

# **CHAPTER 4 EMPIRICAL RESULTS FOR CALENDAR ANOMALIES**

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## EMPIRICAL RESULTS FOR CALENDAR ANOMALIES

This chapter elaborates the findings of the analysis and results of the calendar anomalies for the forty stocks of the trading/services sector in the Kuala Lumpur Stock Exchange (KLSE). The plots of the closing prices of all these stocks are included in Appendix B. Three calendar anomalies are examined in this chapter, namely the pre-holiday effect, half-monthly effect, and time-of-the-month effect. The empirical results of these calendar anomalies are discussed below.

### 4.1 The Pre-Holiday Effect for Whole Period: 3 January 1995 to 2 November 2000

The results of the Kolmogorov-Smirnov test and Levene test are shown in Table 1. The Kolmogorov-Smirnov test is used for testing normality in the

stock returns and Levene test is used for testing the homogeneity of variances. In general, the result shows that the null hypothesis of normality is rejected at five per cent level of significance. Therefore, it shows that most of the trading/services stock returns are not normally distributed. When the assumptions of normality cannot be justified, nonparametric test is more appropriate for testing the hypothesis in this study. However, the results of parametric test will also be reported for comparison.

The Levene statistic indicates that only three stocks (7.5%), namely one stock from the small companies and another 2 stocks from the large companies, have the significant results, i.e., the variance of pre-holiday returns is not equal to the variance of the other trading days' returns. Thus, majority of the stock returns have equal population variances in this period.

Table 2 presents the descriptive statistics of returns for the whole period in this study. It lists the mean, standard deviation, and size of the sample for forty stocks. In general, the pre-holiday mean returns are much higher than the other trading days. The results indicate that about 95% (19 stocks) of the small companies and 90% (18 stocks) of the large companies have higher mean returns on the trading day before holiday. In addition, the pre-holiday returns for majority of the stocks have a lower standard deviation compared to the other trading days' returns, i.e., 90% (18 stocks) of the small companies and 95% (19 stocks) of the large companies fall in this category.

The statistical tests of equality of mean returns between pre-holiday and the other trading days are summarized in Table 3. This table shows the results of a parametric test and nonparametric test, i.e., the two independent sample t-test and Mann-Whitney test. The results that are statistically significant indicate that the mean returns are different between pre-holiday and the other trading days. This is only true for one stock based on the t-test. However, if the Mann-Whitney test is employed, we notice that only 6 stocks (30%) of the small companies and 1 stock (5%) of the large companies have shown significant difference in mean returns between pre-holiday and the other trading days. Only one stock exhibits significant result in both statistical tests. The result suggests that the pre-holiday effect is more pronounced for small companies than for large companies. Generally, we can conclude that there appears to be no persistent pre-holiday effect for the entire period.

Table 4 presents the statistical tests of equality of mean returns after controlling for the month-of-the-year effect, i.e., two-way ANOVA. All the F-statistics for two-way ANOVA are reported in Table 4. The results show that only 10% (2 stocks) of the small companies have significant difference in the mean returns between pre-holiday and the other trading days, after controlling for the month-of-the-year effect. Thus, there is no persistent pre-holiday effect in this period. The results also show that there is no significant result in the month-of-the-year effect and interaction between the pre-holiday and month-of-the-year effects in this period.

**Table 1: Results of Kolmogorov-Smirnov Test for Normality and Levene Test for Equality of Variances for Returns of Pre-Holiday and the Other Trading Days of Whole Period: Jan. 1995 to Nov. 2000**

	Kolmogorov-Smirnov Statistic		Levene Statistic
	Pre-Holiday	Other Days	
<b>SMALL COMPANIES</b>			
1 PERNAS	0.976	4.434**	0.364
2 MULPHA	1.248	5.188**	0.719
3 MMOSAICS	1.126	4.222**	0.554
4 KAMUNTG	1.407*	4.507**	3.921*
5 METPLEX	1.291	3.349**	0.150
6 PMIND	1.464*	4.800**	1.003
7 TV3	1.499*	4.769**	1.504
8 KEMAS	1.343	4.452**	2.464
9 ANTAH	1.227	4.133**	1.634
10 DKKMAT	1.406*	4.809**	3.099
11 JOHAN	1.220	5.238**	2.814
12 TSTORE	1.245	4.720**	1.359
13 TNTT	0.882	4.127**	1.035
14 KKELLAS	1.636**	5.101**	2.335
15 MECHMAR	1.099	4.394**	2.301
16 ILB	1.515*	4.810**	0.050
17 MFCB	0.833	4.828**	0.410
18 SJA	1.082	4.185**	0.490
19 SRIWANI	1.500*	3.845**	0.826
20 NCK	0.989	4.718**	2.256
<b>LARGE COMPANIES</b>			
1 TENAGA	0.772	4.108**	0.073
2 TELEKOM	1.028	3.680**	0.976
3 SIME	0.723	3.912**	0.117
4 RESORTS	0.585	3.456**	0.165
5 GENTING	1.237	3.413**	2.515
6 BJTOTO	1.051	3.743**	3.553
7 TANJONG	1.184	3.250**	1.881
8 MAGNUM	1.128	2.712**	2.208
9 MAS	1.569*	4.413**	0.536
10 MALAKOFF	1.428*	5.324**	0.043
11 TRI	0.849	4.102**	3.294
12 TIME	1.671**	4.752**	0.603
13 SARAWAK	0.580	4.010**	1.602
14 PETDAG	1.204	5.415**	0.196
15 EON	1.230	4.678**	0.161
16 NSTP	0.832	4.712**	0.003
17 HAPSENG	1.639**	6.210**	0.149
18 MUIIIND	1.112	4.550**	0.772
19 NALURI	1.518*	4.430**	5.346*
20 MPHB	0.691	3.791**	4.949*

Note: \* statistically significant at 5% level of significance

\*\* statistically significant at 1% level of significance

**Table 2: Descriptive Statistics of Returns of Pre-Holiday and the Other Trading Days  
for Whole Period: Jan. 1995 to Nov. 2000**

