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APPENDICES

Appendix A1 - Monthly closings of Portfolio constituents and Bench mark index

MONTH	DATE	SAMSUNG	CHINA_MOB	NASPERS	EMAR	KCHOL	AK_BANK	BRKMS	TAIWAN_CE	MSCI_INDEX
134	9/30/2015	1,134,000	59.50	173,066	6.46	11.80	6.78	16.67	33.35	792.05
133	8/31/2015	1,089,000	59.82	171,900	6.75	11.35	6.82	14.07	34.85	818.73
132	7/31/2015	1,185,000	65.00	177,000	7.90	12.30	7.42	12.54	34.20	901.68
131	6/30/2015	1,268,000	64.09	189,500	7.88	12.40	7.75	13.62	38.95	972.25
130	5/29/2015	1,307,000	65.74	178,505	7.75	11.90	7.93	12.97	41.70	1004.22
129	4/30/2015	1,410,000	71.43	187,103	8.24	12.65	7.79	12.60	43.60	1047.78
128	3/31/2015	1,441,000	65.03	187,000	6.60	11.85	7.65	11.00	44.10	974.57
127	2/27/2015	1,357,000	67.75	171,225	7.55	11.70	8.20	12.80	42.95	990.28
126	1/30/2015	1,365,000	65.32	169,785	6.70	12.75	8.96	12.45	42.60	961.61
125	12/31/2014	1,327,000	58.82	151,512	7.26	12.40	8.66	17.50	43.40	956.31
124	11/28/2014	1,287,000	61.72	143,396	10.60	12.50	8.99	19.25	45.45	1004.72
123	10/31/2014	1,244,000	62.09	137,264	10.00	11.35	8.03	18.13	46.45	1016.07
122	9/30/2014	1,184,000	58.75	124,500	11.55	10.50	7.42	16.20	45.30	1005.33
121	8/29/2014	1,234,000	62.28	135,552	11.15	11.05	8.24	15.25	47.50	1087.88
120	7/31/2014	1,343,000	54.49	133,068	9.77	11.25	8.53	14.03	44.85	1065.77
119	6/30/2014	1,322,000	48.61	125,200	8.41	10.40	7.79	14.09	45.20	1050.78
118	5/30/2014	1,443,000	49.06	116,673	10.45	10.35	8.18	14.64	44.60	1027.69
117	4/30/2014	1,343,000	47.43	99,200	9.91	9.43	7.37	15.22	47.90	995.28
116	3/31/2014	1,343,000	45.59	116,134	9.05	9.02	6.80	17.79	47.00	994.65
115	2/28/2014	1,349,000	47.55	129,878	8.27	8.18	5.72	16.15	48.30	966.42
114	1/31/2014	1,280,000	47.85	113,567	7.27	7.66	5.76	18.58	44.30	936.53
113	12/31/2013	1,372,000	52.29	109,601	6.95	8.80	6.70	21.00	46.25	1002.69
112	11/29/2013	1,494,000	54.24	97,288	5.73	9.54	7.40	20.80	46.85	1018.28
111	10/31/2013	1,465,000	52.02	93,900	5.53	9.80	7.84	19.88	42.75	1034.42
110	9/30/2013	1,367,000	56.43	92,844	5.30	9.32	7.44	17.75	42.80	987.46
109	8/30/2013	1,368,000	53.97	84,837	5.23	8.24	6.78	17.55	39.50	929.54
108	7/31/2013	1,280,000	52.92	82,590	5.43	8.54	7.44	17.58	36.65	947.55
107	6/28/2013	1,342,000	51.77	73,000	4.71	9.26	7.86	16.47	36.90	940.33
106	5/31/2013	1,538,000	51.80	74,513	5.43	10.65	8.94	16.71	39.45	1008.88

105	4/30/2013	1,520,000	55.24	60,050	5.10	10.85	9.42	17.40	39.20	1039.45
104	3/29/2013	1,527,000	53.13	57,285	4.66	10.50	9.46	13.65	37.50	1034.9
103	2/28/2013	1,544,000	54.80	58,282	4.82	9.46	8.74	14.58	38.05	1054.62
102	1/31/2013	1,448,000	54.70	57,883	4.43	9.18	8.90	15.01	39.90	1069.01
101	12/31/2012	1,522,000	58.72	54,320	3.41	9.26	8.80	12.80	38.90	1055.2
100	11/30/2012	1,406,000	56.92	54,900	3.42	8.18	8.38	13.78	38.05	1007.02
99	10/31/2012	1,310,000	55.39	56,291	3.28	8.42	8.64	13.42	37.45	995.33
98	9/28/2012	1,346,000	55.36	51,497	3.16	7.18	7.10	14.27	36.30	1002.66
97	8/31/2012	1,233,000	53.69	48,900	3.01	7.40	7.18	12.80	32.55	947.33
96	7/31/2012	1,309,000	58.12	44,990	3.09	7.00	6.76	12.39	34.90	952.49
95	6/29/2012	1,201,000	54.67	43,499	2.55	6.90	6.62	13.38	35.35	937.35
94	5/31/2012	1,211,000	50.73	44,889	2.65	5.56	5.70	11.25	33.75	906.3
93	4/30/2012	1,390,000	55.34	46,845	2.97	6.21	6.52	13.40	34.85	1026.02
92	3/30/2012	1,275,000	55.08	43,100	2.76	6.90	7.00	14.45	34.55	1041.45
91	2/29/2012	1,206,000	53.01	41,692	2.87	6.93	7.02	15.58	37.75	1079.44
90	1/31/2012	1,107,000	51.08	39,178	2.49	6.59	6.68	15.64	36.90	1019.39
89	12/30/2011	1,058,000	48.49	35,319	2.34	5.41	6.02	12.80	35.00	916.39
88	11/30/2011	1,004,000	49.67	36,435	2.46	6.02	6.46	13.99	32.55	928.32
87	10/31/2011	968,000	47.56	37,999	2.53	6.02	6.46	15.30	37.85	995
86	9/30/2011	840,000	48.71	35,097	2.50	6.59	7.34	14.58	32.90	880.43
85	8/31/2011	744,000	51.17	36,601	2.60	5.81	6.40	18.90	38.75	1033.15
84	7/29/2011	844,000	49.83	35,820	2.62	6.74	7.38	18.39	45.60	1137.73
83	6/30/2011	826,000	46.78	38,195	2.75	6.65	7.50	22.29	42.80	1146.22
82	5/31/2011	902,000	45.77	40,375	2.86	6.90	7.40	24.70	41.70	1167.97
81	4/29/2011	893,000	46.09	39,500	2.99	7.79	7.90	22.90	41.95	1204.03
80	3/31/2011	932,000	46.25	36,400	2.94	6.84	7.50	21.64	35.50	1170.87
79	2/28/2011	923,000	47.27	39,995	2.43	6.38	7.48	20.28	29.40	1107.77
78	1/31/2011	981,000	49.14	37,300	2.77	6.23	7.52	20.97	31.35	1119.08
77	12/31/2010	949,000	49.62	38,795	3.23	7.16	8.58	20.37	32.80	1151.38
76	11/30/2010	826,000	49.85	35,400	3.29	6.72	8.50	18.19	31.35	1075.85
75	10/29/2010	745,000	51.37	36,782	3.50	6.52	9.00	17.44	32.19	1105.75
74	9/30/2010	777,000	51.13	34,080	3.39	6.57	8.85	17.18	32.98	1075.53

73	8/31/2010	756,000	51.32	29,778	2.96	5.67	8.10	15.48	29.08	970.05
72	7/30/2010	810,000	50.94	31,100	2.96	5.67	8.35	13.21	29.43	991.41
71	6/30/2010	774,000	49.41	25,990	2.78	5.14	7.65	12.53	26.96	917.99
70	5/31/2010	776,000	46.57	30,130	3.05	5.19	7.80	10.79	27.01	926.4
69	4/30/2010	849,000	48.90	30,000	3.56	5.48	7.45	12.57	27.95	1020.03
68	3/31/2010	818,000	48.12	31,650	3.64	4.95	7.35	13.09	29.57	1010.33
67	2/26/2010	744,000	49.43	28,800	2.71	4.38	5.85	12.78	29.23	935.93
66	1/29/2010	784,000	46.95	27,000	2.79	4.86	6.60	13.26	29.48	933.59
65	12/31/2009	799,000	46.43	30,000	3.51	4.21	7.09	14.08	33.57	989.47
64	11/30/2009	720,000	46.87	27,731	3.41	3.56	6.15	11.52	33.13	953.13
63	10/30/2009	723,000	46.73	28,444	3.99	3.66	6.15	11.70	33.57	914.26
62	9/30/2009	815,000	49.11	25,667	3.68	3.71	6.45	11.26	35.65	914.05
61	8/31/2009	771,000	49.22	25,450	3.16	3.79	6.45	10.46	35.25	839.46
60	7/31/2009	724,000	52.47	23,150	2.49	3.30	6.23	8.31	34.31	844.02
59	6/30/2009	592,000	50.08	20,300	2.53	2.53	5.18	7.18	31.01	761.3
58	5/29/2009	558,000	49.21	19,061	3.16	2.79	4.84	7.16	33.57	773.12
57	4/30/2009	592,000	43.16	17,382	2.14	2.32	4.65	6.17	31.20	662.73
56	3/31/2009	568,000	43.52	16,000	2.00	1.86	3.66	4.81	27.60	569.97
55	2/27/2009	477,000	43.35	15,400	1.87	1.68	2.94	5.38	25.87	499.3
54	1/30/2009	488,000	44.97	15,705	1.78	1.83	3.59	5.71	22.07	529.53
53	12/31/2008	451,000	50.85	16,625	2.06	2.08	3.59	5.55	26.61	567.04
52	11/28/2008	486,000	45.83	15,420	2.66	2.00	3.23	6.26	24.39	526.97
51	10/31/2008	535,000	43.89	16,200	4.86	2.25	3.92	9.41	16.74	570.52
50	9/30/2008	539,000	50.08	16,100	7.05	3.11	4.91	10.17	18.42	786.92
49	8/29/2008	516,000	56.72	19,375	8.28	3.29	4.61	11.68	30.71	956.25
48	7/31/2008	564,000	66.85	17,929	9.55	3.70	4.88	13.80	38.81	1041.86
47	6/30/2008	625,000	66.95	17,100	9.86	2.65	3.18	12.76	40.09	1087.12
46	5/30/2008	741,000	73.79	17,750	10.41	2.73	4.05	13.24	49.86	1210.04
45	4/30/2008	711,000	86.32	16,426	10.46	3.04	4.99	14.32	48.40	1191.53
44	3/31/2008	623,000	75.01	14,100	9.96	2.57	4.20	14.90	57.59	1104.58
43	2/29/2008	560,000	74.62	14,919	11.32	3.20	4.91	14.34	53.77	1167.66
42	1/31/2008	595,000	75.52	13,700	10.91	3.15	5.06	13.00	40.87	1088.72

