	1985.35	0.0079	-0.0473
30-Dec-04	14-Dec-04	16	2004.1	11962000	2006.8	0.0107	0.0176
30-Dec-04	15-Dec-04	15	2025.3	11062600	2028.7	0.0106	-0.0752
30-Dec-04	16-Dec-04	14	2029.8	10969400	2033.2	0.0022	-0.0084
30-Dec-04	17-Dec-04	13	2009.3	10662800	2012.1	-0.0101	-0.0280
30-Dec-04	20-Dec-04	10	2025.5	10743600	2026.85	0.0081	0.0076
30-Dec-04	21-Dec-04	9	2042.2	9999200	2044.65	0.0082	-0.0693
30-Dec-04	22-Dec-04	8	2028.4	9877200	2035.35	-0.0068	-0.0122
30-Dec-04	23-Dec-04	7	2039.1	9974000	2045.15	0.0053	0.0098
30-Dec-04	24-Dec-04	6	2058.8	9418200	2062.7	0.0097	-0.0557
30-Dec-04	27-Dec-04	3	2061.3	8769800	2062.6	0.0012	-0.0688
30-Dec-04	28-Dec-04	2	2077.6	7149400	2071.35	0.0079	-0.1848
30-Dec-04	29-Dec-04	1	2073.3	6343200	2069.6	-0.0020	-0.1128
27-Jan-05	30-Dec-04	28	2064.1	10631800	2059.8	-0.0044	0.6761
27-Jan-05	31-Dec-04	27	2087.2	11336800	2080.5	0.0112	0.0663
27-Jan-05	03-Jan-05	24	2118.7	11977400	2115	0.0151	0.0565
27-Jan-05	04-Jan-05	23	2108.9	12632200	2103.75	-0.0046	0.0547
27-Jan-05	05-Jan-05	22	2033.8	12451400	2032.2	-0.0356	-0.0143
27-Jan-05	06-Jan-05	21	1998.5	12973400	1998.35	-0.0173	0.0419
27-Jan-05	07-Jan-05	20	2019.8	12953200	2015.5	0.0107	-0.0016
27-Jan-05	10-Jan-05	17	1977	13613400	1982	-0.0212	0.0510
27-Jan-05	11-Jan-05	16	1953.7	12489800	1952.05	-0.0118	-0.0825
27-Jan-05	12-Jan-05	15	1916.1	12852800	1913.6	-0.0193	0.0291
27-Jan-05	13-Jan-05	14	1950.3	10967000	1954.55	0.0178	-0.1467
27-Jan-05	14-Jan-05	13	1926.4	12429400	1931.1	-0.0123	0.1333
27-Jan-05	17-Jan-05	10	1934.8	11345600	1932.9	0.0044	-0.0872
27-Jan-05	18-Jan-05	9	1928	11449600	1934.05	-0.0035	0.0092
27-Jan-05	19-Jan-05	8	1924	11112200	1926.65	-0.0021	-0.0295
27-Jan-05	20-Jan-05	7	1925.5	10270000	1925.3	0.0008	-0.0758
27-Jan-05	24-Jan-05	3	1910.1	9083400	1909	-0.0080	-0.1155
27-Jan-05	25-Jan-05	2	1935.9	6799800	1931.85	0.0135	-0.2514
24-Feb-05	27-Jan-05	28	1962.8	10716400	1955	0.0139	0.5760
24-Feb-05	28-Jan-05	27	2005.6	11280200	2008.3	0.0218	0.0526
24-Feb-05	31-Jan-05	24	2057.3	11490800	2057.6	0.0258	0.0187
24-Feb-05	01-Feb-05	23	2054.8	11758200	2059.85	-0.0012	0.0233
24-Feb-05	02-Feb-05	22	2052.3	11496200	2052.2	-0.0012	-0.0223

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
24-Feb-05	03-Feb-05	21	2086.3	11659400	2079.45	0.0166	0.0142
24-Feb-05	04-Feb-05	20	2083.9	11868200	2077.95	-0.0012	0.0179
24-Feb-05	07-Feb-05	17	2060.3	12120000	2055.1	-0.0113	0.0212
24-Feb-05	08-Feb-05	16	2059.4	12520200	2055.15	-0.0004	0.0330
24-Feb-05	09-Feb-05	15	2079.7	12512200	2070	0.0098	-0.0006
24-Feb-05	10-Feb-05	14	2071	12216200	2063.35	-0.0042	-0.0237
24-Feb-05	11-Feb-05	13	2093.7	12743400	2082.05	0.0110	0.0432
24-Feb-05	14-Feb-05	10	2102.3	12325600	2098.25	0.0041	-0.0328
24-Feb-05	15-Feb-05	9	2098.1	13111800	2089.95	-0.0020	0.0638
24-Feb-05	16-Feb-05	8	2072.9	13232000	2068.8	-0.0120	0.0092
24-Feb-05	17-Feb-05	7	2066.9	13311600	2061.9	-0.0029	0.0060
24-Feb-05	18-Feb-05	6	2057.2	13130800	2055.55	-0.0047	-0.0136
24-Feb-05	21-Feb-05	3	2044.2	12680800	2043.2	-0.0063	-0.0343
24-Feb-05	22-Feb-05	2	2064.1	10476800	2058.4	0.0098	-0.1738
24-Feb-05	23-Feb-05	1	2054.9	6621400	2057.1	-0.0045	-0.3680
31-Mar-05	24-Feb-05	35	2065.3	12588200	2055.3	0.0051	0.9011
31-Mar-05	25-Feb-05	34	2056.2	13158200	2060.9	-0.0044	0.0453
31-Mar-05	28-Feb-05	31	2111.7	13612400	2103.25	0.0270	0.0345
31-Mar-05	01-Mar-05	30	2082.6	12896200	2084.4	-0.0138	-0.0526
31-Mar-05	02-Mar-05	29	2091.1	13275000	2093.25	0.0041	0.0294
31-Mar-05	03-Mar-05	28	2130.6	13291600	2128.85	0.0189	0.0013
31-Mar-05	04-Mar-05	27	2144.5	13550600	2148.15	0.0065	0.0195
31-Mar-05	07-Mar-05	24	2151.3	13566200	2160.1	0.0032	0.0012
31-Mar-05	08-Mar-05	23	2160	14459600	2168.95	0.0040	0.0659
31-Mar-05	09-Mar-05	22	2152.4	14816600	2160.8	-0.0035	0.0247
31-Mar-05	10-Mar-05	21	2157	15662200	2167.4	0.0022	0.0571
31-Mar-05	11-Mar-05	20	2147.6	16092000	2154	-0.0044	0.0274
31-Mar-05	14-Mar-05	17	2139	16222200	2146.35	-0.0040	0.0081
31-Mar-05	15-Mar-05	16	2120.9	17104800	2128.95	-0.0085	0.0544
31-Mar-05	16-Mar-05	15	2120.2	17198400	2125.55	-0.0003	0.0055
31-Mar-05	17-Mar-05	14	2101.3	16973800	2098.5	-0.0089	-0.0131
31-Mar-05	18-Mar-05	13	2113.7	16055200	2109.15	0.0059	-0.0541
31-Mar-05	21-Mar-05	10	2096	16084000	2096.6	-0.0084	0.0018
31-Mar-05	22-Mar-05	9	2061.9	15721000	2061.6	-0.0163	-0.0226
31-Mar-05	23-Mar-05	8	2021.9	15114600	2026.4	-0.0194	-0.0386
31-Mar-05	24-Mar-05	7	2016.1	13961200	2015.4	-0.0029	-0.0763
31-Mar-05	28-Mar-05	3	2037.9	11196000	2029.45	0.0108	-0.1981
31-Mar-05	29-Mar-05	2	1986.6	9130400	1983.85	-0.0252	-0.1845
31-Mar-05	30-Mar-05	1	1997	7096000	1993.7	0.0052	-0.2228
28-Apr-05	31-Mar-05	28	2029	13814200	2035.65	0.0160	0.9468
28-Apr-05	01-Apr-05	27	2060.9	14234500	2067.65	0.0157	0.0304
28-Apr-05	04-Apr-05	24	2048.8	14339000	2063.4	-0.0059	0.0073
28-Apr-05	05-Apr-05	23	2034.5	15264700	2052.55	-0.0070	0.0646
28-Apr-05	06-Apr-05	22	2053.1	15126800	2069.3	0.0091	-0.0090

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
28-Apr-05	07-Apr-05	21	2040	15053300	2052.85	-0.0064	-0.0049
28-Apr-05	08-Apr-05	20	2021.3	15359100	2031.2	-0.0091	0.0203
28-Apr-05	11-Apr-05	17	2001.7	15443300	2008.2	-0.0097	0.0055
28-Apr-05	12-Apr-05	16	2021.3	15123300	2024.95	0.0098	-0.0207
28-Apr-05	13-Apr-05	15	2019.2	15521700	2025.45	-0.0011	0.0263
28-Apr-05	15-Apr-05	13	1940.1	17622600	1956.3	-0.0392	0.1354
28-Apr-05	18-Apr-05	10	1911.4	19285600	1927.8	-0.0148	0.0944
28-Apr-05	19-Apr-05	9	1891.2	18588800	1909.4	-0.0106	-0.0361
28-Apr-05	20-Apr-05	8	1927	18134000	1929.7	0.0189	-0.0245
28-Apr-05	21-Apr-05	7	1940.8	17056400	1948.55	0.0072	-0.0594
28-Apr-05	22-Apr-05	6	1951	16046500	1967.35	0.0052	-0.0592
28-Apr-05	25-Apr-05	3	1956.6	14606000	1970.95	0.0029	-0.0898
28-Apr-05	26-Apr-05	2	1950	11428500	1957.1	-0.0034	-0.2175
28-Apr-05	27-Apr-05	1	1929.6	8719800	1935.4	-0.0105	-0.2370
26-May-05	28-Apr-05	28	1914	19334400	1941.3	-0.0081	1.2173
26-May-05	29-Apr-05	27	1881.9	20100200	1902.5	-0.0168	0.0396
26-May-05	02-May-05	24	1907.4	19606600	1916.75	0.0136	-0.0246
26-May-05	03-May-05	23	1903.1	19743400	1920.7	-0.0023	0.0070
26-May-05	04-May-05	22	1931.5	19729800	1942.6	0.0149	-0.0007
26-May-05	05-May-05	21	1949.2	18856300	1963.3	0.0092	-0.0443
26-May-05	06-May-05	20	1967.9	19618500	1977.5	0.0096	0.0404
26-May-05	09-May-05	17	1986.2	20218500	2000.75	0.0093	0.0306
26-May-05	10-May-05	16	1971.1	20388700	1994.3	-0.0076	0.0084
26-May-05	11-May-05	15	1971.4	20644000	1985.95	0.0001	0.0125
26-May-05	12-May-05	14	1979.2	20904100	1993.15	0.0040	0.0126
26-May-05	13-May-05	13	1976.6	21360300	1988.3	-0.0013	0.0218
26-May-05	16-May-05	10	2002.4	21780100	2012.6	0.0131	0.0197
26-May-05	17-May-05	9	1974.7	21444400	1990.8	-0.0139	-0.0154
26-May-05	18-May-05	8	1967.2	22969700	1982.75	-0.0038	0.0711
26-May-05	19-May-05	7	1978.3	22539400	1990.85	0.0056	-0.0187
26-May-05	20-May-05	6	1987.7	21589400	1992.4	0.0048	-0.0421
26-May-05	23-May-05	3	2010.2	18978400	2013.9	0.0113	-0.1209
26-May-05	24-May-05	2	2026.1	14415800	2028.6	0.0079	-0.2404
26-May-05	25-May-05	1	2037.4	9954500	2043.85	0.0056	-0.3095
30-Jun-05	26-May-05	35	2036.5	18889400	2074.7	-0.0004	0.8976
30-Jun-05	27-May-05	34	2047.5	20311400	2076.4	0.0054	0.0753
30-Jun-05	30-May-05	31	2042.2	20810400	2072.4	-0.0026	0.0246
30-Jun-05	31-May-05	30	2063	21226500	2087.55	0.0102	0.0200
30-Jun-05	01-Jun-05	29	2061.1	21206900	2087.55	-0.0009	-0.0009
30-Jun-05	02-Jun-05	28	2038.1	21912200	2064.65	-0.0112	0.0333
30-Jun-05	03-Jun-05	27	2075.9	22515500	2094.25	0.0185	0.0275
30-Jun-05	04-Jun-05	26	2067.3	22733800	2092.35	-0.0041	0.0097
30-Jun-05	06-Jun-05	24	2072.4	22455700	2092.8	0.0024	-0.0122
30-Jun-05	07-Jun-05	23	2082.9	22310200	2098.15	0.0051	-0.0065

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
30-Jun-05	08-Jun-05	22	2094.4	22598300	2112.4	0.0055	0.0129
30-Jun-05	09-Jun-05	21	2082.1	23070000	2103.2	-0.0058	0.0209
30-Jun-05	10-Jun-05	20	2071.6	23138400	2090.6	-0.0051	0.0030
30-Jun-05	13-Jun-05	17	2082.6	23415200	2102.75	0.0053	0.0120
30-Jun-05	14-Jun-05	16	2094.7	23335100	2112.35	0.0058	-0.0034
30-Jun-05	15-Jun-05	15	2110.4	23387400	2128.65	0.0075	0.0022
30-Jun-05	16-Jun-05	14	2100.5	23842400	2123.7	-0.0047	0.0195
30-Jun-05	17-Jun-05	13	2108.2	23390600	2123.4	0.0037	-0.0189
30-Jun-05	20-Jun-05	10	2118	23568200	2144.35	0.0046	0.0076
30-Jun-05	21-Jun-05	9	2148.6	23936200	2170	0.0144	0.0156
30-Jun-05	22-Jun-05	8	2164.9	22779100	2187.35	0.0076	-0.0483
30-Jun-05	23-Jun-05	7	2168.3	21681800	2183.85	0.0016	-0.0482
30-Jun-05	24-Jun-05	6	2178.5	21150700	2194.35	0.0047	-0.0245
30-Jun-05	27-Jun-05	3	2180.7	17532400	2199.8	0.0010	-0.1711
30-Jun-05	28-Jun-05	2	2167.2	14023300	2169.85	-0.0062	-0.2001
30-Jun-05	29-Jun-05	1	2195.2	10746800	2191.65	0.0129	-0.2336
28-Jul-05	30-Jun-05	28	2192.7	18469700	2220.6	-0.0011	0.7186
28-Jul-05	01-Jul-05	27	2206.9	19469900	2211.9	0.0065	0.0542
28-Jul-05	04-Jul-05	24	2223.9	20096300	2230.65	0.0077	0.0322
28-Jul-05	05-Jul-05	23	2197	20115600	2210.75	-0.0121	0.0010
28-Jul-05	06-Jul-05	22	2223.5	20620900	2228.2	0.0121	0.0251
28-Jul-05	07-Jul-05	21	2164.8	21635400	2179.4	-0.0264	0.0492
28-Jul-05	08-Jul-05	20	2188.6	21119700	2196.2	0.0110	-0.0238
28-Jul-05	11-Jul-05	17	2209.2	20821500	2218.85	0.0094	-0.0141
28-Jul-05	12-Jul-05	16	2214.5	21380300	2220.8	0.0024	0.0268
28-Jul-05	13-Jul-05	15	2191.9	21998600	2204.05	-0.0102	0.0289
28-Jul-05	14-Jul-05	14	2171.9	22123700	2185.1	-0.0091	0.0057
28-Jul-05	15-Jul-05	13	2203	21919100	2212.55	0.0143	-0.0092
28-Jul-05	18-Jul-05	10	2234.7	21593700	2234	0.0144	-0.0148
28-Jul-05	19-Jul-05	9	2236.3	21709100	2237.3	0.0007	0.0053
28-Jul-05	20-Jul-05	8	2238.4	22003900	2241.9	0.0009	0.0136
28-Jul-05	21-Jul-05	7	2226.6	21736200	2230.5	-0.0053	-0.0122
28-Jul-05	22-Jul-05	6	2265.8	19954800	2265.6	0.0176	-0.0820
28-Jul-05	25-Jul-05	3	2286.1	17753400	2291.75	0.0090	-0.1103
28-Jul-05	26-Jul-05	2	2299.3	14775700	2303.15	0.0058	-0.1677
28-Jul-05	27-Jul-05	1	2320.2	10231900	2319.1	0.0091	-0.3075
25-Aug-05	29-Jul-05	27	2300.7	18581400	2312.3	-0.0084	0.8160
25-Aug-05	01-Aug-05	24	2310	20338600	2318.05	0.0040	0.0946
25-Aug-05	02-Aug-05	23	2349.9	20602200	2353.65	0.0173	0.0130
25-Aug-05	03-Aug-05	22	2341.1	21147500	2357	-0.0037	0.0265
25-Aug-05	04-Aug-05	21	2357.8	21619900	2367.8	0.0071	0.0223
25-Aug-05	05-Aug-05	20	2349.9	21801500	2361.2	-0.0034	0.0084
25-Aug-05	08-Aug-05	17	2315.5	21750600	2324.4	-0.0146	-0.0023
25-Aug-05	09-Aug-05	16	2305.4	21828300	2318.7	-0.0044	0.0036

