Relations between Cash and Futures Markets of Individual Stocks of CNX Nifty

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Abstract

This study is an attempt to examine long-term and short-term relationships between futures and spot markets for all the 50 constituent stocks of CNX Nifty. For examining the relationships 5-min transaction prices data has been used. Each of the 50 stocks have been found to be cointegrated. For 41 out of 50 stocks error correction was taking place. There were 9 stocks for which neither spot nor futures market responded to correct the disequilibrium. The short-term relationships between futures and spot markets for the 50 constituent stocks have been examined buy employing Granger Causality test based on Vector Autoregressive Model (VAR). For all the 50 stocks, it has been found that both spot and futures markets granger causes each other implying that feedback relationship exists between the two markets. The results of the present study have important implications for investors, arbitrageurs and policy makers.

Keywords. Cointegration, Single Stock Futures, Granger Causality.

1. Introduction

For efficient and frictionless markets, the spot and futures prices of a financial asset should react to new information simultaneously. This implies that there should not be any lead-lag relationship between the two markets. However, many research studies have documented that there exists lead-lag relationship between the spot and futures markets. For example Kawaller, Koch, and Koch (1987), Ng (1987), Stoll and Whaley (1990), Chan (1992), Tse (1995), Gupta and Singh (2006) and Mall et al. (2012) report the leading role of futures

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market.On the other hand, Wahab and Lashgari (1993) and Mukherjee and Mishra (2006) among others provide evidence of leading role of spot market.

Derivatives' trading is more than a decade old phenomenon in the Indian capital market. Almost all of the studies which have investigated the issue of lead-lag relationship between spot and futures markets have examined the behavior of stock indices only. Only a few studies have investigated the matter of price discovery at the level of individual stocks. Some of the reason for this may be low trading activity in the futures contracts of individual stocks or absence of futures contracts altogether. But in the recent years, trading volume in derivatives contracts of individual stocks has also surpassed the trading volume in the spot market by many folds. Therefore, it is important to examine relationships between futures and spot markets for individual stocks also. Further, analysis of individual stocks would reveal whether futures and spot relationship for CNX Nifty and its associated futures contract is also supported by its constituent stocks.

This study presents empirical evidence regarding error correction and lead-lag relationship between spot and futures markets for the fifty constituent stocks of CNX Nifty. The rest of the paper is organized as follows. Section 2 describes data and methodology, section 3 discusses empirical findings and section 4 concludes.

2. Data and Methodology

Data for the present study consists of 1-min transaction prices from cash and futures markets for the 50 constituents of CNX Nifty from June 01, 2012 to May 31, 2013.

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For examining the equilibrium relationship between cash and futures markets, we employ Johansen's procedure and estimate the Vector Error Correction Model (VECM) specified below:

$$\Delta S_t = \phi_s + \alpha_s ect_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta S_{t-i} + \sum_{i=1}^{k} \beta_i \Delta F_{t-i} + \varepsilon_{s,t} \quad \ldots\ldots\ldots\ldots (1a)$$

$$\Delta F_t = \phi_f + \alpha_f ect_{t-1} + \sum_{i=1}^{k} \gamma_i \Delta S_{t-i} + \sum_{i=1}^{k} \delta_i \Delta F_{t-i} + \varepsilon_{f,t} \quad \ldots\ldots\ldots\ldots (1b)$$

Where,

$\Delta S_t = S_t - S_{t-1}$ i.e., first difference of log of spot prices

$\Delta F_t = F_t - F_{t-1}$ i.e., first difference of log of futures prices

ect_{t-1} = lagged residual term from potentially cointegrating regression, $S_t = \alpha_s + \beta F_t + ect_t$

ϕ_s, ϕ_f = constants

α_s, α_f = coefficient of the error correction term

α_i, β_i, γ_i and δ_i = coefficients of lagged terms

$\varepsilon_{s,t}$, $\varepsilon_{f,t}$ = residual term at time t

In addition, for examining short-run relationship between cash and futures markets the study uses granger causality based on vector auto regression.

