

Chapter 4

Empirical Results and Discussion

4.1 Analysis of Data

The results of the statistical test mentioned in the earlier chapters are tabulated in this chapter. The period of the data analysis is from 2nd January 1992 to 31st December 1995, for both the thirty selected large capital stocks and the KLSE Composite Index. Further analysis of data is also conducted for two sub-periods, that is, from 2nd January 1992 to 31st December 1993 and from 2nd January 1994 to 31st December 1995 respectively, to find out whether there is any significant differences in the results for the two sub-periods when compared to the results obtained for the whole period. The discussion will be concentrated on the main objective of the study, that is, to test the existence of the *day-of-the-week* anomaly and the Monday or weekend effect on the thirty large capital stocks on the KLSE Main Board. The results of the study will be compared with the findings of some previous studies carried out on the similar topic.

4.2 Daily Mean Return Distribution

Table 4.1 exhibits the daily mean returns of the thirty selected large capital stocks on the KLSE Main Board for the period from 2nd January 1992 to 31st December 1995. The returns are computed on successive trading days' closing prices of individual stocks and also the Composite Index, excluding the returns over holidays or holiday-

weekends. Closing prices are adjusted for all Bonus shares or Right shares issued within the four-year period.

Table 4.1 Summary Statistics of Mean Returns of 30 Selected Large Capital Stocks on KLSE Main Board by *Day-of-the-Week*.

Stock	Description	Monday	Tuesday	Wednesday	Thursday	Friday	F Statistic ¹
Boustead	Mean	-0.0385	-0.0025	-0.0255	-0.0237	-0.0037	2.1350
	Std. Dev.	0.1810	0.0780	0.1670	0.1500	0.1130	(4:909)
	t Statistic	-1.7200	2.5000	-0.6400	-0.5400	1.8700	
Faber Group	Mean	-0.0358	-0.0060	-0.0207	-0.0254	-0.0048	2.1750
	Std. Dev.	0.1770	0.0800	0.1630	0.1440	0.1050	(4:972)
	t Statistic	-1.7000	2.6800 ^b	-0.3300	-0.9000	1.7800	
Genting	Mean	-0.0380	-0.0034	-0.0263	-0.0045	-0.0100	1.1790
	Std. Dev.	0.1890	0.0740	0.1700	0.3270	0.1030	(4:972)
	t Statistic	-1.7300	1.7300	-0.8800	0.6200	0.7500	
Golden Hope	Mean	-0.0348	-0.0034	-0.0220	-0.0200	-0.0070	1.6440
	Std. Dev.	0.1760	0.0770	0.1600	0.1440	0.1040	(4:976)
	t Statistic	-1.6100	2.2800 ^b	-0.4700	-0.3000	1.4400	
Guinness	Mean	-0.0079	-0.0011	0.0025	-0.0014	0.0038	2.7370 ^a
	Std. Dev.	0.0760	0.0180	0.0180	0.0190	0.0220	(4:941)
	t Statistic	-1.5700	-0.2100	2.0600 ^b	-0.4000	2.6300 ^b	
Hi & Lo	Mean	-0.0320	-0.0028	-0.0225	-0.0207	-0.0095	1.3350
	Std. Dev.	0.1770	0.0770	0.0160	0.1450	0.1110	(4:976)
	t Statistic	-1.3400	2.3900 ^b	-0.5200	-0.3700	1.0500	
Hong Leong Industries	Mean	-0.0005	0.0036	0.0008	-0.0040	-0.0078	0.7930
	Std. Dev.	0.0230	0.0700	0.0400	0.0750	0.1040	(4:948)
	t Statistic	0.4100	1.1900	0.7400	-0.5100	-1.0000	
Kian Joo	Mean	-0.0020	0.0026	-0.0009	0.0003	0.0066	1.6860
	Std. Dev.	0.0200	0.0220	0.0340	0.0390	0.0520	(4:903)
	t Statistic	-2.0200 ^b	0.7300	-0.9600	-0.4400	1.6500	
KL Kepong	Mean	-0.0335	-0.0027	-0.0226	-0.0205	-0.0069	1.6220
	Std. Dev.	0.1760	0.0750	0.1590	0.1440	0.1050	(4:976)
	t Statistic	-1.5100	2.4000 ^b	-0.5600	-0.3800	1.4200	
Magnum	Mean	-0.0324	-0.0039	-0.0233	-0.0249	-0.0056	1.5560
	Std. Dev.	0.1770	0.0760	0.1620	0.1600	0.1040	(4:972)
	t Statistic	-1.3300	2.2700	-0.5300	-0.7000	1.7000	
MayBank	Mean	-0.0324	-0.0029	-0.0229	-0.0194	-0.0076	1.4830
	Std. Dev.	0.1750	0.0740	0.1600	0.1440	0.1030	(4:976)
	t Statistic	-1.4300	2.3700 ^b	-0.6100	-0.2800	1.3100	
Malayan Cement	Mean	-0.0339	-0.0054	-0.0225	-0.0192	-0.0084	1.2980
	Std. Dev.	0.1790	0.0750	0.1600	0.1450	0.1050	(4:950)
	t Statistic	-1.4300	2.0100 ^b	-0.4800	-0.1600	1.2800	