41	12/31/2007	556,000	86.87	16,200	13.55	4.38	6.53	14.40	44.00	1245.59
40	11/30/2007	565,000	91.66	18,000	11.27	4.14	6.45	15.75	46.00	1242.06
39	10/31/2007	550,000	103.68	20,600	11.73	4.38	7.95	16.31	53.97	1337.63
38	9/28/2007	575,000	82.04	19,102	9.68	4.38	6.90	17.27	51.72	1204.9
37	8/31/2007	591,000	67.79	17,910	9.91	4.11	6.23	18.10	41.45	1086.98
36	7/31/2007	614,000	57.39	17,900	9.91	4.14	6.64	17.27	38.96	1112.77
35	6/29/2007	566,000	53.90	18,200	10.77	3.62	5.48	17.26	36.88	1059.69
34	5/31/2007	535,000	46.42	18,795	11.09	3.83	5.55	16.40	30.11	1014.78
33	4/30/2007	574,000	45.01	17,900	9.77	3.56	6.00	17.35	28.80	969.93
32	3/30/2007	563,000	44.85	17,550	10.05	3.33	5.58	15.21	27.01	929.03
31	2/28/2007	567,000	46.47	17,150	11.68	3.25	5.58	13.78	26.77	895.54
30	1/31/2007	579,000	46.15	18,209	11.50	3.17	5.40	15.53	27.30	901.48
29	12/29/2006	613,000	43.22	16,600	11.09	2.90	5.16	15.00	28.51	912.65
28	11/30/2006	638,000	42.20	14,600	10.73	2.63	4.89	15.78	28.41	874.08
27	10/31/2006	611,000	40.78	13,330	12.59	2.98	4.98	15.15	25.41	814.44
26	9/29/2006	664,000	35.35	11,960	12.73	2.57	4.65	13.53	24.01	778.16
25	8/31/2006	650,000	33.31	12,450	12.82	2.88	4.80	13.95	21.25	773.12
24	7/31/2006	608,000	32.33	12,185	10.05	2.75	4.32	11.30	23.02	755.84
23	6/30/2006	603,000	28.61	12,187	9.91	2.49	4.56	13.29	22.68	747.54
22	5/31/2006	612,000	25.85	12,300	11.46	2.93	4.57	14.12	25.92	751
21	4/28/2006	644,000	28.86	13,200	13.09	3.48	5.40	14.70	23.83	841.58
20	3/31/2006	630,000	26.54	12,550	16.86	3.43	5.55	16.12	23.83	787.8
19	2/28/2006	687,000	24.23	12,255	16.73	3.84	6.58	18.24	23.35	782.11
18	1/31/2006	740,000	24.60	13,000	18.14	3.50	5.65	17.02	22.78	783.77
17	12/30/2005	659,000	24.04	11,201	20.73	3.05	5.40	19.00	22.35	706.48
16	11/30/2005	598,000	24.49	10,402	21.59	3.19	5.30	19.90	19.97	667.99
15	10/31/2005	552,000	22.45	9,685	24.23	2.42	4.12	19.40	19.63	617.41
14	9/30/2005	588,000	24.64	10,399	24.50	2.93	4.39	22.99	19.97	661.32
13	8/31/2005	544,000	21.85	10,400	20.68	3.00	3.90	23.43	18.43	606.23
12	7/29/2005	565,000	20.17	9,605	15.50	2.63	3.61	22.80	17.97	602.56
11	6/30/2005	494,000	18.59	8,300	20.60	2.52	3.15	19.55	17.84	565.17
10	5/31/2005	489,000	18.26	8,350	11.87	2.48	2.99	22.96	16.20	548.15

9	4/29/2005	452,000	17.80	7,318	11.08	2.22	2.72	24.57	17.25	531.99
8	3/31/2005	502,000	16.41	7,121	5.91	2.52	2.68	27.07	16.61	548.69
7	2/28/2005	527,000	16.20	7,786	5.92	2.94	3.27	32.75	18.34	588.68
6	1/31/2005	495,000	15.74	7,485	5.44	2.92	3.42	29.19	18.25	542.28
5	12/31/2004	450,500	17.16	7,500	5.23	2.97	3.42	33.50	18.97	542.17
4	11/30/2004	434,500	16.32	6,690	4.12	2.65	2.78	29.60	17.61	517.95
3	10/29/2004	439,500	14.55	5,620	3.19	3.02	2.72	26.25	16.43	474.27
2	9/30/2004	458,000	15.30	5,121	3.24	2.97	2.78	23.80	17.07	464.15
1	8/31/2004	451,000	14.62	4,896	2.49	2.75	2.62	21.20	15.43	439.75
0	7/30/2004	417,000	14.52	4,500	2.38	2.55	2.48	15.30	13.11	423.14

Table 4.2 : Monthly closings of the eight stocks and the MSCI Emerging market index

Appendix A2 - Monthly returns of Portfolio constituents and Bench mark index

MONTH	DATE	RETSAM	RETCHINA	RETNASP	RETEMAR	RETKCHOL	RETAKBANK	RETBKRM	RETTAIWAN	REINDEX
134	09/30/15	0.0413	-0.0053	0.0068	-0.0430	0.0396	-0.0059	0.1848	-0.0430	-0.0326
133	08/31/15	-0.0810	-0.0797	-0.0288	-0.1456	-0.0772	-0.0809	0.1220	0.0190	-0.0920
132	07/31/15	-0.0655	0.0142	-0.0660	0.0025	-0.0081	-0.0426	-0.0793	-0.1220	-0.0726
131	06/30/15	-0.0298	-0.0251	0.0616	0.0168	0.0420	-0.0227	0.0501	-0.0659	-0.0318
130	05/29/15	-0.0730	-0.0797	-0.0460	-0.0595	-0.0593	0.0180	0.0294	-0.0436	-0.0416
129	04/30/15	-0.0215	0.0984	0.0006	0.2485	0.0675	0.0183	0.1455	-0.0113	0.0751
128	03/31/15	0.0619	-0.0401	0.0921	-0.1258	0.0128	-0.0671	-0.1406	0.0268	-0.0159
127	02/27/15	-0.0059	0.0372	0.0085	0.1269	-0.0824	-0.0848	0.0281	0.0082	0.0298
126	01/30/15	0.0286	0.1105	0.1206	-0.0771	0.0282	0.0346	-0.2886	-0.0184	0.0055
125	12/31/14	0.0311	-0.0470	0.0566	-0.3151	-0.0080	-0.0367	-0.0909	-0.0451	-0.0482
124	11/28/14	0.0346	-0.0060	0.0447	0.0600	0.1013	0.1196	0.0618	-0.0215	-0.0112
123	10/31/14	0.0507	0.0569	0.1025	-0.1342	0.0810	0.0822	0.1191	0.0254	0.0107
122	09/30/14	-0.0405	-0.0567	-0.0815	0.0359	-0.0498	-0.0995	0.0623	-0.0463	-0.0759
121	08/29/14	-0.0812	0.1430	0.0187	0.1412	-0.0178	-0.0340	0.0870	0.0591	0.0207

120	07/31/14	0.0159	0.1210	0.0628	0.1617	0.0817	0.0950	-0.0043	-0.0077	0.0143
119	06/30/14	-0.0839	-0.0092	0.0731	-0.1952	0.0048	-0.0477	-0.0376	0.0135	0.0225
118	05/30/14	0.0745	0.0344	0.1761	0.0546	0.0976	0.1099	-0.0381	-0.0689	0.0326
117	04/30/14	0.0000	0.0404	-0.1458	0.0955	0.0455	0.0838	-0.1445	0.0191	0.0006
116	03/31/14	-0.0044	-0.0412	-0.1058	0.0933	0.1027	0.1888	0.1015	-0.0269	0.0292
115	02/28/14	0.0539	-0.0063	0.1436	0.1375	0.0679	-0.0069	-0.1308	0.0903	0.0319
114	01/31/14	-0.0671	-0.0849	0.0362	0.0472	-0.1295	-0.1403	-0.1152	-0.0422	-0.0660
113	12/31/13	-0.0817	-0.0360	0.1266	0.2127	-0.0776	-0.0946	0.0096	-0.0128	-0.0153
112	11/29/13	0.0198	0.0427	0.0361	0.0362	-0.0265	-0.0561	0.0463	0.0959	-0.0156
111	10/31/13	0.0717	-0.0781	0.0114	0.0428	0.0515	0.0538	0.1200	-0.0012	0.0476
110	09/30/13	-0.0007	0.0456	0.0944	0.0140	0.1311	0.0973	0.0114	0.0835	0.0623
109	08/30/13	0.0688	0.0198	0.0272	-0.0369	-0.0351	-0.0887	-0.0017	0.0778	-0.0190
108	07/31/13	-0.0462	0.0222	0.1314	0.1525	-0.0778	-0.0534	0.0674	-0.0068	0.0077
107	06/28/13	-0.1274	-0.0006	-0.0203	-0.1323	-0.1305	-0.1208	-0.0144	-0.0646	-0.0679
106	05/31/13	0.0118	-0.0623	0.2408	0.0641	-0.0184	-0.0510	-0.0397	0.0064	-0.0294
105	04/30/13	-0.0046	0.0397	0.0483	0.0956	0.0333	-0.0042	0.2747	0.0453	0.0044
104	03/29/13	-0.0110	-0.0305	-0.0171	-0.0338	0.1099	0.0824	-0.0638	-0.0145	-0.0187
103	02/28/13	0.0663	0.0018	0.0069	0.0883	0.0305	-0.0180	-0.0286	-0.0464	-0.0135
102	01/31/13	-0.0486	-0.0685	0.0656	0.2986	-0.0086	0.0114	0.1727	0.0257	0.0131
101	12/31/12	0.0825	0.0316	-0.0106	-0.0026	0.1320	0.0501	-0.0711	0.0223	0.0478
100	11/30/12	0.0733	0.0276	-0.0247	0.0414	-0.0285	-0.0301	0.0268	0.0160	0.0117
99	10/31/12	-0.0267	0.0005	0.0931	0.0373	0.1727	0.2169	-0.0596	0.0317	-0.0073
98	09/28/12	0.0916	0.0311	0.0531	0.0515	-0.0297	-0.0111	0.1148	0.1152	0.0584
97	08/31/12	-0.0581	-0.0762	0.0869	-0.0265	0.0571	0.0621	0.0331	-0.0673	-0.0054
96	07/31/12	0.0899	0.0631	0.0343	0.2145	0.0145	0.0211	-0.0740	-0.0127	0.0162
95	06/29/12	-0.0083	0.0777	-0.0310	-0.0378	0.2406	0.1614	0.1893	0.0474	0.0343
94	05/31/12	-0.1288	-0.0833	-0.0418	-0.1103	-0.1043	-0.1258	-0.1604	-0.0316	-0.1167
93	04/30/12	0.0902	0.0047	0.0869	0.0791	-0.0993	-0.0686	-0.0727	0.0087	-0.0148
92	03/30/12	0.0572	0.0390	0.0338	-0.0411	-0.0055	-0.0028	-0.0725	-0.0848	-0.0352
91	02/29/12	0.0894	0.0378	0.0642	0.1534	0.0520	0.0509	-0.0038	0.0230	0.0589
90	01/31/12	0.0463	0.0534	0.1093	0.0664	0.2181	0.1096	0.2219	0.0543	0.1124
89	12/30/11	0.0538	-0.0238	-0.0306	-0.0519	-0.1012	-0.0681	-0.0851	0.0753	-0.0129