		Pre-Holiday			Other Days			Total Obs.
		Mean	Std. Dev.	n	Mean	Std. Dev.	n	
<b>SMALL COMPANIES</b>								
1	PERNAS	0.0054	0.0254	69	-0.0011	0.0312	1306	1375
2	MULPHA	0.0025	0.0374	69	-0.0020	0.0490	1309	1378
3	MMOSAICS	0.0022	0.0295	69	-0.0006	0.0382	1303	1372
4	KAMUNTG	0.0042	0.0313	68	-0.0014	0.0481	1297	1365
5	METPLEX	0.0138	0.0355	69	-0.0019	0.0412	1309	1378
6	PMIND	-0.0002	0.0561	68	-0.0017	0.0445	1284	1352
7	TV3	0.0018	0.0361	69	-0.0008	0.0449	1307	1376
8	KEMAS	0.0089	0.0359	69	-0.0014	0.0476	1292	1361
9	ANTAH	0.0053	0.0350	69	-0.0012	0.0441	1309	1378
10	DKMAT	0.0029	0.0320	69	-0.0017	0.0401	1309	1378
11	JOHAN	-0.0013	0.0264	69	-0.0015	0.0402	1309	1378
12	TSTORE	0.0005	0.0287	68	-0.0006	0.0375	1279	1347
13	TNTT	0.0011	0.0348	69	0.0003	0.0417	1273	1342
14	KKELLAS	0.0056	0.0354	69	-0.0015	0.0484	1284	1353
15	MECHMAR	0.0038	0.0321	69	-0.0018	0.0451	1292	1361
16	ILB	0.0032	0.0449	68	-0.0010	0.0436	1266	1334
17	MFCB	0.0010	0.0369	69	-0.0014	0.0454	1309	1378
18	SJA	0.0005	0.0401	69	-0.0011	0.0462	1290	1359
19	SRIWANI	0.0088	0.0449	69	-0.0022	0.0494	1305	1374
20	NCK	-0.0040	0.0338	68	-0.0015	0.0483	1269	1337
<b>LARGE COMPANIES</b>								
1	TENAGA	0.0045	0.0291	69	-0.0004	0.0314	1307	1376
2	TELEKOM	0.0012	0.0242	69	0.0001	0.0281	1305	1374
3	SIME	0.0021	0.0232	69	-0.0005	0.0288	1284	1353
4	RESORTS	0.0022	0.0261	69	-0.0013	0.0324	1307	1376
5	GENTING	0.0016	0.0193	69	-0.0008	0.0254	1307	1376
6	BJTOTD	0.0022	0.0226	69	0.0001	0.0337	1307	1376
7	TANJONG	0.0011	0.0227	69	-0.0003	0.0315	1306	1375
8	MAGNUM	-0.0001	0.0239	69	-0.0009	0.0317	1305	1374
9	MAS	0.0015	0.0309	69	-0.0006	0.0368	1309	1378
10	MALAKOFF	0.0024	0.0274	69	0.0002	0.0324	1280	1349
11	TRI	-0.0022	0.0325	69	-0.0010	0.0523	1309	1378
12	TIME	0.0056	0.0567	69	-0.0005	0.0609	1293	1362
13	SARAWAK	0.0055	0.0262	69	-0.0013	0.0371	1305	1374
14	PETDAG	-0.0024	0.0221	68	-0.0003	0.0249	1277	1345
15	EON	0.0018	0.0261	69	-0.0011	0.0309	1283	1352
16	NSTP	0.0072	0.0294	69	-0.0010	0.0356	1307	1376
17	HAPSENG	0.0033	0.0329	69	-0.0001	0.0299	1287	1356
18	MUIIND	0.0050	0.0371	69	-0.0016	0.0448	1305	1374
19	NALURI	0.0021	0.0327	69	-0.0015	0.0493	1309	1378
20	MPHB	0.0013	0.0264	68	-0.0014	0.0444	1293	1361

Note: Std. Dev. refers to standard deviation,  
Total Obs. refers to the number of observations, and  
n is the sample size.

**Table 3: Tests of Equality of Mean Returns of Pre-Holiday and the Other Trading Days  
for Whole Period: Jan. 1995 to Nov. 2000**

		Two Independent Samples Test		Mann-Whitney Test	
		t-statistic	P-value	Z-statistic	P-value
<b>SMALL COMPANIES</b>					
1	PERNAS	1.691	0.091	-1.816	0.069
2	MULPHA	0.753	0.452	-1.179	0.240
3	MMOSAICS	0.610	0.542	-1.345	0.179
4	KAMUNTG	1.395	0.167	-2.703	0.007**
5	METPLEX	3.109	0.002**	-3.557	0.000**
6	PMIND	0.261	0.794	-1.296	0.195
7	TV3	0.471	0.638	-0.781	0.435
8	KEMAS	1.759	0.079	-3.150	0.002**
9	ANTAH	1.199	0.231	-2.022	0.043*
10	DKMAT	0.929	0.353	-1.881	0.060
11	JOHAN	0.046	0.963	-0.385	0.700
12	TSTORE	0.232	0.816	-0.341	0.733
13	TNTT	0.170	0.865	-1.026	0.305
14	KKELLAS	1.202	0.230	-1.306	0.192
15	MECHMAR	1.023	0.306	-2.424	0.015*
16	ILB	0.767	0.443	-1.036	0.300
17	MFCB	0.429	0.668	-1.154	0.248
18	SJA	0.283	0.777	-0.507	0.612
19	SRIWANI	1.823	0.069	-2.079	0.038*
20	NCK	-0.431	0.666	-0.161	0.872
<b>LARGE COMPANIES</b>					
1	TENAGA	1.247	0.213	-1.527	0.127
2	TELEKOM	0.332	0.740	-0.553	0.580
3	SIME	0.753	0.452	-1.332	0.183
4	RESORTS	0.903	0.367	-0.937	0.349
5	GENTING	0.755	0.450	-1.312	0.190
6	BJTOTD	0.507	0.612	-0.642	0.521
7	TANJONG	0.363	0.717	-0.196	0.845
8	MAGNUM	0.200	0.842	-0.107	0.914
9	MAS	0.462	0.644	-0.014	0.989
10	MALAKOFF	0.550	0.582	-0.442	0.659
11	TRI	-0.181	0.856	-0.085	0.932
12	TIME	0.811	0.418	-0.939	0.348
13	SARAWAK	1.500	0.134	-2.247	0.025
14	PETDAG	-0.676	0.499	-0.865	0.387
15	EON	0.723	0.470	-0.394	0.694
16	NSTP	1.868	0.062	-2.218	0.027*
17	HAPSENG	0.903	0.367	-0.694	0.488
18	MUIIND	1.205	0.229	-1.735	0.083
19	NALURI	0.866	0.389	-0.985	0.325
20	MPHB	0.769	0.444	-1.330	0.184