3. Empirical Results

First of all, all the 50 constituent stocks of CNX Nifty are subjected to Augmented Dickey-Fuller (ADF) test to determine whether the price series of the stocks are stationary or not. The ADF test results reveal that all the log price series have a unit root while their first difference (returns) are stationary. Therefore, it can be concluded that all the 50 stocks are integrated of the order 1, i.e., I(1).

After confirming that all the underlying time series are integrated of order one, the next step is to test whether the spot and futures series for the underlying stocks are cointegrated. For this purpose Johansen-Juselius (1990) procedure has been utilized. The results of J-J cointegration analysis are shown in Table A.1 in the appendix. The table reports the results of two likelihood ratio test statistics namely trace and maximum eigenvalue test. The results of both the test statistics reveal that futures and spot price series for each of the fifty stocks are cointegrated.

Once it is found that the two time series are cointegrated, then the appropriate modeling strategy is to estimate an Error Correction Model (ECM). For each of the 50 stocks, the specification of VECM given in equations 1(a) and 1(b) is estimated. Table 1 presents coefficients of the error correction term based on eqs. 1a and 1b along with standard errors and p-values. In total, 37 out of 50 stocks have significant error correction term, ect_{t-1}. 15 stocks have significant error correction term (ect_{t-1}) for ΔS_t and 22 stocks have significant error correction term for ΔF_t. Further, 3 stocks viz., BHEL, BPCL and SIEMENS have significant error correction term for both spot and futures markets.

Table 1: Coefficients of Error Correction Term (ECT

Company	ΔS_t			ΔF_t		
	ect_{t-1}	Std. Error	p-value	ect_{t-1}	Std. Error	p-value
ACC	-0.0112**	0.0036	0.0018	0	0.0036	0.9928
AMBUJACEM	-0.0084**	0.0034	0.0132	0.0034	0.0032	0.2961
AXISBANK	0.0031	0.0027	0.2436	0.0069**	0.0027	0.0098
BAJAJAUTO	-0.0039	0.0038	0.2988	0.0086**	0.0037	0.0201
BHARTIARTL	-0.0003	0.0077	0.9721	0.0187**	0.0076	0.0144
BHEL	-0.0183**	0.0038	0.0000	-0.007*	0.0038	0.0704
BPCL	-0.0582**	0.0142	0.0000	-0.0395**	0.0140	0.0047
CAIRN	-0.0034	0.0033	0.3054	0.0051	0.0032	0.1151
CIPLA	-0.0129**	0.0057	0.0231	0.0088	0.0056	0.1199
COALINDIA	-0.003	0.0021	0.1600	0.0017	0.0021	0.4113
DLF	0.0014	0.0055	0.7991	0.0105*	0.0055	0.0539
DRREDDY	-0.0055	0.0040	0.1701	0.0076*	0.0040	0.0586
GAIL	-0.0003	0.0037	0.9436	0.0111**	0.0036	0.0024
GRASIM	-0.0053	0.0039	0.1766	0.0131**	0.0040	0.0011
HCLTECH	-0.0032	0.0049	0.5125	0.0125**	0.0047	0.0081
HDFC	-0.0082**	0.0031	0.0072	-0.0017	0.0029	0.5636
HDFCBANK	-0.0037	0.0036	0.3047	0.0063*	0.0036	0.0767
HEROMOTOCO	-0.0008	0.0021	0.7191	0.0044**	0.0021	0.0371
HINDALCO	-0.0077	0.0104	0.4602	0.0127	0.0105	0.2266
HINDUNILVR	-0.0159**	0.0048	0.0008	-0.0046	0.0046	0.3166
ICICIBANK	0.002	0.0026	0.4476	0.0051**	0.0026	0.0499
IDFC	-0.0014	0.0036	0.6968	0.0042	0.0036	0.2395
INFY	-0.0033	0.0042	0.4330	0.0014	0.0042	0.7384
ITC	0.0028	0.0027	0.3169	0.009**	0.0027	0.0009
JINDALSTEL	-0.0148*	0.0082	0.0704	0.0108	0.0082	0.1885
JPASSOCIAT	0.006	0.0044	0.1660	0.0128**	0.0044	0.0038
KOTAKBANK	0.0013	0.0051	0.7962	0.0222**	0.0049	0.0000
LT	0.002	0.0048	0.6847	0.0116**	0.0049	0.0175
M&M	-0.0029	0.0038	0.4461	0.0059	0.0037	0.1113
MARUTI	-0.0109*	0.0056	0.0506	0.0032	0.0055	0.5605
NTPC	-0.0068**	0.0033	0.0376	0.0043	0.0032	0.1789
ONGC	-0.0035	0.0029	0.2336	0.0016	0.0029	0.5739
PNB	-0.0017	0.0026	0.5110	0.0027	0.0027	0.3134
POWERGRID	-0.0106**	0.0040	0.0083	0.0063	0.0040	0.1082
RANBAXY	-0.0104	0.0063	0.1008	0.0098	0.0064	0.1216
RCOM	-0.0175*	0.0099	0.0765	0.0068	0.0101	0.5006
RELIANCE	-0.0029	0.0041	0.4829	0.0051	0.0041	0.2176

