CHAPTER 4: RESEARCH RESULTS

Behaviour of trading and non-trading returns for seven KLSE indices

The KLSE operates five trading days a week from Monday to Friday. From January 1994 to December 1997, it had two daily trading sessions: a morning ssion from 9.30 a.m. to 12.30 p.m. and an afternoon session from 2.30 p.m. to)0 p.m. From December 1997 to 26 November 1999, the morning trading was tended for another half an hour from 9.00 p.m. to 12.30 p.m. while the ternoon trading remain unchanged. The period under this study is from 3 anuary 1994 to 26 November 1999. Six series of returns are calculated. Each aries of return consists of 1400 trading or non-trading day returns. The days fter the public holidays are excluded. The six series of return are close to open)vernight non-trading), open to close (daily trading), morning trading, afternoon ading, daily close to close and daily open to open. Additionally, these returns ire computed for each of the seven KLSE indices namely the Composite Index, :mas Index, Industrial Index, Finance Index, Property Index, Plantation Index and Mining Index.

4.1.1. The mean return for seven KLSE Indices by weekday

(a) close to open (overnight non-trading) return

Table 1 displays the summary statistics for the trading and non-trading day returns for seven KLSE indices by weekday. The last column shows that the average returns of the close to open (overnight non-trading) are all positive across all weekdays and indices, suggesting that the KLSE is more susceptible

Table 1: Summary Statistics for Seven KLSE Indices

dices	Return	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
	close to open	mean	0.0606	0.0168	0.0761	0.0623	0.0442	0.0521
		standard deviation	0.5572	0.4338	0.4461	0.4499	0.5713	0.4952
		kurtosis	40.5178	24.7914	18.5916	34.5044	48.0401	39.7019
		skewness	3.4956	-0.9743	2.7867	1.0534	5.0248	2.9797
	open to close	mean	-0.3014	-0.0705	0.0083	-0.2125	0.085	-0.0958
		standard deviation	1.9870	2.3177	1.7915	1.8280	1.6534	1.9272
		kurtosis	13.7451	65.7188	5.4056	7.4303	19.2427	33.420
		skewness	2.1419	-5.7837	0.7985	-0.2388	2.2167	-1.141
mposite Index	morning	mean	-0.2711	-0.1726	-0.0671	-0.2649	-0.1029	-0.174
		standard deviation	1.8379	1.3525	1.4106	1.6060	1.1623	1.488
		kurtosis	34.2903	15.8343	7.2234	6.0773	7.7008	20.562
		skewness	3.9577	-2.1531	0.3902	-0.3249	0.8481	1.148
	afternoon	mean	-0.0303	0.1021	0.0754	0.0525	0.1879	0.078
		standard deviation	1.0676	1.3121	0.9578	1.0062	1.0747	1.089
		kurtosis	31.7678	85.1932	3.0221	5.4241	15.2840	43.827
		skewness	3.0994	-6.7452	0.4943	-0.3963	1.9900	-1.317
	close to close	mean	-0.2408	-0.0537	0.0844	-0.1502	0.1292	-0.043
		standard deviation	2.3325	2.2765	1.9647	1.8838	1.9306	2.084
		kurtosis	24.2557	46.2544	7.9778	6.3501	18.4956	24.70
		skewness	3.2003	-4.5967	1.2984	-0.7682	2.4660	0.188
	open to open	mean	0.171	-0.3007	-0.0594	0.0709	-0.1555	-0.05
		standard deviation	2.0566	2.1787	2.4429	1.9320	2.0755	2.147
		kurtosis	30.1897	17.6594	39.1167	4.4961	8.1965	23.55
		skewness	3.2955	2.4842	-3.7808	0.8190	0.3701	0.110
		Observations	272	274	284	281	289	140
	close to open	mean	0.0854	0.0186	0.1088	0.0658	0.0639	0.06
		standard deviation	0.4980	0.5554	0.6949	0.3832	0.4841	0.53
		kurtosis	30.9746	117.2244	162.2117	21.0112	39.2751	133.1
		skewness	2.5912	-8.5689	11.2194	-0.5468	4.6468	4.21
	open to close	mean	-0.4338	-0.0853	-0.0211	-0.2387	0.1292	-0.1
		standard deviation	2.0797	2.1813	1.7360	1.9123	1.6100	1.91
		kurtosis	10.7371	43.7003	3.8375	7.6459	21.7380	20.9
		skewness	1.6941	-4.3286	0.3812	-0.5800	2.7517	-0.5
Emas	morning	mean	-0.3119	-0.2151	-0.0914	-0.2731	-0.0979	-0.1
		standard deviation	1.9055	1.3390	1.4257	1.5956	1.1698	1.5
		kurtosis	35.4781	11.8334	9.0311	5.6970	9.2971	22.2
		skewness	4.0282	-1.8715	-0.1555	-0.5947	1.2032	1.2
	afternoon	mean	-0.1219	0.1298	0.0703	0.0344	0.2271	0.0
		standard deviation	1.0512	1.2058	0.9769	0.9638	1.0014	1.0
		kurtosis	26.1140	50.4066	3.1771	3.3701	15.6119	25.
		skewness	2.2975	-4.2933	0.4650	-0.3208	2.0529	-0.4
	close to close	mean	-0.3483	-0.0667	0.0877	-0.1730	0.1931	-0.0
		standard deviation	2.3553	2.1915	1.9176	1.9469	1.8570	2.0
		kurtosis	17.7086	28.9459	5.2517	7.2885	21.1306	17.
		skewness	2.4635	-3.3746	0.9006	-0.8288	2.9942	0.3

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:mas	open to open	mean	0.2396	-0.4311	-0.0353	0.0443	-0.1552	-0.06ε
		standard deviation	1.9600	2.2837	2.4446	1.8998	2.1255	2.161
		kurtosis	29.5209	12.4756	24.3147	2.9188	7.9857	16.63
		skewness	3.4581	1.6312	-2.0080	0.4766	0.1773	0.35ₐ
	close to open	mean	0.0394	0.0444	0.0606	0.0438	0.0494	0.04₹
		standard deviation	0.6171	0.5686	0.3475	0.8166	0.6021	0.60₹
		kurtosis	60.1034	86.9614	21.1056	113.2423	44.7609	107.4:
		skewness	-3.9241	5.8083	-0.1273	-4.8726	3.7705	-1.48
	open to close	mean	-0.3267	-0.0948	-0.0095	-0.1544	0.152	-0.08
		standard deviation	1.7680	2.0971	1.6599	1.9007	1.6941	1.83
		kurtosis	11.2818	62.9851	5.6324	26.1645	30.4259	33.9:
		skewness	1.5836	-5.6393	0.3180	2.4218	3.5225	-0.2:
ndustrial	morning	mean	-0.2466	-0.1964	-0.0517	-0.1717	0.0249	-0.1:
		standard deviation	1.5938	1.2737	1.3997	1.7009	1.6371	1.5:
		kurtosis	32.4009	20.0640	8.7863	26.7158	77.5398	39.2
		skewness	3.5534	-2.5729	-0.3543	2.3637	6.7049	2.7₹
	afternoon	mean	-0.0801	0.1017	0.04217	0.0173	0.1271	0.0ₐ
		standard deviation	1.0107	1.2010	0.9599	1.0330	1.6716	1.2(
		kurtosis	32.0215	52.6966	5.2667	9.2750	98.0818	86.4
		skewness	3.2259	-4.6104	0.2577	-1.1356	-6.4094	-4.0
	close to close	mean	-0.2873	-0.0504	0.0511	-0.1106	0.2014	-0.0
		standard deviation	2.0019	2.1145	1.7288	1.7549	1.9091	1.9
		kurtosis	19.5851	48.6479	5.8350	4.4129	28.7453	25.ₔ
		skewness	2.3829	-4.8348	0.4718	-0.0513	3.6421	0.0
	open to open	mean	0.2423	-0.2948	-0.1206	0.0133	-0.0929	-0.(
		standard deviation	1.9280	1.9239	2.2464	1.8395	2.1266	2.(
		kurtosis	45.3179	12.4553	43.4008	5.0551	23.9872	29.
		skewness	4.3929	1.8864	-4.5657	0.3680	2.4790	0.ₐ
Finance	close to open	mean	0.1259	0.0447	0.0806	0.0982	0.0836	0.(
		standard deviation	0.601	0.461	0.515	0.548	0.919	0.
		kurtosis	52.980	21.716	17.725	29.018	75.891	8:
		skewness	4.866	1.636	0.523	1.986	6.840	5
	open to close	mean	-0.4355	-0.0737	-0.0176	-0.2743	0.1524	-0.
		standard deviation	2.4067	2.5360	2.1266	2.1226	1.9408	2.
		kurtosis	9.6283	27.8593	5.0024	5.7869	20.3207	15
		skewness	1.4538	-2.9461	0.4662	-0.1137	1.4957	-0
	morning	mean	-0.2484	-0.1767	0.0589	-0.2345	-0.0529	-0
		standard deviation	2.2279	1.5370	1.8508	1.7820	1.6184	1
		kurtosis	24.8400	7.6728	20.0734	5.3002	13.5210	1ₑ
		skewness	3.1840	-1.1032	2.8191	-0.2168	-0.7027	1
	afternoon	mean	-0.1871	0.103	0.0098	-0.0399	0.2053	0
		standard deviation	1.2702	1.3880	1.2798	1.0512	1.1820	1
		kurtosis	32.8192	36.8787	26.2706	5.1527	13.4274	2
		skewness	2.9120	-3.0731	-2.4384	-0.5676	1.9372	-ₗ
	close to close	mean	-0.3096	-0.029	0.063	-0.1761	0.236	-
		standard deviation	2.7367	2.4965	2.1953	2.1642	2.0878	:
		kurtosis	16.8078	17.4937	5.3538	5.5149	22.4056	1
		skewness	2.3060	-2.1475	0.5984	-0.2193	3.1452	ₗ

nance	open to open	mean	0.2799	-0.3883	-0.0527	0.0823	-0.1458	-0.0462
		standard deviation	2.4018	2.5852	2.6456	2.2872	2.4620	2.4862
		kurtosis	29.9837	11.7245	17.4724	3.7927	6.6341	13.931(
		skewness	2.7392	1.7359	-1.8054	0.4291	0.6718	0.6007
	close to open	mean	0.1381	0.1269	0.0876	0.1065	0.1531	0.122<
		standard deviation	0.5227	1.0248	1.2332	0.6744	0.7791	0.884:
		kurtosis	8.4408	178.2990	114.1417	87.0339	77.4038	164.33(
		skewness	0.2395	12.0148	-2.9627	5.2481	7.3964	3.491:
	open to close	mean	-0.7515	-0.0766	-0.1779	-0.2622	0.1554	-0.217
		standard deviation	2.8588	2.9647	2.3345	2.4594	2.1515	2.579
		kurtosis	9.1725	12.8650	4.6093	7.1298	21.2696	10.81!
		skewness	1.0404	-1.1161	-0.1941	0.0834	2.2993	0.156
'roperty	morning	mean	-0.5233	-0.4016	-0.3564	-0.4138	-0.2599	-0.38!
		standard deviation	2.4527	2.0000	1.8409	1.9547	1.6074	1.98:
		kurtosis	33.9177	14.2370	10.3115	8.6001	10.6517	21.82
		skewness	3.5735	-1.9395	-1.4396	-0.0937	0.3049	0.66:
	afternoon	mean	-0.2281	0.325	0.1785	0.1516	0.4152	0.17'
		standard deviation	1.3722	1.8719	1.3921	1.2834	1.3055	1.47:
		kurtosis	7.9936	21.5095	4.5818	3.3226	15.0327	15.66
		skewness	-0.0159	1.5949	1.1565	0.7140	2.4618	1.30!
	close to close	mean	-0.6134	0.0503	-0.0903	-0.1557	0.3085	-0.09
		standard deviation	3.0677	2.8539	2.3872	2.4616	2.2494	2.62
		kurtosis	10.6741	10.5894	6.2808	7.2054	22.7025	11.0!
		skewness	1.2780	-0.6617	-0.3986	0.1930	3.2673	0.55
	open to open	mean	0.3164	-0.6443	-0.0621	-0.0722	-0.0778	-0.1(
		standard deviation	2.4891	3.1109	3.0939	2.5531	2.7954	2.8:
		kurtosis	20.2925	9.7025	9.3405	3.4086	6.5457	9.3!
		skewness	2.5211	1.3244	-0.9351	0.0787	0.7328	0.5:
	close to open	mean	0.0653	0.0419	0.0635	0.0417	0.0657	0.0!
		standard deviation	0.4563	0.4317	0.5546	0.3856	0.5156	0.4'
		kurtosis	22.3388	74.0198	128.8976	44.8130	67.7698	85.8
		skewness	-1.1037	4.7472	8.7286	-3.4926	6.5389	4.7
	open to close	mean	-0.4192	-0.1142	0.0335	-0.264	0.1565	-0.1
		standard deviation	2.1580	2.2289	1.7840	1.9424	1.6239	1.9
		kurtosis	9.8324	24.3542	7.1831	13.9808	12.0646	15.:
		skewness	1.0122	-3.4782	-0.1810	-0.7903	1.6144	-0.;
Plantation	morning	mean	-0.2849	-0.2854	-0.0515	-0.2594	-0.096	-0.'
		standard deviation	1.7826	1.6236	1.4860	1.6311	1.1541	1.!
		kurtosis	33.7632	14.3767	23.8240	12.8372	7.0896	22.
		skewness	3.3319	-2.6366	-1.6761	-1.4744	0.5455	-0.:
	afternoon	mean	-0.1343	0.1712	0.085	-0.0046	0.2525	0.(
		standard deviation	1.1814	1.4900	1.0801	0.9265	0.9974	1.:
		kurtosis	9.3357	20.3656	11.9179	4.8236	5.3088	15
		skewness	0.8606	0.4412	1.5571	0.4199	1.0408	0.
	close to close	mean	-0.354	-0.0723	0.097	-0.2223	0.2223	-(
		standard deviation	2.2707	2.2882	1.8892	1.9928	1.8309	2.
		kurtosis	9.7706	20.2391	7.0884	15.2634	27.0647	1!
		skewness	1.1700	-3.0566	0.1635	-0.4766	3.1291	-0