Table 4.1 (Cont'd) Summary Statistics of Mean Returns of 30 Selected Large Capital Stocks on KLSE Main Board by *Day-of-the-Week*.

Stock	Description	Monday	Tuesday	Wednesday	Thursday	Friday	F Statistic ¹
MMC	Mean	-0.0330	-0.0037	-0.0237	-0.0191	-0.0124	1.2010
	Std. Dev.	0.1790	0.0790	0.1600	0.1430	0.1280	(4.978)
	t Statistic	-1.3300	2.3400 ^b	-0.5500	-0.0900	0.6900	
MOX	Mean	0.0146	0.0264	-0.0084	0.0245	0.0285	1.9680
	Std. Dev.	0.1270	0.1640	0.1580	0.1470	0.1570	(4.971)
	t Statistic	-0.3100	0.9000	-2.6300 ^b	0.7500	1.1700	
MPHB	Mean	-0.0366	-0.0037	-0.0198	-0.0209	-0.0040	1.8800
	Std. Dev.	0.1790	0.0790	0.1630	0.1460	0.1080	(4.974)
	t Statistic	-1.7900	2.1300 ^b	-0.2900	-0.4500	1.7300	
MUIB	Mean	-0.0363	-0.0044	-0.0183	-0.0185	-0.0067	1.6690
	Std. Dev.	0.1760	0.0770	0.1460	0.1510	0.1050	(4.956)
	t Statistic	-1.8000	2.0000 ^b	-0.1800	-0.1800	1.3900	
Nestle	Mean	-0.0324	-0.0049	-0.0300	-0.0236	-0.0050	0.3910
	Std. Dev.	0.2680	0.2330	0.2750	0.2780	0.2310	(4.915)
	t Statistic	-0.6900	0.8000	-0.5700	-0.2400	0.7400	
NSTP	Mean	-0.0420	-0.0059	-0.0295	-0.0206	0.0120	2.3060
	Std. Dev.	0.1990	0.0750	0.1760	0.1440	0.2920	(4.956)
	t Statistic	-1.9900 ^b	1.4900	-1.0100	-0.3500	1.6800	
Oreintal	Mean	-0.0276	-0.0119	-0.0288	-0.0208	-0.0068	0.9030
	Std. Dev.	0.1630	0.1030	0.1750	0.1450	0.1060	(4.956)
	t Statistic	-0.8200	0.9900	-0.9000	-0.1900	1.6600	
Perlis Plantation	Mean	-0.0303	-0.0116	-0.0273	-0.0196	-0.0055	1.0670
	Std. Dev.	0.1770	0.1020	0.1610	0.1430	0.1060	(4.973)
	t Statistic	-1.0500	1.0000	-0.8500	-0.0900	1.8000	
Renong	Mean	-0.0454	-0.0043	-0.0208	-0.0479	-0.0225	1.2760
	Std. Dev.	0.2030	0.0880	0.2110	0.2360	0.2050	(4.924)
	t Statistic	-1.1800	2.5900 ^b	0.5100	-1.1900	0.3900	
Rothman	Mean	0.0224	0.0128	0.0058	0.0023	-0.0017	0.7160
	Std. Dev.	0.1610	0.1570	0.1510	0.1620	0.1510	(4.975)
	t Statistic	1.3900	0.4700	-0.2300	-0.6000	-1.0000	
Sime Darby	Mean	-0.0304	-0.0056	-0.0178	-0.0241	-0.0078	1.0690
	Std. Dev.	0.1760	0.0750	0.1800	0.1480	0.1030	(4.976)
	t Statistic	-1.2200	1.8700	-0.0700	-0.7800	1.2700	
Sungei Way	Mean	-0.0338	-0.0002	-0.0262	-0.0160	-0.0009	2.3250
	Std. Dev.	0.1750	0.0760	0.1630	0.1570	0.0770	(4.972)
	t Statistic	-1.7100	2.5000 ^b	-1.0900	-0.0600	2.3600 ^b	
Shell	Mean	-0.0381	-0.0099	-0.0273	-0.0234	-0.0071	1.4690
	Std. Dev.	0.1880	0.1030	0.1620	0.1690	0.1010	(4.985)
	t Statistic	-1.4900	1.5100	-0.6100	-0.2200	1.9300	
Tan Chong	Mean	0.0112	0.0233	0.0119	0.0186	0.0296	0.5950
	Std. Dev.	0.1290	0.1600	0.1050	0.1450	0.1580	(4.969)
	t Statistic	-0.8500	0.4300	-0.9700	-0.0500	1.0900	