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RELINFRA	-0.0052	0.0055	0.3381	0.004	0.0056	0.4775
RPOWER	-0.0077	0.0060	0.2002	0.008	0.0063	0.1993
SAIL	-0.0156**	0.0040	0.0001	-0.0025	0.0042	0.5531
SBIN	-0.0029	0.0027	0.2839	0.0011	0.0028	0.6917
SESAGOA	-0.0026	0.0026	0.3174	0.0029	0.0026	0.2601
SIEMENS	-0.0169**	0.0069	0.0142	0.0207**	0.0069	0.0027
STER	-0.0023	0.0047	0.6234	0.0089*	0.0048	0.0614
SUNPHARMA	0.0001	0.0050	0.9784	0.0194**	0.0049	0.0001
TATAMOTORS	-0.0086*	0.0049	0.0789	-0.0022	0.0049	0.6516
TATAPOWER	-0.0031	0.0043	0.4716	0.0107**	0.0044	0.0144
TATASTEEL	-0.0018	0.0022	0.4140	0.0015	0.0022	0.4897
TCS	0.0004	0.0036	0.9122	0.0089**	0.0036	0.0127
WIPRO	-0.0037	0.0044	0.4050	0.0067	0.0044	0.1277

[Notes: ** and * denotes significance at 5% an 10% level respectively]

Cointegration relationship for each of the 50 individual stocks has also been examined by using the following specification of VECM:

$$\Delta S_t = \phi_s + \alpha_s z_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta S_{t-i} + \sum_{i=1}^{k} \beta_i \Delta F_{t-i} + \varepsilon_{s,t} \quad \ldots\ldots\ldots 2(a)$$

$$\Delta F_t = \phi_f + \alpha_f z_{t-1} + \sum_{i=1}^{k} \gamma_i \Delta S_{t-i} + \sum_{i=1}^{k} \delta_i \Delta F_{t-i} + \varepsilon_{f,t} \quad \ldots\ldots\ldots 2(b)$$

Where,

z_{t-1} = lagged basis term given by: $F_{t-1} - S_{t-1}$

All other variables/coefficients are defined as in eqs. 4.1a and 4.1b.

Table 2 summarizes the results of VECM based on eqs. 2(a) and 2(b). The table presents the coefficient of the error correction term (z_{t-1}). From the table it can be seen that α_s is significant for 13 stocks while α_f is significant for 26 stocks. Further, for 5 stocks viz., BPCL, CIPLA, LT, POWERGRID and SIEMENS both α_s and α_f are significant. This implies that for these 5 stocks both spot and futures markets respond to correct for disequilibrium from the long-term relationship.