ıtation	open to open	mean	0.2673	-0.4092	-0.13	0.0909	-0.1825	-0.074
		standard deviation	1.8094	2.2708	2.3906	1.9177	1.9952	2.0989
		kurtosis	10.9916	10.8601	20.5364	5.6983	9.3195	13.3531
		skewness	1.6268	0.9921	-2.8256	0.0948	0.8543	-0.2805
	close to open	mean	0.1777	0.0532	0.0794	0.0603	0.0708	0.0877
		standard deviation	0.7198	0.4261	0.5370	0.5259	0.8019	0.6196
		kurtosis	92.0818	24.9850	15.0383	38.3601	70.3932	80.6840
		skewness	7.3243	-2.2319	1.0054	-3.3448	-2.5431	0.7120
	open to close	mean	-0.7270	-0.1488	0.0548	-0.2715	0.1590	-0.1809
		standard deviation	3.8065	4.0349	3.1046	2.9997	3.2386	3.4624
		kurtosis	19.1830	45.6389	4.4071	5.7186	14.9360	24.823
		skewness	2.4562	-4.5086	0.4503	0.6031	1.8756	-0.327
⁄ining	morning	mean	-0.4795	-0.3177	-0.2136	-0.3702	-0.2508	-0.324
		standard deviation	2.9053	2.6189	3.2684	2.2240	2.0447	2.644
		kurtosis	31.0175	16.6228	62.9934	6.1273	11.6537	42.087
		skewness	3.4877	-2.2804	-5.5719	0.0680	-0.9632	-1.735
	afternoon	mean	-0.2475	0.1689	0.2684	0.0986	0.4098	0.143
		standard deviation	1.8626	2.3041	2.8835	1.9892	2.2293	2.291
		kurtosis	8.4187	31.7133	86.6031	14.8081	12.7677	55.085
		skewness	0.7225	-3.0012	7.3596	1.3366	2.5297	3.133
	close to close	mean	-0.5494	-0.0956	0.1342	-0.2112	0.2298	-0.093
		standard deviation	3.9145	4.0732	3.0670	3.0087	3.3906	3.516
		kurtosis	19.0805	42.7070	4.6412	5.6462	13.9074	23.84
		skewness	2.4824	-4.3570	0.4014	0.6318	1.8389	-0.21
	open to open	mean	0.3376	-0.6956	-0.1621	0.0725	-0.1373	-0.11
		standard deviation	3.3723	3.9493	4.3150	3.2269	3.2003	3.645
		kurtosis	14.8492	18.0481	34.3771	4.0377	5.7613	21.36
		skewness	2.0917	2.3598	-3.3378	0.4830	0.7643	-0.07

avourable news during the non-trading period. This result is similar to the lings of Chang, Kang and Rhee (1994) for the KLSE Composite Index return n February 3, 1990 to February 10, 1992 as well as Ho and Cheung (1991) the Hong Kong Hang Seng Index from April 9, 1986 to October 16, 1987. wever, studies done by Prince (1982), Rogalski (1984), Smirlock and Starks)86) and Harris (1986) showed a negative Monday overnight or weekend turn. Most KLSE indices have high weekend return particularly the mining ocks (0.1777%). By looking at the last column, the average overnight non-ading return is the highest for Property Index (0.1224%) followed by Mining dex (0.0877%) while the Industrial Index has the lowest average overnight turn (0.0476%).

) open to close return (daily trading day)return

As for the daily open to close (daily trading day) return, the all day open to close return is negative for all seven indices. This result is consistent with the study done by Chang, Kang and Rhee (1994). Smirlock and Starks (1986) obtained the same result for the DJIA from 1968 to 1974. All seven indices have negative return particularly on Monday, Tuesday and Thursday. This may suggest that less favourable news is released during the early week trading. The similar result is obtained by Smirlock and Starks (1986) which shows a negative Monday and Thursday return for the DJIA from 1963 to 1983. Interestingly, however, all indices have positive trading return on Friday. This result is consistent with the findings of Ho and Cheung (1991) for the Hang Seng Index

m April 1986 to October 1987. In contrast, Rogalski (1984) showed a positive

urn for all days except Thursday for the Standard and Poor's Composite Index

P 500) from January 2, 1979 to April 30,1984. Only three indices have positive

ednesday trading return – the Composite Index, Plantation Index and Mining

dex. The Property Index has the highest negative open to close return

).2176%) followed by Mining Index (-0.1809%) while the lowest negative

en to close return is the Industrial Index (-0.0836%). Perhaps the property and

ning stocks are going through a phase of consolidation.

;) morning trading return

The daily open to close return is divided into two trading returns: the

morning trading return which is computed from the morning open to morning

lose and the afternoon trading return which is computed from morning close to

afternoon close (data for afternoon open is not obtainable). From the last column

n Table 1, all seven indices have negative morning return, suggesting that

unfavourable information is produced during the morning session. This result is

consistent with the findings of Chang, Kang and Rhee (1994). By looking at

weekday, almost all indices have negative morning return throughout Monday to

Friday. However, only the Industrial Index and Finance Index have positive

morning return on Friday and Wednesday respectively. Just like the open to

close return, once again the property stocks suffer the biggest losses during the

morning trading (-0.3893%) while the Industrial Index has the lowest negative

return(-0.1261%).

afternoon trading return

The reverse occurs during the afternoon trading where all seven indices ve positive return from Tuesday to Friday as indicated in Table 1, similar to the ;ult obtained by Chang, Kang and Rhee (1994). Surprisingly, all indices have gative Monday afternoon return. In other words, the negative Monday morning d afternoon returns contribute to the negative Monday open to close return. onversely, the positive open to close return on Friday may be attributable to the ositive afternoon return, which offsets the negative morning return. The largest ositive afternoon return is again dominated by property stocks (0.1716%) and ie mining stocks (0.1438%). This implies that the price reversal from a negative iorning to a positive afternoon return of property and mining stocks is faster than ther stocks.

e) daily close to close return

The daily close to close return is decomposed of the close to open overnight non-trading) return and the open to close (daily trading) return. Since :he average daily trading return is negative, it is expected that the average daily close to close return should turn out to be negative too. From the last column in Table 1, the average daily return is indeed negative for all indices. All indices have negative daily return particularly on Monday, Tuesday and Thursday but positive return on Wednesday and Friday. Thus, it indicates that the negative Monday close to close return accrues primarily from the negative Monday open to close return and not from the positive Friday close to Monday open return,

ilar to the study done by Smirlock and Starks (1986) for the DJIA from 1963 to

i8. However, this result contradicts the findings of Rogalski (1984) for the S&P

) from 1979 to 1984, where the negative Monday daily close to close return

:rues mainly from the negative weekend non-trading return from Friday close

Vlonday open. Similarly, the positive daily return on Friday is attributable to the

sitive open to close return on Friday. As expected, the largest negative daily

urn is the Property Index (-0.0952%) followed by the Mining Index (-0.0932%)

iile the Industrial Index has the lowest daily losses (-0.0359%).

daily open to open return

The daily open to open shows quite a similar result as the daily close to

ose return where all indices have negative all day return. Nevertheless, the last

)lumn in Table 1 shows that the average return of the daily open to open series

, slightly lower than the daily close to close series. Surprisingly, there is a

averse trend in the weekday open to open return as compared to the daily close

) close return. All indices have positive Monday open to open return, which

nainly accrues from the positive Friday trading return and the positive Friday

:lose to Monday open return. In contrast, there is a negative daily open to open

·eturn for Wednesday and Friday, as opposed to a positive Wednesday and

Friday daily close to close return. Once again, the mining stocks and the property

stocks have the highest negative open to open return (-0.1176% and -0.1078%

respectively).

2 The return volatility for seven KLSE indices by weekday

·eturn volatility of close to open and open to close series

Volatility refers to the risk of a stock. A high (low) volatility shows a high

v) variation in the stock prices. Table 1 shows the standard deviation or

atility of each return for seven KLSE indices. The table shows that the open to

se return (daily trading) of all indices has higher standard deviation or volatility

n the close to open (overnight non-trading) return. The magnitude of standard

viation or volatility of the open to close return is between three to five times

ʒater than the close to open return. This result is consistent with the findings of

ʒnch and Roll (1986) and Lockwood and Linn (1990) for the US market. As for

ʒ weekday, it seems that the open to close returns of Monday and Tuesday for

indices have high volatility than other days. The Property Index and Mining

dex have the highest standard deviation for the overnight return (0.8843% and

6196% respectively) as well as having the highest standard deviation for the

ʒily trading return (2.5793% and 3.4624% respectively). This implies that there

a great fluctuation in the price of property and mining stocks during the non-

ading and the trading day. On the other hand, the Industrial Index, which is

xpected to have the lowest volatility for both returns, has only the lowest

olatility in the daily trading return (1.8331%). Surprisingly, the lowest overnight

ion-trading return volatility is the Plantation Index (0.4728%).

eturn volatility of morning and afternoon series

For all indices, the return volatility in the morning trading session is higher that in the afternoon trading session. The variance of the morning return is it two to three times greater than the variance of the corresponding afternoon ng session. Thus there is more variation in the morning return. This result is lar to the findings of Chang, Kang and Rhee (1994) for the KLSE from ruary 3, 1990 to February 10, 1992. The return volatility of the morning and rnoon trading session is particularly high for the mining and property stocks ughout the week as compared to other stocks.

return volatility of daily close to close and open to open series

The return volatility of the daily close to close series is almost similar to daily open to open series for all indices. The mining and property stocks as)ected have the highest return volatility for both daily close to close and open open returns. The negative close to close return on Monday of all indices ∍ms to suggest that it has a higher volatility than the positive Monday open to en return. In contrast, the positive Friday close to close return also seems to licate that it has lower volatility than the negative Friday open to open return. ∍vertheless, these results need to be tested by a relevant hypothesis that will ı highlighted in the next section.

.1.3 Kurtosis and Skewness

Kurtosis measures the peakedness of the distribution of returns while skewness measures the extent of non symmetry of the returns. From Table 1, the kurtosis of each return for all indices is unusually large throughout the non-trading and trading day. This suggests that the distribution of the returns is peaked. The close to open series seems to have the highest kurtosis among all the returns. The Emas Index and Property Index have extremely high kurtosis particularly on Tuesday and Wednesday for the close to open return. The sign of skewness for the all day returns is different for morning returns, afternoon returns and non-trading returns. Interestingly, most of the returns on Monday and Friday seem to skew to the right, showing that the value of mean return is greater than the mode return. It also indicates that only a small proportion of the returns is unrepresentatively high. The large kurtosis and skewness observed is similar to the findings of Chang, Kang and Rhee (1994). However, Chang et al. (1993) observe only large kurtosis and skewness during the opening of the morning session for the Tokyo Stock Exchange.

4.2 Testing The Existence of Weekday, Overnight, Weekend and Daily Effect

Trading day returns or weekday returns comprise the open to close (daily trading) return, which is decomposed of the morning return and the afternoon return throughout Monday to Friday. The weeknight or overnight non-trading return refers to the close to open return for Tuesday to Friday. For instance, the

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close to open or weeknight return for Tuesday measures the return from the Monday close to Tuesday open. The weekend return measures the non-trading return from the Friday close to the Monday open. Lastly, the daily return refers to the daily close to close return. In addition to that, the daily open to open return is also used as a basis for comparison.

4.2.1 Weekday Effect

The weekday effect comprises the return of the daily open to close trading which is decomposed of the morning trading and the afternoon trading. By referring to the second row and all day column for all indices in Table 2, the average daily trading return is significantly negative. There is a significant negative Monday trading return for all indices at the 1% level, similar to the study done by Smirlock and Starks (1986) for the DJIA from 1963 to 1983. All indices, except the Industrial Index and Mining Index, also have significant negative return on Thursday. Conversely, the open to close return for Tuesday, Wednesday and Friday is statistically insignificant for all indices. The value of F_1 provides evidence that at least two days of the open to close return are not equal to each other. The F_2 statistic also indicates that the open to close return is equal through Tuesday to Friday. In addition to that, return volatility as shown by F_3 and F_4 is also significantly different across the weekdays for all indices.

Table 2: Testing The Existence Of Weekday, Overnight, Weekend and Daily Effects

Indices	Return	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day	F_1	F_2	F_3	F_4
Composite Index	close to open	Mean	0.0606	0.0168	0.0761	0.0623	0.0442	0.0521	0.58	0.79	40.47ᶜ	30.02ᶜ
		t-value	1.79ᵃ	0.64	2.87ᶜ	2.32ᵇ	1.32	3.94ᶜ				
	open to close	Mean	-0.3014	-0.0705	0.0083	-0.2125	0.085	-0.0958	1.89	1.26	38.19ᶜ	37.5ᶜ
		t-value	-2.5ᵇ	-0.5	0.08	-1.95ᵃ	0.87	-1.86ᵃ				
	morning	Mean	-0.2711	-0.1726	-0.0671	-0.2649	-0.103	-0.1745	1.08	1.11	67.54ᶜ	29.79ᶜ
		t-value	-2.43ᵇ	-2.11ᵇ	-0.8	-2.77ᶜ	-1.5	-4.39ᶜ				
	afternoon	Mean	-0.0303	0.1021	0.0754	0.0525	0.1879	0.0787	1.48	0.84	33.72ᶜ	33.4ᶜ
		t-value	-0.47	1.29	1.33	0.87	2.97ᶜ	2.7ᶜ				
	close to close	Mean	-0.2408	-0.0537	0.0844	-0.1502	0.1292	-0.0434	1.56	1.14	22.35ᶜ	12.62ᵇ
		t-value	-1.7ᵃ	-0.39	0.72	-1.34	1.14	-0.78				
	open to open	Mean	0.171	-0.3007	-0.0594	0.0709	-0.156	-0.0561	2.06ᵃ	1.46	17.83ᶜ	16.7ᶜ
		t-value	1.37	-2.28ᵇ	-0.41	0.62	1.27	-0.98				
		Obs	272	274	284	281	289	1400				
Emas	close to open	Mean	0.0854	0.0186	0.1088	0.0658	0.0639	0.0687	1.08	1.29	105.6ᶜ	102.7ᶜ
		t-value	2.83ᶜ	0.56	2.64ᶜ	2.88ᶜ	2.24ᵇ	4.82ᶜ				
	open to close	Mean	-0.4338	-0.0853	-0.0211	-0.2387	0.1292	-0.1265	3.54ᶜ	1.9	34.56ᶜ	29.33ᶜ
		t-value	-3.44ᶜ	-0.65	-0.20	-2.09ᵇ	1.36	-2.47ᶜ				
	morning	Mean	-0.3119	-0.2151	-0.0914	-0.2731	-0.0979	-0.1963	1.25	1.17	77.06ᶜ	28.11ᶜ
		t-value	-2.70ᶜ	-2.66ᶜ	-1.08	-2.87ᶜ	-1.42	-4.88ᶜ				
	afternoon	Mean	-0.1219	0.1298	0.0703	0.0344	0.2271	0.0698	4.25ᶜ	1.88	19.25ᶜ	19.21ᶜ
		t-value	-1.91ᵃ	1.78ᵃ	1.21	0.60	3.86ᶜ	2.49ᵇ				
	close to close	Mean	-0.3483	-0.0667	0.0877	-0.1730	0.1931	-0.0578	3ᵇ	1.91	23.09ᶜ	9.01ᵃ
		t-value	-2.44ᵇ	-0.50	0.77	-1.49	1.77ᵃ	-1.05				
	open to open	Mean	0.2396	-0.4311	-0.0353	0.0443	-0.1552	-0.0681	3.66ᶜ	2.48ᵃ	24.56ᶜ	19.14ᶜ
		t-value	2.02ᵇ	-3.12ᶜ	-0.24	0.39	-1.24	-1.18				
	close to open	Mean	0.0394	0.0444	0.0606	0.0438	0.0494	0.0476	0.05	0.05	188.2ᶜ	188.1ᶜ
		t-value	1.05	1.29	2.94ᶜ	0.9	1.39	2.93ᶜ				
	open to close	Mean	-0.3267	-0.0948	-0.0095	0.152	0.1261	-0.0836	2.62ᵇ	1.49	20.86ᶜ	20.12ᶜ
		t-value	-3.05ᶜ	-0.75	-0.1	1.5	0.11	-1.71ᵃ				