88	11/30/11	0.0372	0.0444	-0.0412	-0.0249	0.0000	0.0000	-0.0856	-0.1400	-0.0670
87	10/31/11	0.1524	-0.0236	0.0827	0.0108	-0.0866	-0.1199	0.0494	0.1505	0.1301
86	09/30/11	0.1290	-0.0481	-0.0411	-0.0385	0.1343	0.1469	-0.2286	-0.1510	-0.1478
85	08/31/11	-0.1185	0.0269	0.0218	-0.0069	-0.1384	-0.1328	0.0277	-0.1502	-0.0919
84	07/29/11	0.0218	0.0652	-0.0622	-0.0463	0.0143	-0.0160	-0.1750	0.0654	-0.0074
83	06/30/11	-0.0843	0.0221	-0.0540	-0.0416	-0.0358	0.0135	-0.0976	0.0264	-0.0186
82	05/31/11	0.0101	-0.0069	0.0222	-0.0425	-0.1149	-0.0633	0.0786	-0.0060	-0.0299
81	04/29/11	-0.0418	-0.0035	0.0852	0.0187	0.1392	0.0533	0.0582	0.1817	0.0283
80	03/31/11	0.0098	-0.0216	-0.0899	0.2097	0.0716	0.0027	0.0671	0.2075	0.0570
79	02/28/11	-0.0591	-0.0381	0.0723	-0.1248	0.0244	-0.0053	-0.0329	-0.0622	-0.0101
78	01/31/11	0.0337	-0.0097	-0.0385	-0.1407	-0.1303	-0.1235	0.0295	-0.0442	-0.0281
77	12/31/10	0.1489	-0.0046	0.0959	-0.0194	0.0651	0.0094	0.1198	0.0463	0.0702
76	11/30/10	0.1087	-0.0296	-0.0376	-0.0597	0.0307	-0.0556	0.0430	-0.0261	-0.0270
75	10/29/10	-0.0412	0.0047	0.0793	0.0321	-0.0072	0.0169	0.0151	-0.0240	0.0281
74	09/30/10	0.0278	-0.0037	0.1445	0.1441	0.1595	0.0926	0.1098	0.1341	0.1087
73	08/31/10	-0.0667	0.0075	-0.0425	0.0000	0.0000	-0.0299	0.1718	-0.0119	-0.0215
72	07/30/10	0.0465	0.0310	0.1966	0.0654	0.1019	0.0915	0.0543	0.0916	0.0800
71	06/30/10	-0.0026	0.0610	-0.1374	-0.0864	-0.0091	-0.0192	0.1613	-0.0019	-0.0091
70	05/31/10	-0.0860	-0.0476	0.0043	-0.1435	-0.0522	0.0470	-0.1416	-0.0336	-0.0918
69	04/30/10	0.0379	0.0162	-0.0521	-0.0223	0.1058	0.0136	-0.0397	-0.0548	0.0096
68	03/31/10	0.0995	-0.0265	0.0990	0.3422	0.1303	0.2564	0.0243	0.0116	0.0795
67	02/26/10	-0.0510	0.0528	0.0667	-0.0294	-0.0980	-0.1136	-0.0362	-0.0085	0.0025
66	01/29/10	-0.0188	0.0112	-0.1000	-0.2046	0.1537	-0.0688	-0.0582	-0.1218	-0.0565
65	12/31/09	0.1097	-0.0094	0.0818	0.0293	0.1819	0.1525	0.2222	0.0133	0.0381
64	11/30/09	-0.0041	0.0030	-0.0251	-0.1458	-0.0260	0.0000	-0.0154	-0.0131	0.0425
63	10/30/09	-0.1129	-0.0485	0.1082	0.0839	-0.0153	-0.0465	0.0391	-0.0583	0.0002
62	09/30/09	0.0571	-0.0022	0.0085	0.1670	-0.0201	0.0000	0.0765	0.0113	0.0889
61	08/31/09	0.0649	-0.0619	0.0994	0.2666	0.1502	0.0361	0.2587	0.0274	-0.0054
60	07/31/09	0.2230	0.0477	0.1404	-0.0142	0.3008	0.2029	0.1574	0.1064	0.1087
59	06/30/09	0.0609	0.0177	0.0650	-0.1990	-0.0934	0.0697	0.0028	-0.0763	-0.0153
58	05/29/09	-0.0574	0.1402	0.0966	0.4771	0.2059	0.0404	0.1605	0.0760	0.1666
57	04/30/09	0.0423	-0.0083	0.0864	0.0680	0.2477	0.2705	0.2827	0.1304	0.1627

56	03/31/09	0.1908	0.0039	0.0390	0.0678	0.1034	0.2449	-0.1059	0.0669	0.1415
55	02/27/09	-0.0225	-0.0360	-0.0194	0.0511	-0.0818	-0.1799	-0.0578	0.1722	-0.0571
54	01/30/09	0.0820	-0.1156	-0.0553	-0.1328	-0.1183	0.0000	0.0288	-0.1706	-0.0662
53	12/31/08	-0.0720	0.1095	0.0781	-0.2286	0.0395	0.1116	-0.1134	0.0910	0.0760
52	11/28/08	-0.0916	0.0442	-0.0481	-0.4513	-0.1127	-0.1762	-0.3348	0.4570	-0.0763
51	10/31/08	-0.0074	-0.1236	0.0062	-0.3109	-0.2755	-0.2031	-0.0747	-0.0912	-0.2750
50	09/30/08	0.0446	-0.1171	-0.1690	-0.1494	-0.0533	0.0650	-0.1293	-0.4002	-0.1771
49	08/29/08	-0.0851	-0.1515	0.0807	-0.1323	-0.1114	-0.0537	-0.1536	-0.2087	-0.0822
48	07/31/08	-0.0976	-0.0015	0.0485	-0.0323	0.3949	0.5330	0.0815	-0.0319	-0.0416
47	06/30/08	-0.1565	-0.0927	-0.0366	-0.0524	-0.0289	-0.2148	-0.0363	-0.1959	-0.1016
46	05/30/08	0.0422	-0.1452	0.0806	-0.0044	-0.1011	-0.1881	-0.0754	0.0302	0.0155
45	04/30/08	0.1413	0.1508	0.1650	0.0502	0.1831	0.1876	-0.0389	-0.1596	0.0787
44	03/31/08	0.1125	0.0052	-0.0549	-0.1204	-0.1983	-0.1451	0.0391	0.0710	-0.0540
43	02/29/08	-0.0588	-0.0119	0.0890	0.0375	0.0175	-0.0296	0.1031	0.3156	0.0725
42	01/31/08	0.0701	-0.1307	-0.1543	-0.1946	-0.2818	-0.2241	-0.0972	-0.0711	-0.1259
41	12/31/07	-0.0159	-0.0523	-0.1000	0.2015	0.0582	0.0116	-0.0857	-0.0435	0.0028
40	11/30/07	0.0273	-0.1159	-0.1262	-0.0387	-0.0550	-0.1887	-0.0343	-0.1477	-0.0714
39	10/31/07	-0.0435	0.2638	0.0784	0.2112	0.0000	0.1522	-0.0556	0.0435	0.1102
38	09/28/07	-0.0271	0.2102	0.0666	-0.0229	0.0672	0.1084	-0.0459	0.2478	0.1085
37	08/31/07	-0.0375	0.1812	0.0006	0.0000	-0.0085	-0.0622	0.0481	0.0639	-0.0232
36	07/31/07	0.0848	0.0647	-0.0165	-0.0802	0.1430	0.2124	0.0006	0.0564	0.0501
35	06/29/07	0.0579	0.1611	-0.0317	-0.0287	-0.0533	-0.0135	0.0524	0.2248	0.0443
34	05/31/07	-0.0679	0.0313	0.0500	0.1349	0.0741	-0.0750	-0.0548	0.0455	0.0462
33	04/30/07	0.0195	0.0036	0.0199	-0.0271	0.0716	0.0753	0.1407	0.0663	0.0440
32	03/30/07	-0.0071	-0.0349	0.0233	-0.1401	0.0243	0.0000	0.1038	0.0090	0.0374
31	02/28/07	-0.0207	0.0069	-0.0582	0.0158	0.0249	0.0333	-0.1127	-0.0194	-0.0066
30	01/31/07	-0.0555	0.0678	0.0969	0.0369	0.0909	0.0465	0.0353	-0.0424	-0.0122
29	12/29/06	-0.0392	0.0242	0.1370	0.0339	0.1042	0.0552	-0.0494	0.0035	0.0441
28	11/30/06	0.0442	0.0348	0.0953	-0.1480	-0.1184	-0.0181	0.0416	0.1181	0.0732
27	10/31/06	-0.0798	0.1536	0.1145	-0.0107	0.1626	0.0710	0.1197	0.0583	0.0466
26	09/29/06	0.0215	0.0612	-0.0394	-0.0071	-0.1084	-0.0312	-0.0301	0.1299	0.0065
25	08/31/06	0.0691	0.0303	0.0217	0.2761	0.0481	0.1111	0.2345	-0.0769	0.0229