Table 2: Coefficients of z_{t-1}

Company	ΔS_t			ΔF_t		
	z_{t-1}	Std. Error	p-value	z_{t-1}	Std. Error	p-value
ACC	0.0071**	0.0033	0.0314	-0.0027	0.0033	0.4157
AMBUJACEM	0.0033	0.0030	0.2815	-0.0071**	0.0029	0.0140
AXISBANK	-0.004	0.0026	0.1222	-0.0075**	0.0026	0.0033
BAJAJAUTO	0.0018	0.0036	0.6141	-0.0097**	0.0036	0.0063
BHARTIARTL	-0.0004	0.0077	0.9595	-0.0193**	0.0076	0.0116
BHEL	0.0168**	0.0038	0.0000	0.0055	0.0038	0.1448
BPCL	0.0622**	0.0135	0.0000	0.0457**	0.0133	0.0006
CAIRN	0.0038	0.0033	0.2495	-0.0046	0.0032	0.1472
CIPLA	0.0111**	0.0057	0.0488	-0.0103*	0.0056	0.0668
COALINDIA	0.0013	0.0020	0.5099	-0.0026	0.0019	0.1688
DLF	-0.0021	0.0055	0.7010	-0.0112**	0.0055	0.0402
DRREDDY	0.0046	0.0039	0.2390	-0.008**	0.0040	0.0437
GAIL	-0.0004	0.0037	0.9136	-0.0115**	0.0036	0.0014
GRASIM	0.0017	0.0037	0.6497	-0.0148**	0.0038	0.0001
HCLTECH	0.0031	0.0049	0.5244	-0.0126**	0.0047	0.0075
HDFC	0.0044*	0.0026	0.0899	-0.0008	0.0025	0.7424
HDFCBANK	-0.0015	0.0032	0.6402	-0.0094**	0.0031	0.0025
HEROMOTOCO	0.001	0.0021	0.6274	-0.0041*	0.0021	0.0515
HINDALCO	0.0017	0.0098	0.8639	-0.0166*	0.0099	0.0942
HINDUNILVR	0.0153**	0.0047	0.0012	0.0041	0.0046	0.3713
ICICIBANK	-0.0009	0.0026	0.7187	-0.004	0.0026	0.1175
IDFC	-0.0026	0.0031	0.4089	-0.0067**	0.0031	0.0301
INFY	0.0018	0.0041	0.6667	-0.0027	0.0041	0.5031
ITC	-0.0036	0.0027	0.1804	-0.0096**	0.0026	0.0003
JINDALSTEL	0.0139*	0.0081	0.0849	-0.011	0.0081	0.1703
JPASSOCIAT	-0.0049	0.0043	0.2593	-0.0115**	0.0044	0.0086
KOTAKBANK	-0.0014	0.0051	0.7821	-0.0222**	0.0049	0.0000
LT	-0.0075*	0.0043	0.0823	-0.0151**	0.0044	0.0006
M&M	0.0004	0.0036	0.9069	-0.0076**	0.0036	0.0314
MARUTI	0.0061	0.0051	0.2284	-0.0054	0.0050	0.2811
NTPC	0.0058*	0.0032	0.0758	-0.0051	0.0032	0.1074
ONGC	0.0027	0.0029	0.3580	-0.0023	0.0028	0.4128
PNB	0.0007	0.0026	0.7936	-0.0036	0.0026	0.1703
POWERGRID	0.0084**	0.0039	0.0336	-0.008**	0.0039	0.0402
RANBAXY	0.0097	0.0062	0.1158	-0.0098	0.0062	0.1131
RCOM	0.0173*	0.0099	0.0784	-0.007	0.0101	0.4879
RELIANCE	0.0029	0.0041	0.4734	-0.005	0.0041	0.2203
RELINFRA	0.0053	0.0055	0.3354	-0.0039	0.0056	0.4810