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
25-Aug-05	10-Aug-05	15	2360	21923000	2360.15	0.0237	0.0043
25-Aug-05	11-Aug-05	14	2380.9	22125200	2380.95	0.0089	0.0092
25-Aug-05	12-Aug-05	13	2360.5	22065600	2361.55	-0.0086	-0.0027
25-Aug-05	16-Aug-05	9	2364.6	22154100	2369.8	0.0017	0.0040
25-Aug-05	17-Aug-05	8	2404.6	22312900	2403.15	0.0169	0.0072
25-Aug-05	18-Aug-05	7	2382.9	21737800	2388.45	-0.0090	-0.0258
25-Aug-05	19-Aug-05	6	2384.8	21288000	2383.45	0.0008	-0.0207
25-Aug-05	22-Aug-05	3	2365.6	19229400	2367.85	-0.0081	-0.0967
25-Aug-05	23-Aug-05	2	2327	13851800	2326.1	-0.0163	-0.2797
25-Aug-05	24-Aug-05	1	2323.2	10358600	2322.5	-0.0016	-0.2522
29-Sep-05	25-Aug-05	35	2327.4	21877400	2354.55	0.0018	1.1120
29-Sep-05	26-Aug-05	34	2335.6	21887000	2357.05	0.0035	0.0004
29-Sep-05	29-Aug-05	31	2309.5	22993300	2337.65	-0.0112	0.0505
29-Sep-05	30-Aug-05	30	2349.9	22620800	2367.75	0.0175	-0.0162
29-Sep-05	31-Aug-05	29	2364.8	22678300	2384.65	0.0063	0.0025
29-Sep-05	01-Sep-05	28	2390.3	21987700	2405.75	0.0108	-0.0305
29-Sep-05	02-Sep-05	27	2408	22870300	2415.8	0.0074	0.0401
29-Sep-05	05-Sep-05	24	2412.9	23100900	2422.95	0.0020	0.0101
29-Sep-05	06-Sep-05	23	2422.8	23268600	2428.65	0.0041	0.0073
29-Sep-05	08-Sep-05	21	2445.8	23788000	2454.45	0.0095	0.0223
29-Sep-05	09-Sep-05	20	2443	23551400	2455.45	-0.0011	-0.0099
29-Sep-05	12-Sep-05	17	2477.1	23894000	2484.15	0.0140	0.0145
29-Sep-05	13-Sep-05	16	2486.3	24373200	2500.35	0.0037	0.0201
29-Sep-05	14-Sep-05	15	2483.3	24956200	2492.45	-0.0012	0.0239
29-Sep-05	15-Sep-05	14	2516.2	24239600	2523.95	0.0132	-0.0287
29-Sep-05	16-Sep-05	13	2541.1	24519100	2552.35	0.0099	0.0115
29-Sep-05	19-Sep-05	10	2561	24090900	2567.1	0.0078	-0.0175
29-Sep-05	20-Sep-05	9	2562.5	23319800	2578	0.0006	-0.0320
29-Sep-05	21-Sep-05	8	2558.9	22383000	2567.3	-0.0014	-0.0402
29-Sep-05	22-Sep-05	7	2474.9	19970800	2476.5	-0.0328	-0.1078
29-Sep-05	23-Sep-05	6	2474.1	18600600	2477.75	-0.0003	-0.0686
29-Sep-05	26-Sep-05	3	2559.9	14796700	2557.35	0.0347	-0.2045
29-Sep-05	27-Sep-05	2	2577.6	12155500	2574.85	0.0069	-0.1785
29-Sep-05	28-Sep-05	1	2601.8	9758300	2598.05	0.0094	-0.1972
27-Oct-05	29-Sep-05	28	2607.7	18611100	2611.2	0.0023	0.9072
27-Oct-05	30-Sep-05	27	2593	19910000	2601.4	-0.0056	0.0698
27-Oct-05	03-Oct-05	24	2627.2	20686000	2630.05	0.0132	0.0390
27-Oct-05	04-Oct-05	23	2661.8	20227900	2663.35	0.0132	-0.0221
27-Oct-05	05-Oct-05	22	2644.8	21328800	2644.4	-0.0064	0.0544
27-Oct-05	06-Oct-05	21	2567.5	25207100	2579.15	-0.0292	0.1818
27-Oct-05	07-Oct-05	20	2567.7	25114700	2574.05	0.0001	-0.0037
27-Oct-05	10-Oct-05	17	2562.5	24402700	2566.85	-0.0020	-0.0283
27-Oct-05	11-Oct-05	16	2587.1	23982900	2589.55	0.0096	-0.0172
27-Oct-05	13-Oct-05	14	2534.2	24042200	2537.3	-0.0204	0.0025

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
27-Oct-05	14-Oct-05	13	2486.5	25283700	2484.4	-0.0188	0.0516
27-Oct-05	17-Oct-05	10	2485.5	24463800	2485.15	-0.0004	-0.0324
27-Oct-05	18-Oct-05	9	2461	23789000	2468.2	-0.0099	-0.0276
27-Oct-05	19-Oct-05	8	2406.2	25517300	2412.45	-0.0223	0.0727
27-Oct-05	20-Oct-05	7	2393.8	23857100	2395.45	-0.0051	-0.0651
27-Oct-05	21-Oct-05	6	2445.5	21346600	2443.75	0.0216	-0.1052
27-Oct-05	24-Oct-05	3	2394.1	19153400	2394.85	-0.0210	-0.1027
27-Oct-05	25-Oct-05	2	2417.7	14099100	2418.2	0.0099	-0.2639
27-Oct-05	26-Oct-05	1	2413.7	10583700	2408.5	-0.0017	-0.2493
24-Nov-05	27-Oct-05	28	2348.5	22969600	2352.9	-0.0270	1.1703
24-Nov-05	28-Oct-05	27	2297.3	25618900	2316.05	-0.0218	0.1153
24-Nov-05	31-Oct-05	24	2359.7	23808600	2370.95	0.0271	-0.0707
24-Nov-05	01-Nov-05	23	2371.7	23979200	2386.75	0.0051	0.0072
24-Nov-05	02-Nov-05	22	2409.6	22965900	2419.05	0.0160	-0.0423
24-Nov-05	07-Nov-05	17	2449.4	22918300	2461.6	0.0165	-0.0021
24-Nov-05	08-Nov-05	16	2477.3	23252600	2492.65	0.0114	0.0146
24-Nov-05	09-Nov-05	15	2480.8	24728700	2489.1	0.0014	0.0635
24-Nov-05	10-Nov-05	14	2490	25376300	2500.7	0.0037	0.0262
24-Nov-05	11-Nov-05	13	2548.1	23516800	2548.65	0.0234	-0.0733
24-Nov-05	14-Nov-05	10	2559	23433900	2558.7	0.0043	-0.0035
24-Nov-05	16-Nov-05	8	2584.5	23635800	2582.75	0.0099	0.0086
24-Nov-05	17-Nov-05	7	2609.6	22113800	2603.95	0.0097	-0.0644
24-Nov-05	18-Nov-05	6	2624.2	19032000	2620.05	0.0056	-0.1394
24-Nov-05	21-Nov-05	3	2606.7	16214600	2602.5	-0.0067	-0.1480
24-Nov-05	22-Nov-05	2	2572.4	13319100	2572.85	-0.0132	-0.1786
24-Nov-05	23-Nov-05	1	2614.7	10019500	2608.6	0.0164	-0.2477
29-Dec-05	24-Nov-05	35	2640.4	17951200	2635	0.0098	0.7916
29-Dec-05	25-Nov-05	34	2668.2	19271000	2664.3	0.0105	0.0735
29-Dec-05	26-Nov-05	33	2687.6	19541100	2683.45	0.0073	0.0140
29-Dec-05	28-Nov-05	31	2721.3	20323500	2712	0.0125	0.0400
29-Dec-05	29-Nov-05	30	2704.6	21040600	2698.3	-0.0061	0.0353
29-Dec-05	30-Nov-05	29	2649.7	21878400	2652.25	-0.0203	0.0398
29-Dec-05	01-Dec-05	28	2706.6	20390700	2698.95	0.0215	-0.0680
29-Dec-05	02-Dec-05	27	2702.1	19940600	2697.95	-0.0016	-0.0221
29-Dec-05	05-Dec-05	24	2660	20988700	2660.5	-0.0156	0.0526
29-Dec-05	06-Dec-05	23	2653.4	21056000	2662.3	-0.0025	0.0032
29-Dec-05	07-Dec-05	22	2688.3	21535500	2693	0.0132	0.0228
29-Dec-05	08-Dec-05	21	2694.8	22875400	2706.7	0.0024	0.0622
29-Dec-05	09-Dec-05	20	2751.8	22413400	2756.45	0.0212	-0.0202
29-Dec-05	12-Dec-05	17	2769.4	22878900	2776.2	0.0064	0.0208
29-Dec-05	13-Dec-05	16	2803.8	24607400	2812.3	0.0124	0.0755
29-Dec-05	14-Dec-05	15	2801.4	23549200	2804.55	-0.0008	-0.0430
29-Dec-05	15-Dec-05	14	2767.7	23155300	2778.55	-0.0120	-0.0167
29-Dec-05	16-Dec-05	13	2811.9	22242300	2810.15	0.0160	-0.0394

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
29-Dec-05	19-Dec-05	10	2842.8	21895900	2842.6	0.0110	-0.0156
29-Dec-05	20-Dec-05	9	2824.5	21105400	2826.2	-0.0064	-0.0361
29-Dec-05	21-Dec-05	8	2818.1	20140600	2822.9	-0.0023	-0.0457
29-Dec-05	22-Dec-05	7	2830.7	19030000	2835.25	0.0045	-0.0551
29-Dec-05	23-Dec-05	6	2791.2	18259700	2804.85	-0.0139	-0.0405
29-Dec-05	26-Dec-05	3	2738.7	15230400	2749.6	-0.0188	-0.1659
29-Dec-05	27-Dec-05	2	2808.9	12028600	2805.9	0.0256	-0.2102
29-Dec-05	28-Dec-05	1	2797	9182900	2794.05	-0.0042	-0.2366
25-Jan-06	29-Dec-05	27	2807	20431300	2821.95	0.0036	1.2249
25-Jan-06	30-Dec-05	26	2820.8	22572800	2836.55	0.0049	0.1048
25-Jan-06	02-Jan-06	23	2819.7	23069300	2835.95	-0.0004	0.0220
25-Jan-06	03-Jan-06	22	2868.9	24246000	2883.35	0.0174	0.0510
25-Jan-06	04-Jan-06	21	2890.1	24330700	2904.4	0.0074	0.0035
25-Jan-06	05-Jan-06	20	2883.9	24463300	2899.85	-0.0021	0.0054
25-Jan-06	06-Jan-06	19	2895.7	25264700	2914	0.0041	0.0328
25-Jan-06	09-Jan-06	16	2893.5	25376700	2910.1	-0.0008	0.0044
25-Jan-06	10-Jan-06	15	2857.3	26316500	2870.8	-0.0125	0.0370
25-Jan-06	12-Jan-06	13	2831.4	28130700	2850.7	-0.0091	0.0689
25-Jan-06	13-Jan-06	12	2823.7	28994200	2850.55	-0.0027	0.0307
25-Jan-06	16-Jan-06	9	2821.2	27030000	2833.1	-0.0009	-0.0677
25-Jan-06	17-Jan-06	8	2801.9	27355600	2829.1	-0.0068	0.0120
25-Jan-06	18-Jan-06	7	2797	27105300	2809.2	-0.0017	-0.0091
25-Jan-06	19-Jan-06	6	2869.3	25013000	2870.85	0.0258	-0.0772
25-Jan-06	20-Jan-06	5	2897.6	22954500	2900.95	0.0099	-0.0823
25-Jan-06	23-Jan-06	2	2881.7	17175100	2884.05	-0.0055	-0.2518
25-Jan-06	24-Jan-06	1	2906.3	13483700	2908	0.0085	-0.2149
23-Feb-06	25-Jan-06	29	2922.3	23772200	2940.35	0.0055	0.7630
23-Feb-06	27-Jan-06	27	2978.6	23309700	2982.75	0.0193	-0.0195
23-Feb-06	30-Jan-06	24	2972.4	23644000	2974.5	-0.0021	0.0143
23-Feb-06	31-Jan-06	23	3002.3	23735700	3001.1	0.0101	0.0039
23-Feb-06	01-Feb-06	22	2963.1	24512100	2971.55	-0.0131	0.0327
23-Feb-06	02-Feb-06	21	2956.5	25670500	2967.45	-0.0022	0.0473
23-Feb-06	03-Feb-06	20	2921.8	28369100	2940.6	-0.0117	0.1051
23-Feb-06	06-Feb-06	17	2991.6	27712100	3000.45	0.0239	-0.0232
23-Feb-06	07-Feb-06	16	3004.2	28303300	3020.1	0.0042	0.0213
23-Feb-06	08-Feb-06	15	2993	28379100	3008.95	-0.0037	0.0027
23-Feb-06	10-Feb-06	13	3021.1	28056200	3027.55	0.0094	-0.0114
23-Feb-06	13-Feb-06	10	3028.2	28305700	3041.15	0.0024	0.0089
23-Feb-06	14-Feb-06	9	3009.2	28604600	3017.55	-0.0063	0.0106
23-Feb-06	15-Feb-06	8	3017.2	26704900	3022.2	0.0027	-0.0664
23-Feb-06	16-Feb-06	7	3013.9	26763700	3021.6	-0.0011	0.0022
23-Feb-06	17-Feb-06	6	2978.4	24179500	2981.5	-0.0118	-0.0966
23-Feb-06	20-Feb-06	3	3010.1	17558200	3005.85	0.0106	-0.2738
23-Feb-06	21-Feb-06	2	3039.5	14235500	3035.5	0.0098	-0.1892

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
23-Feb-06	22-Feb-06	1	3056.9	11509400	3050.8	0.0057	-0.1915
30-Mar-06	23-Feb-06	35	3054.2	23135800	3062.1	-0.0009	1.0102
30-Mar-06	24-Feb-06	34	3044.1	24772000	3050.05	-0.0033	0.0707
30-Mar-06	27-Feb-06	31	3055.2	25259900	3067.45	0.0036	0.0197
30-Mar-06	28-Feb-06	30	3071.1	25598900	3074.7	0.0052	0.0134
30-Mar-06	01-Mar-06	29	3101.8	25990200	3123.1	0.0100	0.0153
30-Mar-06	02-Mar-06	28	3134.6	26487300	3150.7	0.0106	0.0191
30-Mar-06	03-Mar-06	27	3137.6	28091300	3147.35	0.0010	0.0606
30-Mar-06	06-Mar-06	24	3185.5	28336700	3190.4	0.0153	0.0087
30-Mar-06	07-Mar-06	23	3167.4	30551800	3182.8	-0.0057	0.0782
30-Mar-06	08-Mar-06	22	3082.7	32596100	3116.7	-0.0267	0.0669
30-Mar-06	09-Mar-06	21	3113.9	31633900	3129.1	0.0101	-0.0295
30-Mar-06	10-Mar-06	20	3166.5	31393000	3183.9	0.0169	-0.0076
30-Mar-06	13-Mar-06	17	3180.9	31997300	3202.65	0.0045	0.0192
30-Mar-06	14-Mar-06	16	3171.9	32344000	3195.35	-0.0028	0.0108
30-Mar-06	16-Mar-06	14	3205	32425000	3226.6	0.0104	0.0025
30-Mar-06	17-Mar-06	13	3214	31814900	3234.05	0.0028	-0.0188
30-Mar-06	20-Mar-06	10	3251.7	32149700	3265.65	0.0117	0.0105
30-Mar-06	21-Mar-06	9	3242	31533700	3262.3	-0.0030	-0.0192
30-Mar-06	22-Mar-06	8	3227.3	30955000	3240.15	-0.0045	-0.0184
30-Mar-06	23-Mar-06	7	3239.3	29392800	3247.15	0.0037	-0.0505
30-Mar-06	24-Mar-06	6	3279.9	26779500	3279.8	0.0125	-0.0889
30-Mar-06	27-Mar-06	3	3326.5	22160600	3321.65	0.0142	-0.1725
30-Mar-06	28-Mar-06	2	3332.4	17964800	3325	0.0018	-0.1893
30-Mar-06	29-Mar-06	1	3364.9	13943100	3354.2	0.0098	-0.2239
27-Apr-06	30-Mar-06	28	3394.1	23374100	3418.95	0.0087	0.6764
27-Apr-06	31-Mar-06	27	3403.6	24115200	3402.55	0.0028	0.0317
27-Apr-06	03-Apr-06	24	3474	25002600	3473.3	0.0207	0.0368
27-Apr-06	04-Apr-06	23	3489.7	26204500	3483.15	0.0045	0.0481
27-Apr-06	05-Apr-06	22	3510.2	27180400	3510.9	0.0059	0.0372
27-Apr-06	07-Apr-06	20	3458.2	28279200	3454.8	-0.0148	0.0404
27-Apr-06	10-Apr-06	17	3488.6	27636200	3478.45	0.0088	-0.0227
27-Apr-06	12-Apr-06	15	3387	27750700	3380	-0.0291	0.0041
27-Apr-06	13-Apr-06	14	3348.5	26195900	3345.5	-0.0114	-0.0560
27-Apr-06	17-Apr-06	10	3424.7	26890000	3425.15	0.0227	0.0265
27-Apr-06	18-Apr-06	9	3524.1	25780500	3518.1	0.0290	-0.0413
27-Apr-06	19-Apr-06	8	3546.7	25411700	3535.85	0.0064	-0.0143
27-Apr-06	20-Apr-06	7	3581.8	24773000	3573.5	0.0099	-0.0251
27-Apr-06	21-Apr-06	6	3583.9	22440500	3573.05	0.0006	-0.0942
27-Apr-06	24-Apr-06	3	3556.5	18876100	3548.9	-0.0076	-0.1588
27-Apr-06	25-Apr-06	2	3465.5	14557700	3462.65	-0.0256	-0.2288
27-Apr-06	26-Apr-06	1	3579.5	9930200	3555.75	0.0329	-0.3179
25-May-06	27-Apr-06	28	3502.1	22886900	3508.1	-0.0216	1.3048
25-May-06	28-Apr-06	27	3497.6	24430100	3508.35	-0.0013	0.0674