24	07/31/06	0.0083	0.1300	-0.0002	0.0137	0.1020	-0.0526	-0.1497	0.0150	0.0111
23	06/30/06	-0.0147	0.1068	-0.0092	-0.1350	-0.1490	-0.0013	-0.0588	-0.1250	-0.0046
22	05/31/06	-0.0497	-0.1043	-0.0682	-0.1250	-0.1587	-0.1544	-0.0395	0.0877	-0.1076
21	04/28/06	0.0222	0.0874	0.0518	-0.2237	0.0140	-0.0265	-0.0881	0.0000	0.0683
20	03/31/06	-0.0830	0.0953	0.0241	0.0082	-0.1063	-0.1567	-0.1162	0.0206	0.0073
19	02/28/06	-0.0716	-0.0150	-0.0573	-0.0777	0.0959	0.1651	0.0717	0.0250	-0.0021
18	01/31/06	0.1229	0.0233	0.1606	-0.1250	0.1497	0.0456	-0.1042	0.0192	0.1094
17	12/30/05	0.1020	-0.0184	0.0768	-0.0400	-0.0451	0.0185	-0.0452	0.1192	0.0576
16	11/30/05	0.0833	0.0909	0.0740	-0.1088	0.3197	0.2856	0.0258	0.0173	0.0819
15	10/31/05	-0.0612	-0.0889	-0.0687	-0.0111	-0.1739	-0.0614	-0.1562	-0.0170	-0.0664
14	09/30/05	0.0809	0.1277	-0.0001	0.1846	-0.0240	0.1258	-0.0188	0.0836	0.0909
13	08/31/05	-0.0372	0.0833	0.0828	0.3343	0.1416	0.0818	0.0276	0.0256	0.0061
12	07/29/05	0.1437	0.0850	0.1572	-0.2474	0.0425	0.1454	0.1662	0.0073	0.0662
11	06/30/05	0.0102	0.0181	-0.0060	0.7359	0.0174	0.0549	-0.1485	0.1012	0.0310
10	05/31/05	0.0819	0.0258	0.1410	0.0707	0.1153	0.0974	-0.0653	-0.0609	0.0304
9	04/29/05	-0.0996	0.0847	0.0277	0.8751	-0.1187	0.0153	-0.0926	0.0385	-0.0304
8	03/31/05	-0.0474	0.0130	-0.0854	-0.0019	-0.1414	-0.1812	-0.1733	-0.0943	-0.0679
7	02/28/05	0.0646	0.0292	0.0402	0.0884	0.0058	-0.0419	0.1220	0.0049	0.0856
6	01/31/05	0.0988	-0.0828	-0.0020	0.0400	-0.0168	0.0000	-0.1287	-0.0380	0.0002
5	12/31/04	0.0368	0.0515	0.1211	0.2703	0.1208	0.2279	0.1318	0.0772	0.0468
4	11/30/04	-0.0114	0.1216	0.1904	0.2913	-0.1229	0.0224	0.1276	0.0718	0.0921
3	10/29/04	-0.0404	-0.0490	0.0974	-0.0154	0.0172	-0.0219	0.1029	-0.0375	0.0218
2	09/30/04	0.0155	0.0465	0.0460	0.2987	0.0797	0.0626	0.1226	0.1063	0.0555
1	08/31/04	0.0815	0.0069	0.0880	0.0492	0.0793	0.0578	0.3856	0.1770	0.0393
0	07/30/04									

Table 4.3 : Monthly returns of the eight stocks and the MSCI Emerging market index

Appendix A3 - Excess Returns of Portfolio constituents

MONTH	DATE	EXC.RETSAM	EXC.RETCHI	EXC.RETNAS	EXC.RETEMAR	EXC.RETKCHO	EXC.RETAK	EXC.RETBRM	EXC.RETTAIW
134	9/30/2015	0.0313	-0.0185	-0.0238	-0.0637	0.0219	-0.0197	0.1773	-0.0551
133	8/31/2015	-0.0910	-0.0928	-0.0594	-0.1663	-0.0950	-0.0947	0.1145	0.0069
132	7/31/2015	-0.0755	0.0011	-0.0966	-0.0182	-0.0258	-0.0564	-0.0868	-0.1340
131	6/30/2015	-0.0399	-0.0382	0.0310	-0.0040	0.0243	-0.0365	0.0426	-0.0780
130	5/29/2015	-0.0831	-0.0928	-0.0766	-0.0802	-0.0770	0.0042	0.0219	-0.0556
129	4/30/2015	-0.0315	0.0853	-0.0301	0.2277	0.0498	0.0045	0.1380	-0.0234
128	3/31/2015	0.0519	-0.0533	0.0615	-0.1466	-0.0049	-0.0809	-0.1481	0.0147
127	2/27/2015	-0.0159	0.0241	-0.0221	0.1061	-0.1001	-0.0986	0.0206	-0.0038
126	1/30/2015	0.0186	0.0974	0.0900	-0.0979	0.0105	0.0208	-0.2961	-0.0305
125	12/31/2014	0.0210	-0.0601	0.0260	-0.3358	-0.0257	-0.0505	-0.0984	-0.0572
124	11/28/2014	0.0245	-0.0191	0.0141	0.0393	0.0836	0.1057	0.0543	-0.0336
123	10/31/2014	0.0406	0.0437	0.0719	-0.1549	0.0632	0.0684	0.1116	0.0133
122	9/30/2014	-0.0506	-0.0698	-0.1122	0.0151	-0.0675	-0.1133	0.0548	-0.0584
121	8/29/2014	-0.0912	0.1298	-0.0120	0.1205	-0.0355	-0.0478	0.0795	0.0470
120	7/31/2014	0.0059	0.1078	0.0322	0.1410	0.0640	0.0812	-0.0117	-0.0198
119	6/30/2014	-0.0939	-0.0223	0.0425	-0.2160	-0.0129	-0.0615	-0.0451	0.0014
118	5/30/2014	0.0644	0.0212	0.1455	0.0339	0.0798	0.0961	-0.0456	-0.0810
117	4/30/2014	-0.0100	0.0272	-0.1764	0.0748	0.0277	0.0700	-0.1520	0.0071
116	3/31/2014	-0.0145	-0.0544	-0.1364	0.0726	0.0850	0.1750	0.0941	-0.0390
115	2/28/2014	0.0439	-0.0194	0.1130	0.1168	0.0502	-0.0208	-0.1383	0.0782
114	1/31/2014	-0.0771	-0.0980	0.0056	0.0265	-0.1473	-0.1541	-0.1227	-0.0542
113	12/31/2013	-0.0917	-0.0491	0.0959	0.1919	-0.0953	-0.1084	0.0021	-0.0249
112	11/29/2013	0.0098	0.0295	0.0055	0.0154	-0.0443	-0.0699	0.0388	0.0838
111	10/31/2013	0.0617	-0.0913	-0.0192	0.0221	0.0338	0.0400	0.1125	-0.0132
110	9/30/2013	-0.0108	0.0324	0.0638	-0.0068	0.1133	0.0835	0.0039	0.0715

109	8/30/2013	0.0587	0.0067	-0.0034	-0.0576	-0.0529	-0.1025	-0.0092	0.0657
108	7/31/2013	-0.0562	0.0091	0.1007	0.1317	-0.0955	-0.0672	0.0599	-0.0188
107	6/28/2013	-0.1375	-0.0137	-0.0509	-0.1530	-0.1482	-0.1346	-0.0219	-0.0767
106	5/31/2013	0.0018	-0.0754	0.2102	0.0434	-0.0362	-0.0648	-0.0471	-0.0057
105	4/30/2013	-0.0146	0.0266	0.0176	0.0749	0.0156	-0.0180	0.2672	0.0333
104	3/29/2013	-0.0210	-0.0436	-0.0477	-0.0546	0.0922	0.0686	-0.0713	-0.0265
103	2/28/2013	0.0563	-0.0113	-0.0237	0.0676	0.0128	-0.0318	-0.0361	-0.0584
102	1/31/2013	-0.0587	-0.0816	0.0350	0.2779	-0.0264	-0.0024	0.1652	0.0136
101	12/31/2012	0.0725	0.0185	-0.0412	-0.0234	0.1143	0.0363	-0.0786	0.0103
100	11/30/2012	0.0632	0.0145	-0.0553	0.0207	-0.0462	-0.0439	0.0193	0.0040
99	10/31/2012	-0.0368	-0.0126	0.0625	0.0166	0.1550	0.2031	-0.0671	0.0196
98	9/28/2012	0.0816	0.0180	0.0225	0.0308	-0.0475	-0.0249	0.1074	0.1031
97	8/31/2012	-0.0681	-0.0894	0.0563	-0.0473	0.0394	0.0483	0.0256	-0.0794
96	7/31/2012	0.0799	0.0500	0.0037	0.1938	-0.0032	0.0073	-0.0815	-0.0248
95	6/29/2012	-0.0183	0.0645	-0.0616	-0.0585	0.2228	0.1476	0.1818	0.0353
94	5/31/2012	-0.1388	-0.0964	-0.0724	-0.1311	-0.1221	-0.1396	-0.1679	-0.0436
93	4/30/2012	0.0802	-0.0084	0.0563	0.0584	-0.1171	-0.0824	-0.0802	-0.0034
92	3/30/2012	0.0472	0.0259	0.0031	-0.0618	-0.0232	-0.0167	-0.0800	-0.0968
91	2/29/2012	0.0794	0.0246	0.0335	0.1326	0.0343	0.0371	-0.0113	0.0110
90	1/31/2012	0.0363	0.0403	0.0786	0.0456	0.2004	0.0958	0.2144	0.0422
89	12/30/2011	0.0438	-0.0369	-0.0613	-0.0727	-0.1189	-0.0819	-0.0925	0.0632
88	11/30/2011	0.0272	0.0312	-0.0718	-0.0457	-0.0177	-0.0138	-0.0931	-0.1521
87	10/31/2011	0.1423	-0.0367	0.0521	-0.0099	-0.1044	-0.1337	0.0419	0.1384
86	9/30/2011	0.1190	-0.0612	-0.0717	-0.0592	0.1165	0.1331	-0.2361	-0.1630
85	8/31/2011	-0.1285	0.0138	-0.0088	-0.0276	-0.1561	-0.1466	0.0202	-0.1623
84	7/29/2011	0.0118	0.0521	-0.0928	-0.0670	-0.0034	-0.0298	-0.1825	0.0534
83	6/30/2011	-0.0943	0.0089	-0.0846	-0.0623	-0.0536	-0.0003	-0.1051	0.0143