Note: \* statistically significant at 5% level of significance

\*\* statistically significant at 1% level of significance

**Table 4: Tests of Equality of Mean Returns of Pre-Holiday and the Other Trading Days for Whole Period: Jan. 1995 to Nov. 2000 Controlling for the Month-of-the-Year Effect**

		Two-way ANOVA				
		F <sub>HOLIDAY</sub> statistic	P-value	F <sub>MONTH</sub> statistic	P-value	F <sub>INTERACTION</sub> statistic
<b>SMALL COMPANIES</b>						
1	PERNAS	6.846	0.009**	1.405	0.164	1.789
2	MULPHA	0.458	0.499	0.767	0.674	0.708
3	MMOSAICS	0.061	0.805	0.591	0.837	0.488
4	KAMUNTG	0.705	0.401	0.379	0.964	0.261
5	METPLEX	5.594	0.018*	0.609	0.822	0.774
6	PMIND	0.087	0.769	1.354	0.189	1.350
7	TV3	1.461	0.227	0.603	0.827	0.534
8	KEMAS	2.240	0.135	0.361	0.970	0.386
9	ANTAH	0.497	0.481	0.428	0.944	0.507
10	DKMAT	0.807	0.369	0.479	0.917	0.504
11	JOHAN	0.201	0.654	0.593	0.836	0.437
12	TSTORE	0.015	0.903	0.693	0.747	0.524
13	TNTT	0.163	0.687	0.847	0.592	0.844
14	KKELLAS	0.706	0.401	0.570	0.854	0.530
15	MECHMAR	1.251	0.264	0.775	0.666	0.747
16	ILB	0.056	0.814	1.454	0.143	1.802
17	MFCB	0.091	0.763	0.869	0.571	1.023
18	SJA	0.011	0.916	0.432	0.942	0.514
19	SRIWANI	1.436	0.231	0.673	0.765	0.368
20	NCK	0.007	0.935	0.678	0.761	0.420
<b>LARGE COMPANIES</b>						
1	TENAGA	1.015	0.314	1.709	0.066	0.726
2	TELEKOM	0.080	0.777	1.340	0.196	0.547
3	SIME	0.031	0.860	0.863	0.577	0.714
4	RESORTS	0.452	0.501	0.748	0.692	1.174
5	GENTING	0.309	0.578	0.373	0.967	0.501
6	BJTOTO	0.572	0.450	0.448	0.934	0.337
7	TANJONG	0.236	0.627	1.054	0.396	1.452
8	MAGNUM	0.210	0.647	0.697	0.742	0.812
9	MAS	0.033	0.855	0.969	0.473	0.858
10	MALAKOFF	0.403	0.526	1.089	0.366	0.652
11	TRI	0.107	0.744	0.732	0.708	0.375
12	TIME	0.001	0.979	1.011	0.434	1.308
13	SARAWAK	2.029	0.155	0.716	0.724	0.522
14	PETDAG	0.384	0.536	0.832	0.607	0.498
15	EON	0.016	0.899	0.543	0.875	0.283
16	NSTP	2.383	0.123	0.493	0.909	0.440
17	HAPSENG	0.104	0.747	1.305	0.216	1.145
18	MUJIND	0.865	0.352	0.155	0.999	0.122
19	NALURI	0.331	0.566	0.983	0.460	0.731
20	MPHB	0.091	0.763	0.400	0.957	0.207
						0.996

Note: \* statistically significant at 5% level of significance,

\*\* statistically significant at 1% level of significance,

F<sub>HOLIDAY</sub> refers to the F-statistic for testing the pre-holiday effect,

F<sub>MONTH</sub> refers to the F-statistic for testing the month-of-the-year effect, and

F<sub>INTERACTION</sub> refers to the F-statistic for testing the interaction between these two effects.

#### **4.2 The Pre-Holiday Effect for Subperiod 1: 3 January 1995 to 30 June 1997**

Table 5 summarizes the results of the Kolmogorov-Smirnov test and Levene test for the first subperiod. As reported in the Table 5, the Kolmogorov-Smirnov statistic indicates that the null hypothesis of normality is rejected at five per cent level of significance. Thus, we can conclude that most of the trading/services stock returns are not normally distributed, especially for the returns of the other trading days. Therefore, nonparametric test is also carried out to test the hypothesis in this study.

From the Levene statistic, we find that only one stock from the small companies and 5 stocks from the large companies show that the null hypothesis of equal population variances is rejected at five per cent level of significance. Therefore, most of the stocks still have equal population variances in the first period.

The descriptive statistics of returns for the first subperiod in this study are reported in Table 6. It shows the mean, standard deviation, and size of the sample for forty stocks. For majority of the stocks, the pre-holiday generates mean returns that are higher than the other trading days. From the results, all small companies and 95% (19 stocks) of the large companies have higher pre-holiday mean returns. In addition, 85% (17 stocks) of the small companies and 55% (11 stocks) of the large companies show smaller standard deviation in pre-holiday returns compared to the other trading days' returns.

Table 7 reports the results of both parametric and nonparametric tests, i.e., the two independent sample t-test and Mann-Whitney test, used to test for the equality of mean returns between pre-holiday and the other trading days in the first subperiod. However, the nonparametric test is more appropriate as the assumption of normality is not satisfied. From the parametric test statistic results, 55% of the small companies and 30% of the large companies show significant results which indicate that the mean returns are statistically significant different between pre-holiday and the other trading days. However, the nonparametric test indicates that 65% of the small companies and 30% of the large companies have significantly different mean returns between pre-holiday and the other trading days. There are 16 stocks that exhibit significant results in both statistical tests. In general, we can deduce that the presence of the pre-holiday effect is clearer in this period compared to the whole period. We also observe that the pre-holiday effect is more evident among the small companies compared to the large companies. Hence, the firm size effect with respect to pre-holiday returns also exists in this period.

The F-statistics for the two-way ANOVA, i.e., for testing equality of mean returns after controlling for the month-of-the-year effect are summarized in Table 8. The results show that after controlling for the month-of-the-year effect, 3 small companies and 2 large companies report significant difference in the mean returns between pre-holiday and the other trading days. Thus, the pre-holiday effect and firm size effect are less obvious compared to the case when the month-of-the-year effect is not controlled. The result also

shows that only 1 stock from the small companies and 2 stocks from the large companies have significant month-of-the-year effect. It also shows that there is a significant interaction between pre-holiday and month-of-the-year effects for 2 stocks from the small companies and 4 stocks from the large companies.