Expiry	Date	DTE	FClose	Open Int	Spot Close	D FP	D OI
25-May-06	29-Apr-06	26	3545.4	24138400	3557.6	0.0137	-0.0119
25-May-06	02-May-06	23	3595	23276800	3605.45	0.0140	-0.0357
25-May-06	03-May-06	22	3612.4	23868200	3634.25	0.0048	0.0254
25-May-06	04-May-06	21	3627.4	23767200	3648.4	0.0042	-0.0042
25-May-06	05-May-06	20	3644.1	24112100	3663.95	0.0046	0.0145
25-May-06	08-May-06	17	3685.9	23593300	3693.15	0.0115	-0.0215
25-May-06	09-May-06	16	3713	24338400	3720.55	0.0074	0.0316
25-May-06	10-May-06	15	3745.4	24282100	3754.25	0.0087	-0.0023
25-May-06	11-May-06	14	3692.9	24354100	3701.05	-0.0140	0.0030
25-May-06	12-May-06	13	3633	25477500	3650.05	-0.0162	0.0461
25-May-06	15-May-06	10	3462.1	28131000	3502.95	-0.0471	0.1042
25-May-06	16-May-06	9	3520.3	26837100	3523.3	0.0168	-0.0460
25-May-06	17-May-06	8	3641.3	25954700	3635.1	0.0344	-0.0329
25-May-06	18-May-06	7	3363.9	26225000	3388.9	-0.0762	0.0104
25-May-06	19-May-06	6	3224.4	23805300	3246.9	-0.0415	-0.0923
25-May-06	22-May-06	3	3020.9	20224100	3081.35	-0.0631	-0.1504
25-May-06	23-May-06	2	3190.5	16332300	3199.35	0.0561	-0.1924
25-May-06	24-May-06	1	3087.3	12261400	3115.55	-0.0324	-0.2493
29-Jun-06	25-May-06	35	3112.7	20704100	3177.7	0.0082	0.6886
29-Jun-06	26-May-06	34	3179.2	19120500	3209.6	0.0214	-0.0765
29-Jun-06	29-May-06	31	3175	19791100	3214.9	-0.0013	0.0351
29-Jun-06	30-May-06	30	3125.4	21734700	3185.3	-0.0156	0.0982
29-Jun-06	31-May-06	29	3032.4	23068900	3071.05	-0.0297	0.0614
29-Jun-06	01-Jun-06	28	2889.9	26357500	2962.25	-0.0470	0.1426
29-Jun-06	02-Jun-06	27	3061.6	24031400	3091.35	0.0594	-0.0883
29-Jun-06	05-Jun-06	24	2957.3	25003700	3016.65	-0.0341	0.0405
29-Jun-06	06-Jun-06	23	2902.8	24468200	2937.3	-0.0184	-0.0214
29-Jun-06	07-Jun-06	22	2838.1	25383600	2860.45	-0.0223	0.0374
29-Jun-06	08-Jun-06	21	2705.6	24945700	2724.35	-0.0467	-0.0173
29-Jun-06	09-Jun-06	20	2831.3	25237000	2866.3	0.0464	0.0117
29-Jun-06	12-Jun-06	17	2716	26901000	2776.85	-0.0407	0.0659
29-Jun-06	13-Jun-06	16	2629.2	26436200	2663.3	-0.0320	-0.0173
29-Jun-06	14-Jun-06	15	2618.3	24040400	2632.8	-0.0041	-0.0906
29-Jun-06	15-Jun-06	14	2786.7	24541900	2798.8	0.0643	0.0209
29-Jun-06	16-Jun-06	13	2880.8	23283600	2890.35	0.0337	-0.0513
29-Jun-06	19-Jun-06	10	2909.4	23137900	2916.9	0.0099	-0.0063
29-Jun-06	20-Jun-06	9	2839.4	24001100	2861.3	-0.0241	0.0373
29-Jun-06	21-Jun-06	8	2912.1	24467500	2923.45	0.0256	0.0194
29-Jun-06	22-Jun-06	7	2982.3	23040400	2994.75	0.0241	-0.0583
29-Jun-06	23-Jun-06	6	3042.3	21169300	3042.7	0.0201	-0.0812
29-Jun-06	25-Jun-06	4	3043.9	21203400	3050.3	0.0005	0.0016
29-Jun-06	26-Jun-06	3	2930.6	16800600	2943.2	-0.0372	-0.2076
29-Jun-06	27-Jun-06	2	2981.1	13606600	2982.45	0.0172	-0.1901
29-Jun-06	28-Jun-06	1	2983.5	10809100	2981.1	0.0008	-0.2056

APPENDIX C

Sample Data of Correlation between Futures Price and Cost of Carry for NIFTY

	correl D FP and D COC			0.0311			
Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
25-Jul-02	28-Jun-02	27	1062.25	1057.8	0.0560		
25-Jul-02	01-Jul-02	24	1072.45	1068.95	0.0490	0.0096	-0.1240
25-Jul-02	02-Jul-02	23	1068.3	1068.05	0.0037	-0.0039	-0.9253
25-Jul-02	03-Jul-02	22	1072.25	1069.9	0.0359	0.0037	8.8007
25-Jul-02	04-Jul-02	21	1070.95	1070.55	0.0064	-0.0012	-0.8216
25-Jul-02	05-Jul-02	20	1073.8	1073.85	-0.0008	0.0027	-1.1309
25-Jul-02	08-Jul-02	17	1080.85	1082.05	-0.0235	0.0066	27.0362
25-Jul-02	09-Jul-02	16	1078.4	1080.3	-0.0396	-0.0023	0.6856
25-Jul-02	10-Jul-02	15	1072.45	1071.7	0.0168	-0.0055	-1.4239
25-Jul-02	11-Jul-02	14	1060.55	1056.6	0.0960	-0.0111	4.7148
25-Jul-02	12-Jul-02	13	1062.45	1058.25	0.1097	0.0018	0.1432
25-Jul-02	15-Jul-02	10	1049.6	1048	0.0549	-0.0121	-0.4993
25-Jul-02	16-Jul-02	9	1039.15	1035.95	0.1234	-0.0100	1.2463
25-Jul-02	17-Jul-02	8	1035.15	1032.55	0.1132	-0.0038	-0.0827
25-Jul-02	18-Jul-02	7	1042.8	1041.3	0.0740	0.0074	-0.3458
25-Jul-02	19-Jul-02	6	1036.2	1035.9	0.0174	-0.0063	-0.7653
25-Jul-02	22-Jul-02	3	1016.4	1012	0.5206	-0.0191	28.9653
25-Jul-02	23-Jul-02	2	1022.65	1021.9	0.1321	0.0061	-0.7463
25-Jul-02	24-Jul-02	1	1008.05	1004.05	1.4313	-0.0143	9.8387
29-Aug-02	25-Jul-02	35	1009.75	1001.55	0.0839	0.0017	-0.9414
29-Aug-02	26-Jul-02	34	983.75	973.5	0.1109	-0.0257	0.3223
29-Aug-02	29-Jul-02	31	975.25	971.65	0.0429	-0.0086	-0.6127
29-Aug-02	30-Jul-02	30	963.4	960.65	0.0343	-0.0122	-0.2013
29-Aug-02	31-Jul-02	29	965.4	958.9	0.0839	0.0021	1.4448
29-Aug-02	01-Aug-02	28	960.05	957.7	0.0315	-0.0055	-0.6243
29-Aug-02	02-Aug-02	27	957	954.75	0.0314	-0.0032	-0.0040
29-Aug-02	05-Aug-02	24	967.2	963.25	0.0614	0.0107	0.9559
29-Aug-02	06-Aug-02	23	969.6	966.65	0.0477	0.0025	-0.2230
29-Aug-02	07-Aug-02	22	972.65	969.1	0.0598	0.0031	0.2545
29-Aug-02	08-Aug-02	21	955.9	953.55	0.0422	-0.0172	-0.2948
29-Aug-02	09-Aug-02	20	966.7	961.95	0.0887	0.0113	1.1012
29-Aug-02	12-Aug-02	17	970.85	969.85	0.0218	0.0043	-0.7539
29-Aug-02	13-Aug-02	16	974.75	976.05	-0.0300	0.0040	-2.3741
29-Aug-02	14-Aug-02	15	969.75	969.65	0.0025	-0.0051	-1.0825
29-Aug-02	16-Aug-02	13	979.05	979.25	-0.0057	0.0096	-3.2854
29-Aug-02	19-Aug-02	10	980.4	979.85	0.0202	0.0014	-4.5714
29-Aug-02	20-Aug-02	9	987.75	988.55	-0.0324	0.0075	-2.6030
29-Aug-02	21-Aug-02	8	988.95	988.45	0.0228	0.0012	-1.7027
29-Aug-02	22-Aug-02	7	985.55	985.7	-0.0078	-0.0034	-1.3439
29-Aug-02	23-Aug-02	6	995.05	995.2	-0.0090	0.0096	0.1555
29-Aug-02	26-Aug-02	3	998.3	998.85	-0.0661	0.0033	6.3080
29-Aug-02	27-Aug-02	2	986.95	987.7	-0.1367	-0.0114	1.0688

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
29-Aug-02	28-Aug-02	1	984	985.7	-0.6214	-0.0030	3.5447
26-Sep-02	29-Aug-02	28	983.45	987.25	-0.0496	-0.0006	-0.9202
26-Sep-02	30-Aug-02	27	1002.15	1010.6	-0.1120	0.0190	1.2579
26-Sep-02	02-Sep-02	24	1007.9	1013.5	-0.0831	0.0057	-0.2576
26-Sep-02	03-Sep-02	23	997.5	1001.1	-0.0564	-0.0103	-0.3215
26-Sep-02	04-Sep-02	22	1001.8	1006.95	-0.0839	0.0043	0.4880
26-Sep-02	05-Sep-02	21	1001.35	1008.6	-0.1237	-0.0004	0.4739
26-Sep-02	06-Sep-02	20	992.1	995.2	-0.0562	-0.0092	-0.5459
26-Sep-02	09-Sep-02	17	984.7	998.55	-0.2958	-0.0075	4.2670
26-Sep-02	11-Sep-02	15	991.5	998.85	-0.1773	0.0069	-0.4007
26-Sep-02	12-Sep-02	14	994	1001.65	-0.1971	0.0025	0.1122
26-Sep-02	13-Sep-02	13	984.7	992	-0.2045	-0.0094	0.0375
26-Sep-02	16-Sep-02	10	979.35	985.75	-0.2345	-0.0054	0.1465
26-Sep-02	17-Sep-02	9	989.8	994.9	-0.2056	0.0107	-0.1233
26-Sep-02	18-Sep-02	8	978.45	983.6	-0.2362	-0.0115	0.1491
26-Sep-02	19-Sep-02	7	974.35	976.05	-0.0897	-0.0042	-0.6205
26-Sep-02	20-Sep-02	6	971.3	969.6	0.1051	-0.0031	-2.1724
26-Sep-02	23-Sep-02	3	965.9	970.3	-0.5454	-0.0056	-6.1890
26-Sep-02	24-Sep-02	2	962.75	966.2	-0.6439	-0.0033	0.1806
26-Sep-02	25-Sep-02	1	969.25	970.05	-0.2970	0.0068	-0.5387
31-Oct-02	26-Sep-02	35	963.35	969.9	-0.0697	-0.0061	-0.7653
31-Oct-02	27-Sep-02	34	968.3	976.45	-0.0887	0.0051	0.2733
31-Oct-02	30-Sep-02	31	957.75	963.15	-0.0653	-0.0109	-0.2643
31-Oct-02	01-Oct-02	30	955.6	955.2	0.0050	-0.0022	-1.0769
31-Oct-02	03-Oct-02	28	952.4	948.2	0.0568	-0.0033	10.3104
31-Oct-02	04-Oct-02	27	948.9	948.2	0.0098	-0.0037	-0.8268
31-Oct-02	07-Oct-02	24	958.8	954.75	0.0635	0.0104	5.4530
31-Oct-02	08-Oct-02	23	963.3	960.8	0.0407	0.0047	-0.3594
31-Oct-02	09-Oct-02	22	955.35	954.75	0.0103	-0.0083	-0.7473
31-Oct-02	10-Oct-02	21	958.05	958.45	-0.0072	0.0028	-1.6961
31-Oct-02	11-Oct-02	20	969.65	971.05	-0.0260	0.0121	2.6292
31-Oct-02	14-Oct-02	17	969.6	972.45	-0.0622	-0.0001	1.3933
31-Oct-02	16-Oct-02	15	972.65	973.6	-0.0234	0.0031	-0.6230
31-Oct-02	17-Oct-02	14	975.85	973.3	0.0673	0.0033	-3.8717
31-Oct-02	18-Oct-02	13	972.15	971.65	0.0142	-0.0038	-0.7883
31-Oct-02	21-Oct-02	10	968.15	967.35	0.0298	-0.0041	1.0889
31-Oct-02	22-Oct-02	9	962.9	962.5	0.0166	-0.0054	-0.4415
31-Oct-02	23-Oct-02	8	957.85	957.35	0.0235	-0.0052	0.4137
31-Oct-02	24-Oct-02	7	949.6	946.9	0.1464	-0.0086	5.2323
31-Oct-02	25-Oct-02	6	935.9	932.2	0.2377	-0.0144	0.6231
31-Oct-02	28-Oct-02	3	927.7	922.7	0.6485	-0.0088	1.7286
31-Oct-02	29-Oct-02	2	937.5	936.9	0.1152	0.0106	-0.8223
31-Oct-02	30-Oct-02	1	938.4	937.75	0.2494	0.0010	1.1646
28-Nov-02	31-Oct-02	28	952	951.4	0.0081	0.0145	-0.9675
28-Nov-02	01-Nov-02	27	952.55	951.45	0.0154	0.0006	0.9006
28-Nov-02	04-Nov-02	24	963.45	962.1	0.0210	0.0114	0.3652
28-Nov-02	05-Nov-02	23	962.85	962.3	0.0089	-0.0006	-0.5748

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
28-Nov-02	07-Nov-02	21	960.65	960.7	-0.0009	-0.0023	-1.0998
28-Nov-02	08-Nov-02	20	958.85	956.95	0.0357	-0.0019	-41.0156
28-Nov-02	11-Nov-02	17	955.55	954.05	0.0333	-0.0034	-0.0682
28-Nov-02	12-Nov-02	16	961.75	959.85	0.0445	0.0065	0.3374
28-Nov-02	13-Nov-02	15	960.3	962.65	-0.0587	-0.0015	-2.3184
28-Nov-02	14-Nov-02	14	970.65	971.9	-0.0331	0.0108	-0.4358
28-Nov-02	15-Nov-02	13	988.75	990.35	-0.0448	0.0186	0.3530
28-Nov-02	18-Nov-02	10	993.5	996.85	-0.1212	0.0048	1.7065
28-Nov-02	20-Nov-02	8	996.95	1001.6	-0.2094	0.0035	0.7280
28-Nov-02	21-Nov-02	7	1002.75	1008.75	-0.3068	0.0058	0.4652
28-Nov-02	22-Nov-02	6	1014.7	1020.15	-0.3214	0.0119	0.0476
28-Nov-02	25-Nov-02	3	1021.25	1026.2	-0.5802	0.0065	0.8053
28-Nov-02	26-Nov-02	2	1032.85	1036.15	-0.5742	0.0114	-0.0104
28-Nov-02	27-Nov-02	1	1028.45	1031.1	-0.9264	-0.0043	0.6134
26-Dec-02	28-Nov-02	28	1039.65	1049.7	-0.1237	0.0109	-0.8665
26-Dec-02	29-Nov-02	27	1045.75	1050.15	-0.0560	0.0059	-0.5474
26-Dec-02	02-Dec-02	24	1066.45	1067.9	-0.0204	0.0198	-0.6359
26-Dec-02	03-Dec-02	23	1056.95	1055	0.0289	-0.0089	-2.4182
26-Dec-02	04-Dec-02	22	1042.65	1036.4	0.0984	-0.0135	2.4039
26-Dec-02	05-Dec-02	21	1052.7	1045.95	0.1103	0.0096	0.1209
26-Dec-02	06-Dec-02	20	1076.15	1069.8	0.1065	0.0223	-0.0340
26-Dec-02	09-Dec-02	17	1065.75	1058.65	0.1415	-0.0097	0.3288
26-Dec-02	10-Dec-02	16	1069.4	1063.7	0.1202	0.0034	-0.1505
26-Dec-02	11-Dec-02	15	1069.55	1069.75	-0.0045	0.0001	-1.0373
26-Dec-02	12-Dec-02	14	1071.95	1077	-0.1209	0.0022	25.9321
26-Dec-02	13-Dec-02	13	1085.8	1086.2	-0.0102	0.0129	-0.9156
26-Dec-02	16-Dec-02	10	1074.25	1078.45	-0.1405	-0.0106	12.7724
26-Dec-02	17-Dec-02	9	1070.55	1073.25	-0.1008	-0.0034	-0.2827
26-Dec-02	18-Dec-02	8	1072.45	1077.95	-0.2302	0.0018	1.2846
26-Dec-02	19-Dec-02	7	1073.6	1076	-0.1148	0.0011	-0.5011
26-Dec-02	20-Dec-02	6	1078.35	1079.3	-0.0528	0.0044	-0.5399
26-Dec-02	23-Dec-02	3	1075.35	1076	-0.0725	-0.0028	0.3724
26-Dec-02	24-Dec-02	2	1087.85	1085	0.4722	0.0116	-7.5118
30-Jan-03	26-Dec-02	35	1093.15	1094.8	-0.0155	0.0049	-1.0329
30-Jan-03	27-Dec-02	34	1098.8	1098.4	0.0039	0.0052	-1.2485
30-Jan-03	30-Dec-02	31	1092.8	1091.95	0.0090	-0.0055	1.3439
30-Jan-03	31-Dec-02	30	1092.1	1093.5	-0.0154	-0.0006	-2.7013
30-Jan-03	01-Jan-03	29	1102.6	1100.15	0.0276	0.0096	-2.7963
30-Jan-03	02-Jan-03	28	1095.1	1093.05	0.0241	-0.0068	-0.1276
30-Jan-03	03-Jan-03	27	1091.6	1089.6	0.0245	-0.0032	0.0150
30-Jan-03	06-Jan-03	24	1084.75	1084.35	0.0055	-0.0063	-0.7737
30-Jan-03	07-Jan-03	23	1082.2	1081.8	0.0058	-0.0024	0.0459
30-Jan-03	08-Jan-03	22	1092.05	1089.35	0.0405	0.0091	6.0005
30-Jan-03	09-Jan-03	21	1100.7	1097.35	0.0523	0.0079	0.2900
30-Jan-03	10-Jan-03	20	1085.55	1080.25	0.0881	-0.0138	0.6859
30-Jan-03	13-Jan-03	17	1079.65	1073.75	0.1160	-0.0054	0.3172
30-Jan-03	14-Jan-03	16	1082.8	1078.95	0.0801	0.0029	-0.3094