82	5/31/2011	0.0000	-0.0201	-0.0085	-0.0632	-0.1326	-0.0771	0.0711	-0.0180
81	4/29/2011	-0.0519	-0.0166	0.0545	-0.0020	0.1215	0.0395	0.0507	0.1696
80	3/31/2011	-0.0003	-0.0347	-0.1205	0.1890	0.0539	-0.0111	0.0596	0.1954
79	2/28/2011	-0.0692	-0.0512	0.0416	-0.1455	0.0067	-0.0191	-0.0404	-0.0743
78	1/31/2011	0.0237	-0.0228	-0.0692	-0.1614	-0.1480	-0.1374	0.0220	-0.0563
77	12/31/2010	0.1389	-0.0177	0.0653	-0.0402	0.0474	-0.0044	0.1124	0.0342
76	11/30/2010	0.0987	-0.0427	-0.0682	-0.0805	0.0129	-0.0694	0.0355	-0.0382
75	10/29/2010	-0.0512	-0.0084	0.0487	0.0114	-0.0249	0.0031	0.0076	-0.0360
74	9/30/2010	0.0177	-0.0168	0.1138	0.1233	0.1418	0.0788	0.1023	0.1220
73	8/31/2010	-0.0767	-0.0057	-0.0731	-0.0207	-0.0177	-0.0437	0.1644	-0.0240
72	7/30/2010	0.0365	0.0178	0.1660	0.0447	0.0842	0.0777	0.0468	0.0796
71	6/30/2010	-0.0126	0.0478	-0.1680	-0.1071	-0.0268	-0.0330	0.1538	-0.0139
70	5/31/2010	-0.0960	-0.0608	-0.0263	-0.1642	-0.0700	0.0332	-0.1491	-0.0457
69	4/30/2010	0.0279	0.0031	-0.0828	-0.0430	0.0881	-0.0002	-0.0472	-0.0669
68	3/31/2010	0.0894	-0.0396	0.0683	0.3215	0.1126	0.2426	0.0168	-0.0004
67	2/26/2010	-0.0611	0.0397	0.0360	-0.0501	-0.1157	-0.1274	-0.0437	-0.0205
66	1/29/2010	-0.0288	-0.0019	-0.1306	-0.2254	0.1360	-0.0827	-0.0657	-0.1339
65	12/31/2009	0.0997	-0.0225	0.0512	0.0086	0.1642	0.1387	0.2147	0.0012
64	11/30/2009	-0.0142	-0.0101	-0.0557	-0.1666	-0.0437	-0.0138	-0.0229	-0.0252
63	10/30/2009	-0.1229	-0.0616	0.0776	0.0632	-0.0331	-0.0603	0.0316	-0.0704
62	9/30/2009	0.0470	-0.0154	-0.0221	0.1463	-0.0378	-0.0138	0.0690	-0.0007
61	8/31/2009	0.0549	-0.0751	0.0687	0.2458	0.1325	0.0223	0.2512	0.0153
60	7/31/2009	0.2129	0.0346	0.1098	-0.0350	0.2831	0.1891	0.1499	0.0944
59	6/30/2009	0.0509	0.0045	0.0344	-0.2198	-0.1111	0.0558	-0.0047	-0.0883
58	5/29/2009	-0.0675	0.1270	0.0660	0.4563	0.1881	0.0266	0.1530	0.0639
57	4/30/2009	0.0322	-0.0214	0.0558	0.0473	0.2300	0.2567	0.2753	0.1184
56	3/31/2009	0.1807	-0.0092	0.0083	0.0471	0.0857	0.2311	-0.1134	0.0548

55	2/27/2009	-0.0326	-0.0492	-0.0500	0.0303	-0.0996	-0.1937	-0.0653	0.1601
54	1/30/2009	0.0720	-0.1288	-0.0860	-0.1536	-0.1361	-0.0138	0.0213	-0.1827
53	12/31/2008	-0.0821	0.0964	0.0475	-0.2493	0.0218	0.0978	-0.1209	0.0790
52	11/28/2008	-0.1016	0.0311	-0.0788	-0.4720	-0.1304	-0.1901	-0.3422	0.4449
51	10/31/2008	-0.0175	-0.1367	-0.0244	-0.3316	-0.2932	-0.2169	-0.0822	-0.1033
50	9/30/2008	0.0345	-0.1302	-0.1997	-0.1701	-0.0710	0.0512	-0.1368	-0.4123
49	8/29/2008	-0.0951	-0.1647	0.0500	-0.1531	-0.1291	-0.0676	-0.1611	-0.2208
48	7/31/2008	-0.1076	-0.0146	0.0179	-0.0531	0.3772	0.5192	0.0740	-0.0440
47	6/30/2008	-0.1666	-0.1058	-0.0672	-0.0731	-0.0467	-0.2286	-0.0437	-0.2080
46	5/30/2008	0.0322	-0.1583	0.0500	-0.0251	-0.1188	-0.2019	-0.0829	0.0181
45	4/30/2008	0.1312	0.1376	0.1343	0.0295	0.1654	0.1738	-0.0464	-0.1716
44	3/31/2008	0.1025	-0.0079	-0.0855	-0.1412	-0.2160	-0.1589	0.0316	0.0590
43	2/29/2008	-0.0689	-0.0251	0.0584	0.0168	-0.0003	-0.0434	0.0956	0.3036
42	1/31/2008	0.0601	-0.1438	-0.1849	-0.2154	-0.2996	-0.2379	-0.1047	-0.0832
41	12/31/2007	-0.0260	-0.0654	-0.1306	0.1808	0.0405	-0.0022	-0.0932	-0.0555
40	11/30/2007	0.0172	-0.1291	-0.1568	-0.0595	-0.0727	-0.2025	-0.0418	-0.1597
39	10/31/2007	-0.0535	0.2506	0.0478	0.1905	-0.0177	0.1384	-0.0631	0.0314
38	9/28/2007	-0.0371	0.1971	0.0359	-0.0436	0.0495	0.0946	-0.0533	0.2357
37	8/31/2007	-0.0475	0.1681	-0.0301	-0.0207	-0.0262	-0.0760	0.0406	0.0518
36	7/31/2007	0.0748	0.0516	-0.0471	-0.1009	0.1252	0.1986	-0.0069	0.0443
35	6/29/2007	0.0479	0.1480	-0.0623	-0.0494	-0.0710	-0.0273	0.0450	0.2128
34	5/31/2007	-0.0780	0.0182	0.0194	0.1141	0.0564	-0.0888	-0.0622	0.0334
33	4/30/2007	0.0095	-0.0096	-0.0107	-0.0478	0.0538	0.0615	0.1332	0.0542
32	3/30/2007	-0.0171	-0.0480	-0.0073	-0.1609	0.0066	-0.0138	0.0963	-0.0031
31	2/28/2007	-0.0308	-0.0062	-0.0888	-0.0049	0.0072	0.0195	-0.1202	-0.0315
30	1/31/2007	-0.0655	0.0547	0.0663	0.0161	0.0732	0.0327	0.0278	-0.0545
29	12/29/2006	-0.0492	0.0110	0.1064	0.0132	0.0865	0.0414	-0.0569	-0.0085

28	11/30/2006	0.0342	0.0217	0.0647	-0.1688	-0.1361	-0.0319	0.0341	0.1060
27	10/31/2006	-0.0899	0.1405	0.0839	-0.0314	0.1448	0.0572	0.1122	0.0462
26	9/29/2006	0.0115	0.0481	-0.0700	-0.0278	-0.1262	-0.0451	-0.0376	0.1178
25	8/31/2006	0.0590	0.0172	-0.0089	0.2553	0.0304	0.0973	0.2270	-0.0890
24	7/31/2006	-0.0017	0.1169	-0.0308	-0.0070	0.0842	-0.0664	-0.1572	0.0029
23	6/30/2006	-0.0247	0.0936	-0.0398	-0.1557	-0.1667	-0.0151	-0.0663	-0.1371
22	5/31/2006	-0.0597	-0.1174	-0.0988	-0.1457	-0.1764	-0.1683	-0.0469	0.0756
21	4/28/2006	0.0122	0.0743	0.0212	-0.2445	-0.0037	-0.0403	-0.0956	-0.0121
20	3/31/2006	-0.0930	0.0822	-0.0066	-0.0125	-0.1240	-0.1705	-0.1237	0.0085
19	2/28/2006	-0.0817	-0.0282	-0.0879	-0.0984	0.0782	0.1513	0.0642	0.0130
18	1/31/2006	0.1129	0.0102	0.1300	-0.1457	0.1319	0.0317	-0.1117	0.0072
17	12/30/2005	0.0920	-0.0315	0.0462	-0.0608	-0.0629	0.0047	-0.0527	0.1071
16	11/30/2005	0.0733	0.0777	0.0434	-0.1295	0.3020	0.2718	0.0183	0.0053
15	10/31/2005	-0.0713	-0.1020	-0.0993	-0.0319	-0.1916	-0.0753	-0.1636	-0.0291
14	9/30/2005	0.0708	0.1146	-0.0307	0.1639	-0.0417	0.1120	-0.0263	0.0715
13	8/31/2005	-0.0472	0.0702	0.0521	0.3136	0.1239	0.0680	0.0201	0.0135
12	7/29/2005	0.1337	0.0719	0.1266	-0.2682	0.0247	0.1316	0.1588	-0.0048
11	6/30/2005	0.0002	0.0049	-0.0366	0.7151	-0.0004	0.0411	-0.1560	0.0892
10	5/31/2005	0.0718	0.0127	0.1104	0.0499	0.0975	0.0836	-0.0728	-0.0729
9	4/29/2005	-0.1096	0.0716	-0.0030	0.8544	-0.1364	0.0015	-0.1001	0.0265
8	3/31/2005	-0.0575	-0.0002	-0.1160	-0.0226	-0.1591	-0.1950	-0.1808	-0.1064
7	2/28/2005	0.0546	0.0161	0.0096	0.0677	-0.0119	-0.0557	0.1145	-0.0071
6	1/31/2005	0.0887	-0.0959	-0.0326	0.0192	-0.0346	-0.0138	-0.1362	-0.0500
5	12/31/2004	0.0268	0.0383	0.0905	0.2495	0.1031	0.2141	0.1243	0.0652
4	11/30/2004	-0.0214	0.1085	0.1598	0.2706	-0.1406	0.0086	0.1201	0.0598
3	10/29/2004	-0.0504	-0.0622	0.0668	-0.0362	-0.0005	-0.0357	0.0955	-0.0496
2	9/30/2004	0.0055	0.0334	0.0153	0.2780	0.0619	0.0488	0.1152	0.0942