Table 4.1 (Cont'd) Summary Statistics of Mean Returns of 30 Selected Large Capital Stocks on KLSE Main Board by *Day-of-the-Week*.

Stock	Description	Monday	Tuesday	Wednesday	Thursday	Friday	F Statistic ¹
Telekom	Mean	-0.0013	0.0003	-0.0031	0.0006	-0.0063	0.9900
	Std. Dev.	0.0180	0.0200	0.0210	0.0190	0.0850	(4:909)
	t Statistic	-0.2800	0.4900	1.8500	0.6800	-0.9900	
Tenaga	Mean	-0.0442	-0.0080	-0.0229	-0.0293	-0.0124	1.2900
	Std. Dev.	0.2020	0.0850	0.1650	0.1640	0.1190	(4:925)
	t Statistic	-1.4600	1.9600	0.0200	-0.5400	1.1500	
Time	Mean	-0.0370	-0.0017	-0.0218	-0.0209	-0.0051	2.0700
	Std. Dev.	0.1760	0.0800	0.1610	0.1440	0.1050	(4:972)
	t Statistic	-1.8200	2.4700 ^b	-0.4700	-0.4100	1.6600	
UMW	Mean	-0.0339	-0.0074	-0.0242	-0.0198	-0.0084	1.2260
	Std. Dev.	0.1750	0.1050	0.1590	0.1450	0.1040	(4:973)
	t Statistic	-1.4100	1.5400	-0.5600	-0.1300	1.4200	

¹ denotes the F Statistic for testing the equality of mean returns across the *day-of-the-week*. The degrees of freedom are in parentheses.

The t Statistic tests the mean return of the day of the week against the average mean returns of the other days.

^a denotes statistically significant at 5 percent level for F Statistic.

^b denotes statistically significant at 5 percent level for t-test.

The results tabulated in Table 4.1 above show that, out of 30 stocks analyzed, 23 stocks have lowest and negative returns on Monday and 1 stock has lowest but positive returns on Monday. In other words, 77% of the 30 large capital stocks are found to have lowest and negative returns on Monday. Hence, it can be said that the 30 large capital stocks in general exhibit a pattern of low and negative average returns at the start of the week.

On the other hand, 19 sample stocks are found to have highest (negative) returns on Tuesday, 8 stocks have highest on Friday. Therefore, 63% of the sample stocks show highest returns on Tuesday while 27% of the sample stocks show highest returns on

Friday. As a result, it cannot be said that the 30 large capital stocks exhibit a pattern of a high average returns at the end of the week.

Table 4.2 shows the daily mean returns of the KLSE Composite Index for the period from 2nd January 1992 to 31st December 1995 and two sub-period daily mean returns, that is, from 2nd January 1992 to 31st December 1993 and from 2nd January 1994 to 31st December 1995 respectively. The results show that the Composite Index exhibits lowest and negative returns on Monday for all the three periods. As for the Friday returns, the Composite Index shows high and positive returns on all the three periods even though they are not the highest returns if compared to Wednesday returns. Interestingly, two out of three periods show significant highest and positive returns on Wednesday. The results clearly exhibit a general low and negative returns on Monday and consistent high and positive returns at the end of the week. This finding is consistent with the findings of Wong (1987) of the KLSE Industrial Index for the period of 1974-1984 and Yit (1995) of the KLSE Composite Index for the period 1984-1993.

4.3 Cross Country Comparison

Table 4.3 shows that the mean daily returns of the KLSE Composite Index for the period from 2nd January 1992 to 31st December 1995. The results exhibit the general pattern that is consistent with the findings of studies by Gibbons and Hess (1981), Keim and Stambaugh (1984), Wong and Ho (1986) and others; that is, a low and negative Monday returns and high and positive returns on weekend.