**Table 5: Results of Kolmogorov-Smirnov Test for Normality and Levene Test for Equality of Variances for Returns of Pre-Holiday and the Other Trading Days of Subperiod 1: Jan. 1995 to Jun. 1997**

	Kolmogorov-Smirnov Statistic		Levene Statistic
	Pre-Holiday	Other Days	
<b>SMALL COMPANIES</b>			
1 PERNAS	0.863	3.131**	0.326
2 MULPHA	0.866	2.837**	0.008
3 MMOSAICS	0.723	3.079**	0.956
4 KAMUNTG	0.779	2.539**	2.147
5 METPLEX	0.978	2.323**	0.315
6 PMIND	0.565	2.413**	0.000
7 TV3	1.440*	3.911**	1.337
8 KEMAS	1.297	2.313**	0.415
9 ANTAH	1.072	2.600**	0.668
10 DKMAT	1.153	3.239**	1.599
11 JOHAN	0.932	3.676**	1.106
12 TSTORE	1.245	3.041**	0.162
13 TNTT	0.866	3.434**	1.090
14 KKELLAS	0.875	2.516**	5.365*
15 MECHMAR	1.094	2.637**	0.107
16 ILB	1.635**	3.025**	3.211
17 MFBC	0.746	2.561**	0.126
18 SJA	0.923	2.665**	0.007
19 SRIWANI	1.239	2.468**	3.067
20 NCK	0.673	3.602**	0.529
<b>LARGE COMPANIES</b>			
1 TENAGA	0.793	3.118**	8.681**
2 TELEKOM	0.785	2.508**	0.163
3 SIME	0.744	2.809**	1.429
4 RESORTS	0.526	2.765**	5.790*
5 GENTING	0.962	2.407**	1.334
6 BJTOTO	1.089	3.373**	0.464
7 TANJONG	1.145	2.261**	0.143
8 MAGNUM	0.798	2.204**	3.072
9 MAS	1.020	2.986**	1.039
10 MALAKOFF	1.275	3.775**	7.600**
11 TRI	0.382	2.181**	1.932
12 TIME	0.768	2.611**	0.656
13 SARAWAK	0.564	2.967**	0.403
14 PETDAG	0.862	3.930**	4.928*
15 EON	0.782	3.126**	4.901*
16 NSTP	0.624	3.077**	0.317
17 HAPSENG	1.193	4.073**	0.022
18 MUIIND	0.719	2.951**	0.275
19 NALURI	0.891	2.862**	0.278
20 MPHB	0.684	1.988**	0.124

Note: \* statistically significant at 5% level of significance

\*\* statistically significant at 1% level of significance

**Table 6: Descriptive Statistics of Returns of Pre-Holiday and the Other Trading Days  
for Subperiod 1: Jan. 1995 to Jun. 1997**

		Pre-Holiday			Other Days			Total Obs.
		Mean	Std. Dev.	n	Mean	Std. Dev.	n	
<b>SMALL COMPANIES</b>								
1	PERNAS	0.0095	0.0244	29	-0.0010	0.0256	554	583
2	MULPHA	0.0083	0.0225	29	-0.0016	0.0260	554	583
3	MMOSAICS	0.0085	0.0181	29	-0.0009	0.0248	554	583
4	KAMUNTG	0.0093	0.0160	29	-0.0011	0.0232	554	583
5	METPLEX	0.0204	0.0253	29	-0.0005	0.0254	554	583
6	PMIND	0.0079	0.0201	29	-0.0013	0.0230	554	583
7	TV3	0.0079	0.0292	29	0.0008	0.0210	554	583
8	KEMAS	0.0132	0.0300	29	-0.0018	0.0266	554	583
9	ANTAH	0.0148	0.0256	29	-0.0003	0.0261	554	583
10	DKMAT	0.0064	0.0179	29	-0.0013	0.0222	554	583
11	JOHAN	0.0034	0.0153	29	-0.0010	0.0214	554	583
12	TSTORE	0.0045	0.0229	29	-0.0004	0.0235	554	583
13	TNTT	0.0060	0.0242	29	0.0015	0.0337	554	583
14	KKELLAS	0.0008	0.0120	29	-0.0010	0.0216	554	583
15	MECHMAR	0.0096	0.0250	29	-0.0014	0.0267	554	583
16	ILB	0.0164	0.0472	29	-0.0005	0.0269	554	583
17	MFCB	0.0071	0.0212	29	-0.0018	0.0244	554	583
18	SJA	0.0165	0.0326	29	-0.0004	0.0362	554	583
19	SRIWANI	0.0045	0.0182	29	-0.0004	0.0325	554	583
20	NCK	0.0057	0.0227	29	-0.0003	0.0291	554	583
<b>LARGE COMPANIES</b>								
1	TENAGA	0.0037	0.0299	29	-0.0002	0.0174	554	583
2	TELEKOM	0.0059	0.0125	29	-0.0004	0.0149	554	583
3	SIME	0.0088	0.0220	29	-0.0002	0.0177	554	583
4	RESORTS	0.0032	0.0272	29	-0.0020	0.0195	554	583
5	GENTING	0.0034	0.0146	29	-0.0013	0.0187	554	583
6	BJTOTO	0.0058	0.0159	29	0.0018	0.0205	554	583
7	TANJONG	0.0027	0.0186	29	-0.0002	0.0224	554	583
8	MAGNUM	0.0098	0.0232	29	-0.0005	0.0203	554	583
9	MAS	0.0040	0.0151	29	-0.0005	0.0179	554	583
10	MALAKOFF	0.0073	0.0261	29	0.0007	0.0183	554	583
11	TRI	0.0056	0.0183	29	-0.0017	0.0254	554	583
12	TIME	0.0045	0.0318	29	-0.0013	0.0268	554	583
13	SARAWAK	0.0122	0.0259	29	-0.0019	0.0290	554	583
14	PETDAG	0.0009	0.0229	29	0.0001	0.0166	554	583
15	EON	0.0031	0.0210	29	-0.0003	0.0160	554	583
16	NSTP	0.0118	0.0166	29	0.00003	0.0181	554	583
17	HAPSENG	0.0001	0.0151	29	0.0005	0.0205	554	583
18	MUIIND	0.0065	0.0219	29	-0.0012	0.0221	554	583
19	NALURI	0.0091	0.0235	29	-0.0019	0.0222	554	583
20	MPHB	0.0064	0.0230	29	-0.0005	0.0245	554	583

Note: Std. Dev. refers to standard deviation,  
Total Obs. refers to the number of observations, and  
n is the sample size.