Sector	Period		1	2	3	4	5	6	7	8	9	10
Industrial	morning	Mean	-0.2466	-0.1964	-0.0517	0.0249	0.8049	-0.1261	1.5	1.33	30.93[c]	29.79[c]
		t-value	-2.55[b]	-2.55[b]	-0.62	0.26	1	-3.08[c]	1.25	0.47		
	afternoon	Mean	-0.0801	0.1017	0.04217	0.0173	0.1271	0.0426	1.25	0.47	129.8[c]	111.7[c]
		t-value	-1.31	1.4	0.74	0.63	2.84[c]	1.32				
	close to close	Mean	-0.2873	-0.0504	0.0511	0.1214	0.2014	-0.0359	2.56[b]	1.5	16.32[c]	14.6[c]
		t-value	-2.37[b]	-0.39	0.5	1.12	1.77[a]	-0.7				
	open to open	Mean	0.2423	-0.2948	-0.1206	0.0133	-0.093	-0.0516	2.62[b]	1.08	15.43[c]	14.02[c]
		t-value	2.07[b]	-2.54[b]	-0.9	0.12	-0.74	-0.95				
	close to open	Mean	0.1259	0.0447	0.0806	0.0982	0.0836	0.0865	0.59	0.35	182.1[c]	180.4[c]
		t-value	3.46[c]	1.61	2.63[c]	3[c]	1.55	5.12[c]				
	open to close	Mean	-0.4355	-0.0737	-0.0176	-0.2743	0.1524	-0.1262	2.9[b]	1.84	25.84[c]	21.74[c]
		t-value	-2.98[c]	-0.48	-0.48	-2.17[b]	1.34	-2.11[b]				
Finance	morning	Mean	-0.2484	-0.1767	0.0589	-0.2345	-0.053	-0.1464	0.92	0.99	47.13[c]	12.13[b]
		t-value	-1.84[a]	-1.9[a]	0.54	-2.21[b]	-0.56	-3.06[c]				
	afternoon	Mean	-0.1871	0.103	0.0098	-0.0399	0.2053	0.0202	4[c]	2.2[a]	126.8[c]	121.5[c]
		t-value	-2.43[b]	1.23	0.1294	-0.64	2.95[c]	0.61				
	close to close	mean	-0.3096	-0.029	0.063	-0.1761	0.236	-0.0397	2.28[a]	1.69	29.55[c]	10.5[b]
		t-value	-1.87[a]	-0.19	0.48	-1.36	1.92[a]	-0.63				
	open to open	mean	0.2799	-0.3883	-0.0527	0.0823	-0.146	-0.0462	2.78[b]	1.75	7.48	6.82
		t-value	1.92[a]	-2.49[b]	-0.34	0.6	-1.01	-0.7				
	close to open	mean	0.1381	0.1269	0.0876	0.1065	0.1531	0.1224	0.24	0.25	243.6[c]	122.3[c]
		t-value	4.36[c]	2.05[b]	1.2	2.65[c]	3.34[c]	5.18[c]				
	open to close	mean	-0.75	-0.0766	-0.1779	-0.2622	0.1554	-0.2176	4.72[c]	1.5	41.01[c]	32.23[c]
		t-value	-4.34[c]	-0.43	-1.28	-1.79[a]	1.23	-3.16[c]				
Property	morning	mean	-0.5233	-0.4016	-0.3564	-0.4138	-0.26	-0.3893	0.65	0.41	53.61[c]	15.63[c]
		t-value	-3.52[c]	-3.32[c]	-3.26[c]	-3.55[c]	-2.75[c]	-7.34[c]				
	afternoon	mean	-0.2281	0.325	0.1785	0.1516	0.4152	0.1716	7.9[c]	2.02	65.57[c]	64.21[c]
		t-value	-2.74[c]	2.87[c]	2.16[b]	1.98[b]	5.41[c]	4.36[c]				
	close to close	mean	-0.6134	0.0503	-0.0903	-0.1557	0.3085	-0.0952	4.64[c]	1.9[a]	38.03[c]	17.74[c]
		t-value	-3.3[c]	0.29	-0.64	-1.06	2.33[b]	-1.36				
	open to open	mean	0.3164	-0.6443	-0.0621	-0.0722	-0.078	-0.1078	4.05[c]	2.7[b]	23.78[c]	14.4[c]
		t-value	2.1[b]	-3.43[c]	-0.34	-0.47	-0.47	-1.42				

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Sector	Period								F1	F2	F3	F4
Plantation	close to open	mean	0.0653	0.0419	0.0635	0.0417	0.0657	0.0557	0.2	0.22	45.93ᶜ	45.08ᶜ
		t-value	2.36ᵇ	1.61	1.93ᵃ	1.81ᵃ	2.17ᵇ	4.41ᶜ				
	open to close	mean	-0.4192	-0.1142	0.0335	-0.264	0.1565	-0.1177	3.86ᵇ	2.6ᵃ	37.94ᶜ	30.74ᶜ
		t-value	-3.2ᶜ	-0.85	0.32	-2.28ᵇ	1.64	-2.24ᵇ				
	morning	mean	-0.2849	-0.2854	-0.0515	-0.2594	-0.096	-0.1935	1.49	1.74	56.8ᶜ	40.98ᶜ
		t-value	-2.64ᶜ	-2.91ᶜ	-0.58	-2.67ᶜ	-1.41	-4.68ᶜ				
	afternoon	mean	-0.1343	0.1712	0.085	-0.0046	0.2525	0.0759	4.81ᶜ	2.7ᵇ	79.68ᶜ	79.17ᶜ
		t-value	-1.88ᵃ	1.9ᵃ	1.33	-0.08	4.3ᶜ	2.46ᵇ				
	close to close	mean	-0.354	-0.0723	0.097	-0.2223	0.2223	-0.062	3.59ᶜ	2.7ᵇ	23.95ᶜ	16.83ᶜ
		t-value	-2.57ᵇ	-0.52	0.87	-1.87ᵃ	2.06ᵇ	-1.12				
	open to open	mean	0.2673	-0.4092	-0.13	0.0909	-0.183	-0.074	4.26ᶜ	2.5ᵇ	30.51ᶜ	18.37ᶜ
		t-value	2.44ᵇ	-2.98ᶜ	-0.92	0.79	-1.56	-1.32				
Mining	close to open	mean	0.1777	0.0532	0.0794	0.0603	0.0708	0.0877	1.85	0.11	143.8ᶜ	125.8ᶜ
		t-value	4.07ᶜ	2.06ᵇ	2.49ᵇ	1.92ᵃ	1.50	5.30ᶜ				
	open to close	mean	-0.7270	-0.1488	0.0548	-0.2715	0.1590	-0.1809	2.79ᵇ	0.95	38.54ᶜ	31.52ᶜ
		t-value	-3.15ᶜ	-0.61	0.30	-1.52	0.83	-1.96ᵇ				
	morning	mean	-0.4795	-0.3177	-0.2136	-0.3702	-0.2508	-0.3247	0.44	0.21	81.79ᶜ	75.39ᶜ
		t-value	-2.72ᶜ	-2.01ᵇ	-1.10	-2.79ᶜ	-2.08ᵇ	-4.59ᶜ				
	afternoon	mean	-0.2475	0.1689	0.2684	0.0986	0.4098	0.1438	3.22ᵇ	0.92	65.96ᶜ	42.69ᶜ
		t-value	-2.19ᵇ	1.21	1.57	0.83	3.13ᶜ	2.35ᵇ				
	close to close	mean	-0.5494	-0.0956	0.1342	-0.2112	0.2298	-0.0932	2.14ᵃ	1.01	42.41ᶜ	33.48ᶜ
		t-value	-2.31ᵇ	-0.39	0.74	-1.18	1.15	-0.99				
	open to open	mean	0.3376	-0.6956	-0.1621	0.0725	-0.1373	-0.1176	3.77ᶜ	3.13ᵇ	41.48ᶜ	37.87ᶜ
		t-value	1.65ᵃ	-2.92ᶜ	-0.63	0.38	-0.73	-1.21				

[a] the t-value or F-statistic is significant at 10% level.
[b] the t-value or F-statistic is significant at 5% level.
[c] the t-value or F-statistic is significant at 1% level.

F_1 testing equality of mean returns for Monday through Friday
F_2 testing equality of mean returns for Tuesday through Friday
F_3 testing equality of variance for Monday through Friday
F_4 testing equality of variance for Tuesday through Friday

The morning return has almost similar result as the open to close return. The only difference is that the morning returns not only has the effect of a significant negative Monday and Thursday effect but it also has significant negative Tuesday return for all indices. Anyway, there is no evidence of a significant weekday difference in the mean return of the morning trading but the volatility across the weekdays is significantly different.

All seven indices except the Finance Index have significant positive afternoon trading return for all day return. The most obvious of a significant positive afternoon return of all indices occurs on Friday. There is a significant negative Monday afternoon return for all indices except for Composite Index and Industrial Index.

4.2.2 Overnight effect

Overnight non-trading effect or weeknight effect occurs from the previous day close to the current day open throughout Tuesday to Friday. By referring to the close to open return in Table 2, the existence of overnight non-trading effect can be determined. From Table 2, there is only evidence of an overnight effect on Tuesday for property and mining stocks. Similarly, there is a significant overnight effect on Wednesday except the Property Index. All indices have overnight effect on Thursday (except Industrial Index) as well as an overnight Friday effect (except the Mining Index).

4.2.3 Weekend Effect

Weekend effect, on the other hand, occurs from the previous week Friday close to the current week Monday open. It is also called Monday non-trading effect. By referring to Monday close to open return in Table 2, all indices have significant weekend effect except the Industrial Index. Nevertheless, the F_1 and F_2 values indicate the close to open return is equal across all weekdays. Anyway, there is a significant difference in volatility across all weekdays for all indices. This result is consistent with the findings of Smirlock and Starks (1986) for the DJIA from 1963 to 1968 and Ho and Cheung (1991) for the Hang Seng Index from April 1986 to October 1987 (pre-crash period). In contrast, Rogalski (1984) observes a significant negative weekend effect for the S&P 500 from January 1979 to April 1984 and the DJIA from October 1974 to April 1984.

4.2.4 Daily Effect

The daily effect refers to the daily close to close return. It is calculated from the previous day close to the current day close. From Table 2, Monday effect occurs in the daily close to close return for all indices where the negative daily return on Monday is significantly less than zero. In other words, this effect is mainly attributable to the negative Monday open to close return and not to the positive weekend effect from Friday close to Monday open. This result is similar to Smirlock and Starks (1986) for the DJIA from 1963 to 1983 but contradicts with Rogalski (1984). The Monday daily return for all indices is significantly different

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from zero. Once again, the daily return volatility is also significantly different across all weekdays, indicated by F_3 and F_4 values.

As a comparison, the effects of daily open to open return are also tested. The daily open to open return is computed from the previous day open to the current day open. As expected, there is a significant negative Tuesday open to open return for all indices. This occurs mainly because of the negative Monday open to close return. Similarly, the significant positive Monday open to open return for all indices is mainly caused by the positive Friday open to close return. Interestingly, the Monday daily open to open return is significantly different from from zero. Thus, the Monday effect exists in the daily open to open return for all indices. The daily open to open return is equal throughout Tuesday to Friday. The volatility for all indices is again significantly different across all weekdays except for Finance Index.

4.3 Testing Of Homogeneity across Trading and Non-trading Returns

4.3.1 Homogeneity Between Close to Open and Open to Close Returns

Tests of equality of mean and variance are performed between close to open (overnight non-trading) and open to close (daily trading) series for each index. The purpose is to test if there is a significant difference in the mean return and volatility between the non-trading and trading periods. The result is presented in Table 3. The equality of mean test is indicated by the t-value while the equality of variance test is shown by the F-value. By looking at all the t_1 values and the all day return column, there is evidence of a significant difference

between the close to open and open to close returns for all indices. However, across the weekdays, the overnight and trading day returns are only different on Monday and Thursday. The high F_5 values for each index across the weekdays support the rejection of the null hypothesis of equal variance between the overnight and daily trading day. Obviously, this shows that the volatility of the open to close period is evidently higher than the close to open period, suggests that private information is greater released during the trading day. This result is consistent with the findings of Chang, Kang and Rhee (1994) for the KLSE market, French and Roll (1986) and Lockwood and Linn (1990) for the US market. In contrast, Cheung, Ho, Pope and Draper (1994) find that the open to close return variance is not significantly different from the close to open return variance for the Hong Kong market. The volatility between open to close and close to open return is the greatest among the mining stocks.