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
30-Jan-03	15-Jan-03	15	1085.85	1085	0.0188	0.0028	-0.7655
30-Jan-03	16-Jan-03	14	1087.4	1088.35	-0.0225	0.0014	-2.1948
30-Jan-03	17-Jan-03	13	1086.75	1086.5	0.0064	-0.0006	-1.2837
30-Jan-03	20-Jan-03	10	1077.3	1076.35	0.0318	-0.0087	3.9850
30-Jan-03	21-Jan-03	9	1078.45	1077.9	0.0204	0.0011	-0.3575
30-Jan-03	22-Jan-03	8	1081	1082.9	-0.0790	0.0024	-4.8728
30-Jan-03	23-Jan-03	7	1071.85	1070.9	0.0456	-0.0085	-1.5771
30-Jan-03	24-Jan-03	6	1060	1056.05	0.2240	-0.0111	3.9121
30-Jan-03	27-Jan-03	3	1043.1	1037.65	0.6286	-0.0159	1.8063
30-Jan-03	28-Jan-03	2	1050.75	1046.2	0.7811	0.0073	0.2426
30-Jan-03	29-Jan-03	1	1038.85	1037.2	0.5722	-0.0113	-0.2674
27-Feb-03	30-Jan-03	28	1042.1	1034.6	0.0929	0.0031	-0.8377
27-Feb-03	31-Jan-03	27	1045.5	1041.85	0.0466	0.0033	-0.4979
27-Feb-03	03-Feb-03	24	1057.35	1055.3	0.0291	0.0113	-0.3757
27-Feb-03	04-Feb-03	23	1052.55	1054.8	-0.0334	-0.0045	-2.1482
27-Feb-03	05-Feb-03	22	1047.65	1047.4	0.0039	-0.0047	-1.1168
27-Feb-03	06-Feb-03	21	1064.3	1063.6	0.0113	0.0159	1.8880
27-Feb-03	07-Feb-03	20	1058.1	1057.5	0.0102	-0.0058	-0.0948
27-Feb-03	10-Feb-03	17	1049.85	1048.6	0.0252	-0.0078	1.4710
27-Feb-03	11-Feb-03	16	1050.15	1048	0.0461	0.0003	0.8278
27-Feb-03	12-Feb-03	15	1047.05	1044.45	0.0597	-0.0030	0.2940
27-Feb-03	14-Feb-03	13	1040.45	1036	0.1187	-0.0063	0.9892
27-Feb-03	17-Feb-03	10	1063.65	1058.2	0.1849	0.0223	0.5581
27-Feb-03	18-Feb-03	9	1062.05	1059.3	0.1037	-0.0015	-0.4392
27-Feb-03	19-Feb-03	8	1068.6	1064.3	0.1814	0.0062	0.7496
27-Feb-03	20-Feb-03	7	1069.05	1065.6	0.1662	0.0004	-0.0838
27-Feb-03	21-Feb-03	6	1069.3	1066.15	0.1770	0.0002	0.0648
27-Feb-03	24-Feb-03	3	1073.15	1070.15	0.3359	0.0036	0.8978
27-Feb-03	25-Feb-03	2	1058.95	1055.55	0.5789	-0.0132	0.7232
27-Feb-03	26-Feb-03	1	1052.05	1049.65	0.8222	-0.0065	0.4204
27-Mar-03	27-Feb-03	28	1061.1	1052.95	0.0991	0.0086	-0.8794
27-Mar-03	28-Feb-03	27	1070.5	1063.4	0.0887	0.0089	-0.1050
27-Mar-03	03-Mar-03	24	1064.9	1058.85	0.0855	-0.0052	-0.0368
27-Mar-03	04-Mar-03	23	1053.9	1046.6	0.1088	-0.0103	0.2730
27-Mar-03	05-Mar-03	22	1045.35	1040.7	0.0730	-0.0081	-0.3294
27-Mar-03	06-Mar-03	21	1034.9	1031.25	0.0606	-0.0100	-0.1698
27-Mar-03	07-Mar-03	20	1023.45	1017.1	0.1120	-0.0111	0.8496
27-Mar-03	10-Mar-03	17	1007.2	1006.7	0.0105	-0.0159	-0.9061
27-Mar-03	11-Mar-03	16	1015.65	1014.55	0.0244	0.0084	1.3187
27-Mar-03	12-Mar-03	15	1003.95	1001.7	0.0538	-0.0115	1.2085
27-Mar-03	13-Mar-03	14	1003.05	999.65	0.0873	-0.0009	0.6214
27-Mar-03	17-Mar-03	10	994.05	993	0.0380	-0.0090	-0.5642
27-Mar-03	19-Mar-03	8	1004.2	1003.9	0.0134	0.0102	-0.6466
27-Mar-03	20-Mar-03	7	1021.8	1025.25	-0.1734	0.0175	-13.8928
27-Mar-03	21-Mar-03	6	1029.35	1030.55	-0.0699	0.0074	-0.5967
27-Mar-03	22-Mar-03	5	1036.7	1037.15	-0.0312	0.0071	-0.5530
27-Mar-03	24-Mar-03	3	1012.2	1013.9	-0.2014	-0.0236	5.4447

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
27-Mar-03	25-Mar-03	2	1012.05	1011.3	0.1334	-0.0001	-1.6627
27-Mar-03	26-Mar-03	1	1015.75	1013.85	0.6740	0.0037	4.0511
24-Apr-03	27-Mar-03	28	1003.9	1002.7	0.0154	-0.0117	-0.9772
24-Apr-03	28-Mar-03	27	1001.1	1000.6	0.0067	-0.0028	-0.5668
24-Apr-03	31-Mar-03	24	980.5	978.2	0.0352	-0.0206	4.2886
24-Apr-03	01-Apr-03	23	982.2	984.3	-0.0334	0.0017	-1.9490
24-Apr-03	02-Apr-03	22	998.85	999.4	-0.0090	0.0170	-0.7305
24-Apr-03	03-Apr-03	21	1006.35	1009.15	-0.0476	0.0075	4.2877
24-Apr-03	04-Apr-03	20	1014.8	1016.95	-0.0381	0.0084	-0.2002
24-Apr-03	07-Apr-03	17	1028.65	1031.5	-0.0586	0.0136	0.5380
24-Apr-03	08-Apr-03	16	1016.25	1018.1	-0.0409	-0.0121	-0.3016
24-Apr-03	09-Apr-03	15	1006.15	1004.85	0.0310	-0.0099	-1.7583
24-Apr-03	10-Apr-03	14	973.65	962.2	0.3042	-0.0323	8.8033
24-Apr-03	11-Apr-03	13	959.8	949.8	0.2900	-0.0142	-0.0465
24-Apr-03	15-Apr-03	9	953.6	951.2	0.1008	-0.0065	-0.6525
24-Apr-03	16-Apr-03	8	958.6	958.65	-0.0023	0.0052	-1.0233
24-Apr-03	17-Apr-03	7	941.05	940.7	0.0191	-0.0183	-9.1509
24-Apr-03	21-Apr-03	3	947.65	947.2	0.0570	0.0070	1.9793
24-Apr-03	22-Apr-03	2	944.25	943.5	0.1430	-0.0036	1.5094
24-Apr-03	23-Apr-03	1	934.05	934.2	-0.0578	-0.0108	-1.4042
29-May-03	24-Apr-03	35	934.55	929.7	0.0535	0.0005	-1.9258
29-May-03	25-Apr-03	34	929.15	924.3	0.0554	-0.0058	0.0354
29-May-03	28-Apr-03	31	934.25	929.5	0.0592	0.0055	0.0682
29-May-03	29-Apr-03	30	930.3	932.3	-0.0258	-0.0042	-1.4354
29-May-03	30-Apr-03	29	930.65	934.05	-0.0453	0.0004	0.7566
29-May-03	02-May-03	27	938.05	938.3	-0.0036	0.0080	-0.9215
29-May-03	05-May-03	24	945.85	945.4	0.0071	0.0083	-3.0090
29-May-03	06-May-03	23	949.6	951.85	-0.0370	0.0040	-6.1894
29-May-03	07-May-03	22	947	950.15	-0.0543	-0.0027	0.4670
29-May-03	08-May-03	21	937.15	941.55	-0.0803	-0.0104	0.4777
29-May-03	09-May-03	20	934.65	937.85	-0.0615	-0.0027	-0.2338
29-May-03	12-May-03	17	932.95	936	-0.0691	-0.0018	0.1235
29-May-03	13-May-03	16	944.2	944.25	-0.0012	0.0121	-0.9828
29-May-03	14-May-03	15	951.9	952.15	-0.0063	0.0082	4.2896
29-May-03	15-May-03	14	959.8	959.85	-0.0013	0.0083	-0.7875
29-May-03	16-May-03	13	970.5	973.1	-0.0741	0.0111	54.3100
29-May-03	19-May-03	10	965.25	966.55	-0.0485	-0.0054	-0.3460
29-May-03	20-May-03	9	971.35	971.55	-0.0082	0.0063	-0.8300
29-May-03	21-May-03	8	964.6	968	-0.1583	-0.0069	18.2269
29-May-03	22-May-03	7	962.65	963.25	-0.0320	-0.0020	-0.7976
29-May-03	23-May-03	6	969.6	967.9	0.1053	0.0072	-4.2858
29-May-03	26-May-03	3	984.6	982.45	0.2623	0.0155	1.4914
29-May-03	27-May-03	2	974.8	976.85	-0.3781	-0.0100	-2.4415
29-May-03	28-May-03	1	989.2	990.8	-0.5818	0.0148	0.5386
26-Jun-03	29-May-03	28	996.5	1002.6	-0.0785	0.0074	-0.8651
26-Jun-03	30-May-03	27	999.35	1006.8	-0.0990	0.0029	0.2621
26-Jun-03	02-Jun-03	24	1009.2	1015.15	-0.0882	0.0099	-0.1096

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
26-Jun-03	03-Jun-03	23	1003.7	1010.65	-0.1080	-0.0054	0.2249
26-Jun-03	04-Jun-03	22	1018.4	1021.05	-0.0425	0.0146	-0.6063
26-Jun-03	05-Jun-03	21	1027.8	1035.05	-0.1205	0.0092	1.8336
26-Jun-03	06-Jun-03	20	1039.2	1046.4	-0.1243	0.0111	0.0314
26-Jun-03	09-Jun-03	17	1042	1052.1	-0.2043	0.0027	0.6436
26-Jun-03	10-Jun-03	16	1031	1037.8	-0.1479	-0.0106	-0.2759
26-Jun-03	11-Jun-03	15	1039.35	1044.1	-0.1094	0.0081	-0.2601
26-Jun-03	12-Jun-03	14	1044.05	1051.3	-0.1779	0.0045	0.6261
26-Jun-03	13-Jun-03	13	1045.65	1056.2	-0.2780	0.0015	0.5623
26-Jun-03	16-Jun-03	10	1040.3	1051.8	-0.3958	-0.0051	0.4237
26-Jun-03	17-Jun-03	9	1070.8	1081.95	-0.4144	0.0293	0.0469
26-Jun-03	18-Jun-03	8	1074.75	1086.75	-0.4997	0.0037	0.2059
26-Jun-03	19-Jun-03	7	1080.85	1092.55	-0.5537	0.0057	0.1082
26-Jun-03	20-Jun-03	6	1096.05	1100.25	-0.2295	0.0141	-0.5856
26-Jun-03	23-Jun-03	3	1085.55	1089.2	-0.4028	-0.0096	0.7553
26-Jun-03	24-Jun-03	2	1086.75	1085.35	0.2320	0.0011	-1.5760
26-Jun-03	25-Jun-03	1	1111.55	1106.65	1.5905	0.0228	5.8545
31-Jul-03	26-Jun-03	35	1104.4	1116.35	-0.1107	-0.0064	-1.0696
31-Jul-03	27-Jun-03	34	1113.5	1125.55	-0.1140	0.0082	0.0295
31-Jul-03	30-Jun-03	31	1123.6	1134.15	-0.1085	0.0091	-0.0477
31-Jul-03	01-Jul-03	30	1121.2	1130.7	-0.1012	-0.0021	-0.0671
31-Jul-03	02-Jul-03	29	1130.75	1133.8	-0.0334	0.0085	-0.6697
31-Jul-03	03-Jul-03	28	1137.75	1144.65	-0.0777	0.0062	1.3248
31-Jul-03	04-Jul-03	27	1136.7	1138.45	-0.0205	-0.0009	-0.7361
31-Jul-03	07-Jul-03	24	1140.6	1140.55	0.0007	0.0034	-1.0321
31-Jul-03	08-Jul-03	23	1140.5	1145.9	-0.0739	-0.0001	-113.4371
31-Jul-03	09-Jul-03	22	1133.75	1141.05	-0.1050	-0.0059	0.4205
31-Jul-03	10-Jul-03	21	1159.9	1162.35	-0.0362	0.0231	-0.6556
31-Jul-03	11-Jul-03	20	1158.2	1161.65	-0.0535	-0.0015	0.4801
31-Jul-03	14-Jul-03	17	1171.55	1171.5	0.0009	0.0115	-1.0169
31-Jul-03	15-Jul-03	16	1158.2	1159.85	-0.0320	-0.0114	-36.4407
31-Jul-03	16-Jul-03	15	1173.3	1168.75	0.0933	0.0130	-3.9113
31-Jul-03	17-Jul-03	14	1154.75	1152	0.0613	-0.0158	-0.3425
31-Jul-03	18-Jul-03	13	1144.1	1140	0.0994	-0.0092	0.6215
31-Jul-03	21-Jul-03	10	1118.75	1115.8	0.0951	-0.0222	-0.0439
31-Jul-03	22-Jul-03	9	1112.9	1109.2	0.1332	-0.0052	0.4014
31-Jul-03	23-Jul-03	8	1118.1	1119.05	-0.0382	0.0047	-1.2869
31-Jul-03	24-Jul-03	7	1137.05	1139.45	-0.1084	0.0169	1.8373
31-Jul-03	25-Jul-03	6	1163.85	1162.75	0.0567	0.0236	-1.5232
31-Jul-03	28-Jul-03	3	1168.65	1169.2	-0.0565	0.0041	-1.9952
31-Jul-03	29-Jul-03	2	1179.25	1174.75	0.6882	0.0091	-13.1885
31-Jul-03	30-Jul-03	1	1183.65	1183	0.1977	0.0037	-0.7127
28-Aug-03	31-Jul-03	28	1181.35	1185.85	-0.0489	-0.0019	-1.2472
28-Aug-03	01-Aug-03	27	1186.95	1195.75	-0.0985	0.0047	1.0148
28-Aug-03	04-Aug-03	24	1196.7	1203.6	-0.0862	0.0082	-0.1244
28-Aug-03	05-Aug-03	23	1179.85	1184.45	-0.0609	-0.0141	-0.2938
28-Aug-03	06-Aug-03	22	1165.25	1171.05	-0.0812	-0.0124	0.3340

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
28-Aug-03	07-Aug-03	21	1191.9	1196.95	-0.0725	0.0229	-0.1079
28-Aug-03	08-Aug-03	20	1215.95	1222.65	-0.0989	0.0202	0.3647
28-Aug-03	11-Aug-03	17	1224.3	1232.85	-0.1474	0.0069	0.4900
28-Aug-03	12-Aug-03	16	1224.75	1234.75	-0.1830	0.0004	0.2415
28-Aug-03	13-Aug-03	15	1242.3	1246.9	-0.0887	0.0143	-0.5152
28-Aug-03	14-Aug-03	14	1242.25	1247.75	-0.1136	0.0000	0.2806
28-Aug-03	18-Aug-03	10	1274.35	1281.4	-0.1986	0.0258	0.7484
28-Aug-03	19-Aug-03	9	1274.7	1277.7	-0.0940	0.0003	-0.5266
28-Aug-03	20-Aug-03	8	1287.8	1287.4	0.0140	0.0103	-1.1487
28-Aug-03	21-Aug-03	7	1303.3	1300.95	0.0928	0.0120	5.6394
28-Aug-03	22-Aug-03	6	1312.35	1311.15	0.0549	0.0069	-0.4086
28-Aug-03	25-Aug-03	3	1273.5	1271.1	0.2264	-0.0296	3.1240
28-Aug-03	26-Aug-03	2	1326	1318.2	1.0619	0.0412	3.6914
28-Aug-03	27-Aug-03	1	1344.3	1340.3	1.0728	0.0138	0.0102
25-Sep-03	28-Aug-03	28	1334.3	1341.05	-0.0649	-0.0074	-1.0605
25-Sep-03	29-Aug-03	27	1358.8	1356.55	0.0221	0.0184	-1.3406
25-Sep-03	01-Sep-03	24	1372.25	1375.95	-0.0404	0.0099	-2.8279
25-Sep-03	02-Sep-03	23	1385.25	1385.45	-0.0023	0.0095	-0.9441
25-Sep-03	03-Sep-03	22	1359.65	1359.35	0.0036	-0.0185	-2.5980
25-Sep-03	04-Sep-03	21	1370.9	1372.7	-0.0225	0.0083	-7.2294
25-Sep-03	05-Sep-03	20	1401.6	1398.4	0.0411	0.0224	-2.8291
25-Sep-03	08-Sep-03	17	1422.7	1417.35	0.0798	0.0151	0.9392
25-Sep-03	09-Sep-03	16	1409.5	1407.05	0.0391	-0.0093	-0.5094
25-Sep-03	10-Sep-03	15	1416.4	1409.55	0.1164	0.0049	1.9724
25-Sep-03	11-Sep-03	14	1414.15	1403.15	0.2008	-0.0016	0.7258
25-Sep-03	12-Sep-03	13	1379.9	1372.1	0.1570	-0.0242	-0.2182
25-Sep-03	15-Sep-03	10	1339.85	1329.25	0.2859	-0.0290	0.8215
25-Sep-03	16-Sep-03	9	1369.35	1357.95	0.3344	0.0220	0.1695
25-Sep-03	17-Sep-03	8	1343.5	1341.6	0.0637	-0.0189	-0.8096
25-Sep-03	18-Sep-03	7	1302.15	1302.35	-0.0079	-0.0308	-1.1240
25-Sep-03	19-Sep-03	6	1323.75	1322.15	0.0726	0.0166	-10.1873
25-Sep-03	22-Sep-03	3	1299.65	1302.9	-0.2997	-0.0182	-5.1302
25-Sep-03	23-Sep-03	2	1330.85	1328.2	0.3588	0.0240	-2.1971
25-Sep-03	24-Sep-03	1	1371.9	1372.05	-0.0394	0.0308	-1.1097
30-Oct-03	25-Sep-03	35	1361.05	1357.2	0.0291	-0.0079	-1.7403
30-Oct-03	26-Sep-03	34	1390.65	1386.95	0.0282	0.0217	-0.0318
30-Oct-03	29-Sep-03	31	1405.15	1399.95	0.0431	0.0104	0.5263
30-Oct-03	30-Sep-03	30	1418.25	1417.1	0.0097	0.0093	-0.7739
30-Oct-03	01-Oct-03	29	1422.45	1420.85	0.0140	0.0030	0.4353
30-Oct-03	03-Oct-03	27	1447.2	1449.3	-0.0193	0.0174	-2.3838
30-Oct-03	06-Oct-03	24	1482.25	1478.9	0.0339	0.0242	-2.7555
30-Oct-03	07-Oct-03	23	1475.2	1477.85	-0.0281	-0.0048	-1.8277
30-Oct-03	08-Oct-03	22	1479.6	1478.6	0.0111	0.0030	-1.3938
30-Oct-03	09-Oct-03	21	1506.5	1502.1	0.0501	0.0182	3.5323
30-Oct-03	10-Oct-03	20	1528.05	1523.1	0.0584	0.0143	0.1648
30-Oct-03	13-Oct-03	17	1551.7	1546.75	0.0677	0.0155	0.1585
30-Oct-03	14-Oct-03	16	1520.05	1520.8	-0.0111	-0.0204	-1.1640

