

ANNEXURE

Granger causality test for Sectoral indices and USD/INR

Null Hypothesis	F-statistics	Probability
Nifty Auto does not Granger cause USD/INR	0.664	0.515
USD/INR does not Granger cause Nifty Auto	4.781	0.008*
Nifty Bank does not Granger cause USD/INR	0.642	0.526
USD/INR does not Granger cause Nifty Bank	77.363	4.E-30*
Nifty Financial service does not Granger cause USD/INR	0.851	0.427
USD/INR does not Granger cause Nifty Financial service	11.126	2.E-05*
Nifty FMCG does not Granger cause USD/INR	3.375	0.035**
USD/INR does not Granger cause Nifty FMCG	2.720	0.066***
Nifty IT does not Granger cause USD/INR	0.356	0.700
USD/INR does not Granger cause Nifty IT	2.630	0.073***
Nifty Media does not Granger cause USD/INR	2.836	0.059**
USD/INR does not Granger cause Nifty Media	27.307	5.E-12*
Nifty Metal does not Granger cause USD/INR	0.331	0.717
USD/INR does not Granger cause Nifty Metal	4.318	0.014**
Nifty Pharma does not Granger cause USD/INR	3.563	0.029**
USD/INR does not Granger cause Nifty Pharma	2.738	0.065***
Nifty Private bank does not Granger cause USD/INR	1.090	0.336
USD/INR does not Granger cause Nifty Private bank	27.109	6.E-12*
Nifty PSU does not Granger cause USD/INR	0.234	0.791
USD/INR does not Granger cause Nifty PSU	0.895	0.409
Nifty Realty does not Granger cause USD/INR	0.026	0.974
USD/INR does not Granger cause Nifty Realty	12.831	4.E-06*

Johansen Co-integration Test for Nifty Auto and USD/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.
None*	0.033	18.143	12.320	0.004
At most 1	0.000	0.494	4.129	0.545
Trace test indicates 1 co-integrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.
None*	0.033	17.649	11.224	0.003
At most 1	0.000	0.494	4.129	0.545
Maximum Eigenvalue test indicates 1 cointegrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Bank and USD/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.
None*	0.024	12.671	12.320	0.043
At most 1	4.30E-05	0.0222	4.129	0.903
Trace test indicates 1 co-integrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized	Eigenvalue	Max-Eigen	0.05 Critical	Prob.

No. of CE(s)		Statistic	value	
None*	0.024	12.671	11.224	0.027
At most 1	4.30E-05	0.0222	4.129	0.903
Maximum Eigenvalue test indicates 1 cointegrating eqn at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
**Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty IT and USD/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.013	8.568	15.494	0.406
At most 1	0.003	1.774	3.841	0.182
Trace test indicates no co-integration at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
**Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.013	6.793	14.264	0.513
At most 1	0.003	1.774	3.841	0.182
Maximum Eigenvalue test indicates no co-integration at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
**Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Financial service and USD/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.150	7.982	15.494	0.467
At most 1	0.000	0.163	3.841	0.685
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.015	7.818	14.264	0.397
At most 1	0.000	0.163	3.841	0.685
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty FMCG and USD/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.
None*	0.029	15.386	12.320	0.014
At most 1	8.88E-05	0.045	4.129	0.860
Trace test indicates 1 co-integrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized	Eigenvalue	Max-Eigen	0.05 Critical	Prob.

No. of CE(s)		Statistic	value	
None*	0.029	15.340	11.224	0.009
At most 1	8.88E-05	0.045	4.129	0.860
Maximum Eigenvalue test indicates 1 cointegrating eqn at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
**Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Metal and USD/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.026	9.785	15.494	0.297
At most 1	0.002	0.720	3.841	0.395
Trace test indicates no co-integration at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
**Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.026	9.064	14.264	0.280
At most 1	0.002	0.720	3.841	0.395
Maximum Eigenvalue test indicates no co-integration at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
**Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Media and USD/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.027	15.240	15.494	0.054