4.3.2 Homogeneity Between Morning and Afternoon Trading Returns

Table 3 also shows the result of equality of mean and variance between morning and afternoon trading returns. The last column under the t_2 values provides evidence of a significant different between the morning and afternoon trading return for all indices. Chang, Kang and Rhee (1994) also find the similar result. The difference is significantly seen on Tuesday, Thursday and Friday (except Industrial Index). As for Monday, only the Composite Index and Property Index shows a difference between the morning and afternoon return at 10% level. The return variance of the morning session is indeed higher than the afternoon session as shown by the F_6 values under the all day column of each

Table 3: Testing Equality of Mean and Volatility for Seven Indices

Indices	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
Composite Index	t_1	2.89^c	0.61	0.61	2.45^b	-0.4	2.78^c
	F_5	12.72^c	28.55^c	16.13^c	16.51^c	8.38^c	15.14^c
	t_2	-1.87^a	-2.41^b	-1.41	-2.8^c	-3.12^c	-5.14^c
	F_6	2.97^c	1.06	2.17^c	2.55^c	1.17^a	1.87^c
	t_3	-2.18^b	1.3	0.77	-1.37	1.71^a	0.16
	F_7	1.29^b	1.09	0.65	0.95	0.86	0.94
	F_8	3.43^c	1.74	0.51	2.74^b	2.3^b	4.53^c
	F_9	555.09^c	700.07^c	748.4^c	589.23^c	518.6^c	2981.6^c
Emas	t_1	4^c	0.76	1.17	2.62^c	-0.66	3.67^c
	F_5	17.44^c	15.42^c	6.24^c	24.9^c	11.06^c	12.93^c
	t_2	-1.44	-3.17^c	-1.58	-2.76^c	-3.59^c	-5.43^c
	F_6	3.29^c	1.23^b	0.62	2.74^c	1.36^c	2.07^c
	t_3	-3.16^c	1.9^a	0.67	1.08	2.1^b	0.13
	F_7	1.44^c	0.92	0.16	1.05	0.76	0.91
	F_8	6.18^c	3.42^c	0.68	2.76^c	3.21^c	5.79^c
	F_9	622.79^c	582.96^c	511.05^c	702.55^c	618.5^c	2845.9^c
Industrial	t_1	3.22^c	1.06	0.69	1.61	-0.97	2.54^b
	F_5	8.21^c	13.6^c	22.82^c	5.42^c	7.92^c	9.09^c
	t_2	-1.45	-2.82^c	-0.93	-1.59	-0.74	-3.24^c
	F_6	2.49^b	1.12	2.13^b	2.71^c	0.96	1.61^c
	t_3	-3.14^c	1.42	1.02	-0.82	1.75^a	0.21
	F_7	1.08	1.21^a	0.59	0.91	0.81	0.89
	F_8	5.39^c	2.25^b	0.62	1.06	1.15	2.61^b
	F_9	429.02^c	507.29^c	788.55^c	287.33^c	387.6^c	2038.9^c
Finance	t_1	3.73^c	0.76	0.76	2.85^c	-0.54	3.92^c
	F_5	16.06^c	30.26^c	17.02^c	14.97^c	4.46^c	12.53^c
	t_2	-0.39	-2.24^b	-0.29	-1.58	-2.19^b	-2.86^c
	F_6	3.08^c	1.23^b	1.82^c	2.87^c	1.87^c	2.07^c
	t_3	-2.67^c	1.66^a	0.57	-1.38	2.01^b	0.07
	F_7	1.3^b	0.93	0.69	0.9	0.72	0.89
	F_8	4.73^c	2.15^a	0.22	2.3^b	2.08^a	0.95
	F_9	598.59^c	742.15^c	567.88^c	603.5^c	345.6^c	2922^c
Property	t_1	5.05^c	1.07	1.69^a	2.42^b	-0.02	4.67^c
	F_5	29.91^c	8.37^c	3.58^c	13.3^c	7.63^c	8.51^c
	t_2	-1.73^a	-4.39^c	-3.9^c	-4.05^c	-5.54^c	-8.5^c
	F_6	3.19^c	1.14	1.75^c	2.32^c	1.52^c	1.81^c
	t_3	-3.88^c	2.72^c	-0.12	-0.39	1.83^a	0.12
	F_7	1.52^c	0.84	0.6	0.93	0.65	0.86
	F_8	9.46^c	6^c	2.23^b	3.22^c	4.77^c	12.96^c
	F_9	741.04^c	376.2^c	354.95^c	538.46^c	492.0^c	2146.8^c

Plantation	t_1	3.62^c	1.14	0.27	2.59^c	-0.91	3.21^c
	F_5	22.36^c	26.66^c	10.34^c	25.37^c	9.92^c	17.25^c
	t_2	-1.16	-3.43^c	-1.25	-2.28^b	-3.88^c	-5.22^c
	F_6	2.28^c	1.19	1.89^c	3.1^c	1.34^b	1.8^c
	t_3	-3.53^c	1.73^a	1.26	-1.9^a	2.54^c	0.15
	F_7	1.57^c	1.02	0.62	1.08	0.84	0.97
	F_8	6.44^c	3.61^c	0.84	2.97^c	4.29^c	5.39^c
	F_9	612.3^c	642.84^c	565.26^c	728.14^c	551.2^c	2959.8^c
Mining	t_1	3.85^c	0.82	0.13	1.83^a	-0.45	2.86^c
	F_5	27.96^c	89.67^c	33.42^c	32.54^c	16.31^c	31.23^c
	t_2	-1.11	-2.31^b	-1.86^a	-2.63^c	-3.71^c	-5.01^c
	F_6	2.43^c	1.29^b	0.51	1.25^b	0.84	1.33^c
	t_3	-2.83^c	1.75^a	0.94	-1.34	1.34	0.18
	F_7	1.35^c	1.06	0.03	0.88	1.12	0.93
	F_8	5.47^c	2.53^b	0.42	1.88	2.43^b	5.01
	F_9	700	998.35	799.18	723.24	565.79	3529.11

[a] t-statistic of F-statistic is significant at 10% level
[b] t-statistic of F-statistic is significant at 5% level
[c] t-statistic of F-statistic is significant at 1% level
t_1 testing the equality of mean between close to open and open to close
t_2 testing the equality of mean between morning and afternoon trading
t_3 testing the equality of mean between daily close to close and open to open
F_5 testing the equality of variance between close to open and open to close
F_6 testing the equality of variance between morning and afternoon trading
F_7 testing the equality of variance between close to close and open to open
F_8 testing equality of mean among all types of return for each weekday.
F_9 testing equality of variance among all types of return for each weekday.

index. The significant difference is evidently seen on Monday and Thursday for all indices.

4.3.3 Homogeneity Between Close to Close and Open to Open returns

The results of testing the equality of mean and variance between close to close and open to open return are shown by t_3 and F_7 values respectively in Table 3. The last column indicates that the volatility is not significantly different between close to close and open to open return. This is consistent to the study done by Chang et al. (1993) for the TOPIX index returns and Chang, Kang and Rhee (1994) for the KLSE market. However, it contradicts to Amihud and Mendelson (1987) for US market and Choe and Shin (1993) for the Korean market where they find that the open to open return variance is greater than the close to close return variance. In contrast, Cheung, Ho, Pope and Draper (1994) observe a lower open to open return variance. The variance between the close to close and open to open return is only significantly different on Monday for all indices except the Industrial Index.

4.3.4 Homogeneity Among All Returns For Each Weekday

The value of F_8 in Table 3 is the result for testing the equality of mean of all returns by each weekday and index. The null hypothesis of equal mean is rejected for average or all day returns of each index. There is also a significant different in the mean of all types of returns on Monday, indicating instability in the

Monday returns. This inequality of mean of all returns is brought forward to Tuesday for all indices except the Composite Index.

When equality of variance or return volatility is tested across all returns and weekday as indicated by F_9 values in Table 3, there is highly significant different in the all returns volatility for each day and index, suggests that the price changes frequently over the trading and non-trading day.

4   Behaviour of Seven KLSE Indices by Sub-Periods

The previous results shown from Table 1 to Table 3 are for the entire imple period from January 3, 1994 to November 26,1999. However, when the tire sample period is further classified into 3 sub-periods, it shows some fferences in the results. These sub-periods are classified according to the conomic situations in Malaysia. The first sub-period is before financial crisis, iat is, from January 3, 1994 to December 31, 1996. The second sub-period is uring the financial crisis from January 3, 1997 to August 28,1998. The third sub-eriod is the period after capital control is imposed, that is, from September 2, 998 to November 26,1999.

Table 4A displays the results of seven KLSE indices by different return series and sub-periods. By referring to the average all day return of the Composite Index, the overnight (close to open) return, 0.0434% is significant in sub period 1, similar to the result of the entire sample period. Although the overnight effect is not significant in sub-period 2, it turns negative during the financial crisis (-0.0254%). This trend reverses after the financial crisis (sub-period 3) where there is a highly significant positive overnight return. There is also a weekend effect (Monday close to open) occuring in sub-period 3 which might have contributed to the weekend effect of the entire sample period. As for daily trading (open to close) return, only sub-period 2 shows a highly significant negative daily trading return. This result is similar to the one obtained for the entire sample period. In other words, the highly significant negative daily trading return may be primarily accrued from the sub-period 2 due to the financial crisis.

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Table 4A: Behaviour of Composite Index by Sub-Periods

Sample period	Return	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
Sub-Period 1 **1994 – 1996** **(3.1.94 to 31.12.96)**	close to open	mean	0.0401	0.0289	0.0415	0.0604	0.0459	0.0434
		t-value	1.44	1.64	1.75^a	3.2^c	1.59	4.07^c
	open to close	mean	-0.2922	0.0034	0.0906	-0.1748	0.0878	-0.0545
		t-value	-2.93^c	0.04	0.86	-1.77^a	0.98	-1.24
	morning	mean	-0.2237	-0.1234	0.0792	-0.1984	-0.0682	-0.106
		t-value	-2.99^c	-1.85^a	0.91	-2.54^b	-0.96	-3.11^c
	afternoon	mean	-0.0686	0.1268	0.0114	0.0236	0.1561	0.0515
		t-value	-1.18	2.43^b	0.19	0.45	3.12^c	2.11^b
	close to close	mean	-0.2522	0.0323	0.1321	-0.1144	0.1337	-0.0111
		t-value	-2.35^b	0.32	1.19	-1.11	1.27	-0.23
	open to open	mean	0.1638	-0.3011	-0.0219	0.1642	-0.0914	-0.0195
		t-value	1.53	-2.9^c	-0.21	1.43	-0.84	0.4
		Observations	138	140	141	141	149	709
Sub-Period 2 **1997 – 1998** **(2.1.97 to 28.8.98)**	close to open	mean	-0.0528	-0.0711	0.0501	0.0089	-0.0645	-0.0254
		t-value	-0.78	-1.26	0.78	0.13	-0.81	-0.84
	open to close	mean	-0.5541	-0.4272	-0.1875	-0.6394	-0.1171	-0.384
		t-value	-2.12^b	-1.82^b	-0.76	-2.28^b	-0.52	-3.43^c
	morning	mean	-0.4607	-0.4238	-0.2776	-0.5126	-0.3712	-0.4081
		t-value	-1.97^b	-2.4^c	-1.43^a	-1.92^b	-2.25^b	-4.36^c
	afternoon	mean	-0.0934	-0.0035	0.0901	-0.1269	0.2542	0.0241
		t-value	-0.077	-0.032	0.7	-0.78	1.54^a	0.39
	close to close	mean	-0.6069	-0.5	-0.1374	-0.6306	-0.1816	-0.4094
		t-value	-2.03^b	-1.91^b	-0.51	-2.07^b	-0.67	-3.26^c
	open to open	mean	-0.1238	-0.59	-0.3407	-0.1893	-0.7241	-0.3926
		t-value	-0.47	-2.18^b	-1.28^a	-0.65	-2.41^c	-3.16^c
		Observations	79	78	81	77	77	392
Sub-Period 3 **1998 – 1999** **(2.9.98 to 26.11.99)**	close to open	mean	0.2748	0.1091	0.1887	0.1317	0.1732	0.1743
		t-value	2.44^c	1.21	2.79^c	1.79	1.79^b	4.41^c
	open to close	mean	0.0385	0.2416	0.0768	0.2252	0.3252	0.1842
		t-value	0.1	0.44	0.28	0.87	1.16	1.16
	morning	mean	-0.1178	0.0541	-0.1246	-0.1111	0.1432	-0.0307
		t-value	-0.3	0.2	-0.6	-0.52	0.86	-0.27
	afternoon	mean	0.1564	0.1875	0.2015	0.3364	0.1821	0.2149
		t-value	0.69	0.56	1.36^a	2.54^c	1.04	2.32^b
	close to close	mean	0.3133	0.3507	0.2655	0.3568	0.4984	0.3586
		t-value	0.66	0.7	0.85	1.55^a	1.6^a	2.18^b
	open to open	mean	0.6123	0.1063	0.2227	0.1799	0.3876	0.2983
		t-value	1.5^a	0.24	0.43	0.67	1.2	1.68^b
		Observations	55	56	62	63	63	299

^{a} t statistic is significant at 10% level
^{b} t statistic is significant at 5% level
^{c} t statistic is significant at 1% level

The highly significant average negative morning returns of sub-periods 1 and 2 seem to be the cause of a highly significant negative morning return of the entire sample period. The trend of the negative morning returns across the weekdays is also similar to the entire sample period. In contrast, the highly significant positive afternoon returns for sub-periods 1 and 3 might have also contributed to the highly significant positive afternoon return of the whole sample period. From the whole sample period, the average daily close to close return and open to open return are found to be insignificant. This might be due to the fact that the average negative daily return in sub-period 2 may have been offset by the average positive daily return of sub-period 3.

The return series of the Emas Index as shown in Table 4B has almost similar result as the Composite Index. The overnight return in sub periods 1 and 3 is much higher than the Composite Index. The Emas Index also has a significant negative open to close return in sub-period 1 and not just in sub-period 2. Thus, it resulted in a higher negative open to close return than the Composite Index for the entire sample period. On the other hand, the afternoon return of the whole sample period is only due to the positive afternoon effect in sub-period 3, resulting in a lower positive afternoon return than the Composite Index.