Table 4.2 Summary Statistics of Mean Returns of KLSE Composite Index by *Day-of-the-Week*.

Stock	Description	Monday	Tuesday	Wednesday	Thursday	Friday	F Statistic ¹
Period : 2nd January 1992 - 31st December 1995							
Composite Index	Mean	-0.0021	0.0001	0.0027	0.0002	0.0024	4.9720 ^a
	Std. Dev.	0.0120	0.0110	0.0130	0.0130	0.0130	(4:982)
	t Statistic	-3.4700 ^b	-0.8400	2.6100 ^b	-0.6600	2.1600 ^b	
Period : 2nd January 1992 - 31st December 1993							
Composite Index	Mean	-0.0003	0.0003	0.0034	0.0022	0.0030	3.1270 ^a
	Std. Dev.	0.0090	0.0080	0.0090	0.0100	0.0110	(4:491)
	t Statistic	-2.3500 ^b	-2.0800 ^b	2.0100 ^b	0.5800	1.3500	
Period : 2nd January 1994 - 31st December 1995							
Composite Index	Mean	-0.0040	-0.0001	0.0021	-0.0019	0.0018	2.8510 ^a
	Std. Dev.	0.0140	0.0140	0.0160	0.0150	0.0160	(4:486)
	t Statistic	-2.6300 ^b	0.1900	1.8000	-1.1200	1.6400	

¹ denotes the F Statistic tests the equality of mean returns across the *day-of-the-week*. The degrees of freedom are in parentheses.

The t Statistic tests the mean return of the day of the week against the average mean returns of the other days.

^a denotes statistically significant at 5 percent level for F Statistic.

^b denotes statistically significant at 5 percent level for t-test.

4.4 Result of Oneway Analysis of Variance (ANOVA)

Table 4.1 also displays the statistical results of Oneway ANOVA test for the *day-of-the-week* anomalies. The F Statistic associated with the test revealed that of the 30 stocks tested, only one stock, Guinness, rejects the null hypothesis of equal means across the trading days of the week. A rejection of the null hypothesis indicates that at least two of the five means are not equal.

On the other hand, from the same test carried out, the KLSE Composite Index F Statistic exhibits the rejection of the null hypothesis of equal means across the trading days of the week for both the whole period and the two sub-periods of the study. The results are definitely contrary to that of the 30 selected large capital stocks. Therefore,

the selected large capital stocks do not exhibit *day-of-the-week* effect although the overall market exhibits such effect.

Table 4.3 Average Mean Returns on Some Countries' Common Stock Indices by *Day-of-the-Week*.

Country	Period	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	F Statistic ¹
Malaysia								
Composite Index	1985-1993	-0.0973	0.0129	0.1443	0.1563	0.1622	-	4.7400*
	1992-1995	-0.0021	0.0001	0.0027	0.0002	0.0024	-	4.9720*
Singapore	1985-1993	-0.0600	0.0600	0.0400	0.0700	0.1100	-	1.2000
Japan	1985-1993	-0.1800	-0.0100	0.0800	0.1500	0.0300	0.2500	3.9400*
Australia	1985-1993	0.0300	0.0500	0.0800	0.0800	0.0800	-	0.2280
U.S.	1985-1993	-0.0500	0.0200	0.0500	0.0700	0.0900	-	1.0410
U.K.	1985-1993	-0.1100	0.0900	0.1200	0.2100	0.1200	-	2.5870*
Hong Kong	1985-1993	0.0600	0.1500	0.2700	0.1800	0.1000	-	1.5780

* denotes statistically significant at 0.5 percent level for F test.

* denotes statistically significant at 5 percent level for F test.

Note : The daily mean returns for the countries except for KLSE Composite Index for the period 1992-1995 are obtained from results presented in Yit (1995)

4.5 Results of Tukey Test

Table 4.4 shows the result of Guinness when it is subjected to the Tukey test. The Tukey test is used to determine the pairs of days which are different in the daily mean. Guinness has a Monday-Friday pair which are significantly different in the daily mean. When the KLSE Composite Index is similarly tested for the *day-of-the-week* anomaly, it shows that it has two pairs of days which are significantly different in the daily mean returns. The two pairs are Monday-Wednesday and Monday-Friday.

In general the results indicate the existence of *day-of-the-week* effect for Guinness and the Composite Index.

Table 4.4 Results of Oneway ANOVA and Tukey Test for *Day-of-the-Week* Effect of the 30 large Capital Stocks and Composite Index.