At most 1	0.001	0.977	3.841	0.322
Maximum Eigenvalue test indicates 1 cointegrating eqn at the 0.10 level *denotes rejection of the hypothesis at the 0.10 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.027	14.263	14.264	0.050
At most 1	0.001	0.977	3.841	0.322
Maximum Eigenvalue test indicates 1 co-integrating eqn(s) at the 0.10 level *denotes rejection of the hypothesis at the 0.10 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Pharma and USD/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.017	10.442	15.494	0.248
At most 1	0.002	1.205	3.841	0.272
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.017	9.236	14.264	0.267
At most 1	0.002	1.205	3.841	0.272
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Private and USD/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.014	7.581	15.494	0.511
At most 1	3.12E-06	0.001	3.841	0.965
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.014	7.80	14.264	0.423
At most 1	3.12E-06	0.001	3.841	0.965
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty PSU and USD/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.
None*	0.163	94.132	12.320	0.000
At most 1	0.003	1.929	4.129	0.194
Trace test indicates 1 co-integrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized	Eigenvalue	Max-Eigen	0.05 Critical	Prob.

No. of CE(s)		Statistic	value	
None*	0.163	92.203	11.224	0.000
At most 1	0.003	1.929	4.128	0.194
Maximum Eigenvalue test indicates 1 cointegrating eqn at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
**Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Realty and USD/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.
None*	0.051	28.888	12.320	0.000
At most 1	0.003	1.672	4.129	0.230
Trace test indicates 1 co-integrating eqn at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
**Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.
None*	0.051	27.21	11.224	0.000
At most 1	0.003	1.672	4.129	0.230
Maximum Eigenvalue test indicates 1 cointegrating eqn at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
**Mackinnon-Haug-Michelis (1999) p-values				

Sectoral indices and EURO/INR

Null Hypothesis	F-statistics	Probability
Nifty Auto does not Granger cause Euro/INR	2.858	0.058**
Euro/INR does not Granger cause Nifty Auto	0.198	0.819
Nifty Bank does not Granger cause Euro/INR	1.111	0.329
Euro/INR does not Granger cause Nifty Bank	18.944	1.E-08*
Nifty Financial service does not Granger cause Euro/INR	3.768	0.023**
Euro/INR does not Granger cause Nifty Financial service	0.267	0.765
Nifty FMCG does not Granger cause Euro/INR	1.551	0.212
Euro/INR does not Granger cause Nifty FMCG	0.274	0.760
Nifty IT does not Granger cause Euro/INR	0.656	0.018**
Euro/INR does not Granger cause Nifty IT	4.017	0.519
Nifty Media does not Granger cause Euro/INR	0.226	0.797
Euro/INR does not Granger cause Nifty Media	7.186	0.000*
Nifty Metal does not Granger cause Euro/INR	0.452	0.636
Euro/INR does not Granger cause Nifty Metal	3.307	0.037**
Nifty Pharma does not Granger cause Euro/INR	0.423	0.654
Euro/INR does not Granger cause Nifty Pharma	3.881	0.021**
Nifty Private bank does not Granger cause Euro/INR	0.543	0.581
Euro/INR does not Granger cause Nifty Private bank	5.428	0.004*
Nifty PSU does not Granger cause Euro/INR	0.590	0.554
Euro/INR does not Granger cause Nifty PSU	0.263	0.768
Nifty Realty does not Granger cause Euro/INR	0.713	0.490
Euro/INR does not Granger cause Nifty Realty	1.996	0.136

Johansen Co-integration Test for Nifty Auto and Euro/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.019	10.344	15.494	0.255
At most 1	6.56E-07	0.000	3.841	0.987
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.019	10.344	14.264	0.190
At most 1	6.56E-07	0.000	3.841	0.987
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Bank and Euro/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.013	7.260	15.494	0.547
At most 1	1.22E-06	0.000	3.841	0.981
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized	Eigenvalue	Max-Eigen	0.05 Critical	Prob.**