The return series behaviour of Industrial Index is similar to the Composite Index as shown in Table 4C. However, the significant negative morning return for the entire period is mainly caused by the significant negative Monday return of sub-period 2 only (but not sub period 1). The afternoon return for the entire

Table 4B: Behaviour of Emas Index by Sub-Periods

Sample period	Return	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
Sub-Period 1 1994 – 1996 (3.1.94 to 31.12.96)	close to open	mean t-value	0.0821 2.40[b]	0.0575 3.07[c]	0.0692 2.67[c]	0.0963 5.03[c]	0.0721 2.25[b]	0.0754 6.28[c]
	open to close	mean t-value	-0.4711 -4.11[c]	-0.0122 -0.11	0.0853 0.73	-0.2446 -2.24	0.1413 1.58	-0.0961 -1.96[b]
	morning	mean t-value	-0.2890 -3.50[c]	-0.1515 -2.04[b]	0.0614 0.65	-0.2250 -2.62[c]	-0.0446 -0.65	-0.1281 -3.5[c]
	afternoon	mean t-value	-0.1821 -2.83[c]	0.1393 2.25[b]	0.0239 0.35	-0.0196 -0.35	0.1859 3.49[c]	0.0320 1.16
	close to close	mean t-value	-0.3890 -3.13[c]	0.0454 0.39	0.1544 1.27	-0.1484 -1.32	0.2134 1.96[b]	-0.0207 -0.39
	open to open	mean t-value	0.2563 2.30[b]	-0.4465 -3.70[c]	-0.0315 -0.26	0.1910 1.47	-0.1274 -1.05	-0.0333 -0.61
		Observations	138	140	141	141	149	709
Sub-Period 2 1997 – 1998 (2.1.97 to 28.8.98)	close to open	mean t-value	-0.0261 -0.53	-0.1426 -1.39[a]	0.1554 1.16	-0.0121 -0.24	-0.0408 -0.72	-0.0119 -0.31
	open to close	mean t-value	-0.5641 -2.22[b]	-0.5131 -2.37[c]	-0.2620 -1.18	-0.6521 -2.25[b]	-0.0989 -0.47	-0.4174 -3.89[c]
	morning	mean t-value	-0.4651 -2.02[b]	-0.5414 -3.27[c]	-0.3714 -2.04[b]	-0.5396 -2.10[b]	-0.4197 -2.52[c]	-0.4666 -5.16[c]
	afternoon	mean t-value	-0.0991 -0.95	0.0283 0.29	0.1094 0.99	-0.1126 -0.79	0.3208 2.30[b]	0.0492 0.91
	close to close	mean t-value	-0.5902 -2.10[b]	-0.6557 -2.69[c]	-0.1066 -0.40	-0.6642 -2.17[b]	-0.1397 -0.57	-0.4293 -3.57[c]
	open to open	mean t-value	-0.0709 -0.31	-0.6732 -2.37[c]	-0.2856 -0.98	-0.2806 -1.10	-0.7131 -2.36[c]	-0.4025 -3.29[c]
		Observations	79	78	81	77	77	392
Sub-Period 3 1998 – 1999 (2.9.98 to 26.11.99)	close to open	mean t-value	0.2539 2.64[c]	0.1460 2.42[c]	0.1378 3.28[c]	0.0926 1.36[a]	0.1724 2.19[b]	0.1585 5.03[c]
	open to close	mean t-value	-0.1529 -0.37	0.3277 0.66	0.0518 0.20	0.2798 1.08	0.3793 1.35[a]	0.1829 1.19
	morning	mean t-value	-0.1495 -0.36	0.0804 0.31	-0.0728 -0.34	-0.0549 -0.26	0.1692 0.98	-0.0035 -0.03
	afternoon	mean t-value	-0.0034 -0.02	0.2473 0.85	0.1246 0.77	0.3347 2.47[c]	0.2102 1.24	0.1863 2.10[b]
	close to close	mean t-value	0.1010 0.21	0.4737 1.03	0.1896 0.68	0.3724 1.54[a]	0.5517 1.81[b]	0.3413 2.15[b]
	open to open	mean t-value	0.6440 1.62[a]	-0.0553 -0.12	0.2831 0.60	0.1131 0.42	0.4610 1.46[a]	0.2878 1.67[b]
		Observations	55	56	62	63	63	299

[a] t statistic s significant at 10% level
[b] t statistic is significant at 5% level
[c] t statistic is significant at 1% level

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Table 4C: Behaviour of Industrial Index by Sub-Periods

Sample period	Return	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
Sub-Period 1 1994 – 1996 (3.1.94 to 31.12.96)	close to open	mean	0.0273	0.0698	0.0538	0.0997	0.0230	0.0545
		t-value	0.50	1.19	2.24[b]	1.82[a]	0.55	2.53[b]
	open to close	mean	-0.3366	-0.0201	0.0819	-0.1718	0.2094	-0.0434
		t-value	-3.33[c]	-0.21	0.81	-1.74[a]	2.11[b]	-0.96
	morning	mean	-0.2547	-0.1475	0.0414	-0.1680	0.1404	-0.0744
		t-value	-3.53[c]	-2.01[b]	0.41	-2.11[b]	0.93	-1.63
	afternoon	mean	-0.0819	0.1274	0.0405	-0.0038	0.0690	0.0310
		t-value	-1.50	2.43[b]	0.58	-0.07	0.43	0.76
	close to close	mean	-0.3093	0.0497	0.1357	-0.0720	0.2324	0.0111
		t-value	-2.81[c]	0.49	1.31	-0.66	2.19[b]	0.23
	open to open	mean	0.2981	-0.2948	-0.0400	0.1923	-0.1234	0.0042
		t-value	3.00[c]	-2.49[b]	-0.38	1.73[a]	-1.08	0.08
		Observations	138	140	141	141	149	709
Sub-Period 2 1997 – 1998 (2.1.97 to 28.8.98)	close to open	mean	-0.0572	-0.0934	0.0557	-0.0102	0.0057	-0.0195
		t-value	-1.02	-2.18[b]	1.40[a]	-0.28	0.08	-0.84
	open to close	mean	-0.4666	-0.4302	-0.1954	-0.5809	-0.1132	-0.3564
		t-value	-2.23[b]	-2.12[b]	-0.86	-2.46[c]	-0.56	-3.69[c]
	morning	mean	-0.3608	-0.4012	-0.2063	-0.4505	-0.2936	-0.3413
		t-value	-1.94[b]	-2.65[c]	-1.12	-1.97[b]	-1.83[b]	-4.16[c]
	afternoon	mean	-0.1058	-0.0290	0.0109	-0.1304	0.1804	-0.0150
		t-value	-0.92	-0.26	0.09	-0.76	1.40[a]	-0.26
	close to close	mean	-0.5238	-0.5236	-0.1397	-0.5911	-0.1075	-0.3758
		t-value	-2.34[c]	-2.30[b]	-0.60	-2.36[c]	-0.44	-3.55[c]
	open to open	mean	-0.0982	-0.5375	-0.3510	-0.2810	-0.5880	-0.3700
		t-value	-0.45	-2.53[c]	-1.75[b]	-1.11	-2.41[c]	-3.67[c]
		Observations	79	78	81	77	77	392
Sub-Period 3 1998 – 1999 (2.9.98 to 26.11.99)	close to open	mean	0.2083	0.1729	0.0823	-0.0153	0.1652	0.1193
		t-value	2.23[b]	3.44[c]	1.43[a]	-0.09	1.85[b]	2.53[c]
	open to close	mean	-0.1007	0.1858	0.0255	0.4058	0.3404	0.1788
		t-value	-0.28	0.38	0.10	1.18	1.12	1.14
	morning	mean	-0.0620	-0.0336	-0.0614	0.1610	0.1411	0.0332
		t-value	-0.17	-0.13	-0.33	0.53	0.86	0.29
	afternoon	mean	-0.0387	0.2195	0.0869	0.2448	0.1992	0.1456
		t-value	-0.18	0.75	0.62	1.99[b]	1.01	1.65[b]
	close to close	mean	0.1076	0.3588	0.1077	0.3905	0.5055	0.2981
		t-value	0.25	0.76	0.40	1.63[a]	1.52[a]	1.92[b]
	open to open	mean	0.5914	0.0430	-0.0027	-0.0273	0.5843	0.2336
		t-value	1.43[a]	0.11	-0.01	-0.10	1.47[a]	1.30[a]
		Observations	55	56	62	63	63	299

[a] t statistic is significant at 10% level
[b] t statistic is significant at 5% level
[c] t statistic is significant at 1% level

sample period does not show a significant positive return. It further indicates that the significant positive afternoon return in sub period 3 does not really change the significance of the afternoon return for the entire sample period.

Surprisingly, the finance stocks behave differently from the Composite Index when it is classified into different sub-periods. From Table 4D, the average all day overnight returns are all positive throughout all the sub- periods as compared to the negative overnight return for sub-period 2 for most indices. This may imply that the finance stocks have more favourable non-trading effect than other stocks during the financial crisis. However, it is more exposed to unfavourable news during the trading day particularly in the afternoon. Most stocks have significant positive afternoon return in sub-period 2 but not the finance stocks. Although there is a significant positive afternoon return in sub-period 3, it is ineffective in changing the significance of the afternoon return for the entire sample period.

The previous result discovered in Table 1 shows that property stocks suffer the highest losses particularly during the trading day. Referring to Table 4E, the magnitude of the negative morning return is much higher than the positive afternoon return for the entire sample period, resulting in a high negative daily trading (open to close) return. The high negative morning return of the entire period is mainly attributable to the high negative morning returns in sub periods 1 and 2. The negative morning returns for the property stocks are the highest among all indices throughout all sub-periods.

Table 4D: Behaviour of Finance Index by Sub-Periods

Sample period	Return	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
Sub-Period 1 1994 – 1996 (3.1.94 to 31.12.96)	close to open	mean	0.1113	0.0435	0.0675	0.1229	0.0173	0.0718
		t-value	3.89^c	1.52	2.40^b	3.13^c	0.39	4.59^c
	open to close	mean	-0.4072	0.0223	0.0680	-0.1977	0.1903	-0.0607
		t-value	-3.79^c	0.19	0.55	-1.80^a	1.98^b	-1.21
	morning	mean	-0.1787	-0.0920	0.0580	-0.1915	0.0639	-0.0661
		t-value	-2.23^b	-1.20	0.60	-2.00^b	0.80	-1.71^a
	afternoon	mean	-0.2285	0.1143	0.0100	-0.0062	0.1264	0.0054
		t-value	-3.67^c	1.80^a	0.16	-0.12	2.41^b	0.20
	close to close	mean	-0.2959	0.0658	0.1355	-0.0748	0.2076	0.0111
		t-value	-2.52^b	0.52	1.06	-0.66	1.88^a	0.21
	open to open	mean	0.3105	-0.3854	0.0003	0.1975	-0.1119	0.0001
		t-value	2.70^c	-3.32^c	0.00	1.43	-0.85	0.00
		Observations	138	140	141	141	149	709
Sub-Period 2 1997 – 1998 (2.1.97 to 28.8.98)	close to open	mean	-0.0239	-0.0593	0.0828	0.0457	0.1055	0.0302
		t-value	-0.41	-1.07	1.03	0.71	0.64	0.73
	open to close	mean	-0.6607	-0.5796	-0.3518	-0.8133	-0.2544	-0.5309
		t-value	-1.96^b	-1.92^b	-1.11	-2.44^c	-0.93	-3.79^c
	morning	mean	-0.4605	-0.5328	-0.1699	-0.4688	-0.5837	-0.4407
		t-value	-1.46^a	-2.61^c	-0.62	-1.66^b	-2.25^b	-3.67^c
	afternoon	mean	-0.2002	-0.0468	-0.1819	-0.3445	0.3293	-0.0902
		t-value	-1.52^a	-0.33	-0.91	-2.10^b	1.91^b	-1.22
	close to close	mean	-0.6846	-0.6389	-0.2690	-0.7676	-0.1489	-0.5007
		t-value	-1.88^b	-2.00^b	-0.83	-2.20^b	-0.55	-3.42^c
	open to open	mean	-0.2412	-0.6368	-0.5118	-0.3179	-0.7125	-0.4835
		t-value	-0.80	-1.85^b	-1.54^a	-0.91	-1.95^b	-3.21^c
		Observations	79	78	81	77	77	392
Sub-Period 3 1998 – 1999 (2.9.98 to 26.11.99)	close to open	mean	0.3778	0.1927	0.1075	0.1073	0.2137	0.1955
		t-value	2.75^c	2.31^b	1.56^a	1.24	2.09^b	4.50^c
	open to close	mean	-0.1832	0.3909	0.2244	0.2129	0.5601	0.2489
		t-value	-0.39	0.72	0.78	0.73	1.72^b	1.45^a
	morning	mean	-0.1188	0.1075	-0.0354	-0.0443	0.3195	0.0489
		t-value	-0.26	0.37	-0.17	-0.18	1.46^a	0.38
	afternoon	mean	-0.0644	0.2834	0.2598	0.2572	0.2406	0.2000
		t-value	-0.22	0.88	1.46^a	1.74^b	1.17	1.93^b
	close to close	mean	0.1946	0.5836	0.3320	0.3202	0.7738	0.4444
		t-value	0.35	1.20	1.10	1.15	2.11^b	2.49^c
	open to open	mean	0.9513	-0.0495	0.4267	0.3136	0.4665	0.4171
		t-value	1.94^a	-0.09	0.87	1.03	1.26	2.14^b
		Observations	55	56	62	63	63	299

^{a} t statistic is significant at 10% level
^{b} t statistic is significant at 5% level
^{c} t statistic is significant at 1% level

Table 4E: Behaviour of Property Index by Sub-Periods

Sample period	Return	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
Sub-Period 1 1994 – 1996 (3.1.94 to 31.12.96)	close to open	mean	0.1734	0.2145	0.0346	0.1221	0.2000	0.1493
		t-value	3.49^c	1.86^a	0.31	3.35^c	2.58^c	3.95^c
	open to close	mean	-0.9109	-0.0115	0.0898	-0.3551	0.1904	-0.1923
		t-value	-5.15^c	-0.05	0.53	-2.31^b	1.40	-2.48^b
	morning	mean	-0.5768	-0.2978	-0.0084	-0.3567	-0.1906	-0.2837
		t-value	-4.84^c	-1.81^a	-0.07	-3.04^c	-1.77^a	-4.98^c
	afternoon	mean	-0.3341	0.2862	0.0982	0.0016	0.3810	0.0914
		t-value	-3.27^c	1.82^a	0.89	0.02	2.77^c	1.83^a
	close to close	mean	-0.7375	0.2029	0.1245	-0.2330	0.3904	-0.0430
		t-value	-3.82^c	1.08	0.61	-1.46	2.77^c	-0.53
	open to open	mean	0.3806	-0.7329	-0.1326	0.2198	-0.0902	-0.0723
		t-value	2.26^b	-3.37^c	-0.66	1.19	-0.47	-0.83
		Observations	138	140	141	141	149	709
Sub-Period 2 1997 – 1998 (2.1.97 to 28.8.98)	close to open	mean	0.0133	-0.0253	0.1759	0.0298	-0.0177	0.0364
		t-value	0.38	-0.53	1.12	0.24	-0.61	0.86
	open to close	mean	-0.6453	-0.7013	-0.6122	-0.5921	-0.1690	-0.5456
		t-value	-2.17^b	-2.59^c	-2.13^b	-1.60^a	-0.70	-4.13^c
	morning	mean	-0.5916	-0.8599	-0.8761	-0.7122	-0.7220	-0.7531
		t-value	-2.39^c	-4.33^c	-3.41^c	-2.27^b	-3.47^c	-6.81^c
	afternoon	mean	-0.0538	0.1586	0.2639	0.1202	0.5530	0.2075
		t-value	-0.48	1.24	1.96^b	0.80	3.59^c	3.37^c
	close to close	mean	-0.6320	-0.7265	-0.4363	-0.5622	-0.1867	-0.5092
		t-value	-2.06^b	-2.51^c	-1.75^b	-1.55^a	-0.75	-3.89^c
	open to open	mean	-0.0901	-0.6205	-0.4557	-0.5919	-0.6233	-0.4745
		t-value	-0.35	-2.12^b	-1.38^a	-1.83^b	-1.62^a	-3.33^c
		Observations	79	78	81	77	77	392
Sub-Period 3 1998 – 1999 (2.9.98 to 26.11.99)	close to open	mean	0.2286	0.1201	0.0927	0.1652	0.2511	0.1715
		t-value	2.94^c	1.96^b	1.30^a	3.05^c	2.70^c	5.25^c
	open to close	mean	-0.5040	0.6308	-0.2195	0.3489	0.4689	0.1522
		t-value	-0.84	1.10	-0.65	1.11	1.23	0.77
	morning	mean	-0.2914	-0.0230	-0.4689	-0.1769	0.1412	-0.1626
		t-value	-0.51	-0.07	-2.00^b	-0.76	0.61	-1.11
	afternoon	mean	-0.2126	0.6538	0.2493	0.5258	0.3277	0.3149
		t-value	-0.76	1.90^b	1.12	2.43^c	1.47^a	2.73^c
	close to close	mean	-0.2754	0.7509	-0.1268	0.5141	0.7200	0.3237
		t-value	-0.42	1.34^a	-0.40	1.63^a	1.80^b	1.60^a
	open to open	mean	0.7394	-0.4560	-0.1268	-0.0907	0.6181	0.2887
		t-value	1.50^a	-0.73	0.61	-0.25	1.67^b	1.33^a
		Observations	55	56	62	63	63	299

^{a} t statistic is significant at 10% level
^{b} t statistic is significant at 5% level
^{c} t statistic is significant at 1% level

The plantation stocks as displayed in Table 4F have a highly significant negative overnight return in sub period 2. This may suggest that the plantation stocks are more subjected to unfavourable news in the non-trading session during the financial crisis. The high negative open to close returns in sub periods 1 and 2 may have contributed to the significant negative open to close return of the entire sample period. The afternoon return of the plantation stocks for the entire sample period is mainly contributed by the significant positive return in sub periods 2 and 3 as compared to the Composite Index where it is contributed by sub periods 1 and 3. The behaviour of the mining stock is quite similar to the plantation stocks as shown in Table 4G. It also has a significant afternoon return in sub-period 2.