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
30-Oct-03	15-Oct-03	15	1541.75	1537	0.0741	0.0143	-7.6724
30-Oct-03	16-Oct-03	14	1562.05	1555.7	0.1047	0.0132	0.4144
30-Oct-03	17-Oct-03	13	1570.85	1569.45	0.0247	0.0056	-0.7643
30-Oct-03	20-Oct-03	10	1541.4	1542.7	-0.0303	-0.0187	-2.2291
30-Oct-03	21-Oct-03	9	1510.7	1506.5	0.1114	-0.0199	-4.6693
30-Oct-03	22-Oct-03	8	1497.65	1494.1	0.1068	-0.0086	-0.0410
30-Oct-03	23-Oct-03	7	1475.35	1470.45	0.1711	-0.0149	0.6021
30-Oct-03	24-Oct-03	6	1516.2	1506.05	0.4030	0.0277	1.3555
30-Oct-03	25-Oct-03	5	1524.45	1521.95	0.1182	0.0054	-0.7068
30-Oct-03	27-Oct-03	3	1484.85	1485.3	-0.0364	-0.0260	-1.3077
30-Oct-03	28-Oct-03	2	1480.55	1481.75	-0.1458	-0.0029	3.0106
30-Oct-03	29-Oct-03	1	1503.1	1498.45	1.1154	0.0152	-8.6487
27-Nov-03	30-Oct-03	28	1525.45	1516.85	0.0727	0.0149	-0.9348
27-Nov-03	31-Oct-03	27	1559.45	1555.9	0.0304	0.0223	-0.5820
27-Nov-03	03-Nov-03	24	1609	1601.65	0.0687	0.0318	1.2601
27-Nov-03	04-Nov-03	23	1619.4	1618.7	0.0068	0.0065	-0.9015
27-Nov-03	05-Nov-03	22	1609.9	1609.15	0.0076	-0.0059	0.1268
27-Nov-03	06-Nov-03	21	1617.7	1612.2	0.0584	0.0048	6.6567
27-Nov-03	07-Nov-03	20	1597.7	1592.05	0.0638	-0.0124	0.0922
27-Nov-03	10-Nov-03	17	1605.1	1594.5	0.1403	0.0046	1.2004
27-Nov-03	11-Nov-03	16	1602.25	1601.15	0.0155	-0.0018	-0.8899
27-Nov-03	12-Nov-03	15	1611.3	1603.8	0.1120	0.0056	6.2463
27-Nov-03	13-Nov-03	14	1587.05	1579.95	0.1153	-0.0150	0.0297
27-Nov-03	14-Nov-03	13	1558.25	1550.45	0.1390	-0.0181	0.2053
27-Nov-03	15-Nov-03	12	1567.65	1562.8	0.0930	0.0060	-0.3311
27-Nov-03	17-Nov-03	10	1590.85	1579.9	0.2486	0.0148	1.6749
27-Nov-03	18-Nov-03	9	1571.55	1564.4	0.1824	-0.0121	-0.2664
27-Nov-03	19-Nov-03	8	1545.85	1540.6	0.1531	-0.0164	-0.1607
27-Nov-03	20-Nov-03	7	1526.35	1522.3	0.1366	-0.0126	-0.1074
27-Nov-03	21-Nov-03	6	1546.8	1540.7	0.2371	0.0134	0.7351
27-Nov-03	24-Nov-03	3	1544.9	1543.9	0.0777	-0.0012	-0.6723
27-Nov-03	25-Nov-03	2	1571.85	1568.65	0.3668	0.0174	3.7210
24-Dec-03	27-Nov-03	27	1604.8	1598.35	0.0537	0.0210	-0.8536
24-Dec-03	28-Nov-03	26	1619.95	1615.25	0.0402	0.0094	-0.2508
24-Dec-03	01-Dec-03	23	1662.25	1657.65	0.0434	0.0261	0.0782
24-Dec-03	02-Dec-03	22	1659.8	1658.5	0.0128	-0.0015	-0.7044
24-Dec-03	03-Dec-03	21	1672.7	1670.5	0.0226	0.0078	0.7597
24-Dec-03	04-Dec-03	20	1678.85	1675.2	0.0392	0.0037	0.7364
24-Dec-03	05-Dec-03	19	1649.6	1645.8	0.0437	-0.0174	0.1154
24-Dec-03	08-Dec-03	16	1651.2	1646.25	0.0676	0.0010	0.5459
24-Dec-03	09-Dec-03	15	1680.8	1675.85	0.0708	0.0179	0.0479
24-Dec-03	10-Dec-03	14	1682.1	1686.9	-0.0733	0.0008	-2.0352
24-Dec-03	11-Dec-03	13	1691.5	1695.4	-0.0638	0.0056	-0.1296
24-Dec-03	12-Dec-03	12	1697.9	1698.9	-0.0177	0.0038	-0.7230
24-Dec-03	15-Dec-03	9	1723.2	1723.95	-0.0174	0.0149	-0.0146
24-Dec-03	16-Dec-03	8	1726.1	1736.25	-0.2638	0.0017	14.1582
24-Dec-03	17-Dec-03	7	1722.05	1733.25	-0.3334	-0.0023	0.2637

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
24-Dec-03	18-Dec-03	6	1746.85	1756.1	-0.3169	0.0144	-0.0496
24-Dec-03	19-Dec-03	5	1772	1778.55	-0.2656	0.0144	-0.1617
24-Dec-03	22-Dec-03	2	1786.8	1789.15	-0.2366	0.0084	-0.1094
24-Dec-03	23-Dec-03	1	1780.3	1780.35	-0.0101	-0.0036	-0.9573
29-Jan-04	24-Dec-03	36	1802.4	1808.7	-0.0349	0.0124	2.4511
29-Jan-04	26-Dec-03	34	1837.1	1837.05	0.0003	0.0193	-1.0083
29-Jan-04	29-Dec-03	31	1877.85	1874.05	0.0235	0.0222	80:6275
29-Jan-04	30-Dec-03	30	1879.25	1873.25	0.0384	0.0007	0.6313
29-Jan-04	31-Dec-03	29	1888.3	1879.75	0.0563	0.0048	0.4681
29-Jan-04	01-Jan-04	28	1925.3	1912.25	0.0874	0.0196	0.5522
29-Jan-04	02-Jan-04	27	1950.8	1946.05	0.0325	0.0132	-0.6283
29-Jan-04	05-Jan-04	24	1957.15	1955	0.0165	0.0033	-0.4928
29-Jan-04	06-Jan-04	23	1922.95	1926.7	-0.0305	-0.0175	-2.8496
29-Jan-04	07-Jan-04	22	1927.2	1916.75	0.0890	0.0022	-3.9177
29-Jan-04	08-Jan-04	21	1982.6	1968.55	0.1219	0.0287	0.3703
29-Jan-04	09-Jan-04	20	1983.35	1971.9	0.1042	0.0004	-0.1452
29-Jan-04	12-Jan-04	17	1953.55	1945.6	0.0864	-0.0150	-0.1714
29-Jan-04	13-Jan-04	16	1983.05	1963.6	0.2218	0.0151	1.5682
29-Jan-04	14-Jan-04	15	1992.35	1982.15	0.1232	0.0047	-0.4445
29-Jan-04	15-Jan-04	14	1951.5	1944.45	0.0931	-0.0205	-0.2445
29-Jan-04	16-Jan-04	13	1908.5	1900.65	0.1141	-0.0220	0.2265
29-Jan-04	19-Jan-04	10	1946.85	1935.35	0.2133	0.0201	0.8686
29-Jan-04	20-Jan-04	9	1890.6	1893.25	-0.0560	-0.0289	-1.2627
29-Jan-04	21-Jan-04	8	1835.55	1824.6	0.2693	-0.0291	-5.8057
29-Jan-04	22-Jan-04	7	1787	1770.5	0.4771	-0.0264	0.7718
29-Jan-04	23-Jan-04	6	1864.6	1847.55	0.5512	0.0434	0.1553
29-Jan-04	27-Jan-04	2	1911.9	1904.7	0.6791	0.0254	0.2322
29-Jan-04	28-Jan-04	1	1866.4	1863.1	0.6371	-0.0238	-0.0619
26-Feb-04	29-Jan-04	28	1868.1	1843.6	0.1697	0.0009	-0.7336
26-Feb-04	30-Jan-04	27	1814.85	1809.75	0.0375	-0.0285	-0.7789
26-Feb-04	03-Feb-04	23	1772.5	1769	0.0309	-0.0233	-0.1755
26-Feb-04	04-Feb-04	22	1825.95	1822.2	0.0336	0.0302	0.0874
26-Feb-04	05-Feb-04	21	1795.95	1804.5	-0.0814	-0.0164	-3.4202
26-Feb-04	06-Feb-04	20	1834.7	1833.65	0.0103	0.0216	-1.1266
26-Feb-04	09-Feb-04	17	1883.35	1880.7	0.0298	0.0265	1.8937
26-Feb-04	10-Feb-04	16	1876.2	1880.75	-0.0545	-0.0038	-2.8277
26-Feb-04	11-Feb-04	15	1897.2	1891.5	0.0722	0.0112	-2.3251
26-Feb-04	12-Feb-04	14	1889.95	1885.3	0.0633	-0.0038	-0.1228
26-Feb-04	13-Feb-04	13	1916.95	1913.6	0.0484	0.0143	-0.2354
26-Feb-04	16-Feb-04	10	1917.6	1913.55	0.0761	0.0003	0.5714
26-Feb-04	17-Feb-04	9	1927.15	1920.1	0.1466	0.0050	0.9261
26-Feb-04	18-Feb-04	8	1920.2	1916.45	0.0880	-0.0036	-0.3999
26-Feb-04	19-Feb-04	7	1858.95	1858.3	0.0180	-0.0319	-0.7955
26-Feb-04	20-Feb-04	6	1853.2	1852.65	0.0178	-0.0031	-0.0098
26-Feb-04	23-Feb-04	3	1810.3	1808.2	0.1393	-0.0231	6.8207
26-Feb-04	24-Feb-04	2	1822.95	1821.35	0.1581	0.0070	0.1348
26-Feb-04	25-Feb-04	1	1788.7	1786.8	0.3826	-0.0188	1.4207

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
25-Mar-04	26-Feb-04	28	1775.75	1765.8	0.0722	-0.0072	-0.8112
25-Mar-04	27-Feb-04	27	1804.8	1800.3	0.0333	0.0164	-0.5393
25-Mar-04	01-Mar-04	24	1848	1852.7	-0.0381	0.0239	-2.1446
25-Mar-04	03-Mar-04	22	1856.8	1860.4	-0.0317	0.0048	-0.1681
25-Mar-04	04-Mar-04	21	1835.8	1843.85	-0.0750	-0.0113	1.3665
25-Mar-04	05-Mar-04	20	1874.75	1867.7	0.0678	0.0212	-1.9041
25-Mar-04	08-Mar-04	17	1885.6	1885.25	0.0039	0.0058	-0.9420
25-Mar-04	09-Mar-04	16	1862	1866.05	-0.0489	-0.0125	-13.4358
25-Mar-04	10-Mar-04	15	1838.9	1844.35	-0.0710	-0.0124	0.4529
25-Mar-04	11-Mar-04	14	1803.1	1805.4	-0.0328	-0.0195	-0.5385
25-Mar-04	12-Mar-04	13	1812.45	1812.2	0.0038	0.0052	-1.1165
25-Mar-04	15-Mar-04	10	1759	1763.4	-0.0899	-0.0295	-24.5442
25-Mar-04	16-Mar-04	9	1745.65	1749.35	-0.0847	-0.0076	-0.0583
25-Mar-04	17-Mar-04	8	1751.85	1749.85	0.0514	0.0036	-1.6069
25-Mar-04	18-Mar-04	7	1717.3	1716.65	0.0195	-0.0197	-0.6212
25-Mar-04	19-Mar-04	6	1727.25	1725.1	0.0747	0.0058	2.8384
25-Mar-04	22-Mar-04	3	1687.45	1685	0.1744	-0.0230	1.3331
25-Mar-04	23-Mar-04	2	1696.55	1696.4	0.0159	0.0054	-0.9087
25-Mar-04	24-Mar-04	1	1694.05	1692.1	0.4146	-0.0015	25.0522
29-Apr-04	25-Mar-04	35	1712.65	1704.45	0.0494	0.0110	-0.8809
29-Apr-04	26-Mar-04	34	1747.25	1747.5	-0.0015	0.0202	-1.0307
29-Apr-04	29-Mar-04	31	1764.65	1762.05	0.0171	0.0100	-12.3031
29-Apr-04	30-Mar-04	30	1744.4	1750.15	-0.0395	-0.0115	-3.3063
29-Apr-04	31-Mar-04	29	1765.55	1771.9	-0.0446	0.0121	0.1286
29-Apr-04	01-Apr-04	28	1811.1	1819.65	-0.0606	0.0258	0.3587
29-Apr-04	02-Apr-04	27	1831.55	1841.1	-0.0693	0.0113	0.1451
29-Apr-04	05-Apr-04	24	1855.9	1856.6	-0.0057	0.0133	-0.9184
29-Apr-04	06-Apr-04	23	1855.8	1851.15	0.0393	-0.0001	-7.9421
29-Apr-04	07-Apr-04	22	1848.9	1848.7	0.0018	-0.0037	-0.9549
29-Apr-04	08-Apr-04	21	1859.45	1853.55	0.0545	0.0057	29.7766
29-Apr-04	12-Apr-04	17	1839.75	1838.2	0.0178	-0.0106	-0.6724
29-Apr-04	13-Apr-04	16	1881.45	1878.45	0.0359	0.0227	1.0116
29-Apr-04	15-Apr-04	14	1860.55	1861.95	-0.0193	-0.0111	-1.5387
29-Apr-04	16-Apr-04	13	1865.8	1868.95	-0.0467	0.0028	1.4151
29-Apr-04	17-Apr-04	12	1864.05	1868.1	-0.0651	-0.0009	0.3938
29-Apr-04	19-Apr-04	10	1835.65	1844.05	-0.1644	-0.0152	1.5244
29-Apr-04	20-Apr-04	9	1841.05	1844.25	-0.0695	0.0029	-0.5774
29-Apr-04	21-Apr-04	8	1871.45	1873.35	-0.0457	0.0165	-0.3426
29-Apr-04	22-Apr-04	7	1889.85	1889.55	0.0082	0.0098	-1.1788
29-Apr-04	23-Apr-04	6	1891.5	1892.45	-0.0301	0.0009	-4.6900
29-Apr-04	27-Apr-04	2	1818	1817.25	0.0743	-0.0389	-3.4653
29-Apr-04	28-Apr-04	1	1816.1	1816.55	-0.0892	-0.0010	-2.2009
27-May-04	29-Apr-04	28	1802.75	1808.95	-0.0441	-0.0074	-0.5051
27-May-04	30-Apr-04	27	1783.35	1796.1	-0.0950	-0.0108	1.1518
27-May-04	03-May-04	24	1755.25	1766.7	-0.0975	-0.0158	0.0268
27-May-04	04-May-04	23	1782.8	1793.1	-0.0902	0.0157	-0.0755
27-May-04	05-May-04	22	1800.25	1809.9	-0.0875	0.0098	-0.0298

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
27-May-04	06-May-04	21	1821.85	1832.8	-0.1027	0.0120	0.1743
27-May-04	07-May-04	20	1786.75	1804.45	-0.1774	-0.0193	0.7273
27-May-04	10-May-04	17	1747.15	1769.1	-0.2644	-0.0222	0.4901
27-May-04	11-May-04	16	1677.9	1699.45	-0.2871	-0.0396	0.0860
27-May-04	12-May-04	15	1694.9	1711.1	-0.2283	0.0101	-0.2049
27-May-04	13-May-04	14	1697.75	1717.5	-0.2974	0.0017	0.3027
27-May-04	14-May-04	13	1573.45	1582.4	-0.1571	-0.0732	-0.4719
27-May-04	17-May-04	10	1337.35	1388.75	-1.3577	-0.1501	7.6439
27-May-04	18-May-04	9	1472	1503.95	-0.8589	0.1007	-0.3674
27-May-04	19-May-04	8	1547.4	1567.85	-0.5908	0.0512	-0.3121
27-May-04	20-May-04	7	1510.75	1543.85	-1.1146	-0.0237	0.8866
27-May-04	21-May-04	6	1549.55	1560.2	-0.4110	0.0257	-0.6313
27-May-04	24-May-04	3	1598.8	1608.85	-0.7520	0.0318	0.8297
27-May-04	25-May-04	2	1601.4	1606.7	-0.5947	0.0016	-0.2091
27-May-04	26-May-04	1	1594.45	1598.8	-0.9808	-0.0043	0.6491
24-Jun-04	27-May-04	28	1552.75	1586.4	-0.2757	-0.0262	-0.7190
24-Jun-04	28-May-04	27	1482.4	1508.75	-0.2349	-0.0453	-0.1478
24-Jun-04	31-May-04	24	1464.15	1483.6	-0.1980	-0.0123	-0.1574
24-Jun-04	01-Jun-04	23	1483.35	1507.9	-0.2569	0.0131	0.2979
24-Jun-04	02-Jun-04	22	1516.6	1535.2	-0.1995	0.0224	-0.2236
24-Jun-04	03-Jun-04	21	1467.85	1495.1	-0.3153	-0.0321	0.5809
24-Jun-04	04-Jun-04	20	1503.5	1521.1	-0.2095	0.0243	-0.3357
24-Jun-04	07-Jun-04	17	1519.45	1542.55	-0.3195	0.0106	0.5253
24-Jun-04	08-Jun-04	16	1531.3	1550.55	-0.2811	0.0078	-0.1203
24-Jun-04	09-Jun-04	15	1529	1548.3	-0.3010	-0.0015	0.0710
24-Jun-04	10-Jun-04	14	1528.25	1544.75	-0.2761	-0.0005	-0.0827
24-Jun-04	11-Jun-04	13	1490.7	1508.45	-0.3278	-0.0246	0.1870
24-Jun-04	14-Jun-04	10	1466.95	1481.35	-0.3517	-0.0159	0.0728
24-Jun-04	15-Jun-04	9	1491.05	1501	-0.2660	0.0164	-0.2435
24-Jun-04	16-Jun-04	8	1485.15	1494.75	-0.2899	-0.0040	0.0899
24-Jun-04	17-Jun-04	7	1509.3	1512.05	-0.0936	0.0163	-0.6771
24-Jun-04	18-Jun-04	6	1484.7	1491.2	-0.2621	-0.0163	1.7997
24-Jun-04	21-Jun-04	3	1475.85	1482	-0.4990	-0.0060	0.9039
24-Jun-04	22-Jun-04	2	1475.95	1474.7	0.1525	0.0001	-1.3056
24-Jun-04	23-Jun-04	1	1447.5	1446.1	0.3484	-0.0193	1.2842
29-Jul-04	24-Jun-04	35	1451	1470.75	-0.1391	0.0024	-1.3992
29-Jul-04	25-Jun-04	34	1467	1488.5	-0.1541	0.0110	0.1078
29-Jul-04	28-Jun-04	31	1496	1514.35	-0.1416	0.0198	-0.0810
29-Jul-04	29-Jun-04	30	1500.5	1518.3	-0.1415	0.0030	-0.0004
29-Jul-04	30-Jun-04	29	1484.9	1505.6	-0.1719	-0.0104	0.2144
29-Jul-04	01-Jul-04	28	1523.1	1537.2	-0.1185	0.0257	-0.3106
29-Jul-04	02-Jul-04	27	1524.7	1537.5	-0.1115	0.0011	-0.0592
29-Jul-04	05-Jul-04	24	1513.55	1526.85	-0.1312	-0.0073	0.1773
29-Jul-04	06-Jul-04	23	1548.7	1558.25	-0.0962	0.0232	-0.2668
29-Jul-04	07-Jul-04	22	1554	1566.8	-0.1342	0.0034	0.3950
29-Jul-04	08-Jul-04	21	1499.4	1518.15	-0.2130	-0.0351	0.5871
29-Jul-04	09-Jul-04	20	1537.65	1553.2	-0.1811	0.0255	-0.1499