**Table 7: Tests of Equality of Mean Returns of Pre-Holiday and the Other Trading Days  
for Subperiod 1: Jan. 1995 to Jun. 1997**

	Two Independent Samples Test		Mann-Whitney Test	
	t-statistic	P-value	Z-statistic	P-value
<b>SMALL COMPANIES</b>				
1 PERNAS	2.153	0.032*	-2.308	0.021*
2 MULPHA	1.998	0.046*	-2.224	0.026*
3 MMOSAICS	1.998	0.046*	-2.528	0.011*
4 KAMUNTG	2.380	0.018*	-3.000	0.003**
5 METPLEX	4.314	0.000**	-4.482	0.000**
6 PMIND	2.116	0.035*	-2.248	0.025*
7 TV3	1.739	0.083	-1.036	0.300
8 KEMAS	2.932	0.003**	-3.371	0.001**
9 ANTAH	3.026	0.003**	-3.749	0.000**
10 DKMAT	1.819	0.069	-2.177	0.029*
11 JOHAN	1.086	0.278	-1.563	0.118
12 TSTORE	1.088	0.277	-1.357	0.175
13 TNTT	0.708	0.479	-1.907	0.057
14 KKELLAS	0.735	0.467	-0.867	0.386
15 MECHMAR	2.176	0.030*	-2.550	0.011*
16 ILB	3.137	0.002**	-2.529	0.011*
17 MFCB	1.866	0.063	-2.102	0.036*
18 SJA	2.456	0.014*	-2.693	0.007**
19 SRIWANI	0.814	0.416	-1.154	0.130
20 NCK	1.092	0.275	-1.840	0.066
<b>LARGE COMPANIES</b>				
1 TENAGA	0.693	0.494	-1.526	0.127
2 TELEKOM	2.244	0.026*	-2.547	0.011*
3 SIME	2.602	0.010**	-3.284	0.001**
4 RESORTS	1.010	0.321	-1.050	0.294
5 GENTING	1.336	0.182	-1.615	0.106
6 BJTOTO	1.032	0.303	-1.160	0.246
7 TANJONG	0.678	0.498	-0.470	0.638
8 MAGNUM	2.632	0.009**	-1.839	0.066
9 MAS	1.331	0.184	-1.900	0.057
10 MALAKOFF	1.353	0.186	-0.258	0.796
11 TRI	1.518	0.130	-1.986	0.047*
12 TIME	1.124	0.262	-1.028	0.304
13 SARAWAK	2.580	0.010**	-2.631	0.009**
14 PETDAG	0.192	0.849	-0.432	0.666
15 EON	0.868	0.392	-0.561	0.575
16 NSTP	3.433	0.001**	-3.640	0.000**
17 HAPSENG	-0.115	0.909	-0.630	0.529
18 MUIIND	1.811	0.071	-1.862	0.063
19 NALURI	2.589	0.010**	-2.383	0.017*
20 MPHB	1.476	0.141	-1.358	0.175

Note: \* statistically significant at 5% level of significance

\*\* statistically significant at 1% level of significance

**Table 8: Tests of Equality of Mean Returns of Pre-Holiday and the Other Trading Days for Subperiod 1: Jan. 1995 to Jun. 1997 Controlling for the Month-of-the-Year Effect**

	Two-way ANOVA					
	F <sub>HOLIDAY</sub> statistic	P-value	F <sub>MONTH</sub> statistic	P-value	F <sub>INTERACTION</sub> statistic	P-value
<b>SMALL COMPANIES</b>						
1 PERNAS	4.598	0.032*	1.095	0.363	2.108	0.027*
2 MULPHA	2.360	0.125	0.930	0.511	0.706	0.704
3 MMOSAICS	2.619	0.106	0.782	0.658	0.722	0.689
4 KAMUNTG	4.951	0.026*	0.738	0.703	0.422	0.924
5 METPLEX	12.019	0.001**	1.079	0.375	1.333	0.216
6 PMIND	2.321	0.128	1.536	0.115	1.496	0.146
7 TV3	1.164	0.281	0.656	0.781	0.986	0.450
8 KEMAS	3.483	0.063	1.019	0.428	1.475	0.154
9 ANTAH	3.610	0.058	0.637	0.798	1.467	0.157
10 DKMAT	1.937	0.165	1.247	0.253	0.612	0.787
11 JOHAN	1.958	0.162	0.753	0.687	0.513	0.866
12 TSTORE	1.127	0.289	0.864	0.576	0.494	0.879
13 TNTT	0.029	0.864	0.629	0.804	1.062	0.389
14 KKELLAS	0.210	0.647	0.546	0.872	0.568	0.824
15 MECHMAR	2.964	0.086	0.985	0.459	1.287	0.241
16 ILB	2.849	0.092	3.039	0.001**	4.087	0.000**
17 MFCB	1.535	0.216	0.956	0.486	0.952	0.479
18 SJA	3.718	0.054	0.724	0.716	0.728	0.683
19 SRIWANI	0.315	0.575	0.422	0.946	0.451	0.907
20 NCK	1.010	0.315	0.742	0.698	0.687	0.721
<b>LARGE COMPANIES</b>						
1 TENAGA	2.484	0.116	1.392	0.172	1.261	0.255
2 TELEKOM	5.034	0.025*	0.637	0.798	0.836	0.583
3 SIME	2.025	0.155	0.596	0.833	1.273	0.248
4 RESORTS	0.763	0.383	2.231	0.012*	3.490	0.000**
5 GENTING	1.700	0.193	0.351	0.973	0.474	0.892
6 BJTOTO	0.225	0.635	0.283	0.989	0.257	0.985
7 TANJONG	0.358	0.550	0.670	0.768	0.738	0.674
8 MAGNUM	1.688	0.194	0.613	0.818	1.185	0.302
9 MAS	0.147	0.702	0.844	0.595	0.959	0.473
10 MALAKOFF	1.712	0.191	1.939	0.032*	2.875	0.003**
11 TRI	0.313	0.576	0.643	0.792	0.846	0.574
12 TIME	0.056	0.813	1.577	0.101	2.101	0.028*
13 SARAWAK	3.229	0.073	1.367	0.184	0.955	0.476
14 PETDAG	1.077	0.300	1.597	0.096	2.017	0.035*
15 EON	0.010	0.922	1.457	0.144	1.622	0.108
16 NSTP	7.266	0.007**	0.759	0.681	0.473	0.893
17 HAPSENG	0.000	0.997	0.702	0.737	0.564	0.827
18 MUIIND	1.800	0.180	0.580	0.846	0.606	0.792
19 NALURI	2.322	0.128	1.410	0.164	1.649	0.098
20 MPHOB	2.130	0.145	1.017	0.430	1.056	0.394

Note: \* statistically significant at 5% level of significance,

\*\* statistically significant at 1% level of significance,

F<sub>HOLIDAY</sub> refers to the F-statistic for testing the pre-holiday effect,

F<sub>MONTH</sub> refers to the F-statistic for testing the month-of-the-year effect, and

F<sub>INTERACTION</sub> refers to the F-statistic for testing the interaction between these two effects.