Table 4F: Behaviour of Plantation Index by Sub-Periods

Sample period	Return	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
Sub-Period 1 1994 – 1996 (3.1.94 to 31.12.96)	close to open	mean	0.1387	0.0932	0.1325	0.0792	0.1113	0.1109
		t-value	3.09^c	2.10^b	2.11^b	1.87^a	1.98^b	4.88^c
	open to close	mean	-0.7010	-0.0431	0.1085	-0.3268	0.2362	-0.1387
		t-value	-4.18^c	-0.24	0.74	-1.88^a	1.96^b	-1.93
	morning	mean	-0.4570	-0.2905	0.0260	-0.2782	-0.0322	-0.2032
		t-value	-4.03^c	-2.05^b	0.21	-2.13^b	-0.39	-3.78^c
	afternoon	mean	-0.2440	0.2474	0.0825	-0.0486	0.2683	0.0645
		t-value	-2.17^b	1.65^a	0.85	-0.60	3.68^c	1.35
	close to close	mean	-0.5623	0.0501	0.2409	-0.2477	0.3475	-0.0279
		t-value	-3.06^c	0.26	1.51	-1.36	2.29^b	-0.36
	open to open	mean	0.4190	-0.6366	-0.0585	0.2060	-0.1830	-0.0533
		t-value	2.81^c	-3.58^c	-0.31	1.23	-1.06	-0.69
		Observations	138	140	141	141	149	709
Sub-Period 2 1997 – 1998 (2.1.97 to 28.8.98)	close to open	mean	-0.0717	-0.0524	-0.0281	0.0068	-0.0322	-0.0357
		t-value	-1.49^a	-1.33^a	-0.91	0.43	-2.71^c	-2.45^c
	open to close	mean	-0.2971	-0.4538	-0.0768	-0.4055	-0.0809	-0.2616
		t-value	-1.50^a	-2.23^b	-0.39	-1.73^b	-0.38	-2.80^c
	morning	mean	-0.2881	-0.4726	-0.2086	-0.3709	-0.3757	-0.3419
		t-value	-1.73^b	-3.21^c	-1.35^a	-1.57^a	-2.34^c	-4.37^c
	afternoon	mean	-0.0090	0.0188	0.1318	-0.0346	0.2947	0.0803
		t-value	-0.09	0.18	1.20	-0.33	2.33^c	1.64^a
	close to close	mean	-0.3688	-0.5062	-0.1049	-0.3986	-0.1132	-0.2973
		t-value	-1.85^b	-2.31^b	-0.52	-1.67^b	-0.53	-3.10^c
	open to open	mean	-0.0284	-0.3559	-0.3666	-0.0326	-0.4509	-0.2473
		t-value	-0.13	-1.80^b	-1.58^a	-0.16	-1.91^b	-2.55^c
		Observations	79	78	81	77	77	392
Sub-Period 3 1998 – 1999 (2.9.98 to 26.11.99)	close to open	mean	0.0778	0.0452	0.0261	0.0006	0.0777	0.0447
		t-value	3.27^c	1.69^b	1.22	0.02	2.19^b	3.43^c
	open to close	mean	0.1122	0.1811	0.0071	0.0494	0.2585	0.1209
		t-value	0.29	0.48	0.03	0.27	1.25	0.95
	morning	mean	0.1514	-0.0119	-0.0226	-0.0809	0.0948	0.0239
		t-value	0.40	-0.05	-0.11	-0.58	0.67	0.23
	afternoon	mean	-0.0392	0.1929	0.0297	0.1303	0.1636	0.0970
		t-value	-0.24	1.10	0.23	1.22	1.18	1.53^a
	close to close	mean	0.1900	0.2263	0.0332	0.0501	0.3362	0.1656
		t-value	0.47	0.62	0.13	0.29	1.58^a	1.31^a
	open to open	mean	0.3113	0.0850	0.0163	-0.0159	0.1467	0.1041
		t-value	1.26	0.20	0.04	-0.07	0.76	0.76
		Observations	55	56	62	63	63	299

[a] t statistic is significant at 10% level
[b] t statistic is significant at 5% level
[c] t statistic is significant at 1% level

Table 4G: Behaviour of Mining Index by Sub-Periods

Sample period	Return	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
	close to open	mean	0.2623	0.0500	0.1108	0.1055	0.1046	0.1259
		t-value	3.28^c	1.17	2.20^b	2.28^b	1.25	4.42^c
Sub-Period 1	open to close	mean	-0.9620	-0.0572	0.0582	-0.3368	0.3214	-0.1864
		t-value	-4.56^c	-0.27	0.29	-1.78^a	2.19^b	-2.13^b
1994 – 1996	morning	mean	-0.4260	-0.1418	0.2932	-0.2500	0.0869	-0.1324
		t-value	-2.82^c	-1.09	1.89^a	-1.66^a	0.87	-2.13^b
(3.1.94 to	afternoon	mean	-0.5360	0.0846	0.0082	-0.0869	0.2345	-0.0540
31.12.96)		t-value	-4.47^c	0.62	0.06	-0.83	2.25^b	-1.00
	close to close	mean	-0.6997	-0.0072	0.1690	-0.2313	0.4260	-0.0605
		t-value	-3.06^c	-0.03	0.86	-1.22	2.26^b	-0.65
	open to open	mean	0.6720	-0.8956	-0.1105	0.1767	-0.1843	-0.0724
		t-value	3.43^c	-4.00^c	-0.47	0.80	-0.89	-0.73
		Observations	138	140	141	141	149	709
	close to open	mean	-0.0042	0.0147	-0.0344	-0.0189	-0.0298	-0.014
		t-value	-0.19	0.70	-0.75	-1.50^a	-0.97	-1.12
Sub-Period 2	open to close	mean	-0.5931	-0.5843	-0.2926	-0.5213	-0.5937	-0.515
		t-value	-1.28^a	-1.41^a	-0.75	-1.36^a	-1.37^a	-2.77
1997 – 1998	morning	mean	-0.5879	-0.7589	-0.7639	-0.7188	-1.0597	-0.776
		t-value	-1.76^b	-2.27^b	-1.38^a	-2.76^c	-3.58^c	-4.65
(2.1.97 to	afternoon	mean	-0.0051	0.1746	0.4713	0.1975	0.4661	0.261
28.8.98)		t-value	-0.02	0.72	0.95	0.73	1.64^a	1.80
	close to close	mean	-0.5973	-0.5696	-0.3270	-0.5402	-0.6234	-0.529
		t-value	-1.28^a	-1.37^a	-0.85	-1.41^a	-1.46^a	-2.86
	open to open	mean	-0.5369	-0.6312	-0.3745	-0.4819	-0.5572	-0.515
		t-value	-1.37^a	-1.30^a	-0.81	-1.24	-1.41^a	-2.71
		Observations	79	78	81	77	77	392
	close to open	mean	0.23	0.11	0.16	0.06	0.11	0.131
		t-value	3.51^c	1.93^b	2.36^c	0.61	1.45^a	3.96
Sub-Period 3	open to close	mean	-0.3300	0.2290	0.5008	0.1800	0.6950	0.270
		t-value	-0.43	0.25	1.00	0.37	1.17	0.9
1998 – 1999	morning	mean	-0.4580	-0.1426	-0.0943	-0.2130	-0.0607	-0.18
		t-value	-0.73	-0.27	-0.25	-0.58	-0.19	-0.9
(2.9.98 to	afternoon	mean	0.1281	0.3716	0.5951	0.3930	0.7557	0.45
26.11.99)		t-value	0.41	0.77	1.79^b	1.16	1.77^b	2.6
	close to close	mean	-0.1034	0.3435	0.6574	0.2360	0.8086	0.40
		t-value	-0.13	0.38	1.34^a	0.48	1.36^a	1.3
	open to open	mean	0.7546	-0.2854	-0.0019	0.5166	0.4871	0.29
		t-value	1.13	-0.37	0.00	1.00	0.94	0.9
		Observations	55	56	62	63	63	29

^{a} t statistic is significant at 10% level
^{b} t statistic is significant at 5% level
^{c} t statistic is significant at 1% level

5 Testing Homogeneity of Each Return Series between Sub-Periods

5.1 Testing Homogeneity for Composite Index between Sub-Periods

(a) equality in mean return

For each return series, the null hypothesis of equality of means is tested between two sub-periods. The two sub-periods are between sub-periods 1 and 2, between sub-periods 2 and 3 as well as between sub-periods 1 and 3. Across the all day column from Table 5A, the null hypothesis of equality of means between each two sub-periods is rejected for most return series. For all return series, the mean returns are significantly different between sub-periods 1 and 2, sub-periods 2 and 3 as well as sub-periods 1 and 3. The significant difference occurs particularly on Thursday. However, there is insignificant difference in the morning return between sub-periods 1 and 3 as well as insignificant difference in the afternoon return between sub-periods 1 and 2 across all days. For all day return series, the returns of sub-period 1 is greater than sub-period 2, sub-period 2 is less than sub-period 3 and sub-period 1 is less than sub-period 3 respectively. Surprisingly, the Wednesday and Friday afternoon returns of sub-period 1 are found to be lower than those in sub-period 2. Similarly, the Friday afternoon return of sub-period 2 is higher than sub-period 3. However, both cases are insignificant.

le 5A: Testing Equality of Mean Returns and Volatility for Composite Index between Sub-Periods

dices	Period	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
	Period 1&2	t	1.1	1.98^b	1.19	1.89^a	1	3.23^c
		F	0.3	0.35	0.2	0.25	0.3	0.28
to open	Period 2&3	t	-1.31	-1.23	-0.71	-2.23^b	-1.25	-3.01^c
		F	0.52	0.41	0.6	0.33	0.22	0.89
	Period 1&3	t	-1.14	-0.63	-0.06	-1.76^a	-1.04	-1.94^a
		F	0.35	0.23	0.61	0.64	0.85	0.97
	Period 1&2	t	1.47	2.07^b	0.15	0.9	1.58	2.58^c
		F	0.28	0.45	0.58	0.62	0.81	0.84
ı to close	Period 2&3	t	-2.64^c	-1.78^a	-1.47	-1.21	-1.92^a	4.09^c
		F	0.21	0.36	0.67	0.68	0.95	0.77
	Period 1&3	t	-2.82^c	-1.27	-2.57^b	-1.26	-1.65^a	-4.3^c
		F	0.24	0.37	0.64	0.58	0.99	0.96
	Period 1&2	t	1.72^a	1.9^a	1.92^a	1.41	1.96^b	3.63^c
		F	0.23	0.29	0.64	0.35	0.58	0.88
·ning	Period 2&3	t	-0.79	-1.56	-0.53	-1.14	-2.18^b	-2.59^c
		F	0.32	0.38	0.65	0.57	0.68	0.82
	Period 1&3	t	-0.38	-0.89	1.07	-0.47	-1.37	-0.83
		F	0.22	0.25	0.38	0.67	0.58	0.79
	Period 1&2	t	0.21	1.2	-0.63	1.08	-0.72	0.48
		F	0.22	0.45	0.58	0.37	0.85	0.65
ernoon	Period 2&3	t	-1.04	-0.61	-0.57	-2.15^b	0.3	-1.77^a
		F	0.26	0.31	0.56	0.79	0.56	0.68
	Period 1&3	t	-1.33	-0.27	-1.44	-2.65^c	-0.19	-2.3^b
		F	0.21	0.33	0.28	0.89	0.67	0.45
	Period 1&2	t	1.33	2.23^b	1.07	1.95^a	1.29	3.4^c
		F	0.41	0.35	0.68	0.67	0.89	0.26
ɔse to close	Period 2&3	t	-1.72^a	-1.62	-0.98	-2.49^b	-1.65^a	-3.77^c
		F	0.34	0.34	0.67	0.88	0.98	0.85
	Period 1&3	t	-1.64	-0.89	-0.5	-2.16^b	-1.41	-2.85^c
		F	0.2	0.28	0.36	0.57	0.68	0.96
	Period 1&2	t	1.19	1.18	1.3	1.34	2.4^b	3.3^c
		F	0.27	0.41	0.5	0.89	0.68	0.28
ıpen to open	Period 2&3	t	-1.59	-1.4	-1.04	-0.92	-2.51^b	-3.28^c
		F	0.3	0.22	0.65	0.94	0.86	0.87
	Period 1&3	t	-1.46	-1.24	-0.65	-0.06	-1.79^a	-2.31^b
		F	0.24	0.39	0.66	0.95	0.28	0.84

[a] t-statistic of F-statistic is significant at 10% level
[b] t-statistic of F-statistic is significant at 5% level
[c] t-statistic of F-statistic is significant at 1% level
t - testing the equality of mean of each return series between sub periods
F - testing the equality of variance of each return series between sub periods
Period 1 is sub-period 1 from January 3, 1994 to December 31, 1996
Period 2 is sub-period 2 from January 3, 1997 to August 28, 1998
Period 3 is sub-period 3 from September 2, 1998 to November 26, 1999

(b) equality in return volatility

Equality of variance or volatility of each return series is also tested between the sub-periods. The F-test in Table 5A shows there is insignificant difference in the return variance or volatility between sub-periods 1 and 2, sub-periods 2 and 3 as well as sub-periods 1 and 3.