1	8/31/2004	0.0715	-0.0062	0.0574	0.0285	0.0616	0.0440	0.3781	0.1649
0	7/30/2004								

Table 4.7 : Excess Returns(Demeaned Returns) of the eight stocks

Appendix A4 – Data for Lambda calculation

Date	MSCI Emerging Markets Index	MSCI_Return (Market return - r_m)	US Treasury rates - r_f	Excess return ($r_m - r_f$)
9/30/2015	792.05	-0.0326	0.0000	-0.0326
8/31/2015	818.73	-0.0920	0.0000	-0.0920
7/31/2015	901.68	-0.0726	0.0400	-0.1126
6/30/2015	972.25	-0.0318	0.0200	-0.0518
5/29/2015	1004.22	-0.0416	0.0100	-0.0516
4/30/2015	1047.78	0.0751	0.0000	0.0751
3/31/2015	974.57	-0.0159	0.0500	-0.0659
2/27/2015	990.28	0.0298	0.0200	0.0098
1/30/2015	961.61	0.0055	0.0100	-0.0045
12/31/2014	956.31	-0.0482	0.0300	-0.0782
11/28/2014	1004.72	-0.0112	0.0400	-0.0512
10/31/2014	1016.07	0.0107	0.0100	0.0007
9/30/2014	1005.33	-0.0759	0.0200	-0.0959
8/29/2014	1087.88	0.0207	0.0200	0.0007
7/31/2014	1065.77	0.0143	0.0100	0.0043
6/30/2014	1050.78	0.0225	0.0200	0.0025
5/30/2014	1027.69	0.0326	0.0500	-0.0174
4/30/2014	995.28	0.0006	0.0200	-0.0194

3/31/2014	994.65	0.0292	0.0300	-0.0008
2/28/2014	966.42	0.0319	0.0400	-0.0081
1/31/2014	936.53	-0.0660	0.0300	-0.0960
12/31/2013	1002.69	-0.0153	0.0100	-0.0253
11/29/2013	1018.28	-0.0156	0.0500	-0.0656
10/31/2013	1034.42	0.0476	0.0300	0.0176
9/30/2013	987.46	0.0623	0.0300	0.0323
8/30/2013	929.54	-0.0190	0.0200	-0.0390
7/31/2013	947.55	0.0077	0.0300	-0.0223
6/28/2013	940.33	-0.0679	0.0200	-0.0879
5/31/2013	1008.88	-0.0294	0.0300	-0.0594
4/30/2013	1039.45	0.0044	0.0300	-0.0256
3/29/2013	1034.90	-0.0187	0.0400	-0.0587
2/28/2013	1054.62	-0.0135	0.0700	-0.0835
1/31/2013	1069.01	0.0131	0.0400	-0.0269
12/31/2012	1055.20	0.0478	0.0200	0.0278
11/30/2012	1007.02	0.0117	0.1100	-0.0983
10/31/2012	995.33	-0.0073	0.0900	-0.0973
9/28/2012	1002.66	0.0584	0.0600	-0.0016
8/31/2012	947.33	-0.0054	0.0900	-0.0954
7/31/2012	952.49	0.0162	0.0700	-0.0538
6/29/2012	937.35	0.0343	0.0400	-0.0057
5/31/2012	906.30	-0.1167	0.0300	-0.1467
4/30/2012	1026.02	-0.0148	0.0700	-0.0848
3/30/2012	1041.45	-0.0352	0.0500	-0.0852
2/29/2012	1079.44	0.0589	0.0800	-0.0211
1/31/2012	1019.39	0.1124	0.0400	0.0724

12/30/2011	916.39	-0.0129	0.0100	-0.0229
11/30/2011	928.32	-0.0670	0.0200	-0.0870
10/31/2011	995.00	0.1301	0.0200	0.1101
9/30/2011	880.43	-0.1478	0.0200	-0.1678
8/31/2011	1033.15	-0.0919	0.0100	-0.1019
7/29/2011	1137.73	-0.0074	0.1600	-0.1674
6/30/2011	1146.22	-0.0186	0.0100	-0.0286
5/31/2011	1167.97	-0.0299	0.0400	-0.0699
4/29/2011	1204.03	0.0283	0.0200	0.0083
3/31/2011	1170.87	0.0570	0.0500	0.0070
2/28/2011	1107.77	-0.0101	0.1300	-0.1401
1/31/2011	1119.08	-0.0281	0.1500	-0.1781
12/31/2010	1151.38	0.0702	0.0700	0.0002
11/30/2010	1075.85	-0.0270	0.1800	-0.2070
10/29/2010	1105.75	0.0281	0.1400	-0.1119
9/30/2010	1075.53	0.1087	0.1400	-0.0313
8/31/2010	970.05	-0.0215	0.1600	-0.1815
7/30/2010	991.41	0.0800	0.1400	-0.0600
6/30/2010	917.99	-0.0091	0.1700	-0.1791
5/31/2010	926.40	-0.0918	0.1500	-0.2418
4/30/2010	1020.03	0.0096	0.1400	-0.1304
3/31/2010	1010.33	0.0795	0.1500	-0.0705
2/26/2010	935.93	0.0025	0.0900	-0.0875
1/29/2010	933.59	-0.0565	0.0200	-0.0765
12/31/2009	989.47	0.0381	0.0400	-0.0019
11/30/2009	953.13	0.0425	0.0800	-0.0375
10/30/2009	914.26	0.0002	0.0100	-0.0098

9/30/2009	914.05	0.0889	0.0600	0.0289
8/31/2009	839.46	-0.0054	0.1100	-0.1154
7/31/2009	844.02	0.1087	0.1400	-0.0313
6/30/2009	761.30	-0.0153	0.1700	-0.1853
5/29/2009	773.12	0.1666	0.1400	0.0266
4/30/2009	662.73	0.1627	0.0400	0.1227
3/31/2009	569.97	0.1415	0.1700	-0.0285
2/27/2009	499.30	-0.0571	0.1600	-0.2171
1/30/2009	529.53	-0.0662	0.1500	-0.2162
12/31/2008	567.04	0.0760	0.1100	-0.0340
11/28/2008	526.97	-0.0763	0.0200	-0.0963
10/31/2008	570.52	-0.2750	0.1200	-0.3950
9/30/2008	786.92	-0.1771	1.0200	-1.1971
8/29/2008	956.25	-0.0822	1.6300	-1.7122
7/31/2008	1041.86	-0.0416	1.5500	-1.5916
6/30/2008	1087.12	-0.1016	1.6000	-1.7016
5/30/2008	1210.04	0.0155	1.9800	-1.9645
4/30/2008	1191.53	0.0787	1.1700	-1.0913
3/31/2008	1104.58	-0.0540	1.2200	-1.2740
2/29/2008	1167.66	0.0725	2.0700	-1.9975
1/31/2008	1088.72	-0.1259	1.6400	-1.7659
12/31/2007	1245.59	0.0028	2.7600	-2.7572
11/30/2007	1242.06	-0.0714	3.6300	-3.7014
10/31/2007	1337.63	0.1102	4.0100	-3.8998
9/28/2007	1204.90	0.1085	3.4300	-3.3215
8/31/2007	1086.98	-0.0232	4.0200	-4.0432
7/31/2007	1112.77	0.0501	5.1300	-5.0799

6/29/2007	1059.69	0.0443	4.2800	-4.2357
5/31/2007	1014.78	0.0462	4.7800	-4.7338
4/30/2007	969.93	0.0440	4.8000	-4.7560
3/30/2007	929.03	0.0374	5.0700	-5.0326
2/28/2007	895.54	-0.0066	5.2400	-5.2466
1/31/2007	901.48	-0.0122	5.0000	-5.0122
12/29/2006	912.65	0.0441	4.7500	-4.7059
11/30/2006	874.08	0.0732	5.2200	-5.1468
10/31/2006	814.44	0.0466	5.1800	-5.1334
9/29/2006	778.16	0.0065	4.6000	-4.5935
8/31/2006	773.12	0.0229	5.1200	-5.0971
7/31/2006	755.84	0.0111	5.0200	-5.0089
6/30/2006	747.54	-0.0046	4.5400	-4.5446
5/31/2006	751.00	-0.1076	4.7500	-4.8576
4/28/2006	841.58	0.0683	4.6000	-4.5317
3/31/2006	787.80	0.0073	4.6500	-4.6427
2/28/2006	782.11	-0.0021	4.4700	-4.4721
1/31/2006	783.77	0.1094	4.3700	-4.2606
12/30/2005	706.48	0.0576	4.0100	-3.9524
11/30/2005	667.99	0.0819	4.0000	-3.9181
10/31/2005	617.41	-0.0664	3.7700	-3.8364
9/30/2005	661.32	0.0909	3.1500	-3.0591
8/31/2005	606.23	0.0061	3.4100	-3.4039
7/29/2005	602.56	0.0662	3.2500	-3.1838
6/30/2005	565.17	0.0310	2.9900	-2.9590
5/31/2005	548.15	0.0304	2.8000	-2.7696
4/29/2005	531.99	-0.0304	2.7000	-2.7304

3/31/2005	548.69	-0.0679	2.6300	-2.6979
2/28/2005	588.68	0.0856	2.5100	-2.4244
1/31/2005	542.28	0.0002	2.0600	-2.0598
12/31/2004	542.17	0.0468	1.8900	-1.8432
11/30/2004	517.95	0.0921	2.0700	-1.9779
10/29/2004	474.27	0.0218	1.7300	-1.7082
9/30/2004	464.15	0.0555	1.4700	-1.4145
8/31/2004	439.75	0.0393	1.4500	-1.4107
7/30/2004	423.14	-0.0210	1.2700	-1.2910
6/30/2004	432.20	0.0022	1.1700	-1.1678
5/31/2004	431.26	-0.0228	0.9400	-0.9628
4/30/2004	441.30	-0.0846	0.8300	-0.9146
3/31/2004	482.06	0.0091	0.9600	-0.9509
2/27/2004	477.73	0.0449	0.9500	-0.9051
1/30/2004	457.19	0.0325	0.8500	-0.8175
12/31/2003	442.78	0.0713	0.9000	-0.8287
11/28/2003	413.33	0.0103	0.9600	-0.9497
10/31/2003	409.11	0.0834	0.9600	-0.8766
9/30/2003	377.63	0.0056	0.8700	-0.8644
8/29/2003	375.52	0.0649	0.9800	-0.9151
7/31/2003	352.62	0.0599	0.9100	-0.8501
6/30/2003	332.68	0.0547	0.8100	-0.7553
5/30/2003	315.44	0.0687	1.1600	-1.0913
4/30/2003	295.17	0.0841	1.1300	-1.0459
3/31/2003	272.27	-0.0321	1.1600	-1.1921
2/28/2003	281.29	-0.0315	1.2100	-1.2415
1/31/2003	290.44	-0.0056	1.1700	-1.1756