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RPOWER	0.0077	0.0060	0.1992	-0.0081	0.0063	0.1970
SAIL	0.0157**	0.0040	0.0001	0.0025	0.0042	0.5520
SBIN	0.0032	0.0027	0.2450	-0.0008	0.0028	0.7687
SESAGOA	0.0024	0.0026	0.3599	-0.0032	0.0026	0.2239
SIEMENS	0.0159**	0.0068	0.0203	-0.0214**	0.0069	0.0019
STER	0.0003	0.0046	0.9554	-0.0107**	0.0047	0.0220
SUNPHARMA	0.0001	0.0050	0.9843	-0.0192**	0.0049	0.0001
TATAMOTORS	0.0063	0.0047	0.1820	0.0003	0.0047	0.9426
TATAPOWER	0.0009	0.0042	0.8377	-0.0122**	0.0042	0.0039
TATASTEEL	0.0018	0.0022	0.4136	-0.0014	0.0022	0.5291
TCS	0.0001	0.0036	0.9878	-0.0083**	0.0035	0.0187
WIPRO	0.0048	0.0044	0.2730	-0.0054	0.0043	0.2097

[Notes: ** and * denotes significance at 5% an 10% level respectively]

Lead-lag Relationship between spot and futures markets based on Granger Causality

To examine the direction of flow of information between spot and futures markets, Granger Causality test has been applied based on VAR. The results of Granger Causality test are presented in Table 3. It can be seen from the table that the null hypothesis that ΔS_t does not granger cause ΔF_t is rejected for all the 50 stocks. Similarly, the null hypothesis that ΔF_t does not granger cause ΔS_t is also rejected. This implies that past history of spot market returns is helpful in predicting returns from the futures market and vice versa. Thus, a feedback relationship exists between futures and spot markets for all the 50 constituent stocks. However, if we examine the size and significance of the lagged coefficients in the VAR model , then it appears that causality from futures to spot market is much stronger than in the reverse direction.

Table 3: Results of Granger Causality Test

Company	Spot does not Granger Cause Futures		Futures does not Granger Cause Spot	
	F-test	p-value	F-test	p-value
ACC	61.598**	0.0000	24.3606**	0.0000
AMBUJACEM	52.3226**	0.0000	30.2269**	0.0000
AXISBANK	24.1431**	0.0000	7.0089**	0.0000
BAJAJAUTO	68.4745**	0.0000	16.5669**	0.0000
BHARTIARTL	41.3765**	0.0000	2.7731**	0.0107
BHEL	27.0596**	0.0000	17.8809**	0.0000
BPCL	11.3285**	0.0000	3.2992**	0.0030
CAIRN	55.0877**	0.0000	23.1826**	0.0000
CIPLA	80.6303**	0.0000	18.4014**	0.0000
COALINDIA	79.8848**	0.0000	21.0517**	0.0000
DLF	14.2593**	0.0000	10.6763**	0.0000
DRREDDY	74.6449**	0.0000	20.219**	0.0000
GAIL	137.5067**	0.0000	8.8394**	0.0000
GRASIM	121.3113**	0.0000	59.9665**	0.0000
HCLTECH	81.8714**	0.0000	12.8117**	0.0000
HDFC	57.9784**	0.0000	25.0339**	0.0000
HDFCBANK	22.6819**	0.0000	20.3783**	0.0000
HEROMOTOCO	38.1385**	0.0000	30.0657**	0.0000
HINDALCO	24.4271**	0.0000	9.3114**	0.0000
HINDUNILVR	20.496**	0.0000	23.371**	0.0000
ICICIBANK	14.445**	0.0000	14.4184**	0.0000
IDFC	46.2933**	0.0000	5.8613**	0.0000
INFY	35.6595**	0.0000	2.5627*	0.0529
ITC	36.7092**	0.0000	12.2994**	0.0000
JINDALSTEL	22.255**	0.0000	13.5209**	0.0000
JPASSOCIAT	24.055**	0.0000	12.9206**	0.0000
KOTAKBANK	42.1862**	0.0000	34.3366**	0.0000
LT	14.5112**	0.0000	9.1325**	0.0000
M&M	41.9627**	0.0000	20.7742**	0.0000
MARUTI	39.0868**	0.0000	10.4755**	0.0000
NTPC	117.084**	0.0000	18.5292**	0.0000
ONGC	58.8536**	0.0000	11.5719**	0.0000
PNB	45.306**	0.0000	19.9521**	0.0000
POWERGRID	108.5538**	0.0000	27.2793**	0.0000
RANBAXY	39.6996**	0.0000	22.7684**	0.0000
RCOM	23.489**	0.0000	16.3771**	0.0000
RELIANCE	19.7071**	0.0000	16.786**	0.0000