2 Testing Homogeneity for Emas Index between Sub Periods

(a) equality in mean return

Table 5B displays the test of equality of means for each return series of the Emas Index. Across all days, the difference in mean returns between sub-periods 1 and 2, sub-periods 2 and 3 and sub-periods 1 and 3 respectively is significant in most return series. There is insignificant difference in the mean the morning return between sub-periods 1 and 3, the afternoon return between sub-periods 1 and 2 as well as between sub-periods 2 and 3. Across the weekdays, the Wednesday morning return of period 1 is higher than period 3, period 1 is higher than period 2 in the afternoon return, and period 2 is higher than period 3 in the Friday afternoon return.

(b) equality in return volatility

The F-test in Table 5B shows insignificant difference in the return volatility is between sub-periods 1 and 2, sub-periods 2 and 3 as well as sub-periods 1 and 3 respectively.

Table 5B: Testing Equality of Mean Returns and Volatility for Emas Index between Sub-Periods

Indices	Period	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
lose to open	Period 1&2	t	0.38	2.3[b]	1.52	1.56	1.23	3.11[c]
		F	0.37	0.51	0.31	0.27	0.4	0.38
	Period 2&3	t	-0.89	-1.71[a]	-0.92	-2.34[b]	-1.39	-3.29[c]
		F	0.95	0.41	0.34	1.1	0.57	0.56
	Period 1&3	t	-0.99	-0.95	-0.14	-2.2[b]	-1.04	-2.23[b]
		F	0.56	0.27	0.2	0.69	0.37	0.47
open to close	Period 1&2	t	1.84[a]	2.49[b]	0.81	2.37[b]	1.86[a]	2.64[c]
		F	0.65	0.91	0.24	0.47	0.46	0.88
	Period 2&3	t	-2.81[c]	-2.2[b]	-0.11	-1.26	-2.24[b]	-3.25[c]
		F	0.87	0.57	0.28	0.88	0.34	0.73
	Period 1&3	t	-2.12[b]	-1.83[a]	-1.43	-0.07	-1.41	-3.01[c]
		F	0.32	0.88	0.41	0.84	0.84	0.76
morning	Period 1&2	t	0.86	2.46[b]	2.32[b]	1.42	2.46[b]	4.06[c]
		F	0.25	0.72	0.27	0.27	0.52	0.87
	Period 2&3	t	-0.71	-2.13[b]	-1.06	-1.42	-2.44[b]	-3.2[c]
		F	0.54	0.53	0.29	0.67	0.79	0.59
	Period 1&3	t	-0.47	-1.16	0.67	-0.89	-1.39	-1.33
		F	0.35	0.57	0.4	0.57	0.58	0.71
afternoon	Period 1&2	t	-0.72	1	-0.7	0.72	-1.08	-0.32
		F	0.37	0.54	0.45	0.74	0.67	0.68
	Period 2&3	t	-0.42	-0.8	-0.08	-2.23[b]	0.51	-1.38
		F	0.57	0.77	0.27	0.81	0.27	0.29
	Period 1&3	t	-1.02	-0.52	-0.68	-2.89[c]	-0.18	-2.16[b]
		F	0.84	0.87	0.47	0.83	0.28	0.51
close to close	Period 1&2	t	0.75	2.94[c]	1.02	1.9[a]	1.52	3.32[c]
		F	0.27	0.24	0.98	0.87	0.39	0.8
	Period 2&3	t	-1.31	-2.33[b]	-0.76	-2.57[b]	-1.79[a]	-3.94[c]
		F	0.57	0.33	0.67	0.53	0.47	0.86
	Period 1&3	t	-1.34	-1.25	-0.14	-2.24[b]	-1.3	-2.76[c]
		F	0.58	0.87	0.75	0.9	0.46	0.97
open to open	Period 1&2	t	1.44	0.85	0.93	1.83[a]	2.13[b]	3.15[c]
		F	0.27	0.18	0.59	0.93	0.49	0.85
	Period 2&3	t	-1.67[a]	-1.21	-1.07	-1.06	-2.67[c]	-3.36[c]
		F	0.87	0.22	0.87	0.84	0.51	0.81
	Period 1&3	t	-1.27	-1.13	-0.87	-0.29	-2.12[b]	-2.29[b]
		F	0.47	0.2	0.64	0.3	0.56	0.95

[a] t-statistic of F-statistic is significant at 10% level
[b] t-statistic of F-statistic is significant at 5% level
[c] t-statistic of F-statistic is significant at 1% level
t - testing the equality of mean of each return series between sub periods
F - testing the equality of variance of each return series between sub periods
Period 1 is sub-period 1 from January 3, 1994 to December 31, 1996
Period 2 is sub-period 2 from January 3, 1997 to August 28, 1998
Period 3 is sub-period 3 from September 2, 1998 to November 26, 1999

Testing Homogeneity for Industrial Index between Sub-Periods

(a) equality in mean return

Table 5C shows there are more significant differences in the mean return particularly on Thursday between sub-periods 1 and 2, 2 and 3 as well as 1 and 3 respectively. Besides having similar insignificant differences in the all day return series as the Emas Index, the Industrial Index have more insignificant differences: they are the open to close return between sub-periods 1 and 3 and the afternoon return between sub-periods 1 and 3. There are four cases of weekday differences. The Wednesday morning return of sub-period 1 is higher than period 3. The Friday afternoon return of period 1 is lower than period 2. Period 1 is higher than period 3 in the Wednesday close to close return and the Thursday open to open return.

(b) equality in return volatility

The F-test in Table 5C does not show a significant difference in the return volatility between sub-periods 1 and 2, 2 and 3 as well as 1 and 3 respectively. It indicates no difference in the price variation between the sub-periods respectively.

Table 5C: Testing Equality of Mean Returns and Volatility for Industrial Index between Sub-Periods

Indices	Period	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
close to open	Period 1&2	t	0.63	2.05[b]	1.27	1.87[a]	1.61	3.33[c]
		F	0.25	0.67	0.25	0.26	0.58	0.39
	Period 2&3	t	-0.94	-1.28	-0.65	-2.43[b]	-1.28	-3.03[c]
		F	0.36	0.36	0.37	0.99	0.58	0.48
	Period 1&3	t	-0.85	-0.59	-0.25	-2.12[b]	-0.53	-1.8[a]
		F	0.56	0.24	0.28	0.97	0.57	0.57
open to close	Period 1&2	t	0.01	1.92[a]	0.04	1.4	0.22	2.19[b]
		F	0.27	0.68	0.38	0.51	0.57	0.59
	Period 2&3	t	-2.58[c]	-4.03[c]	-0.39	-0.03	-1.37	-2.83[c]
		F	0.36	0.87	0.17	0.3	0.58	0.76
	Period 1&3	t	-1.74[a]	-1.05	-0.54	0.81	-1.64	-1.44
		F	0.28	0.57	0.38	0.67	0.57	0.78
morning	Period 1&2	t	0.63	1.7[a]	1.29	1.41	1.81[a]	3.08[c]
		F	0.34	0.38	0.64	0.64	0.57	0.88
	Period 2&3	t	-0.81	-1.32	-0.54	-1.63	-1.88[a]	-2.73[c]
		F	0.41	0.67	0.38	0.59	0.84	0.94
	Period 1&3	t	-0.77	-0.58	0.52	-1.39	0	-1.01
		F	0.28	0.66	0.34	0.64	0.57	0.84
afternoon	Period 1&2	T	0.21	1.44	0.23	0.86	-0.47	0.66
		F	0.22	0.77	0.41	0.31	0.47	0.27
	Period 2&3	T	-0.3	-0.89	-0.42	-1.71[a]	-0.08	-1.58
		F	0.2	0.55	0.31	0.71	0.57	0.47
	Period 1&3	T	-0.27	-0.46	-0.33	-2.1[b]	-0.47	-1.35
		F	0.33	0.27	0.56	0.82	0.57	0.55
close to close	Period 1&2	T	0.96	2.65[c]	1.23	2.19[b]	1.47	3.86[c]
		F	0.37	0.9	0.24	0.84	0.37	0.93
	Period 2&3	t	-1.42	-1.83[a]	-0.69	-2.79[c]	-1.51	-3.08[c]
		F	0.67	0.98	0.18	0.96	0.25	0.95
	Period 1&3	t	-1.31	-0.92	0.12	-2.02[b]	-1.01	-2.3[b]
		F	0.54	0.86	0.34	0.98	0.57	0.78
open to open	Period 1&2	t	1.88[a]	1.08	1.51	1.97[b]	1.96[b]	3.72[c]
		F	0.64	0.59	0.39	0.59	0.84	0.71
	Period 2&3	t	-1.59	-1.41	-0.71	-0.67	-2.61[c]	-3.1[c]
		F	0.38	0.73	0.16	0.39	0.54	0.91
	Period 1&3	t	-0.96	-1.1	-0.1	0.87	-2.27[b]	-1.65[a]
		F	0.58	0.67	0.62	0.58	0.57	0.81

[a] t-statistic of F-statistic is significant at 10% level
[b] t-statistic of F-statistic is significant at 5% level
[c] t-statistic of F-statistic is significant at 1% level
t - testing the equality of mean of each return series between sub periods
F - testing the equality of variance of each return series between sub periods
Period 1 is sub-period 1 from January 3, 1994 to December 31, 1996
Period 2 is sub-period 2 from January 3, 1997 to August 28, 1998
Period 3 is sub-period 3 from September 2, 1998 to November 26, 1999

4.5.4 Testing Homogeneity for Finance Index between Sub Periods

(a) equality in mean return

The significant differences in the all day return series are similar to the Composite Index. Table 5D shows there are more significant differences between the sub-periods particularly on Thursday. However, there is insignificant difference in the open to close return between sub-periods 1 and 2. Throughout the weekdays, the Wednesday afternoon return in sub-period 1 seems to be higher than sub-period 3 where in fact it should be lower. Similarly, the Friday afternoon return in sub-period 2 turns out to be higher than sub-period 3. Conversely, period 1 has lower Friday afternoon return than sub-period 2.

(b) equality in return volatility

The F-test in table 5D indicates there is no significant difference in the return volatility between sub-periods 1 and 2, sub-periods 2 and 3 as well as sub-periods 1 and 3 respectively.

4.5.4 Testing Homogeneity for Finance Index between Sub Periods

(a) equality in mean return

The significant differences in the all day return series are similar to the Composite Index. Table 5D shows there are more significant differences between the sub-periods particularly on Thursday. However, there is insignificant difference in the open to close return between sub-periods 1 and 2. Throughout the weekdays, the Wednesday afternoon return in sub-period 1 seems to be higher than sub-period 3 where in fact it should be lower. Similarly, the Friday afternoon return in sub-period 2 turns out to be higher than sub-period 3. Conversely, period 1 has lower Friday afternoon return than sub-period 2.

(b) equality in return volatility

The F-test in table 5D indicates there is no significant difference in the return volatility between sub-periods 1 and 2, sub-periods 2 and 3 as well as sub-periods 1 and 3 respectively.

Table 5D: Testing Equality of Mean Returns and Volatility for Finance Index between Sub-Periods

Indices	Period	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
	Period 1&2	t	0.87	2.19[b]	1.45	2.14[b]	1.87[a]	3.79[c]
		F	0.56	0.83	0.35	0.38	0.91	0.93
ose to open	Period 2&3	t	-0.85	-1.67[a]	-1.31	-2.26[b]	-1.92[a]	-3.56[c]
		F	0.45	0.38	0.58	0.67	0.84	0.49
	Period 1&3	t	-0.66	-0.95	-0.58	-1.61	-1.43	-2.28[b]
		F	0.25	0.23	0.37	0.68	0.72	0.68
	Period 1&2	t	2.33[b]	1.82[a]	0.22	1.08	0.66	1.11
		F	0.28	0.65	0.59	0.69	0.28	0.38
en to close	Period 2&3	t	-2.99[c]	-2.62[c]	-0.22	-0.58	-0.53	-2.72[c]
		F	0.57	0.92	0.34	0.24	0.42	0.67
	Period 1&3	t	-2.73[c]	-2.15[b]	-0.64	-0.19	-2.05[b]	-3.34[c]
		F	0.27	0.95	0.37	0.34	0.67	0.84
	Period 1&2	t	1.08	2.4[b]	0.94	1.13	2.99[c]	3.62[c]
		F	0.39	0.97	0.27	0.57	0.82	0.85
orning	Period 2&3	t	-0.64	-1.85[a]	-0.37	-1.11	-2.59[c]	-2.76[c]
		F	0.57	0.67	0.28	0.62	0.79	0.84
	Period 1&3	t	-0.19	-0.9	0.46	-0.68	-1.36	-1.12
		F	0.26	0.59	0.35	0.25	0.64	0.38
	Period 1&2	t	1.08	1.18	1.11	2.41[b]	-1.42	1.46
		F	0.28	0.37	0.64	0.9	0.67	0.67
ternoon	Period 2&3	t	-0.47	-1.03	-1.6	-2.67[c]	0.33	-2.34[b]
		F	0.28	0.57	0.5	0.86	0.24	0.95
	Period 1&3	t	-0.78	-0.75	-1.64	-2.09[b]	-0.73	-2.47[b]
		F	0.59	0.68	0.57	0.92	0.54	0.78
	Period 1&2	t	1.23	2.42[b]	1.36	2.31[b]	1.44	3.71[c]
		F	0.48	0.39	0.38	0.97	0.38	0.84
ose to close	Period 2&3	t	-1.38	-2.19[b]	-1.32	-2.36[b]	-2.06[b]	-3.84[c]
		F	0.28	0.99	0.57	0.95	0.95	0.85
	Period 1&3	t	-1.24	-1.42	-0.7	-1.57	-1.94[a]	-3.05[c]
		F	0.37	0.68	0.64	0.86	0.69	0.64
	Period 1&2	t	2.02[b]	0.84	1.69[a]	1.62	1.88[a]	3.56[c]
		F	0.38	0.67	0.84	0.35	0.67	0.87
en to open	Period 2&3	t	-2.19[b]	-0.98	-1.64	-1.33	-2.25[b]	-3.71[c]
		F	0.67	0.37	0.39	0.57	0.94	0.87
	Period 1&3	t	-1.79[a]	-0.89	-1.13	-0.4	-1.84[a]	-2.71[c]
		F	0.68	0.64	0.38	0.28	0.96	0.98

-statistic of F-statistic is significant at 10% level
-statistic of F-statistic is significant at 5% level
-statistic of F-statistic is significant at 1% level
 testing the equality of mean of each return series between sub periods
- testing the equality of variance of each return series between sub periods
ariod 1 is sub-period 1 from January 3, 1994 to December 31, 1996
ariod 2 is sub-period 2 from January 3, 1997 to August 28, 1998
ariod 3 is sub-period 3 from September 2, 1998 to November 26, 1999

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4.5.5 Testing Homogeneity for Property Index between Sub-Periods

(a) equality in mean return

Testing of equality of means is displayed in Table 5E. Except for afternoon series, there is significant difference in all return series between sub-periods 1 and 2, 2 and 3 and 1 and 3 respectively. The difference in Thursday return again is significant between the sub-periods. However, there is insignificant difference in the open to close return between sub-periods 1 and 3. Surprisingly, the all day afternoon return of sub-period 1 is lower than sub-period 2. The afternoon return in sub-period 1 is also lower on Monday, Wednesday and Friday. There are some other surprising results throughout the weekdays too. The Wednesday morning return of sub-period 1 is significantly higher than period 3. In contrast, sub-period 1 shows an insignificant higher Wednesday afternoon return, higher Friday open to open return and higher Friday open to open return than sub-period 3. Sub-period 1 has a lower Tuesday open to open return compared to sub-period 2.