#### **4.3 The Pre-Holiday Effect for Subperiod 2: 1 July 1997 to 2 November 2000**

From the results of Kolmogorov-Smirnov test in Table 9, we notice that majority of the trading/services stock returns are not normally distributed in the second subperiod, particularly for returns of the other trading days. Thus, the nonparametric test will be useful for analysis for this period.

The results of the Levene test for the second subperiod are presented in the Table 9. The Levene statistic indicates that majority of the stocks (especially the large companies) in the second subperiod do not have equal population variances between the pre-holiday returns and the other trading days' returns. Only 5 stocks from the large companies have unequal population variances in this period.

Table 10 shows the descriptive statistics of returns for the second subperiod in this study. It reports the mean, standard deviation, and size of the sample for forty stocks. The mean returns on the pre-holiday are higher than the mean returns during the other trading days. This phenomenon is found in 10 stocks (50%) from the small companies and 12 stocks (60%) from the large companies. However, 95% of the stocks of small companies as well as large companies report that the standard deviation of the pre-holiday returns is smaller than that for the returns of the other trading days.

To test the equality of mean returns between pre-holiday and the other trading days in the second period, the results for both the parametric test and

nonparametric test are summarized in Table 11. However, the nonparametric test is more relevant in this period since the stock returns are not normally distributed. From the results, we cannot find any rejection of the null hypothesis from both statistical tests. Unlike the pre-holiday effect for the whole period and the first subperiod, we can conclude that there is no pre-holiday effect in second subperiod. It means that the results during the second period are not similar to those from the whole period and the first period.

The results from the two-way ANOVA of a pre-holiday effect during the second period are provided in Table 12. This table shows the results of the statistical tests of equality of mean returns after controlling for the month-of-the-year effect. We find that after controlling for the month-of-the-year effect, all the F-statistics for two-way ANOVA are not significant at five per cent level of significance. Thus, the pre-holiday effect, month-of-the-year effect, and interaction between pre-holiday and month effects are not found in this period.

The patterns of the pre-holiday effect differ according to the different periods of study. Accordingly, the pre-holiday effect is more apparent during the first period of the study.

**Table 9: Results of Kolmogorov-Smirnov Test for Normality and Levene Test for Equality of Variances for Returns of Pre-Holiday and the Other Trading Days of Subperiod 2: Jul. 1997 to Nov. 2000**

		Kolmogorov-Smirnov Statistic		Levene Statistic
		Pre-Holiday	Other Days	
<b>SMALL COMPANIES</b>				
1	PERNAS	0.823	3.147**	1.232
2	MULPHA	1.175	3.671**	1.121
3	MMOSAICS	0.808	3.338**	0.287
4	KAMUNTG	1.171	3.550**	3.134
5	METPLEX	1.195	2.382**	0.742
6	PMIND	1.081	3.763**	1.350
7	TV3	1.092	2.565**	3.114
8	KEMAS	0.838	3.485**	2.227
9	ANTAH	1.005	3.386**	1.909
10	DKMAT	1.104	3.023**	2.201
11	JOHAN	1.052	3.670**	2.551
12	TSTORE	0.856	3.352**	1.244
13	TNTT	0.968	2.988**	0.876
14	KKELLAS	1.134	3.572**	1.107
15	MECHMAR	0.839	3.390**	2.365
16	ILB	0.752	3.755**	1.176
17	MFCB	0.665	3.539**	0.356
18	SJA	0.909	3.259**	1.561
19	SRIWANI	0.959	2.602**	0.027
20	NCK	0.773	3.177**	2.485
<b>LARGE COMPANIES</b>				
1	TENAGA	0.755	3.279**	0.594
2	TELEKOM	1.060	2.489**	1.448
3	SIME	0.614	2.899**	1.863
4	RESORTS	0.572	2.196**	1.976
5	GENTING	0.923	2.308**	1.472
6	BJTOTO	1.062	2.515**	4.479*
7	TANJONG	0.627	2.258**	1.822
8	MAGNUM	0.761	1.765**	7.299**
9	MAS	1.353	2.773**	0.340
10	MALAKOFF	1.345	4.438**	0.406
11	TRI	0.780	2.720**	3.343
12	TIME	1.604*	3.013**	1.287
13	SARAWAK	0.619	2.631**	4.223*
14	PETDAG	1.150	4.912**	0.268
15	EON	1.129	3.004**	1.570
16	NSTP	0.904	2.968**	0.135
17	HAPSENG	1.460*	4.290**	0.243
18	MUIIND	0.988	3.209**	1.314
19	NALURI	1.364	2.710**	8.060**
20	MPHB	0.946	2.886**	6.285*

Note: \* statistically significant at 5% level of significance

\*\* statistically significant at 1% level of significance

**Table 10: Descriptive Statistics of Returns of Pre-Holiday and the Other Trading Days  
for Subperiod 2: Jul. 1997 to Nov. 2000**