Stock / Index	F Statistic	P_Value	Pairs of Groups*
Guinness	2.7371	0.0278	1-5
Composite Index	4.9722	0.0006	1-5 & 1-3

* denotes Pairs of Groups which are significantly different at 5 percent level using Tukey HSD procedure.

1 = Monday, 2 = Tuesday, 3 = Wednesday, 4 = Thursday, 5 = Friday.

4.6 Result of t-Test

The results of difference in mean returns of each day of the week compared to the average returns of the rest of the days of the week using t Statistic test are shown in Table 4.1. Out of these 24 lowest Monday returns stocks, only 2 stocks, that is, Kian Joo and NSTP, are significantly negative at 5% significance level. MOX is the only other lowest and negative returns stock (which falls on Wednesday) that is significantly negative at 5% significance level.

On the other hand, only one stock, Guinness, has Friday returns significantly higher than the average returns of the other days. In addition, 11 out of the 19 stocks that exhibit highest (negative) returns on Tuesday have Tuesday returns significantly higher than the average returns for the other days of the week at 5% significance level.

The 30 large capital stocks selected for this study do not exhibit a pattern of low and negative mean returns at the start of the week and a high and positive returns at the end of the week, or on Friday. The results are contrary to other studies on the Malaysia market and other overseas markets.

As for the Composite Index under the similar test, it has significant low and negative Monday returns for all the three periods as shown in Table 4.2. As for the high and positive Friday returns, only one period, from 2nd January 1992 to 31st December 1995, shows significant high and positive returns. The results clearly indicate low and negative beginning of the week returns and consistently high and positive end of the week returns for the Index.

The results of t-test show that the 30 selected large capital stocks do not exhibit the *day-of-the-week* effect but the overall market exhibits such effect which is consistent with the result from the ANOVA test.

4.7 Results of Kruskal-Wallis Test

The results of the Bartlett test are shown in Table 4.5. The results show that out of the 30 selected large capital stocks, 28 stocks are found to be significantly not homogeneous in variance. Only 2 stocks and the KLCI show homogeneity of variance. Even the only stock (i.e., Guinness) that is tested statistically significant in the *day-of-the-week* effect, does not have homogeneity of variance under Bartlett test.

Table 4.5 also shows the results of Kruskal-Wallis test. Kruskal-Wallis test is a non-parametric test that is equivalent to the parametric Oneway ANOVA test. The

objective of this test is to check the equality of the daily mean returns. The results show that 10 stocks and the KLCI exhibit the *day-of-the-week* effect.

Table 4.5 Results of Kruskal-Wallis and Bartlett's tests for *Day-of-the-Week* Effect of the 30 large Capital Stocks and the Composite Index.

Stock / Index	Kruskal-Wallis		Bartlett
	χ^2 test Statistic	P_Value	χ^2 test Statistic
Boustead	16.0848	0.0029	36.0470*
Faber Group	7.5723	0.1217	37.3830*
Genting	8.2286	0.0836	118.9730*
Golden Hope	9.3082	0.0538	38.9680*
Guinness	12.7236	0.0127	193.7080*
Hi & Lo	6.5746	0.1601	37.3260*
Hong Leong Industries	5.1197	0.2752	101.2810*
Kian Joo	7.4760	0.1128	54.2980*
KL Kepong	7.1112	0.1301	40.0280*
Magnum	13.8616	0.0078	42.0750*
MayBank	4.6966	0.3199	42.2290*
Malayan Cement	7.4981	0.1118	40.2550*
MMC	13.1630	0.0105	32.6340*
MOX	12.3358	0.0150	3.7290*
MPHB	8.5501	0.0731	37.8850*
MUIB	9.6209	0.0517	36.4260*
Nestle	0.4948	0.9740	2.3480
NSTP	8.1791	0.0852	79.3880*
Oriental	6.9162	0.1404	21.6980*
Perlis Plantation	10.3547	0.0349	22.5960*
Renong	12.2543	0.0156	32.7470*
Rothman	4.0828	0.3949	0.4910
Sime Darby	1.9478	0.7454	47.4810*
Sungei Way	11.9605	0.0176	58.3280*
Shell	6.7652	0.1488	30.9250*
Tan Chong	14.3440	0.0063	10.7970*
Telekom	6.7721	0.1484	166.1870*
Tenaga	9.7168	0.0599	29.4340*
Time	21.4790	0.0003	36.0900*
UMW	5.7411	0.2193	21.4780*
Composite Index	24.3227	0.0001	1.9750

* denotes statistically significant at 1 percent level.