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
29-Jul-04	12-Jul-04	17	1542.8	1556.95	-0.1933	0.0033	0.0675
29-Jul-04	13-Jul-04	16	1524.75	1539.3	-0.2137	-0.0117	0.1053
29-Jul-04	14-Jul-04	15	1509.85	1522.75	-0.2042	-0.0098	-0.0445
29-Jul-04	15-Jul-04	14	1528.7	1539.4	-0.1794	0.0125	-0.1216
29-Jul-04	16-Jul-04	13	1548.45	1558.8	-0.1845	0.0129	0.0286
29-Jul-04	19-Jul-04	10	1559.4	1571.6	-0.2806	0.0071	0.5207
29-Jul-04	20-Jul-04	9	1551.65	1566.1	-0.3708	-0.0050	0.3216
29-Jul-04	21-Jul-04	8	1576.65	1581.4	-0.1354	0.0161	-0.6349
29-Jul-04	22-Jul-04	7	1587.45	1598.1	-0.3439	0.0068	1.5403
29-Jul-04	23-Jul-04	6	1595.2	1601.6	-0.2402	0.0049	-0.3014
29-Jul-04	26-Jul-04	3	1612.2	1618	-0.4309	0.0107	0.7938
29-Jul-04	27-Jul-04	2	1597.45	1600.75	-0.3715	-0.0091	-0.1380
29-Jul-04	28-Jul-04	1	1593.45	1594.15	-0.1581	-0.0025	-0.5743
26-Aug-04	29-Jul-04	28	1604.45	1618.7	-0.1137	0.0069	-0.2810
26-Aug-04	30-Jul-04	27	1622.95	1632.3	-0.0766	0.0115	-0.3263
26-Aug-04	02-Aug-04	24	1633.6	1639.05	-0.0500	0.0066	-0.3477
26-Aug-04	03-Aug-04	23	1625.35	1630.6	-0.0505	-0.0051	0.0103
26-Aug-04	04-Aug-04	22	1621.55	1626.55	-0.0504	-0.0023	-0.0019
26-Aug-04	05-Aug-04	21	1656.8	1654.95	0.0192	0.0217	-1.3802
26-Aug-04	06-Aug-04	20	1633.35	1633.4	-0.0006	-0.0142	-1.0288
26-Aug-04	09-Aug-04	17	1644.3	1642.6	0.0219	0.0067	-40.7548
26-Aug-04	10-Aug-04	16	1649.15	1652.15	-0.0409	0.0029	-2.8668
26-Aug-04	11-Aug-04	15	1617	1621.6	-0.0682	-0.0195	0.6672
26-Aug-04	12-Aug-04	14	1606.35	1607.2	-0.0136	-0.0066	-0.8005
26-Aug-04	13-Aug-04	13	1598	1598.2	-0.0035	-0.0052	-0.7452
26-Aug-04	16-Aug-04	10	1598.85	1599.15	-0.0068	0.0005	0.9489
26-Aug-04	17-Aug-04	9	1601.5	1604.35	-0.0711	0.0017	9.5297
26-Aug-04	18-Aug-04	8	1580	1581.8	-0.0512	-0.0134	-0.2796
26-Aug-04	19-Aug-04	7	1606.85	1609.2	-0.0752	0.0170	0.4669
26-Aug-04	20-Aug-04	6	1586.15	1590.35	-0.1587	-0.0129	1.1111
26-Aug-04	23-Aug-04	3	1579.7	1578.2	0.1140	-0.0041	-1.7185
26-Aug-04	24-Aug-04	2	1593.9	1591.6	0.2599	0.0090	1.2801
26-Aug-04	25-Aug-04	1	1599.1	1595.7	0.7662	0.0033	1.9479
30-Sep-04	26-Aug-04	35	1606.3	1610.75	-0.0285	0.0045	-1.0371
30-Sep-04	27-Aug-04	34	1600.4	1609	-0.0567	-0.0037	0.9942
30-Sep-04	30-Aug-04	31	1621.65	1628.45	-0.0486	0.0133	-0.1436
30-Sep-04	31-Aug-04	30	1627	1631.75	-0.0350	0.0033	-0.2801
30-Sep-04	01-Sep-04	29	1627.9	1635.45	-0.0574	0.0006	0.6420
30-Sep-04	02-Sep-04	28	1625.3	1629.3	-0.0316	-0.0016	-0.4498
30-Sep-04	03-Sep-04	27	1629.85	1634.1	-0.0347	0.0028	0.0987
30-Sep-04	06-Sep-04	24	1638.5	1644	-0.0503	0.0053	0.4477
30-Sep-04	07-Sep-04	23	1644.3	1650.15	-0.0556	0.0035	0.1059
30-Sep-04	08-Sep-04	22	1650.15	1656.25	-0.0604	0.0036	0.0862
30-Sep-04	09-Sep-04	21	1643.7	1649	-0.0552	-0.0039	-0.0860
30-Sep-04	10-Sep-04	20	1664.1	1668.75	-0.0502	0.0124	-0.0899
30-Sep-04	13-Sep-04	17	1666.05	1675.2	-0.1160	0.0012	1.3092
30-Sep-04	14-Sep-04	16	1677	1685.55	-0.1144	0.0066	-0.0135

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
30-Sep-04	15-Sep-04	15	1673.4	1683.2	-0.1401	-0.0021	0.2248
30-Sep-04	16-Sep-04	14	1697.1	1705.7	-0.1300	0.0142	-0.0725
30-Sep-04	17-Sep-04	13	1729.75	1733.65	-0.0624	0.0192	-0.5202
30-Sep-04	20-Sep-04	10	1726.3	1728.8	-0.0521	-0.0020	-0.1647
30-Sep-04	21-Sep-04	9	1748.65	1750.2	-0.0354	0.0129	-0.3197
30-Sep-04	22-Sep-04	8	1752.25	1753.9	-0.0424	0.0021	0.1951
30-Sep-04	23-Sep-04	7	1726.4	1726.15	0.0074	-0.0148	-1.1758
30-Sep-04	24-Sep-04	6	1721.25	1722.5	-0.0436	-0.0030	-6.8482
30-Sep-04	27-Sep-04	3	1718	1717.5	0.0349	-0.0019	-1.8019
30-Sep-04	28-Sep-04	2	1702.65	1700.25	0.2539	-0.0089	6.2690
30-Sep-04	29-Sep-04	1	1730.65	1727.95	0.5621	0.0164	1.2138
28-Oct-04	30-Sep-04	28	1741.65	1745.5	-0.0284	0.0064	-1.0505
28-Oct-04	01-Oct-04	27	1778.8	1775.15	0.0274	0.0213	-1.9647
28-Oct-04	04-Oct-04	24	1804.25	1805.65	-0.0116	0.0143	-1.4248
28-Oct-04	05-Oct-04	23	1812.35	1812.45	-0.0009	0.0045	-0.9258
28-Oct-04	06-Oct-04	22	1793.1	1794.9	-0.0164	-0.0106	18.0112
28-Oct-04	07-Oct-04	21	1815.5	1815.7	-0.0019	0.0125	-0.8850
28-Oct-04	08-Oct-04	20	1817.65	1820.2	-0.0252	0.0012	12.3630
28-Oct-04	09-Oct-04	19	1815.45	1817.8	-0.0245	-0.0012	-0.0287
28-Oct-04	11-Oct-04	17	1805.55	1807.75	-0.0258	-0.0055	0.0521
28-Oct-04	12-Oct-04	16	1785.8	1786.9	-0.0139	-0.0109	-0.4627
28-Oct-04	14-Oct-04	14	1798.25	1794.75	0.0501	0.0070	-4.6158
28-Oct-04	15-Oct-04	13	1791.35	1795	-0.0564	-0.0038	-2.1252
28-Oct-04	18-Oct-04	10	1785.15	1786	-0.0171	-0.0035	-0.6960
28-Oct-04	19-Oct-04	9	1809.65	1808.4	0.0276	0.0137	-2.6128
28-Oct-04	20-Oct-04	8	1790	1790.05	-0.0013	-0.0109	-1.0455
28-Oct-04	21-Oct-04	7	1783.15	1779.75	0.0982	-0.0038	-79.0884
28-Oct-04	25-Oct-04	3	1758.1	1757.25	0.0580	-0.0140	-0.4088
28-Oct-04	26-Oct-04	2	1782.9	1781.05	0.1869	0.0141	2.2202
28-Oct-04	27-Oct-04	1	1784.5	1783.85	0.1312	0.0009	-0.2982
25-Nov-04	28-Oct-04	28	1801.75	1800.1	0.0118	0.0097	-0.9102
25-Nov-04	29-Oct-04	27	1785.25	1786.9	-0.0123	-0.0092	-2.0457
25-Nov-04	01-Nov-04	24	1794.85	1797.75	-0.0242	0.0054	0.9660
25-Nov-04	02-Nov-04	23	1812.65	1813.7	-0.0091	0.0099	-0.6257
25-Nov-04	03-Nov-04	22	1839.5	1837.4	0.0187	0.0148	-3.0622
25-Nov-04	04-Nov-04	21	1836.7	1834.85	0.0173	-0.0015	-0.0758
25-Nov-04	05-Nov-04	20	1856.8	1852.3	0.0437	0.0109	1.5282
25-Nov-04	08-Nov-04	17	1862.05	1862.8	-0.0085	0.0028	-1.1952
25-Nov-04	09-Nov-04	16	1858.1	1858.75	-0.0079	-0.0021	-0.0772
25-Nov-04	10-Nov-04	15	1878.2	1876.1	0.0268	0.0108	-4.4118
25-Nov-04	11-Nov-04	14	1875.4	1870.55	0.0666	-0.0015	1.4800
25-Nov-04	12-Nov-04	13	1874.05	1872.95	0.0163	-0.0007	-0.7558
25-Nov-04	16-Nov-04	9	1879.85	1879	0.0181	0.0031	0.1126
25-Nov-04	17-Nov-04	8	1886.2	1888.65	-0.0584	0.0034	-4.2289
25-Nov-04	18-Nov-04	7	1894.9	1892.05	0.0774	0.0046	-2.3252
25-Nov-04	19-Nov-04	6	1871.3	1872.35	-0.0337	-0.0125	-1.4348
25-Nov-04	22-Nov-04	3	1875.65	1873.35	0.1472	0.0023	-5.3747

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
25-Nov-04	23-Nov-04	2	1892.15	1892.6	-0.0428	0.0088	-1.2907
25-Nov-04	24-Nov-04	1	1906.15	1904.05	0.3968	0.0074	-10.2710
30-Dec-04	25-Nov-04	35	1896.6	1901.05	-0.0241	-0.0050	-1.0607
30-Dec-04	29-Nov-04	31	1941.4	1939.65	0.0105	0.0236	-1.4345
30-Dec-04	30-Nov-04	30	1955	1958.8	-0.0233	0.0070	-3.2250
30-Dec-04	01-Dec-04	29	1962.5	1962.05	0.0028	0.0038	-1.1222
30-Dec-04	02-Dec-04	28	1994.85	1999	-0.0267	0.0165	-10.3859
30-Dec-04	03-Dec-04	27	1997.35	1996.2	0.0077	0.0013	-1.2874
30-Dec-04	06-Dec-04	24	1993.2	1993.15	0.0004	-0.0021	-0.9510
30-Dec-04	07-Dec-04	23	1993.05	1992.7	0.0027	-0.0001	6.3054
30-Dec-04	08-Dec-04	22	1979.75	1977.95	0.0149	-0.0067	4.4147
30-Dec-04	09-Dec-04	21	1994.95	1989.95	0.0430	0.0077	1.8902
30-Dec-04	10-Dec-04	20	1967.2	1969	-0.0165	-0.0139	-1.3827
30-Dec-04	13-Dec-04	17	1982.75	1985.35	-0.0278	0.0079	0.6857
30-Dec-04	14-Dec-04	16	2004.05	2006.8	-0.0309	0.0107	0.1118
30-Dec-04	15-Dec-04	15	2025.25	2028.7	-0.0408	0.0106	0.3240
30-Dec-04	16-Dec-04	14	2029.75	2033.2	-0.0437	0.0022	0.0691
30-Dec-04	17-Dec-04	13	2009.3	2012.1	-0.0386	-0.0101	-0.1169
30-Dec-04	20-Dec-04	10	2025.5	2026.85	-0.0240	0.0081	-0.3780
30-Dec-04	21-Dec-04	9	2042.2	2044.65	-0.0480	0.0082	0.9994
30-Dec-04	22-Dec-04	8	2028.35	2035.35	-0.1550	-0.0068	2.2326
30-Dec-04	23-Dec-04	7	2039.05	2045.15	-0.1536	0.0053	-0.0091
30-Dec-04	24-Dec-04	6	2058.75	2062.7	-0.1150	0.0097	-0.2514
30-Dec-04	27-Dec-04	3	2061.3	2062.6	-0.0757	0.0012	-0.3422
30-Dec-04	28-Dec-04	2	2077.55	2071.35	0.5380	0.0079	-8.1107
30-Dec-04	29-Dec-04	1	2073.3	2069.6	0.6430	-0.0020	0.1953
27-Jan-05	30-Dec-04	28	2064.1	2059.8	0.0268	-0.0044	-0.9583
27-Jan-05	31-Dec-04	27	2087.2	2080.5	0.0429	0.0112	0.5989
27-Jan-05	03-Jan-05	24	2118.7	2115	0.0262	0.0151	-0.3884
27-Jan-05	04-Jan-05	23	2108.85	2103.75	0.0379	-0.0046	0.4455
27-Jan-05	05-Jan-05	22	2033.75	2032.2	0.0125	-0.0356	-0.6708
27-Jan-05	06-Jan-05	21	1998.5	1998.35	0.0013	-0.0173	-0.8969
27-Jan-05	07-Jan-05	20	2019.8	2015.5	0.0384	0.0107	28.8132
27-Jan-05	10-Jan-05	17	1976.95	1982	-0.0540	-0.0212	-2.4083
27-Jan-05	11-Jan-05	16	1953.7	1952.05	0.0190	-0.0118	-1.3519
27-Jan-05	12-Jan-05	15	1916.05	1913.6	0.0307	-0.0193	0.6153
27-Jan-05	13-Jan-05	14	1950.25	1954.55	-0.0566	0.0178	-2.8443
27-Jan-05	14-Jan-05	13	1926.35	1931.1	-0.0682	-0.0123	0.2042
27-Jan-05	17-Jan-05	10	1934.8	1932.9	0.0354	0.0044	-1.5186
27-Jan-05	18-Jan-05	9	1928	1934.05	-0.1253	-0.0035	-4.5432
27-Jan-05	19-Jan-05	8	1923.95	1926.65	-0.0631	-0.0021	-0.4964
27-Jan-05	20-Jan-05	7	1925.5	1925.3	0.0053	0.0008	-1.0847
27-Jan-05	24-Jan-05	3	1910.05	1909	0.0660	-0.0080	11.3518
27-Jan-05	25-Jan-05	2	1935.85	1931.85	0.3723	0.0135	4.6424
24-Feb-05	27-Jan-05	28	1962.75	1955	0.0509	0.0139	-0.8634
24-Feb-05	28-Jan-05	27	2005.6	2008.3	-0.0179	0.0218	-1.3526
24-Feb-05	31-Jan-05	24	2057.3	2057.6	-0.0022	0.0258	-0.8781