12/31/2002	292.09	-0.0340	1.2000	-1.2340
11/29/2002	302.36	0.0678	1.2500	-1.1822
10/31/2002	283.16	0.0641	1.4800	-1.4159
9/30/2002	266.11	-0.1097	1.6000	-1.7097
8/30/2002	298.89	0.0145	1.7000	-1.6855
7/31/2002	294.62	-0.0786	1.7300	-1.8086
6/28/2002	319.75	-0.0766	1.6900	-1.7666
5/31/2002	346.28	-0.0186	1.7200	-1.7386
4/30/2002	352.84	0.0040	1.7700	-1.7660
3/29/2002	351.43	0.0561	1.7600	-1.7039
2/28/2002	332.77	0.0153	1.7600	-1.7447
1/31/2002	327.75	0.0326	1.6900	-1.6574
12/31/2001	317.40	0.0780	1.6800	-1.6020
11/30/2001	294.43	0.1033	1.8700	-1.7667
10/31/2001	266.86	0.0615	2.1500	-2.0885
9/28/2001	251.40	-0.1569	2.2800	-2.4369
8/31/2001	298.17	-0.0116	3.4000	-3.4116
7/31/2001	301.67		3.6700	

Table 4.9 : Inputs for Lambda calculation

Appendix A5 – Program codes in Matlab

Blacklit.m file

```
% Black Litterman Method implementation in Matlab
clear all

format long g
% Import the Data file(which is in excel format)with titles
[data, hdr] = xlsread('BasicParas.xlsx');
% Determine the dimensions of the table ( number of rows and Columns)
size_of_matrix = size(data); nrw = size_of_matrix(1); ncol =
size_of_matrix(2);

% Return calculation of each stocks
% (The function file findStkReturn.m is being called here)
%-----
returnStk1 = findStkReturn(data(:,1));
returnStk2 = findStkReturn(data(:,2));
returnStk3 = findStkReturn(data(:,3));
returnStk4 = findStkReturn(data(:,4));
returnStk5 = findStkReturn(data(:,5));
returnStk6 = findStkReturn(data(:,6));
returnStk7 = findStkReturn(data(:,7));
returnStk8 = findStkReturn(data(:,8));

returns = [returnStk1' returnStk2' returnStk3' returnStk4'
returnStk5' returnStk6' returnStk7' returnStk8'];
%xlswrite('Retuns.xlsx',returns);
% (The function file findStkReturn.m is being called here)
mkt_ret = findStkReturn(data(:,9));
%disp(returns)
%disp(returnStk1')
%-----

% Calculation of basic return parameters
%-----
%-----
% (The Matlab inbuilt function "mean" is being used here)
av_rets = [mean(returnStk1),mean(returnStk2), mean(returnStk3),
mean(returnStk4), mean(returnStk5),...
mean(returnStk6), mean(returnStk7), mean(returnStk8)];

% (The function file calVar.m is being called here)
var_Rtn =
[calVar(returnStk1),calVar(returnStk2),calVar(returnStk3),calVar(retu
rnStk4), calVar(returnStk5),...
calVar(returnStk6), calVar(returnStk7), calVar(returnStk8)];

% (The Matlab inbuilt function "sqrt" is being used here)
stdDev_Rtn = sqrt(var_Rtn);

% Calculation of Beta
% beta = Cov(stk,mkt_rtn)/Var(mkt_rtn)
% (The function files findCov.m and calVar.m are being called here)
betaStk1 = findCov(returnStk1,mkt_ret )/calVar(mkt_ret);
```

```

betaStk2 = findCov(returnStk2,mkt_ret )/calVar(mkt_ret);
betaStk3 = findCov(returnStk3,mkt_ret )/calVar(mkt_ret);
betaStk4 = findCov(returnStk4,mkt_ret )/calVar(mkt_ret);
betaStk5 = findCov(returnStk5,mkt_ret )/calVar(mkt_ret);
betaStk6 = findCov(returnStk6,mkt_ret )/calVar(mkt_ret);
betaStk7 = findCov(returnStk7,mkt_ret )/calVar(mkt_ret);
betaStk8 = findCov(returnStk8,mkt_ret )/calVar(mkt_ret);

beta = [betaStk1 betaStk2 betaStk3 betaStk4 betaStk5 betaStk6
betaStk7 ...
betaStk8];
%xlswrite('Beta.xlsx',beta);
%-----
-----

% Calculation of Excess returns of each stock
% (The function file findDmeanStk.m is being called here)
%-----
-----
dmeanStk1 = findDmeanStk(returnStk1,mean(returnStk1));
dmeanStk2 = findDmeanStk(returnStk2,mean(returnStk2));
dmeanStk3 = findDmeanStk(returnStk3,mean(returnStk3));
dmeanStk4 = findDmeanStk(returnStk4,mean(returnStk4));
dmeanStk5 = findDmeanStk(returnStk5,mean(returnStk5));
dmeanStk6 = findDmeanStk(returnStk6,mean(returnStk6));
dmeanStk7 = findDmeanStk(returnStk7,mean(returnStk7));
dmeanStk8 = findDmeanStk(returnStk8,mean(returnStk8));

A = [dmeanStk1' dmeanStk2' dmeanStk3' dmeanStk4' dmeanStk5'
dmeanStk6'...
dmeanStk7' dmeanStk8'];
%-----
-----

% Variable definition for Portfolio parameters
miu = av_rets';
obs = nrw-1;
% when portfolio is equally weighted
%-----
weight = 1/8;
w = weight*ones(1,length(miu));

% S the Variance Covariance matrix
%-----
S = (1/obs)*(A'*A);

% Calculation of portfolio parameters
Expected_Return = w*miu;
Portfolio_variance = (w*S)*w';
Portfolio_Stdev = sqrt(Portfolio_variance);

% Conventional Portfolio allocation methods
%(Accepting the inputs by command window)

rate = input('Enter the Risk free rate(%) : ');
prm = input('Enter Market risk premium(%) : ');

% Calculation of monthly rates
rf = rate/(12*100);% rf is monthly risk free rate
rp = prm/(12*100);% rp is monthly market risk premium rate

```

```

% Historical and CAPM returns
miu_hist = miu; % miu_hist is the expected returns when using
historical method
% miu_capm is the expected returns when using CAPM method
miu_capm = rf + beta'*rp;
% Calculation of Zs during Portfolio allocation calculations

% ex_miu_hist is the excess expected returns when using historical
method
ex_miu_hist = miu_hist - rf;
% ex_miu_capm is the excess expected returns when using CAPM method
ex_miu_capm = miu_capm - rf;
% Z_hist is the by result Z, during weightage calculation when using
historical method
Z_hist = inv(S)*ex_miu_hist;
% sumZ_hist is the sum of all Zs, during weightage calculation when
using
historical method
sumZ_hist = sum(Z_hist);
% Z_capm is the by result Z, during weightage calculation when using
% CAPM method
Z_capm = inv(S)*ex_miu_capm;
% sumZ_capm is the sum of all Zs, during weightage calculation when
using
% CAPM method
sumZ_capm = sum(Z_capm);

% Portfolio allocations
% Portfolio allocation while using historical method
w_hist = (1/sumZ_hist)*Z_hist;
% Portfolio allocation while using CAPM method
w_capm = (1/sumZ_capm)*Z_capm;

% Portfolio expected return while using historical method
PER_Hist = w_hist'*ex_miu_hist;
% Portfolio expected return while using CAPM method
PER_Capm = w_capm'*ex_miu_capm;

% Portfolio variance while using historical method
PV_Hist = w_hist'*S*w_hist;

% Portfolio variance while using CAPM method
PV_Capm = w_capm'*S*w_capm;

% Sharp ratio while using historical method
SR_Hist = PER_Hist/sqrt(PV_Hist);
% Sharp ratio while using CAPM method
SR_Capm = PER_Capm/sqrt(PV_Capm);

% Calculation of lambda
ch = input('Do you want to calculate lambda(Y/N) : ');
if ch == 'Y'
    file = 'UT_EMRU.xlsx';
    lambda = callLambda(file);% (The function file callLambda.m is
being called here)
else
    lambda = input('Input your preference : ');
end

```

```

% Inputs for the calculation of implied equilibrium excess returns
% mkt_cap is Market capitalization of stocks
mkt_cap = input('Enter market cap for each stock as a vector : ');
% tot_mkt_cap is the Total market capitalization of stocks
tot_mkt_cap = sum(mkt_cap);

% w_mkt is stock weightages in the portfolio with respect to Total
market capitalization
w_mkt = (1/tot_mkt_cap)*mkt_cap;

% The Implied Equilibrium Excess Returns
Pi = 2*lambda*S*(w_mkt');

% View matrix Q and Link matrix P
Q = input('Enter the view matrix as a column vector : ');
P = input('Enter the link matrix : ');

% Calculation of omega
PO = (P*S)*P'
% The omega is the diagonal omega matrix
omega = diag(diag(PO))

% Calculation of BL Expected Excess Returns

% exp_ret_1 is the results of 1st part of Black Litterman
exp_ret_1 = inv(inv(S)+P'*inv(omega)*P)
% exp_ret_2 is the results of 2nd part of Black Litterman
exp_ret_2 = inv(S)*Pi+P'*inv(omega)*Q

% Derivation of portfolio weightages using BL returns
% ex_miu_bl is the excess expected returns when using BL method
ex_miu_bl = exp_ret_1*exp_ret_2
% Z_bl is the by result Z, during weightage calculation using BL
method
Z_bl = inv(S)*ex_miu_bl
% sumZ_bl is the sum of all Zs, during weightage calculation using BL
% method
sumZ_bl = sum(Z_bl)
% Portfolio allocation while using BL method
w_bl = (1/sumZ_bl)*Z_bl

% Portfolio expected return while using BL method
PER_BL = w_bl'*ex_miu_bl
% Portfolio variance while using BL method
PV_BL = (w_bl'*S)*w_bl
% Sharp ratio while using BL method
SR_BL = PER_BL/sqrt(PV_BL )