No. of CE(s)		Statistic	value	
None	0.013	7.260	14.264	0.458
At most 1	1.22E-06	0.000	3.841	0.981
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty IT and Euro/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.022	14.406	15.494	0.072
At most 1	0.004	2.407	3.841	0.120
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.022	11.998	14.264	0.110
At most 1	0.004	2.407	3.841	0.120
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Financial service and Euro/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.014	7.379	15.494	0.534

At most 1	4.42E-05	0.022	3.841	0.879
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.014	7.379	14.264	0.447
At most 1	4.42E-05	0.022	3.841	0.879
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty FMCG and Euro/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.013	7.511	15.494	0.519
At most 1	0.000	0.233	3.841	0.628
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.013	7.511	14.264	0.456
At most 1	0.000	0.233	3.841	0.628
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Metal and Euro/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.024	9.434	15.494	0.326
At most 1	0.003	1.258	3.841	0.261
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.024	8.176	14.264	0.361
At most 1	0.003	1.258	3.841	0.261
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Media and Euro/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.018	9.556	15.494	0.316
At most 1	0.000	0.125	3.841	0.723
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized	Eigenvalue	Max-Eigen	0.05 Critical	Prob.**

No. of CE(s)		Statistic	value	
None	0.018	9.556	14.264	0.252
At most 1	0.000	0.125	3.841	0.723
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Pharma and Euro/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.017	10.741	15.494	0.227
At most 1	0.003	1.788	3.841	0.181
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.017	10.741	14.264	0.290
At most 1	0.003	1.788	3.841	0.181
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Private bank and Euro/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.014	7.816	15.494	0.485

At most 1	0.000	0.350	3.841	0.553
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.014	7.816	14.264	0.435
At most 1	0.000	0.350	3.841	0.553
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty PSU and Euro/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.164	93.467	12.320	0.000
At most 1	0.000	0.375	4.129	0.603
Trace test indicates 1 co-integrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.164	93.467	11.224	0.000
At most 1	0.000	0.375	4.129	0.603
Trace test indicates 1 co-integrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Realty and Euro/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.052	27.904	12.320	0.000
At most 1	0.000	0.089	4.129	0.806
Trace test indicates 1 co-integrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.052	27.904	11.224	0.000
At most 1	0.000	0.089	4.129	0.806
Trace test indicates 1 co-integrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Sectoral indices and GBP/INR

Null Hypothesis	F-statistics	Probability
Nifty Auto does not Granger cause GBP/INR	0.259	0.771
GBP/INR does not Granger cause Nifty Auto	0.457	0.632
Nifty Bank does not Granger cause GBP/INR	1.970	0.140
GBP/INR does not Granger cause Nifty Bank	11.713	1.E-05*
Nifty Financial service does not Granger cause GBP/INR	0.152	0.858
GBP/INR does not Granger cause Nifty Financial service	1.708	0.182
Nifty FMCG does not Granger cause GBP/INR	0.822	0.439
GBP/INR does not Granger cause Nifty FMCG	1.774	0.170
Nifty IT does not Granger cause GBP/INR	0.296	0.743
GBP/INR does not Granger cause Nifty IT	1.658	0.191
Nifty Media does not Granger cause GBP/INR	0.003	0.996
GBP/INR does not Granger cause Nifty Media	4.556	0.010**
Nifty Metal does not Granger cause GBP/INR	0.528	0.589
GBP/INR does not Granger cause Nifty Metal	0.865	0.422
Nifty Pharma does not Granger cause GBP/INR	0.588	0.555
GBP/INR does not Granger cause Nifty Pharma	3.471	0.031**
Nifty Private bank does not Granger cause GBP/INR	0.104	0.900
GBP/INR does not Granger cause Nifty Private bank	6.031	0.002*
Nifty PSU does not Granger cause GBP/INR	0.854	0.426
GBP/INR does not Granger cause Nifty PSU	0.369	0.691
Nifty Realty does not Granger cause GBP/INR	1.045	0.352
GBP/INR does not Granger cause Nifty Realty	7.955	0.000*