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
24-Feb-05	01-Feb-05	23	2054.8	2059.85	-0.0384	-0.0012	16.5663
24-Feb-05	02-Feb-05	22	2052.25	2052.2	0.0004	-0.0012	-1.0104
24-Feb-05	03-Feb-05	21	2086.3	2079.45	0.0564	0.0166	140.4120
24-Feb-05	04-Feb-05	20	2083.9	2077.95	0.0515	-0.0012	-0.0871
24-Feb-05	07-Feb-05	17	2060.3	2055.1	0.0535	-0.0113	0.0398
24-Feb-05	08-Feb-05	16	2059.4	2055.15	0.0465	-0.0004	-0.1314
24-Feb-05	09-Feb-05	15	2079.65	2070	0.1116	0.0098	1.4015
24-Feb-05	10-Feb-05	14	2071	2063.35	0.0952	-0.0042	-0.1475
24-Feb-05	11-Feb-05	13	2093.7	2082.05	0.1545	0.0110	0.6238
24-Feb-05	14-Feb-05	10	2102.3	2098.25	0.0694	0.0041	-0.5507
24-Feb-05	15-Feb-05	9	2098.05	2089.95	0.1547	-0.0020	1.2289
24-Feb-05	16-Feb-05	8	2072.85	2068.8	0.0880	-0.0120	-0.4312
24-Feb-05	17-Feb-05	7	2066.85	2061.9	0.1233	-0.0029	0.4012
24-Feb-05	18-Feb-05	6	2057.15	2055.55	0.0467	-0.0047	-0.6214
24-Feb-05	21-Feb-05	3	2044.15	2043.2	0.0558	-0.0063	0.1949
24-Feb-05	22-Feb-05	2	2064.1	2058.4	0.4978	0.0098	7.9233
24-Feb-05	23-Feb-05	1	2054.85	2057.1	-0.3940	-0.0045	-1.7915
31-Mar-05	24-Feb-05	35	2065.3	2055.3	0.0499	0.0051	-1.1267
31-Mar-05	25-Feb-05	34	2056.2	2060.9	-0.0242	-0.0044	-1.4842
31-Mar-05	28-Feb-05	31	2111.65	2103.25	0.0463	0.0270	-2.9147
31-Mar-05	01-Mar-05	30	2082.6	2084.4	-0.0104	-0.0138	-1.2240
31-Mar-05	02-Mar-05	29	2091.1	2093.25	-0.0128	0.0041	0.2305
31-Mar-05	03-Mar-05	28	2130.6	2128.85	0.0106	0.0189	-1.8282
31-Mar-05	04-Mar-05	27	2144.5	2148.15	-0.0227	0.0065	-3.1462
31-Mar-05	07-Mar-05	24	2151.3	2160.1	-0.0612	0.0032	1.7005
31-Mar-05	08-Mar-05	23	2159.95	2168.95	-0.0651	0.0040	0.0629
31-Mar-05	09-Mar-05	22	2152.35	2160.8	-0.0641	-0.0035	-0.0149
31-Mar-05	10-Mar-05	21	2157	2167.4	-0.0825	0.0022	0.2860
31-Mar-05	11-Mar-05	20	2147.55	2154	-0.0540	-0.0044	-0.3453
31-Mar-05	14-Mar-05	17	2138.95	2146.35	-0.0731	-0.0040	0.3549
31-Mar-05	15-Mar-05	16	2120.85	2128.95	-0.0858	-0.0085	0.1727
31-Mar-05	16-Mar-05	15	2120.15	2125.55	-0.0611	-0.0003	-0.2882
31-Mar-05	17-Mar-05	14	2101.3	2098.5	0.0343	-0.0089	-1.5616
31-Mar-05	18-Mar-05	13	2113.65	2109.15	0.0590	0.0059	0.7213
31-Mar-05	21-Mar-05	10	2095.95	2096.6	-0.0112	-0.0084	-1.1891
31-Mar-05	22-Mar-05	9	2061.85	2061.6	0.0049	-0.0163	-1.4345
31-Mar-05	23-Mar-05	8	2021.9	2026.4	-0.1000	-0.0194	-21.6259
31-Mar-05	24-Mar-05	7	2016.05	2015.4	0.0166	-0.0029	-1.1658
31-Mar-05	28-Mar-05	3	2037.9	2029.45	0.4986	0.0108	29.0656
31-Mar-05	29-Mar-05	2	1986.55	1983.85	0.2448	-0.0252	-0.5090
31-Mar-05	30-Mar-05	1	1996.95	1993.7	0.5864	0.0052	1.3952
28-Apr-05	31-Mar-05	28	2028.95	2035.65	-0.0424	0.0160	-1.0723
28-Apr-05	01-Apr-05	27	2060.9	2067.65	-0.0436	0.0157	0.0286
28-Apr-05	04-Apr-05	24	2048.8	2063.4	-0.1065	-0.0059	1.4430
28-Apr-05	05-Apr-05	23	2034.45	2052.55	-0.1386	-0.0070	0.3016
28-Apr-05	06-Apr-05	22	2053.05	2069.3	-0.1290	0.0091	-0.0695
28-Apr-05	07-Apr-05	21	2039.95	2052.85	-0.1081	-0.0064	-0.1623

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
28-Apr-05	08-Apr-05	20	2021.3	2031.2	-0.0879	-0.0091	-0.1862
28-Apr-05	11-Apr-05	17	2001.7	2008.2	-0.0687	-0.0097	-0.2194
28-Apr-05	12-Apr-05	16	2021.3	2024.95	-0.0406	0.0098	-0.4087
28-Apr-05	13-Apr-05	15	2019.15	2025.45	-0.0748	-0.0011	0.8418
28-Apr-05	15-Apr-05	13	1940.05	1956.3	-0.2310	-0.0392	2.0894
28-Apr-05	18-Apr-05	10	1911.4	1927.8	-0.3076	-0.0148	0.3315
28-Apr-05	19-Apr-05	9	1891.2	1909.4	-0.3831	-0.0106	0.2456
28-Apr-05	20-Apr-05	8	1927	1929.7	-0.0630	0.0189	-0.8355
28-Apr-05	21-Apr-05	7	1940.8	1948.55	-0.2050	0.0072	2.2529
28-Apr-05	22-Apr-05	6	1950.95	1967.35	-0.5023	0.0052	1.4506
28-Apr-05	25-Apr-05	3	1956.6	1970.95	-0.8769	0.0029	0.7459
28-Apr-05	26-Apr-05	2	1949.95	1957.1	-0.6588	-0.0034	-0.2487
28-Apr-05	27-Apr-05	1	1929.55	1935.4	-1.0898	-0.0105	0.6542
26-May-05	28-Apr-05	28	1914	1941.3	-0.1821	-0.0081	-0.8329
26-May-05	29-Apr-05	27	1881.85	1902.5	-0.1455	-0.0168	-0.2009
26-May-05	02-May-05	24	1907.35	1916.75	-0.0737	0.0136	-0.4932
26-May-05	03-May-05	23	1903.05	1920.7	-0.1445	-0.0023	0.9595
26-May-05	04-May-05	22	1931.5	1942.6	-0.0938	0.0149	-0.3511
26-May-05	05-May-05	21	1949.2	1963.3	-0.1236	0.0092	0.3177
26-May-05	06-May-05	20	1967.9	1977.5	-0.0876	0.0096	-0.2911
26-May-05	09-May-05	17	1986.15	2000.75	-0.1551	0.0093	0.7706
26-May-05	10-May-05	16	1971.1	1994.3	-0.2633	-0.0076	0.6975
26-May-05	11-May-05	15	1971.35	1985.95	-0.1771	0.0001	-0.3274
26-May-05	12-May-05	14	1979.15	1993.15	-0.1813	0.0040	0.0235
26-May-05	13-May-05	13	1976.6	1988.3	-0.1634	-0.0013	-0.0983
26-May-05	16-May-05	10	2002.4	2012.6	-0.1829	0.0131	0.1192
26-May-05	17-May-05	9	1974.65	1990.8	-0.3258	-0.0139	0.7812
26-May-05	18-May-05	8	1967.2	1982.75	-0.3543	-0.0038	0.0875
26-May-05	19-May-05	7	1978.25	1990.85	-0.3265	0.0056	-0.0784
26-May-05	20-May-05	6	1987.7	1992.4	-0.1417	0.0048	-0.5660
26-May-05	23-May-05	3	2010.15	2013.9	-0.2237	0.0113	0.5783
26-May-05	24-May-05	2	2026.1	2028.6	-0.2220	0.0079	-0.0076
26-May-05	25-May-05	1	2037.35	2043.85	-1.1467	0.0056	4.1662
30-Jun-05	26-May-05	35	2036.5	2074.7	-0.1911	-0.0004	-0.8333
30-Jun-05	27-May-05	34	2047.45	2076.4	-0.1487	0.0054	-0.2223
30-Jun-05	30-May-05	31	2042.2	2072.4	-0.1705	-0.0026	0.1467
30-Jun-05	31-May-05	30	2063	2087.55	-0.1420	0.0102	-0.1673
30-Jun-05	01-Jun-05	29	2061.1	2087.55	-0.1583	-0.0009	0.1151
30-Jun-05	02-Jun-05	28	2038.1	2064.65	-0.1664	-0.0112	0.0513
30-Jun-05	03-Jun-05	27	2075.85	2094.25	-0.1177	0.0185	-0.2929
30-Jun-05	04-Jun-05	26	2067.3	2092.35	-0.1668	-0.0041	0.4173
30-Jun-05	06-Jun-05	24	2072.35	2092.8	-0.1473	0.0024	-0.1168
30-Jun-05	07-Jun-05	23	2082.9	2098.15	-0.1142	0.0051	-0.2248
30-Jun-05	08-Jun-05	22	2094.35	2112.4	-0.1404	0.0055	0.2298
30-Jun-05	09-Jun-05	21	2082.1	2103.2	-0.1729	-0.0058	0.2309
30-Jun-05	10-Jun-05	20	2071.55	2090.6	-0.1648	-0.0051	-0.0467
30-Jun-05	13-Jun-05	17	2082.6	2102.75	-0.2039	0.0053	0.2375

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
30-Jun-05	14-Jun-05	16	2094.65	2112.35	-0.1893	0.0058	-0.0715
30-Jun-05	15-Jun-05	15	2110.35	2128.65	-0.2072	0.0075	0.0945
30-Jun-05	16-Jun-05	14	2100.45	2123.7	-0.2831	-0.0047	0.3660
30-Jun-05	17-Jun-05	13	2108.2	2123.4	-0.1989	0.0037	-0.2972
30-Jun-05	20-Jun-05	10	2117.95	2144.35	-0.4460	0.0046	1.2417
30-Jun-05	21-Jun-05	9	2148.55	2170	-0.3974	0.0144	-0.1090
30-Jun-05	22-Jun-05	8	2164.85	2187.35	-0.4653	0.0076	0.1709
30-Jun-05	23-Jun-05	7	2168.3	2183.85	-0.3675	0.0016	-0.2102
30-Jun-05	24-Jun-05	6	2178.5	2194.35	-0.4350	0.0047	0.1835
30-Jun-05	27-Jun-05	3	2180.65	2199.8	-1.0492	0.0010	1.4122
30-Jun-05	28-Jun-05	2	2167.2	2169.85	-0.2200	-0.0062	-0.7904
30-Jun-05	29-Jun-05	1	2195.15	2191.65	0.5745	0.0129	-3.6116
28-Jul-05	30-Jun-05	28	2192.65	2220.6	-0.1629	-0.0011	-1.2835
28-Jul-05	01-Jul-05	27	2206.85	2211.9	-0.0305	0.0065	-0.8129
28-Jul-05	04-Jul-05	24	2223.9	2230.65	-0.0455	0.0077	0.4916
28-Jul-05	05-Jul-05	23	2196.95	2210.75	-0.0980	-0.0121	1.1560
28-Jul-05	06-Jul-05	22	2223.45	2228.2	-0.0349	0.0121	-0.6437
28-Jul-05	07-Jul-05	21	2164.8	2179.4	-0.1152	-0.0264	2.2997
28-Jul-05	08-Jul-05	20	2188.55	2196.2	-0.0628	0.0110	-0.4549
28-Jul-05	11-Jul-05	17	2209.15	2218.85	-0.0928	0.0094	0.4772
28-Jul-05	12-Jul-05	16	2214.45	2220.8	-0.0644	0.0024	-0.3056
28-Jul-05	13-Jul-05	15	2191.9	2204.05	-0.1327	-0.0102	1.0592
28-Jul-05	14-Jul-05	14	2171.9	2185.1	-0.1558	-0.0091	0.1744
28-Jul-05	15-Jul-05	13	2202.95	2212.55	-0.1204	0.0143	-0.2272
28-Jul-05	18-Jul-05	10	2234.7	2234	0.0113	0.0144	-1.0937
28-Jul-05	19-Jul-05	9	2236.3	2237.3	-0.0179	0.0007	-2.5856
28-Jul-05	20-Jul-05	8	2238.4	2241.9	-0.0703	0.0009	2.9316
28-Jul-05	21-Jul-05	7	2226.6	2230.5	-0.0900	-0.0053	0.2801
28-Jul-05	22-Jul-05	6	2265.75	2265.6	0.0040	0.0176	-1.0441
28-Jul-05	25-Jul-05	3	2286.1	2291.75	-0.2962	0.0090	-75.5682
28-Jul-05	26-Jul-05	2	2299.3	2303.15	-0.3011	0.0058	0.0167
28-Jul-05	27-Jul-05	1	2320.15	2319.1	0.1630	0.0091	-1.5411
25-Aug-05	29-Jul-05	27	2300.7	2312.3	-0.0671	-0.0084	-1.4115
25-Aug-05	01-Aug-05	24	2310	2318.05	-0.0522	0.0040	-0.2218
25-Aug-05	02-Aug-05	23	2349.85	2353.65	-0.0253	0.0173	-0.5153
25-Aug-05	03-Aug-05	22	2341.1	2357	-0.1108	-0.0037	3.3794
25-Aug-05	04-Aug-05	21	2357.75	2367.8	-0.0729	0.0071	-0.3417
25-Aug-05	05-Aug-05	20	2349.85	2361.2	-0.0867	-0.0034	0.1895
25-Aug-05	08-Aug-05	17	2315.5	2324.4	-0.0812	-0.0146	-0.0633
25-Aug-05	09-Aug-05	16	2305.35	2318.7	-0.1299	-0.0044	0.5992
25-Aug-05	10-Aug-05	15	2359.95	2360.15	-0.0020	0.0237	-0.9843
25-Aug-05	11-Aug-05	14	2380.9	2380.95	-0.0005	0.0089	-0.7345
25-Aug-05	12-Aug-05	13	2360.45	2361.55	-0.0129	-0.0086	22.8923
25-Aug-05	16-Aug-05	9	2364.55	2369.8	-0.0887	0.0017	5.8760
25-Aug-05	17-Aug-05	8	2404.6	2403.15	0.0271	0.0169	-1.3060
25-Aug-05	18-Aug-05	7	2382.85	2388.45	-0.1207	-0.0090	-5.4475
25-Aug-05	19-Aug-05	6	2384.8	2383.45	0.0340	0.0008	-1.2814

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
25-Aug-05	22-Aug-05	3	2365.55	2367.85	-0.1166	-0.0081	-4.4325
25-Aug-05	23-Aug-05	2	2326.95	2326.1	0.0658	-0.0163	-1.5639
25-Aug-05	24-Aug-05	1	2323.15	2322.5	0.1007	-0.0016	0.5318
29-Sep-05	25-Aug-05	35	2327.35	2354.55	-0.1195	0.0018	-2.1864
29-Sep-05	26-Aug-05	34	2335.55	2357.05	-0.0970	0.0035	-0.1882
29-Sep-05	29-Aug-05	31	2309.45	2337.65	-0.1409	-0.0112	0.4527
29-Sep-05	30-Aug-05	30	2349.9	2367.75	-0.0908	0.0175	-0.3557
29-Sep-05	31-Aug-05	29	2364.75	2384.65	-0.1040	0.0063	0.1456
29-Sep-05	01-Sep-05	28	2390.25	2405.75	-0.0831	0.0108	-0.2011
29-Sep-05	02-Sep-05	27	2408	2415.8	-0.0431	0.0074	-0.4811
29-Sep-05	05-Sep-05	24	2412.85	2422.95	-0.0627	0.0020	0.4531
29-Sep-05	06-Sep-05	23	2422.8	2428.65	-0.0377	0.0041	-0.3976
29-Sep-05	08-Sep-05	21	2445.75	2454.45	-0.0609	0.0095	0.6126
29-Sep-05	09-Sep-05	20	2442.95	2455.45	-0.0919	-0.0011	0.5092
29-Sep-05	12-Sep-05	17	2477.1	2484.15	-0.0602	0.0140	-0.3449
29-Sep-05	13-Sep-05	16	2486.3	2500.35	-0.1268	0.0037	1.1067
29-Sep-05	14-Sep-05	15	2483.25	2492.45	-0.0888	-0.0012	-0.3000
29-Sep-05	15-Sep-05	14	2516.15	2523.95	-0.0796	0.0132	-0.1032
29-Sep-05	16-Sep-05	13	2541.1	2552.35	-0.1223	0.0099	0.5370
29-Sep-05	19-Sep-05	10	2560.95	2567.1	-0.0863	0.0078	-0.2941
29-Sep-05	20-Sep-05	9	2562.45	2578	-0.2420	0.0006	1.8026
29-Sep-05	21-Sep-05	8	2558.85	2567.3	-0.1484	-0.0014	-0.3870
29-Sep-05	22-Sep-05	7	2474.85	2476.5	-0.0343	-0.0328	-0.7690
29-Sep-05	23-Sep-05	6	2474.05	2477.75	-0.0897	-0.0003	1.6159
29-Sep-05	26-Sep-05	3	2559.9	2557.35	0.1196	0.0347	-2.3338
29-Sep-05	27-Sep-05	2	2577.6	2574.85	0.1921	0.0069	0.6066
29-Sep-05	28-Sep-05	1	2601.8	2598.05	0.5192	0.0094	1.7024
27-Oct-05	29-Sep-05	28	2607.7	2611.2	-0.0172	0.0023	-1.0332
27-Oct-05	30-Sep-05	27	2593	2601.4	-0.0431	-0.0056	1.5006
27-Oct-05	03-Oct-05	24	2627.2	2630.05	-0.0163	0.0132	-0.6229
27-Oct-05	04-Oct-05	23	2661.8	2663.35	-0.0091	0.0132	-0.4397
27-Oct-05	05-Oct-05	22	2644.8	2644.4	0.0025	-0.0064	-1.2716
27-Oct-05	06-Oct-05	21	2567.45	2579.15	-0.0779	-0.0292	-32.4920
27-Oct-05	07-Oct-05	20	2567.7	2574.05	-0.0445	0.0001	-0.4296
27-Oct-05	10-Oct-05	17	2562.5	2566.85	-0.0359	-0.0020	-0.1921
27-Oct-05	11-Oct-05	16	2587.1	2589.55	-0.0213	0.0096	-0.4070
27-Oct-05	13-Oct-05	14	2534.2	2537.3	-0.0314	-0.0204	0.4760
27-Oct-05	14-Oct-05	13	2486.5	2484.4	0.0234	-0.0188	-1.7443
27-Oct-05	17-Oct-05	10	2485.5	2485.15	0.0051	-0.0004	-0.7833
27-Oct-05	18-Oct-05	9	2460.95	2468.2	-0.1177	-0.0099	-24.2097
27-Oct-05	19-Oct-05	8	2406.15	2412.45	-0.1177	-0.0223	0.0000
27-Oct-05	20-Oct-05	7	2393.8	2395.45	-0.0354	-0.0051	-0.6988
27-Oct-05	21-Oct-05	6	2445.5	2443.75	0.0430	0.0216	-2.2121
27-Oct-05	24-Oct-05	3	2394.05	2394.85	-0.0401	-0.0210	-1.9334
27-Oct-05	25-Oct-05	2	2417.65	2418.2	-0.0409	0.0099	0.0212
27-Oct-05	26-Oct-05	1	2413.65	2408.5	0.7690	-0.0017	-19.7805
24-Nov-05	27-Oct-05	28	2348.45	2352.9	-0.0243	-0.0270	-1.0317