	Pre-Holiday			Other Days			Total Obs.	
	Mean	Std. Dev.	n	Mean	Std. Dev.	n		
<b>SMALL COMPANIES</b>								
1	PERNAS	0.0023	0.0260	40	-0.0012	0.0348	752	792
2	MULPHA	-0.0016	0.0451	40	-0.0023	0.0605	755	795
3	MMOSAICS	-0.0023	0.0351	40	-0.0005	0.0456	749	789
4	KAMUNTG	0.0005	0.0387	39	-0.0016	0.0603	743	782
5	METPLEX	0.0090	0.0411	40	-0.0030	0.0497	755	795
6	PMIND	-0.0063	0.0719	39	-0.0020	0.0555	730	769
7	TV3	-0.0027	0.0401	40	-0.0020	0.0563	753	793
8	KEMAS	0.0057	0.0397	40	-0.0011	0.0586	738	778
9	ANTAH	-0.0016	0.0393	40	-0.0019	0.0536	755	795
10	DKMAT	0.0004	0.0393	40	-0.0019	0.0492	755	795
11	JOHAN	-0.0047	0.0319	40	-0.0019	0.0496	755	795
12	TSTORE	-0.0025	0.0324	39	-0.0007	0.0454	725	764
13	TNTT	-0.0024	0.0408	40	-0.0007	0.0469	719	759
14	KKELLAS	0.0091	0.0452	40	-0.0019	0.0614	730	770
15	MECHMAR	-0.0003	0.0362	40	-0.0020	0.0550	738	778
16	ILB	-0.0067	0.0410	39	-0.0015	0.0531	712	751
17	MFCB	-0.0035	0.0448	40	-0.0013	0.0560	755	795
18	SJA	-0.0110	0.0414	40	-0.0017	0.0525	736	776
19	SRIWANI	0.0120	0.0570	40	-0.0036	0.0588	751	791
20	NCK	-0.0110	0.0389	39	-0.0024	0.0590	715	754
<b>LARGE COMPANIES</b>								
1	TENAGA	0.0051	0.0289	40	-0.0005	0.0386	753	793
2	TELEKOM	-0.0022	0.0297	40	0.0005	0.0348	751	791
3	SIME	-0.0027	0.0232	40	-0.0008	0.0349	730	770
4	RESORTS	0.0016	0.0266	40	-0.0008	0.0393	753	793
5	GENTING	0.0002	0.0222	40	-0.0004	0.0294	753	793
6	BJTOTO	-0.0005	0.0262	40	-0.0012	0.0408	753	793
7	TANJONG	-0.0001	0.0254	40	-0.0004	0.0368	752	792
8	MAGNUM	-0.0073	0.0219	40	-0.0012	0.0380	751	791
9	MAS	-0.0003	0.0386	40	-0.0006	0.0461	755	795
10	MALAKOFF	-0.0012	0.0281	40	-0.0002	0.0400	726	766
11	TRI	-0.0078	0.0390	40	-0.0005	0.0654	755	795
12	TIME	0.0063	0.0698	40	0.00004	0.0772	739	779
13	SARAWAK	0.0005	0.0257	40	-0.0009	0.0421	751	791
14	PETDAG	-0.0048	0.0214	39	-0.0006	0.0298	723	762
15	EON	0.0006	0.0295	40	-0.0017	0.0385	729	769
16	NSTP	0.0039	0.0358	40	-0.0017	0.0443	753	793
17	HAPSENG	0.0056	0.0414	40	-0.0006	0.0355	733	773
18	MUIIND	0.0039	0.0453	40	-0.0020	0.0560	751	791
19	NALURI	-0.0030	0.0375	40	-0.0013	0.0621	755	795
20	MPHB	-0.0026	0.0283	39	-0.0020	0.0547	739	778

Note: Std. Dev. refers to standard deviation,  
Total Obs. refers to the number of observations, and  
n is the sample size.

**Table 11: Tests of Equality of Mean Returns of Pre-Holiday and the Other Trading Days  
for Subperiod 2: Jul. 1997 to Nov. 2000**

	Two Independent Samples Test		Mann-Whitney Test	
	t-statistic	P-value	Z-statistic	P-value
<b>SMALL COMPANIES</b>				
1 PERNAS	0.639	0.523	-0.513	0.608
2 MULPHA	0.067	0.946	-0.034	0.973
3 MMOSAICS	-0.255	0.799	-0.120	0.904
4 KAMUNTG	0.209	0.835	-1.151	0.250
5 METPLEX	1.499	0.134	-1.486	0.137
6 PMIND	-0.463	0.643	-0.036	0.972
7 TV3	-0.074	0.941	-0.327	0.744
8 KEMAS	0.723	0.470	-1.553	0.120
9 ANTAH	0.032	0.975	-0.111	0.911
10 DKMAT	0.295	0.768	-0.831	0.406
11 JOHAN	-0.350	0.726	-0.346	0.729
12 TSTORE	-0.236	0.814	-0.513	0.608
13 TNTT	-0.225	0.822	-0.056	0.955
14 KKELLAS	1.115	0.265	-1.209	0.227
15 MECHMAR	0.196	0.845	-1.137	0.255
16 ILB	-0.607	0.544	-0.400	0.689
17 MFCB	-0.237	0.813	-0.029	0.977
18 SJA	-1.118	0.264	-1.317	0.188
19 SRIWANI	1.631	0.103	-1.559	0.119
20 NCK	-0.928	0.354	-0.958	0.338
<b>LARGE COMPANIES</b>				
1 TENAGA	0.888	0.375	-0.811	0.418
2 TELEKOM	-0.466	0.641	-0.833	0.405
3 SIME	-0.335	0.737	-0.452	0.652
4 RESORTS	0.385	0.700	-0.436	0.663
5 GENTING	0.134	0.894	-0.475	0.635
6 BJTOTO	0.164	0.871	-0.087	0.931
7 TANJONG	0.055	0.956	-0.085	0.933
8 MAGNUM	-1.627	0.110	-1.106	0.269
9 MAS	0.045	0.964	-0.912	0.362
10 MALAKOFF	-0.159	0.873	-0.304	0.761
11 TRI	-0.694	0.488	-0.993	0.321
12 TIME	0.503	0.615	-0.593	0.553
13 SARAWAK	0.327	0.745	-0.800	0.424
14 PETDAG	-0.877	0.381	-1.485	0.138
15 EON	0.365	0.715	-0.101	0.919
16 NSTP	0.777	0.438	-0.434	0.664
17 HAPSENG	1.055	0.292	-0.486	0.627
18 MUIIND	0.655	0.513	-0.881	0.378
19 NALURI	-0.275	0.784	-0.002	0.999
20 MPHB	-0.104	0.918	-0.657	0.511

**Table 12: Tests of Equality of Mean Returns of Pre-Holiday and the Other Trading Days for Subperiod 2: Jul. 1997 to Nov. 2000 Controlling for the Month-of-the-Year Effect**