Johansen Co-integration Test for Nifty Auto and GBP/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.007	4.027	15.494	0.901
At most 1	0.000	0.140	3.841	0.708
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.007	3.886	14.264	0.871
At most 1	0.000	0.140	3.841	0.708
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Bank and GBP/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.006	3.157	15.494	0.959
At most 1	6.20E-06	0.003	3.841	0.953
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized	Eigenvalue	Max-Eigen	0.05 Critical	Prob.**

No. of CE(s)		Statistic	value	
None	0.006	3.154	14.264	0.935
At most 1	6.20E-06	0.003	3.841	0.953
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty IT and GBP/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.011	7.221	15.494	0.552
At most 1	0.002	1.248	3.841	0.263
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.011	5.972	14.264	0.616
At most 1	0.002	1.248	3.841	0.263
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Financial Service and GBP/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.006	5.733	20.261	0.026

At most 1	0.004	2.342	9.164	0.154
Trace test indicates 1 co-integrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.006	6.851	20.251	0.012
At most 1	0.004	2.342	9.164	0.154
Trace test indicates 1 co-integrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty FMCG and GBP/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.007	4.233	15.494	0.883
At most 1	0.000	0.293	3.841	0.588
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.007	3.940	14.264	0.865
At most 1	0.000	0.293	3.841	0.588
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Metal and GBP/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.015	5.734	15.494	0.726
At most 1	0.001	0.488	3.841	0.484
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.015	5.734	14.264	0.710
At most 1	0.001	0.488	3.841	0.484
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Media and GBP/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.008	4.961	15.494	0.812
At most 1	0.001	0.543	3.841	0.460
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized	Eigenvalue	Max-Eigen	0.05 Critical	Prob.**

No. of CE(s)		Statistic	value	
None	0.008	4.961	14.264	0.812
At most 1	0.001	0.543	3.841	0.460
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Pharma and GBP/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.019	11.439	15.494	0.185
At most 1	0.002	1.878	3.841	0.275
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.019	10.251	14.264	0.195
At most 1	0.002	1.878	3.841	0.275
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty PSU and GBP/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.161	91.355	12.320	0.000

At most 1	2.04E-05	0.010	4.129	0.933
Trace test indicates 1 co-integrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.161	91.355	11.224	0.000
At most 1	2.04E-05	0.010	4.129	0.933
Trace test indicates 1 co-integrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Realty and GBP/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.049	26.030	12.320	0.000
At most 1	2.77E-06	0.001	4.129	0.976
Trace test indicates 1 co-integrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.049	26.028	11.224	0.000
At most 1	2.77E-06	0.001	4.129	0.976
Trace test indicates 1 co-integrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Sectoral indices and YEN/INR

Null Hypothesis	F-statistics	Probability
Nifty Auto does not Granger cause YEN/INR	0.128	0.879
YEN/INR does not Granger cause Nifty Auto	1.810	0.164
Nifty Bank does not Granger cause YEN/INR	0.088	0.915
YEN/INR does not Granger cause Nifty Bank	54.07	5.E-22*
Nifty Financial service does not Granger cause YEN/INR	0.269	0.763
YEN/INR does not Granger cause Nifty Financial service	7.039	0.001*
Nifty FMCG does not Granger cause YEN/INR	0.153	0.858
YEN/INR does not Granger cause Nifty FMCG	3.267	0.038**
Nifty IT does not Granger cause YEN/INR	0.033	0.966
YEN/INR does not Granger cause Nifty IT	0.927	0.396
Nifty Media does not Granger cause YEN/INR	0.654	0.519
YEN/INR does not Granger cause Nifty Media	13.930	1.E-06*
Nifty Metal does not Granger cause YEN/INR	0.320	0.726
YEN/INR does not Granger cause Nifty Metal	2.788	0.062***
Nifty Pharma does not Granger cause YEN/INR	0.230	0.793
YEN/INR does not Granger cause Nifty Pharma	2.992	0.051***
Nifty Private bank does not Granger cause YEN/INR	0.119	0.887
YEN/INR does not Granger cause Nifty Private bank	16.658	1.E-07*
Nifty PSU does not Granger cause YEN/INR	0.421	0.656
YEN/INR does not Granger cause Nifty PSU	0.296	0.743
Nifty Realty does not Granger cause YEN/INR	0.399	0.671
YEN/INR does not Granger cause Nifty Realty	10.761	3.E-05*