RELINFRA	20.6449**	0.0000	11.6994**	0.0000
RPOWER	31.0015**	0.0000	27.0969**	0.0000
SAIL	72.1263**	0.0000	31.2901**	0.0000
SBIN	11.3433**	0.0000	7.9496**	0.0000
SESAGOA	37.2652**	0.0000	37.1285**	0.0000
SIEMENS	97.5313**	0.0000	44.4637**	0.0000
STER	46.6077**	0.0000	19.3367**	0.0000
SUNPHARMA	110.6392**	0.0000	14.0684**	0.0000
TATAMOTORS	26.112**	0.0000	6.244**	0.0001
TATAPOWER	93.0422**	0.0000	26.1755**	0.0000
TATASTEEL	21.3635**	0.0000	16.0505**	0.0000
TCS	35.5089**	0.0000	10.0585**	0.0000
WIPRO	59.6342**	0.0000	12.0184**	0.0000

[Notes: ** and * denotes significance at 5% an 10% level respectively]

4. CONCLUSION

This study has examined long-term and short-term relationships between futures and spot markets for all the 50 constituent stocks of CNX Nifty. For examining the relationships 5-min transaction prices data has been used. Each of the 50 stocks have been found to be cointegrated. For 41 out of 50 stocks error correction was taking place. There were 9 stocks for which neither spot nor futures market responded to correct the disequilibrium. Theoretically, for cointegration to exist at least one of the two series should have significant error correction term. The force behind this error correction is cost of carry which implies that if fairly large deviation exists between the two markets then arbitrage is possible. Insignificant error term may be due to two reasons. First, the deviation between the two markets is substantial to attract arbitrage but there is not sufficient liquidity in either the spot or the futures market so that arbitrageurs find it difficult to buy in one market and sell in other market simultaneously. Second, the error is not substantial which implies that though there is deviation between the two markets but this deviation is within the no arbitrage band.The short-term relationships between futures and spot markets for the 50 constituent stocks have

been examined buy employing Granger Causality test based on Vector Autoregressive Model (VAR). For all the 50 stocks, it has been found that both spot and futures markets granger causes each other implying that feedback relationship exists between the two markets.The results of the present study have important implications for traders, hedgers, arbitrageurs and policy makers.