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
24-Nov-05	28-Oct-05	27	2297.3	2316.05	-0.1084	-0.0218	3.4529
24-Nov-05	31-Oct-05	24	2359.65	2370.95	-0.0717	0.0271	-0.3388
24-Nov-05	01-Nov-05	23	2371.65	2386.75	-0.0993	0.0051	0.3862
24-Nov-05	02-Nov-05	22	2409.55	2419.05	-0.0644	0.0160	-0.3518
24-Nov-05	07-Nov-05	17	2449.35	2461.6	-0.1056	0.0165	0.6407
24-Nov-05	08-Nov-05	16	2477.3	2492.65	-0.1390	0.0114	0.3156
24-Nov-05	09-Nov-05	15	2480.75	2489.1	-0.0806	0.0014	-0.4198
24-Nov-05	10-Nov-05	14	2489.95	2500.7	-0.1108	0.0037	0.3736
24-Nov-05	11-Nov-05	13	2548.1	2548.65	-0.0060	0.0234	-0.9460
24-Nov-05	14-Nov-05	10	2559	2558.7	0.0042	0.0043	-1.7062
24-Nov-05	16-Nov-05	8	2584.45	2582.75	0.0296	0.0099	6.0155
24-Nov-05	17-Nov-05	7	2609.55	2603.95	0.1105	0.0097	2.7313
24-Nov-05	18-Nov-05	6	2624.2	2620.05	0.0950	0.0056	-0.1405
24-Nov-05	21-Nov-05	3	2606.65	2602.5	0.1912	-0.0067	1.0135
24-Nov-05	22-Nov-05	2	2572.35	2572.85	-0.0350	-0.0132	-1.1830
24-Nov-05	23-Nov-05	1	2614.65	2608.6	0.8340	0.0164	-24.8384
29-Dec-05	24-Nov-05	35	2640.35	2635	0.0209	0.0098	-0.9750
29-Dec-05	25-Nov-05	34	2668.15	2664.3	0.0153	0.0105	-0.2671
29-Dec-05	26-Nov-05	33	2687.55	2683.45	0.0167	0.0073	0.0893
29-Dec-05	28-Nov-05	31	2721.25	2712	0.0395	0.0125	1.3741
29-Dec-05	29-Nov-05	30	2704.6	2698.3	0.0280	-0.0061	-0.2923
29-Dec-05	30-Nov-05	29	2649.65	2652.25	-0.0122	-0.0203	-1.4351
29-Dec-05	01-Dec-05	28	2706.55	2698.95	0.0362	0.0215	-3.9695
29-Dec-05	02-Dec-05	27	2702.1	2697.95	0.0205	-0.0016	-0.4332
29-Dec-05	05-Dec-05	24	2659.95	2660.5	-0.0031	-0.0156	-1.1513
29-Dec-05	06-Dec-05	23	2653.35	2662.3	-0.0527	-0.0025	15.9956
29-Dec-05	07-Dec-05	22	2688.3	2693	-0.0286	0.0132	-0.4577
29-Dec-05	08-Dec-05	21	2694.8	2706.7	-0.0755	0.0024	1.6426
29-Dec-05	09-Dec-05	20	2751.8	2756.45	-0.0304	0.0212	-0.5977
29-Dec-05	12-Dec-05	17	2769.35	2776.2	-0.0523	0.0064	0.7214
29-Dec-05	13-Dec-05	16	2803.75	2812.3	-0.0685	0.0124	0.3095
29-Dec-05	14-Dec-05	15	2801.4	2804.55	-0.0270	-0.0008	-0.6063
29-Dec-05	15-Dec-05	14	2767.7	2778.55	-0.1006	-0.0120	2.7302
29-Dec-05	16-Dec-05	13	2811.9	2810.15	0.0172	0.0160	-1.1714
29-Dec-05	19-Dec-05	10	2842.8	2842.6	0.0025	0.0110	-0.8531
29-Dec-05	20-Dec-05	9	2824.5	2826.2	-0.0241	-0.0064	-10.5024
29-Dec-05	21-Dec-05	8	2818.1	2822.9	-0.0766	-0.0023	2.1819
29-Dec-05	22-Dec-05	7	2830.65	2835.25	-0.0835	0.0045	0.0904
29-Dec-05	23-Dec-05	6	2791.2	2804.85	-0.2927	-0.0139	2.5052
29-Dec-05	26-Dec-05	3	2738.7	2749.6	-0.4767	-0.0188	0.6284
29-Dec-05	27-Dec-05	2	2808.85	2805.9	0.1891	0.0256	-1.3968
29-Dec-05	28-Dec-05	1	2796.95	2794.05	0.3735	-0.0042	0.9745
25-Jan-06	29-Dec-05	27	2807	2821.95	-0.0708	0.0036	-1.1896
25-Jan-06	30-Dec-05	26	2820.8	2836.55	-0.0771	0.0049	0.0885
25-Jan-06	02-Jan-06	23	2819.7	2835.95	-0.0899	-0.0004	0.1667
25-Jan-06	03-Jan-06	22	2868.85	2883.35	-0.0825	0.0174	-0.0828
25-Jan-06	04-Jan-06	21	2890.1	2904.4	-0.0846	0.0074	0.0256

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
25-Jan-06	05-Jan-06	20	2883.9	2899.85	-0.0993	-0.0021	0.1733
25-Jan-06	06-Jan-06	19	2895.65	2914	-0.1197	0.0041	0.2056
25-Jan-06	09-Jan-06	16	2893.45	2910.1	-0.1291	-0.0008	0.0786
25-Jan-06	10-Jan-06	15	2857.3	2870.8	-0.1131	-0.0125	-0.1237
25-Jan-06	12-Jan-06	13	2831.4	2850.7	-0.1881	-0.0091	0.6629
25-Jan-06	13-Jan-06	12	2823.65	2850.55	-0.2844	-0.0027	0.5120
25-Jan-06	16-Jan-06	9	2821.15	2833.1	-0.1691	-0.0009	-0.4056
25-Jan-06	17-Jan-06	8	2801.85	2829.1	-0.4355	-0.0068	1.5760
25-Jan-06	18-Jan-06	7	2797	2809.2	-0.2238	-0.0017	-0.4861
25-Jan-06	19-Jan-06	6	2869.25	2870.85	-0.0334	0.0258	-0.8506
25-Jan-06	20-Jan-06	5	2897.55	2900.95	-0.0844	0.0099	1.5243
25-Jan-06	23-Jan-06	2	2881.65	2884.05	-0.1499	-0.0055	0.7747
25-Jan-06	24-Jan-06	1	2906.25	2908	-0.2167	0.0085	0.4462
23-Feb-06	25-Jan-06	29	2922.25	2940.35	-0.0767	0.0055	-0.6463
23-Feb-06	27-Jan-06	27	2978.55	2982.75	-0.0188	0.0193	-0.7549
23-Feb-06	30-Jan-06	24	2972.35	2974.5	-0.0108	-0.0021	-0.4227
23-Feb-06	31-Jan-06	23	3002.25	3001.1	0.0060	0.0101	-1.5529
23-Feb-06	01-Feb-06	22	2963.05	2971.55	-0.0469	-0.0131	-8.8168
23-Feb-06	02-Feb-06	21	2956.45	2967.45	-0.0637	-0.0022	0.3582
23-Feb-06	03-Feb-06	20	2921.8	2940.6	-0.1154	-0.0117	0.8134
23-Feb-06	06-Feb-06	17	2991.55	3000.45	-0.0629	0.0239	-0.4551
23-Feb-06	07-Feb-06	16	3004.15	3020.1	-0.1191	0.0042	0.8940
23-Feb-06	08-Feb-06	15	2992.95	3008.95	-0.1280	-0.0037	0.0740
23-Feb-06	10-Feb-06	13	3021.1	3027.55	-0.0591	0.0094	-0.5385
23-Feb-06	13-Feb-06	10	3028.2	3041.15	-0.1536	0.0024	1.6012
23-Feb-06	14-Feb-06	9	3009.15	3017.55	-0.1115	-0.0063	-0.2742
23-Feb-06	15-Feb-06	8	3017.15	3022.2	-0.0753	0.0027	-0.3251
23-Feb-06	16-Feb-06	7	3013.85	3021.6	-0.1321	-0.0011	0.7550
23-Feb-06	17-Feb-06	6	2978.4	2981.5	-0.0624	-0.0118	-0.5274
23-Feb-06	20-Feb-06	3	3010.1	3005.85	0.1695	0.0106	-3.7164
23-Feb-06	21-Feb-06	2	3039.45	3035.5	0.2341	0.0098	0.3806
23-Feb-06	22-Feb-06	1	3056.85	3050.8	0.7132	0.0057	2.0469
30-Mar-06	23-Feb-06	35	3054.2	3062.1	-0.0266	-0.0009	-1.0373
30-Mar-06	24-Feb-06	34	3044.1	3050.05	-0.0207	-0.0033	-0.2219
30-Mar-06	27-Feb-06	31	3055.15	3067.45	-0.0467	0.0036	1.2567
30-Mar-06	28-Feb-06	30	3071.05	3074.7	-0.0143	0.0052	-0.6945
30-Mar-06	01-Mar-06	29	3101.75	3123.1	-0.0852	0.0100	4.9741
30-Mar-06	02-Mar-06	28	3134.55	3150.7	-0.0661	0.0106	-0.2241
30-Mar-06	03-Mar-06	27	3137.6	3147.35	-0.0414	0.0010	-0.3739
30-Mar-06	06-Mar-06	24	3185.45	3190.4	-0.0233	0.0153	-0.4370
30-Mar-06	07-Mar-06	23	3167.35	3182.8	-0.0762	-0.0057	2.2701
30-Mar-06	08-Mar-06	22	3082.65	3116.7	-0.1798	-0.0267	1.3601
30-Mar-06	09-Mar-06	21	3113.85	3129.1	-0.0838	0.0101	-0.5341
30-Mar-06	10-Mar-06	20	3166.45	3183.9	-0.0989	0.0169	0.1812
30-Mar-06	13-Mar-06	17	3180.85	3202.65	-0.1446	0.0045	0.4621
30-Mar-06	14-Mar-06	16	3171.9	3195.35	-0.1657	-0.0028	0.1458
30-Mar-06	16-Mar-06	14	3205	3226.6	-0.1727	0.0104	0.0422

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
30-Mar-06	17-Mar-06	13	3213.95	3234.05	-0.1726	0.0028	-0.0004
30-Mar-06	20-Mar-06	10	3251.7	3265.65	-0.1541	0.0117	-0.1074
30-Mar-06	21-Mar-06	9	3241.95	3262.3	-0.2503	-0.0030	0.6241
30-Mar-06	22-Mar-06	8	3227.25	3240.15	-0.1795	-0.0045	-0.2828
30-Mar-06	23-Mar-06	7	3239.25	3247.15	-0.1253	0.0037	-0.3022
30-Mar-06	24-Mar-06	6	3279.9	3279.8	0.0018	0.0125	-1.0146
30-Mar-06	27-Mar-06	3	3326.45	3321.65	0.1733	0.0142	93.7235
30-Mar-06	28-Mar-06	2	3332.4	3325	0.4002	0.0018	1.3093
30-Mar-06	29-Mar-06	1	3364.9	3354.2	1.1466	0.0098	1.8653
27-Apr-06	30-Mar-06	28	3394.05	3418.95	-0.0940	0.0087	-1.0820
27-Apr-06	31-Mar-06	27	3403.6	3402.55	0.0041	0.0028	-1.0438
27-Apr-06	03-Apr-06	24	3474	3473.3	0.0030	0.0207	-0.2652
27-Apr-06	04-Apr-06	23	3489.7	3483.15	0.0294	0.0045	8.7282
27-Apr-06	05-Apr-06	22	3510.2	3510.9	-0.0033	0.0059	-1.1110
27-Apr-06	07-Apr-06	20	3458.15	3454.8	0.0174	-0.0148	-6.3466
27-Apr-06	10-Apr-06	17	3488.55	3478.45	0.0614	0.0088	2.5195
27-Apr-06	12-Apr-06	15	3387	3380	0.0497	-0.0291	-0.1913
27-Apr-06	13-Apr-06	14	3348.5	3345.5	0.0230	-0.0114	-0.5358
27-Apr-06	17-Apr-06	10	3424.65	3425.15	-0.0053	0.0227	-1.2280
27-Apr-06	18-Apr-06	9	3524.05	3518.1	0.0676	0.0290	-13.8611
27-Apr-06	19-Apr-06	8	3546.65	3535.85	0.1372	0.0064	1.0304
27-Apr-06	20-Apr-06	7	3581.8	3573.5	0.1193	0.0099	-0.1306
27-Apr-06	21-Apr-06	6	3583.9	3573.05	0.1819	0.0006	0.5247
27-Apr-06	24-Apr-06	3	3556.5	3548.9	0.2567	-0.0076	0.4111
27-Apr-06	25-Apr-06	2	3465.5	3462.65	0.1481	-0.0256	-0.4231
27-Apr-06	26-Apr-06	1	3579.45	3555.75	2.3915	0.0329	15.1490
25-May-06	27-Apr-06	28	3502.05	3508.1	-0.0222	-0.0216	-1.0093
25-May-06	28-Apr-06	27	3497.6	3508.35	-0.0409	-0.0013	0.8438
25-May-06	29-Apr-06	26	3545.4	3557.6	-0.0476	0.0137	0.1624
25-May-06	02-May-06	23	3595	3605.45	-0.0454	0.0140	-0.0448
25-May-06	03-May-06	22	3612.4	3634.25	-0.0987	0.0048	1.1720
25-May-06	04-May-06	21	3627.4	3648.4	-0.0990	0.0042	0.0028
25-May-06	05-May-06	20	3644.1	3663.95	-0.0978	0.0046	-0.0119
25-May-06	08-May-06	17	3685.85	3693.15	-0.0419	0.0115	-0.5715
25-May-06	09-May-06	16	3712.95	3720.55	-0.0460	0.0074	0.0981
25-May-06	10-May-06	15	3745.4	3754.25	-0.0566	0.0087	0.2311
25-May-06	11-May-06	14	3692.9	3701.05	-0.0567	-0.0140	0.0008
25-May-06	12-May-06	13	3633	3650.05	-0.1297	-0.0162	1.2873
25-May-06	15-May-06	10	3462.05	3502.95	-0.4228	-0.0471	2.2609
25-May-06	16-May-06	9	3520.3	3523.3	-0.0341	0.0168	-0.9194
25-May-06	17-May-06	8	3641.25	3635.1	0.0761	0.0344	-3.2325
25-May-06	18-May-06	7	3363.85	3388.9	-0.3816	-0.0762	-6.0160
25-May-06	19-May-06	6	3224.35	3246.9	-0.4182	-0.0415	0.0959
25-May-06	22-May-06	3	3020.9	3081.35	-2.3776	-0.0631	4.6858
25-May-06	23-May-06	2	3190.5	3199.35	-0.4986	0.0561	-0.7903
25-May-06	24-May-06	1	3087.25	3115.55	-3.2850	-0.0324	5.5884
29-Jun-06	25-May-06	35	3112.65	3177.7	-0.2127	0.0082	-0.9352

Expiry	Date	DTE	FClose	spotClose	COC	D Fclose	D COC
29-Jun-06	26-May-06	34	3179.15	3209.6	-0.1009	0.0214	-0.5256
29-Jun-06	29-May-06	31	3175	3214.9	-0.1450	-0.0013	0.4369
29-Jun-06	30-May-06	30	3125.35	3185.3	-0.2280	-0.0156	0.5721
29-Jun-06	31-May-06	29	3032.4	3071.05	-0.1572	-0.0297	-0.3104
29-Jun-06	01-Jun-06	28	2889.9	2962.25	-0.3179	-0.0470	1.0221
29-Jun-06	02-Jun-06	27	3061.55	3091.35	-0.1292	0.0594	-0.5938
29-Jun-06	05-Jun-06	24	2957.3	3016.65	-0.2981	-0.0341	1.3077
29-Jun-06	06-Jun-06	23	2902.8	2937.3	-0.1849	-0.0184	-0.3795
29-Jun-06	07-Jun-06	22	2838.05	2860.45	-0.1286	-0.0223	-0.3043
29-Jun-06	08-Jun-06	21	2705.6	2724.35	-0.1184	-0.0467	-0.0797
29-Jun-06	09-Jun-06	20	2831.25	2866.3	-0.2215	0.0464	0.8706
29-Jun-06	12-Jun-06	17	2716	2776.85	-0.4692	-0.0407	1.1186
29-Jun-06	13-Jun-06	16	2629.15	2663.3	-0.2904	-0.0320	-0.3811
29-Jun-06	14-Jun-06	15	2618.25	2632.8	-0.1330	-0.0041	-0.5420
29-Jun-06	15-Jun-06	14	2786.7	2798.8	-0.1114	0.0643	-0.1623
29-Jun-06	16-Jun-06	13	2880.75	2890.35	-0.0921	0.0337	-0.1731
29-Jun-06	19-Jun-06	10	2909.4	2916.9	-0.0927	0.0099	0.0060
29-Jun-06	20-Jun-06	9	2839.35	2861.3	-0.3080	-0.0241	2.3235
29-Jun-06	21-Jun-06	8	2912.1	2923.45	-0.1750	0.0256	-0.4317
29-Jun-06	22-Jun-06	7	2982.25	2994.75	-0.2151	0.0241	0.2289
29-Jun-06	23-Jun-06	6	3042.25	3042.7	-0.0089	0.0201	-0.9587
29-Jun-06	25-Jun-06	4	3043.9	3050.3	-0.1890	0.0005	20.3010
29-Jun-06	26-Jun-06	3	2930.6	2943.2	-0.5148	-0.0372	1.7235
29-Jun-06	27-Jun-06	2	2981.1	2982.45	-0.0815	0.0172	-0.8417
29-Jun-06	28-Jun-06	1	2983.5	2981.1	0.2897	0.0008	-4.5549