Johansen Co-integration Test for Nifty Auto and YEN/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.020	10.846	15.494	0.221
At most 1	1.49E-05	0.007	3.841	0.929
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.020	10.839	14.264	0.162
At most 1	1.49E-05	0.007	3.841	0.929
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Bank and YEN/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.019	10.557	15.494	0.240
At most 1	0.000	0.362	3.841	0.547
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.019	10.195	14.264	0.199
At most 1	0.000	0.362	3.841	0.547
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty IT and YEN/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.016	10.642	15.494	0.234
At most 1	0.003	2.005	3.841	0.156
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.016	8.636	14.264	0.317
At most 1	0.003	2.005	3.841	0.156
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Financial Service and YEN/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.020	10.778	15.494	0.225
At most 1	0.000	0.152	3.841	0.695
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.020	10.625	14.264	0.174
At most 1	0.000	0.152	3.841	0.695
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty FMCG and GBP/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.025	21.804	20.261	0.030
At most 1	0.016	8.613	9.164	0.135
Trace test indicates 1 co-integrating eqn at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized	Eigenvalue	Max-Eigen	0.05 Critical	Prob.**

No. of CE(s)		Statistic	value	
None	0.025	13.191	15.892	0.126
At most 1	0.016	8.613	9.164	0.063

Trace test indicates 1 co-integrating eqn at the 0.05 level
*denotes rejection of the hypothesis at the 0.05 level
**Mackinnon-Haug-Michelis (1999) p-values

Johansen Co-integration Test for Nifty Metal and YEN/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.017	7.670	15.494	0.501
At most 1	0.005	1.857	3.841	0.172

Trace test indicates no co-integration at the 0.05 level
*denotes rejection of the hypothesis at the 0.05 level
**Mackinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.017	5.813	14.264	0.637
At most 1	0.005	1.857	3.841	0.172

Maximum Eigenvalue test indicates no co-integration at the 0.05 level
*denotes rejection of the hypothesis at the 0.05 level
**Mackinnon-Haug-Michelis (1999) p-values

Johansen Co-integration Test for Nifty Media and YEN/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.025	13.748	15.494	0.090
At most 1	0.001	0.623	3.841	0.429

Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.025	13.125	14.264	0.075
At most 1	0.001	0.623	3.841	0.429
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Pharma and YEN/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.016	9.847	15.494	0.292
At most 1	0.002	1.349	3.841	0.245
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.016	8.498	14.264	0.330
At most 1	0.002	1.349	3.841	0.245
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Private and YEN/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.020	10.541	15.494	0.241
At most 1	8.70E-06	0.004	3.841	0.945
Trace test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.020	10.536	14.264	0.179
At most 1	8.70E-06	0.004	3.841	0.945
Maximum Eigenvalue test indicates no co-integration at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty PSU and YEN/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.165	93.572	12.320	0.000
At most 1	0.000	0.175	4.129	0.729
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**

None	0.165	93.397	11.224	0.000
At most 1	0.000	0.175	4.129	0.729
Maximum Eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				

Johansen Co-integration Test for Nifty Realty and YEN/INR

Unrestricted Cointegration Rank Test(Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None	0.051	27.410	13.320	0.000
At most 1	4.93E-05	0.025	4.129	0.896
Trace test indicates 1 co-integrating eqn(s) at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test(Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical value	Prob.**
None	0.051	27.384	11.224	0.000
At most 1	4.93E-05	0.025	4.129	0.896
Maximum Eigenvalue test indicates 1 co-integrating eqn(s) at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **Mackinnon-Haug-Michelis (1999) p-values				