Appendix A

Table A1: J-J Cointegration test results for Individual Stocks

Symbol	No of CE	Eigenvalue	Trace	p-value	Max-Eigen	p-value
ACC	None	0.0027	53.2731	0.0000	49.1472	0.0000
	At most 1	0.0002	4.1259	0.0422	4.1259	0.0422
AMBUJACEM	None	0.0037	77.0297	0.0000	67.6817	0.0000
	At most 1	0.0005	9.3481	0.0022	9.3481	0.0022
AXISBANK	None	0.0016	30.7127	0.0001	29.2790	0.0001
	At most 1	0.0001	1.4337	0.2312	1.4337	0.2312
BAJAJAUTO	None	0.0034	65.1109	0.0000	61.7311	0.0000
	At most 1	0.0002	3.3798	0.0660	3.3798	0.0660
BHARTIARTL	None	0.0047	88.2381	0.0000	85.4620	0.0000
	At most 1	0.0002	2.7762	0.0957	2.7762	0.0957
BHEL	None	0.0045	84.0386	0.0000	81.5022	0.0000
	At most 1	0.0001	2.5364	0.1112	2.5364	0.1112
BPCL	None	0.0046	88.6433	0.0000	82.2493	0.0000
	At most 1	0.0004	6.3940	0.0114	6.3940	0.0114
CAIRN	None	0.0023	44.7767	0.0000	42.2553	0.0000
	At most 1	0.0001	2.5215	0.1123	2.5215	0.1123
CIPLA	None	0.0045	86.0125	0.0000	81.3675	0.0000
	At most 1	0.0003	4.6450	0.0311	4.6450	0.0311
COALINDIA	None	0.0012	23.8348	0.0022	21.1975	0.0034
	At most 1	0.0001	2.6373	0.1044	2.6373	0.1044
DLF	None	0.0030	58.7355	0.0000	55.2864	0.0000
	At most 1	0.0002	3.4491	0.0633	3.4491	0.0633
DRREDDY	None	0.0031	56.0146	0.0000	55.5204	0.0000
	At most 1	0.0000	0.4942	0.4821	0.4942	0.4821
GAIL	None	0.0025	46.7232	0.0000	42.9245	0.0000
	At most 1	0.0002	3.7987	0.0513	3.7987	0.0513
GRASIM	None	0.0035	67.5682	0.0000	60.0373	0.0000

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	At most 1	0.0004	7.5309	0.0061	7.5309	0.0061
HCLTECH	None	0.0042	76.0835	0.0000	75.0838	0.0000
	At most 1	0.0001	0.9996	0.3174	0.9996	0.3174
HDFC	None	0.0020	38.8770	0.0000	36.4805	0.0000
	At most 1	0.0001	2.3964	0.1216	2.3964	0.1216
HDFCBANK	None	0.0035	69.9320	0.0000	63.1164	0.0000
	At most 1	0.0004	6.8156	0.0090	6.8156	0.0090
HEROMOTOCO	None	0.0017	31.9388	0.0001	30.1556	0.0001
	At most 1	0.0001	1.7831	0.1818	1.7831	0.1818
HINDALCO	None	0.0043	68.1330	0.0000	65.2122	0.0000
	At most 1	0.0002	2.9208	0.0874	2.9208	0.0874
HINDUNILVR	None	0.0033	62.4849	0.0000	60.8759	0.0000
	At most 1	0.0001	1.6089	0.2046	1.6089	0.2046
ICICIBANK	None	0.0011	25.2829	0.0012	19.6314	0.0064
	At most 1	0.0003	5.6515	0.0174	5.6515	0.0174
IDFC	None	0.0014	30.7648	0.0001	25.7807	0.0005
	At most 1	0.0003	4.9841	0.0256	4.9841	0.0256
INFY	None	0.0015	30.1662	0.0002	27.0805	0.0003
	At most 1	0.0002	3.0857	0.0790	3.0857	0.0790
ITC	None	0.0024	44.8305	0.0000	43.3349	0.0000
	At most 1	0.0001	1.4955	0.2214	1.4955	0.2214
JINDALSTEL	None	0.0062	113.1744	0.0001	113.0090	0.0001
	At most 1	0.0000	0.1655	0.6842	0.1655	0.6842
JPASSOCIAT	None	0.0021	41.5051	0.0000	38.5677	0.0000
	At most 1	0.0002	2.9374	0.0865	2.9374	0.0865
KOTAKBANK	None	0.0054	99.4162	0.0001	99.0645	0.0000
	At most 1	0.0000	0.3518	0.5531	0.3518	0.5531
LT	None	0.0030	64.4986	0.0000	55.5644	0.0000
	At most 1	0.0005	8.9342	0.0028	8.9342	0.0028
M&M	None	0.0022	43.9706	0.0000	40.3715	0.0000
	At most 1	0.0002	3.5991	0.0578	3.5991	0.0578
MARUTI	None	0.0039	72.9507	0.0000	71.4472	0.0000
	At most 1	0.0001	1.5035	0.2201	1.5035	0.2201
NTPC	None	0.0027	52.3966	0.0000	48.2390	0.0000
	At most 1	0.0002	4.1575	0.0414	4.1575	0.0414
ONGC	None	0.0014	28.5794	0.0003	25.6839	0.0005
	At most 1	0.0002	2.8955	0.0888	2.8955	0.0888
PNB	None	0.0011	23.3282	0.0027	19.3794	0.0071
	At most 1	0.0002	3.9488	0.0469	3.9488	0.0469
POWERGRID	None	0.0038	74.2221	0.0000	67.4577	0.0000
	At most 1	0.0004	6.7644	0.0093	6.7644	0.0093
RANBAXY	None	0.0041	75.0819	0.0000	75.0039	0.0000
	At most 1	0.0000	0.0780	0.7800	0.0780	0.7800