(b) equality in return volatility

There is insignificant difference in the return volatility between sub-periods 1 and 2 as shown by the F-test in Table 5E. Similarly, the difference in return volatility is also insignificant between sub-periods 2 and 3 as well as between sub-periods 1 and 3.

Table 5E: Testing Equality of Mean Returns and Volatility for Property Index between Sub-Periods

Indices	Period	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
close to open	Period 1&2	t	-0.82	1.97^b	2.26^b	0.69	1.4	2.47^b
		F	0.35	0.97	0.98	0.31	0.5	0.62
	Period 2&3	t	-0.23	-2.29^b	-0.89	-1.88^a	-1.46	-3.03^c
		F	0.24	0.98	0.64	0.84	0.37	0.85
	Period 1&3	t	-0.86	-1.3	-0.91	-2.26^b	-0.86	-1.96^b
		F	0.38	0.97	0.34	0.98	0.31	0.72
open to close	Period 1&2	t	2.26^b	1.51	0.74	0.89	1.98^b	1.89^a
		F	0.97	0.97	0.24	0.64	0.36	0.61
	Period 2&3	t	-2.78^c	-1.9^a	-0.44	-0.93	-2.98^c	-2.4^b
		F	0.94	0.67	0.39	0.59	0.67	0.6
	Period 1&3	t	-0.59	-0.5	-0.33	-0.66	-0.38	-0.36
		F	0.37	0.36	0.27	0.87	0.64	0.29
morning	Period 1&2	t	0.06	2.12^b	3.46^c	1.27	2.51^b	4.18^c
		F	0.37	0.97	0.94	0.39	0.39	0.93
	Period 2&3	t	-0.53	-2.36^b	-1.14	-1.32	-2.78^c	-3.27^c
		F	0.68	0.67	0.38	0.57	0.9	0.9
	Period 1&3	t	-0.7	-0.84	1.93^a	-0.77	-1.49	-0.93
		F	0.64	0.67	0.66	0.61	0.67	0.56
afternoon	Period 1&2	t	-1.76^a	0.55	-0.93	-0.75	-1.07	-1.43
		F	0.67	0.67	0.58	0.91	0.6	0.68
	Period 2&3	t	0.59	-1.51	0.06	-1.58	0.85	-0.87
		F	0.36	0.67	0.39	0.67	0.36	0.61
	Period 1&3	t	-0.51	-1.11	-0.68	-2.76^c	0.27	-2.08^b
		F	0.67	0.69	0.44	0.98	0.41	0.69
close to close	Period 1&2	t	-0.31	2.81^c	1.71^a	0.96	2.18^b	3.2^c
		F	0.28	0.97	0.63	0.54	0.46	0.98
	Period 2&3	t	-0.54	-2.53^b	-0.78	-2.19^b	-1.99^b	-3.59^c
		F	0.37	0.83	0.22	0.87	0.72	0.89
	Period 1&3	t	-0.9	-1.19	0.67	-2.35^b	-0.97	-2.03^b
		F	0.37	0.67	0.31	0.9	0.68	0.78
open to open	Period 1&2	t	1.6	-0.31	0.89	2.35^b	1.39	2.54^b
		F	0.39	0.28	0.35	0.92	0.81	0.69
	Period 2&3	t	-1.62	-0.26	-1.73^a	-1.04	-2.29^b	-3.05^c
		F	0.67	0.58	0.64	0.26	0.54	0.76
	Period 1&3	t	-0.88	-0.53	-1.56	0.85	-1.87^a	-1.85^a
		F	0.69	0.68	0.39	0.34	0.69	0.94

[a] t-statistic of F-statistic is significant at 10% level
[b] t-statistic of F-statistic is significant at 5% level
[c] t-statistic of F-statistic is significant at 1% level
t - testing the equality of mean of each return series between sub periods
F - testing the equality of variance of each return series between sub periods
Period 1 is sub-period 1 from January 3, 1994 to December 31, 1996
Period 2 is sub-period 2 from January 3, 1997 to August 28, 1998
Period 3 is sub-period 3 from September 2, 1998 to November 26, 1999

I.5.6 Testing Homogeneity for Plantation Index between Sub Periods

(a) equality in mean return

The result shown in Table 5F is totally different from other indices. There are more insignificant differences in the mean return between sub-periods 1 and 2, 2 and 3 as well as 1 and 3 respectively. This may imply that there is no difference in the price variation between the sub-periods. The all day afternoon return is slightly lower in sub-period 1 as compared to sub-period 2 although it is insignificant. Sub-period 2 has higher afternoon return than sub-period 3 on Monday, Wednesday and Friday. Sub-period 1 also has higher afternoon return than sub-period 3 on Tuesday, Wednesday and Friday and higher close to close return on Wednesday and Friday. As for open to open return, sub-period 1 has lower Tuesday return than sub-period 2.

(b) equality in return volatility

The difference in return volatility for plantation stocks is insignificant between sub-periods 1 and 2. It is also insignificant between sub-periods 2 and 3 as well as between sub-periods 1 and 3.

Table 5F: Testing Equality of Mean Returns and Volatility for Plantation Index between Sub-Periods

Indices	Period	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
close to open	Period 1&2	t	1.51	1.43	0.76	0.27	1.4	1.03
		F	0.35	0.38	0.26	0.39	0.66	0.55
	Period 2&3	t	-1.01	-1.58	-0.27	-1.49	-1.13	-2.49^b
		F	0.68	0.39	0.19	0.48	0.97	0.68
	Period 1&3	t	-2.24^b	-0.6	0.37	-1.31	-0.1	-1.88^a
		F	0.83	0.22	0.67	0.44	0.37	0.68
open to close	Period 1&2	t	3.02^c	2.2^b	1.86^a	1.23	1.82^a	4.52^c
		F	0.98	0.85	0.88	0.69	0.64	0.9
	Period 2&3	t	-2.45^b	-1.88^a	-1.35	-0.18	-3.17^c	-3.98^c
		F	0.81	0.7	0.65	0.29	0.66	0.6
	Period 1&3	t	-0.84	-0.67	1.11	-1.17	-0.37	-1.84^a
		F	0.6	0.38	0.69	0.66	0.24	0.45
morning	Period 1&2	t	-0.86	0.83	1.16	1.65^a	2.13^b	1.5
		F	0.55	0.27	0.8	0.37	0.98	0.43
	Period 2&3	t	-1.17	-1.68^a	-0.74	-1	-2.15^b	-2.89^c
		F	0.49	0.39	0.6	0.26	0.86	0.56
	Period 1&3	t	-2.03^b	-1.02	0.21	-0.91	-0.82	-2.14^b
		F	0.88	0.37	0.6	0.33	0.93	0.65
afternoon	Period 1&2	t	1.42	1.06	0.32	0.46	0.19	-0.21
		F	0.39	0.84	0.39	0.35	0.34	0.31
	Period 2&3	t	0.17	-0.89	0.6	-1.1	0.7	-0.21
		F	0.39	0.38	0.64	0.29	0.32	0.36
	Period 1&3	t	-0.99	0.21	0.31	-1.27	0.73	-0.39
		F	0.66	0.39	0.29	0.28	0.9	0.4
close to close	Period 1&2	t	-0.68	1.83^a	1.33	0.5	1.76^a	2.11^b
		F	0.34	0.94	0.39	0.31	0.99	0.67
	Period 2&3	t	-1.35	-1.82^a	-0.43	-1.46	-1.47	-2.97^c
		F	0.67	0.67	0.58	0.46	0.48	0.29
	Period 1&3	t	-1.94^a	-0.46	0.71	-1.01	0.04	-1.32
		F	0.66	0.68	0.59	0.42	0.3	0.6
open to open	Period 1&2	t	1.76^a	-1	1.02	0.88	0.91	1.53
		F	0.9	0.69	0.7	0.31	0.66	0.49
	Period 2&3	t	-1.04	-1.04	-0.89	-0.05	-1.9	-2.15^b
		F	0.52	0.39	0.66	0.29	0.67	0.86
	Period 1&3	t	0.4	-1.87^a	-0.2	0.75	-1.12	-1.06
		F	0.49	0.77	0.5	0.64	0.31	0.5

[a] t-statistic of F-statistic is significant at 10% level
[b] t-statistic of F-statistic is significant at 5% level
[c] t-statistic of F-statistic is significant at 1% level
t - testing the equality of mean of each return series between sub periods
F - testing the equality of variance of each return series between sub periods
Period 1 is sub-period 1 from January 3, 1994 to December 31, 1996
Period 2 is sub-period 2 from January 3, 1997 to August 28, 1998
Period 3 is sub-period 3 from September 2, 1998 to November 26, 1999

4.5.7 Testing Homogeneity for Mining Index between Sub-Periods

(a) equality in mean return

Testing on equality of means for Mining Index is shown in Table 5G. This index shows that the mean return of sub-period 1 is higher than sub-period 2 in the weekday and all day afternoon return. This result contradicts with other indices where sub-period 1 has higher afternoon all day return than sub-period 2. Among all indices, the Mining Index is the only index where the all day open to close return and the open to open return between sub-periods 1 and 3 are insignificant.

(b) equality in return volatility

Table 5G also shows the return volatility is insignificantly different between sub-periods 1 and 2. Similarly, difference in the return volatility is also insignificant between sub-periods 2 and 3 as well as between sub-periods 1 and 3.

Table 5G: Testing Equality of Mean Returns and Volatility for Mining Index between Sub-Periods

Indices	Period	Statistic	Monday	Tuesday	Wednesday	Thursday	Friday	All day
close to open	Period 1&2	t	0.82	1.25	0.89	0.48	2.46^b	1.81^a
		F	0.38	0.39	0.37	0.38	0.9	0.4
	Period 2&3	t	-0.31	-0.9	-1.27	-1.14	-1.79^a	-2.37^b
		F	0.6	0.2	0.39	0.68	0.67	0.52
	Period 1&3	t	-1.08	-0.43	-0.99	-1.2	-0.84	-1.97^b
		F	0.64	0.8	0.67	0.38	0.58	0.69
open to close	Period 1&2	t	2.48^b	0.59	1.94^a	1.96^b	1.13	3.56^c
		F	0.91	0.27	0.71	0.84	0.46	0.84
	Period 2&3	t	-3.83^c	-1.78^a	-2.45^b	-0.89	-1.83^a	-4.48^c
		F	0.84	0.69	0.96	0.35	0.64	0.87
	Period 1&3	t	-0.27	-0.83	-0.52	-0.53	-0.06	-0.11
		F	0.39	0.67	0.64	0.47	0.7	0.29
morning	Period 1&2	t	0.5	2.03^b	1.74^a	1.67^a	4.52^c	4.31^c
		F	0.67	0.77	0.68	0.48	0.99	0.69
	Period 2&3	t	-0.2	-1.04	-0.94	-1.15	-2.28^b	-2.29^b
		F	0.6	0.67	0.67	0.39	0.9	0.67
	Period 1&3	t	0.07	0	0.43	-0.11	-0.57	0.35
		F	0.24	0.16	0.22	0.38	0.68	0.28
afternoon	Period 1&2	t	-2.2^b	-0.35	-1.12	-1.16	-0.93	-2.43^b
		F	0.39	0.19	0.24	0.68	0.57	0.89
	Period 2&3	t	-0.34	-0.39	-0.19	-0.46	-0.58	-0.88
		F	0.58	0.48	0.19	0.71	0.64	0.61
	Period 1&3	t	-2.44^b	-0.77	-2.01^b	-1.75^a	-1.63	-3.7^c
		F	0.82	0.68	0.85	0.98	0.38	0.94
close to close	Period 1&2	t	-0.22	1.29	1.27	0.81	2.6^b	2.42^b
		F	0.35	0.73	0.26	0.65	0.96	0.85
	Period 2&3	t	-0.58	-1.01	-1.6	-1.26	-2^b	-2.52^b
		F	0.38	0.37	0.87	0.84	0.69	0.85
	Period 1&3	t	-0.98	-0.52	-1.11	-1.08	-0.79	-1.95^a
		F	0.47	0.34	0.69	0.36	0.62	0.89
open to open	Period 1&2	t	3.06^c	-0.56	0.56	1.59	0.92	2.28^b
		F	0.49	0.31	0.23	0.67	0.55	0.93
	Period 2&3	t	-1.77^a	-0.4	-0.4	-1.58	-1.63	-2.38^b
		F	0.43	0.39	0.38	0.64	0.87	0.89
	Period 1&3	t	0.16	-1	-0.16	0.71	-1.45	-1.49
		F	0.35	0.33	0.37	0.39	0.39	0.8

[a] t-statistic of F-statistic is significant at 10% level
[b] t-statistic of F-statistic is significant at 5% level
[c] t-statistic of F-statistic is significant at 1% level
t - testing the equality of mean of each return series between sub periods
F - testing the equality of variance of each return series between sub periods
Period 1 is sub-period 1 from January 3, 1994 to December 31, 1996
Period 2 is sub-period 2 from January 3, 1997 to August 28, 1998
Period 3 is sub-period 3 from September 2, 1998 to November 26, 1999