```

getcolumns.m

```
function v = getcolumns( data, hdr )
%
for i=1:ncol
    v = genvarname([' ' hdr{1,i}]);
    eval([v '= data(1:nrw, i);']);
end
end
```

findStkReturn.m

```
function stk_return = findStkReturn( prices )
% Finding returns using monthly closing prices
N = length(prices);
for i=1:N-1
    stk_return(i) = ( prices(i)- prices(i+1) )/prices(i+1);
end
end
```

findDmeanStk.m

```
function dRtnStk = findDmeanStk(stk,stk_mean)
% Finding the excess returns of return vector
for i=1:length(stk)
    dRtnStk(i) = stk(i)-stk_mean;
end
```

calVar.m

```
function cv = calVar(data)
% Function to calculate population variance
N = length(data);
m = mean(data);
dev = data - m;
cv = sum(dev.*dev)/N;
```

findCov.m

```
function c = findCov(v1,v2)
% Finding the covariance of two given vectors

v1_bar = mean(v1); v2_bar = mean(v2);

sum = 0;
for i=1:length(v1)
    sum = sum + ( v1(i)-v1_bar )*( v2(i)-v2_bar );
end

c = sum/length(v1);
```

callLambda.m

```
function lambda = callLambda(file)
% Calculating the value of lambda using the given inputs

[data, hdr] = xlsread(file);
avg = mean(data);
variance = var(data);

lambda = avg/(2*variance);
```

% Calculation of basic return parameters

av_rets =

Columns 1 through 3

0.0100344277991056 0.0131344494113276 0.0306219269571734

Columns 4 through 6

0.0207401884631998 0.0177304540616442 0.0138071275335659

Columns 7 through 8

0.0074884030718853 0.0120659150986573

var_Rtn =

Columns 1 through 3

0.00515151092254157 0.00522887437331421 0.00612765016469282

Columns 4 through 6

0.0293993467934386 0.0126953226034172 0.0131276411075319

Columns 7 through 8

0.0137698590590917 0.0101423215123591

stdDev_Rtn =

Columns 1 through 3

0.0717740267961995 0.0723109561084226 0.0782793086625886

Columns 4 through 6

0.171462377195228 0.112673522193181 0.114575918532351

Columns 7 through 8

0.117345042754655 0.10070909349388

beta =

Columns 1 through 3

0.383129361223695 0.56927156530342 0.599198238748652

Columns 4 through 6

0.914274974681077 0.891850820108116 0.840813883036107

Columns 7 through 8

0.680232269292539 0.755549387492689

% Calculation of portfolio parameters

Expected_Return =

0.0157028615495699

Portfolio_variance =

0.0036585346300807

Portfolio_Stdev =

0.0604858217277462

**% Conventional Portfolio allocation methods
% accepting the inputs by command window)**

Enter the Risk free rate(%) : 8

rate =

8

Enter Market risk premium(%) : 9

prm =

9

% Historical and CAPM returns

miu_hist =

0.0100344277991056
0.0131344494113276
0.0306219269571734
0.0207401884631998
0.0177304540616442
0.0138071275335659
0.0074884030718853
0.0120659150986573

miu_capm =

0.00951869306831321
0.0109043411919664
0.0111271162424262
0.0134725568699829
0.013305630793964
0.0129257103109093
0.0117303359847212
0.0122909988608753

% Historical and CAPM excess returns

ex_miu_hist =

0.00336776113243896
0.00646778274466091
0.0239552602905067
0.0140735217965332
0.0110637873949775
0.00714046086689923
0.000821736405218633
0.0053992484319906

ex_miu_capm =

0.00285202640164654
0.00423767452529971
0.00446044957575956
0.00680589020331623
0.00663896412729735
0.00625904364424266
0.00506366931805453
0.00562433219420864

```
% Zs during Portfolio allocation calculations using  
historical and CAPM methods
```

```
Z_hist =
```

```
0.184709165215852  
0.316624889862066  
4.03112493197849  
0.231135626498563  
0.647434854617294  
-0.778984375244907  
-0.644318746587318  
-0.204699906203325
```

```
sumZ_hist =
```

```
3.78302644013672
```

```
Z_capm =
```

```
0.336711193131969  
0.392323552701203  
0.303446399029215  
0.0951735777500381  
0.183282537972123  
0.0463739954765872  
0.121597922544881  
0.313395585731801
```

```
sumZ_capm =
```

```
1.79230476433782
```

```
% Portfolio allocation while using historical and CAPM  
method
```

```
w_hist =
```

```
0.0488257663906722  
0.0836961873971527  
1.06558201370456  
0.0610980732374182  
0.171142037958872  
-0.205915657099334  
-0.170318330253074
```

-0.0541100913362708

w_capm =

0.18786492109581
0.218893326909249
0.169305134409619
0.0531012245482708
0.102260810560217
0.0258739453240925
0.0678444452999074
0.174856191852834

**% Portfolio measures while using historical and CAPM
method**

PER_Hist =

0.0270829576722346

PER_Capm =

0.00474781566022845

PV_Hist =

0.00715907173814409

PV_Capm =

0.00264900018941956

SR_Hist =

0.320086777220127

SR_Capm =

0.0922471280204709

Do you want to calculate lambda(Y/N) : 'N'

ch =

N

Input your preference : 2

lambda =

2

Enter market cap for each stock as a vector : [118.71 69.35 54.52 13.19 10.46 9.63 3.11
2.9614]

mkt_cap =

Columns 1 through 3

118.71 69.35 54.52

Columns 4 through 6

13.19 10.46 9.63

Columns 7 through 8

3.11 2.9614

tot_mkt_cap =

281.9314

w_mkt =

Columns 1 through 3

0.421059874848988 0.245981823947244 0.193380375509787

Columns 4 through 6

0.0467844305387764 0.0371012239147537 0.0341572453440801

Columns 7 through 8

0.0110310522346926 0.010503973661678

% The Implied Equilibrium Excess Returns

Pi =

0.0102799802077666
0.00797050760314531

```

0.00917968287423137
0.0114849301564305
0.0121304593447166
0.0130006273990317
0.00701300563568469
0.00590675101589974

```

Enter the view matrix as a column vector: [0.025; 0.0025; 0.015; 0.005]

```
% View matrix Q and Link matrix P
```

Q =

```

0.025
0.0025
0.015
0.005

```

```

Enter the link matrix : [1      0      0      0      0      0      0      0; 0      0      0      0      0      0      -1     0; 0      1; 0      0      0      -0.81  0.52  0.48  -0.19  0]

```

P =

Columns 1 through 3

```

1      0      0
0     -1      1
0      0      0
0      0      0

```

Columns 4 through 6

```

0      0      0
0      0      0
-1     0      0
-0.81  0.52  0.48

```

Columns 7 through 8

```

0      0
0      0
0      1
-0.19  0

```

PO =

Columns 1 through 3

0.00515151092254157	0.000721205948191193	0.000649077258394267
0.000721205948191193	0.00857800834652314	-0.000568179390521442
0.000649077258394267	-0.000568179390521442	0.0349678306517621
0.00203128776146087	0.000196855364190916	0.019477062889528

Column 4

0.00203128776146087
0.000196855364190916
0.019477062889528
0.0245823983329143

% The diagonal omega matrix

omega =

Columns 1 through 3

0.00515151092254157		0		0
0	0.00857800834652314			0
0	0	0.0349678306517621		
0	0	0		

Column 4

0
0
0
0.0245823983329143

% exp_ret_1 is the results of 1st part of Black Litterman

exp_ret_1 =

Columns 1 through 3

0.00254697988328331	0.000191699895535983	0.000371629683156413
0.000191699895535983	0.00435090583212981	0.00241493960575733
0.000371629683156413	0.00241493960575733	0.00475367188077008
0.000336050182385518	0.00264188933354992	0.00248884326052975
0.000793423679288044	0.00239435950230698	0.00258408701816257
0.00102834804800179	0.00250583071869122	0.00244259166840177
0.000591376827598647	0.000995528845737764	0.00167174248464609
0.000299444959849505	0.00236327074358634	0.00203109961446339

Columns 4 through 6

0.000336050182385518	0.000793423679288044	0.00102834804800179
0.00264188933354992	0.00239435950230698	0.00250583071869122
0.00248884326052975	0.00258408701816257	0.00244259166840177
0.0149496279410606	0.00527005637424208	0.00531759688230397
0.00527005637424208	0.010808221004221	0.00821816921554128
0.00531759688230397	0.00821816921554128	0.010932790404184
0.00305445236985377	0.00439328142098321	0.00369003668779809
0.00429742941298034	0.00225858518630112	0.00170399598862285

Columns 7 through 8

0.000591376827598648	0.000299444959849505
0.000995528845737764	0.00236327074358634
0.00167174248464609	0.00203109961446339
0.00305445236985377	0.00429742941298034
0.00439328142098321	0.00225858518630112
0.00369003668779809	0.00170399598862285
0.0133850782785936	0.0022287421574331
0.0022287421574331	0.00895271920688432

% exp_ret_2 is the results of 2nd part of Black Litterman

exp_ret_2 =

6.53718465973852
0.69248435250794
1.06496444532018
-0.406580008065154
0.254171630246452
0.234259813303185
0.00547867130105299
0.470981595990388

% excess expected returns when using BL method

ex_miu_bl =

0.017628807549352
0.0080779021518575
0.0103470695218012
0.00522454143244795
0.0132142261687512
0.014369700499492
0.00819789850141035
0.00921187758477997


```
% Zs during Portfolio allocation calculations using BL method
```

```
Z_bl =
```

```
3.115119208569  
0.957017479345412  
0.800431318482712  
-0.0296276814807528  
0.0853811517412901  
0.0784532177599586  
0.0671521153702468  
0.356952899385181
```

```
sumZ_bl =
```

```
5.43087970917304
```

```
% Portfolio allocation while using BL method
```

```
w_bl =
```

```
0.573593851343714  
0.176217764081381  
0.147385204855622  
-0.00545541110599634  
0.0157214220003947  
0.0144457660565464  
0.0123648688548235  
0.0657265339135147
```

```
% Portfolio measures while using BL method
```

```
PER_BL =
```

```
0.0141539068943343
```

```
PV_BL =
```

```
0.00260619046126683
```

```
SR_BL =
```

```
0.277251087929272
```

```
>>
```