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RCOM	None	0.0056	101.4741	0.0001	101.3519	0.0000
	At most 1	0.0000	0.1222	0.7266	0.1222	0.7266
RELIANCE	None	0.0023	46.5107	0.0000	41.0073	0.0000
	At most 1	0.0003	5.5033	0.0190	5.5033	0.0190
RELINFRA	None	0.0024	43.4224	0.0000	42.8699	0.0000
	At most 1	0.0000	0.5525	0.4573	0.5525	0.4573
RPOWER	None	0.0037	67.8676	0.0000	67.2310	0.0000
	At most 1	0.0000	0.6367	0.4249	0.6367	0.4249
SAIL	None	0.0031	55.8108	0.0000	55.8100	0.0000
	At most 1	0.0000	0.0008	0.9780	0.0008	0.9780
SBIN	None	0.0015	30.6906	0.0001	27.6797	0.0002
	At most 1	0.0002	3.0109	0.0827	3.0109	0.0827
SESAGOA	None	0.0017	33.8175	0.0000	30.6436	0.0001
	At most 1	0.0002	3.1739	0.0748	3.1739	0.0748
SIEMENS	None	0.0080	132.9019	0.0001	131.3153	0.0001
	At most 1	0.0001	1.5866	0.2078	1.5866	0.2078
STER	None	0.0025	50.3614	0.0000	46.3948	0.0000
	At most 1	0.0002	3.9666	0.0464	3.9666	0.0464
SUNPHARMA	None	0.0046	83.2396	0.0000	83.2386	0.0000
	At most 1	0.0000	0.0011	0.9733	0.0011	0.9733
TATAMOTORS	None	0.0019	36.1036	0.0000	34.0242	0.0000
	At most 1	0.0001	2.0793	0.1493	2.0793	0.1493
TATAPOWER	None	0.0029	56.3548	0.0000	51.6220	0.0000
	At most 1	0.0003	4.7329	0.0296	4.7329	0.0296
TATASTEEL	None	0.0012	22.5798	0.0036	22.5402	0.0020
	At most 1	0.0000	0.0396	0.8423	0.0396	0.8423
TCS	None	0.0029	54.6499	0.0000	53.2289	0.0000
	At most 1	0.0001	1.4210	0.2332	1.4210	0.2332
WIPRO	None	0.0025	48.0755	0.0000	46.1393	0.0000
	At most 1	0.0001	1.9362	0.1641	1.9362	0.1641

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