	Two-way ANOVA					
	F <sub>HOLIDAY</sub> statistic	P-value	F <sub>MONTH</sub> statistic	P-value	F <sub>INTERACTION</sub> statistic	P-value
<b>SMALL COMPANIES</b>						
1 PERNAS	0.733	0.392	0.956	0.486	1.110	0.351
2 MULPHA	0.001	0.976	0.496	0.907	0.413	0.941
3 MMOSAICS	0.369	0.544	0.438	0.939	0.350	0.967
4 KAMUNTG	0.058	0.810	0.178	0.999	0.139	0.999
5 METPLEX	0.897	0.344	0.512	0.896	0.729	0.698
6 PMIND	0.374	0.541	1.140	0.327	1.233	0.268
7 TV3	0.196	0.658	0.508	0.899	0.506	0.886
8 KEMAS	0.577	0.448	0.412	0.951	0.525	0.873
9 ANTAH	0.000	0.999	0.305	0.985	0.252	0.990
10 DKMAT	0.076	0.783	0.185	0.998	0.358	0.964
11 JOHAN	0.006	0.937	0.347	0.975	0.290	0.984
12 TSTORE	0.075	0.785	0.623	0.810	0.473	0.908
13 TNTT	0.059	0.809	0.622	0.811	0.392	0.951
14 KKELLAS	0.301	0.583	0.385	0.962	0.355	0.965
15 MECHMAR	0.082	0.774	0.400	0.956	0.318	0.977
16 ILB	0.469	0.494	0.635	0.800	0.671	0.752
17 MFCB	0.046	0.830	0.554	0.866	0.650	0.771
18 SJA	1.045	0.307	0.360	0.971	0.292	0.983
19 SRIWANI	1.775	0.183	0.748	0.692	0.659	0.763
20 NCK	0.306	0.580	0.475	0.919	0.222	0.894
<b>LARGE COMPANIES</b>						
1 TENAGA	0.473	0.492	1.270	0.237	0.601	0.814
2 TELEKOM	0.801	0.371	1.276	0.233	0.522	0.889
3 SIME	0.238	0.625	0.670	0.767	0.583	0.829
4 RESORTS	0.445	0.505	0.338	0.977	0.701	0.724
5 GENTING	0.007	0.932	0.329	0.980	0.261	0.989
6 BJTOTO	0.210	0.647	0.441	0.937	0.425	0.935
7 TANJONG	0.207	0.649	0.784	0.857	1.066	0.386
8 MAGNUM	1.017	0.313	0.490	0.910	0.651	0.854
9 MAS	0.000	0.996	0.822	0.618	0.698	0.727
10 MALAKOFF	0.017	0.897	0.713	0.727	0.291	0.983
11 TRI	0.152	0.697	0.637	0.798	0.284	0.985
12 TIME	0.027	0.869	0.659	0.778	0.787	0.641
13 SARAWAK	0.031	0.860	0.303	0.985	0.310	0.976
14 PETDAG	0.464	0.496	0.524	0.888	0.377	0.957
15 EON	0.025	0.876	0.711	0.729	0.151	0.999
16 NSTP	0.672	0.413	0.465	0.925	0.560	0.847
17 HAPSENG	0.225	0.635	1.056	0.395	1.062	0.390
18 MUIIND	0.297	0.586	0.151	0.999	0.186	0.997
19 NALURI	0.029	0.864	0.510	0.898	0.401	0.946
20 MPHB	0.001	0.979	0.231	0.995	0.162	0.998

Note: F<sub>HOLIDAY</sub> refers to the F-statistic for testing the pre-holiday effect,  
F<sub>MONTH</sub> refers to the F-statistic for testing the month-of-the-year effect, and  
F<sub>INTERACTION</sub> refers to the F-statistic for testing the interaction between these two effects.

#### **4.4 The Half-Monthly Effect for Whole Period: 3 January 1995 to 2 November 2000**

Table 13 shows the results of the Kolmogorov-Smirnov test, which is used for testing the normality. From the results, the null hypothesis of normality is rejected at five percent level of significance. Thus, we can infer that all of the trading/services stock returns in this period do not satisfy the normality assumption. Therefore, the nonparametric statistical test is useful for analysis.

The Levene test indicates that only 6 stocks (30%) from the large companies have unequal population variances. The null hypothesis of equal population variances cannot be rejected for most of the stocks.

The descriptive statistics of returns for the first and second halves of a trading month for the whole period are summarized in Table 14. This table lists the mean, standard deviation, and size of the sample for forty stocks. In general, the mean returns are higher in the first half of a trading month than the second half of a trading month. The results report that 90% (18 stocks) of both small as well as large companies have higher mean returns in the first half of a trading month. We note that the returns for the first half of a trading month generally have a higher standard deviation compared to the returns for the second half of a trading month, namely 85% (17 stocks) of small companies and 95% (19 stocks) of large companies.

Table 15 details the results of the statistical tests of equality of mean returns between the first and second halves of a trading month. Both the two independent sample t-test and Mann-Whitney test are carried out to test the half-monthly effect in this period. The significance of the test statistic indicates that there is a statistically significant difference between the mean returns for the first and second halves of a trading month. From the t-test, we find that only 2 stocks (10%) from the small companies and 3 stocks (15%) from the large companies show a statistically significant difference between the mean returns for the first and second halves of a trading month. The nonparametric test shows that 2 stocks (10%) from both the small and large companies have significantly different mean returns between the first and second halves of a trading month. Only 2 stocks report a significant result in both the parametric and nonparametric tests. Thus, we can infer that there is no obvious half-monthly effect in the whole period. The results also indicate that the firm size effect does not exist.

The F-statistics for the two-way ANOVA are reported in Table 16. The test is for testing the equality of mean returns after controlling for the month-of-the-year effect. We can see that only 10% (2 stocks) of the small companies and 15% (3 stocks) of the large companies indicate significant difference in the mean returns between the first and second halves of a trading month. Therefore, there is no obvious half-monthly effect in the whole period after controlling for the month-of-the-year effect. The results further show that 15% (3 stocks) of the large companies have significant results in the month-of-the-year effect. This table also shows that only 1 stock from the

large companies has a significant interaction between the half-monthly and month-of-the-year effects in this period. Generally, no interaction between the half-monthly effect and month-of-the-year effect.

**Table 13: Results of Kolmogorov-Smirnov Test for Normality and Levene Test for Equality of Variances for Returns of the First and Second Halves of a Month of Whole Period: Jan. 1995 to Nov. 2000**

	Kolmogorov-Smirnov Statistic		Levene Statistic
	First Half	Second Half	
<b>SMALL COMPANIES</b>			
1 PERNAS	3.125**	2.960**	0.710
2 MULPHA	3.826**	3.182**	1.213
3 MMOSAICS	3.028**	2.998**	0.092
4 KAMUNTG	3.175**	2.805**	2.860
5 METPLEX	2.761**	2.265**	1.762
6 PMIND	3.627**	3.236**	3.823
7 TV3	3.525**	3.444**	0.012
8 KEMAS	3.666**	2.397**	3.090
9 ANTAH	3.099**	2.666**	2.065
10 DKMAT	3.940**	2.505**	0.026
11 JOHAN	3.756**	3.104**	2.061
12 TSTORE	3.383**	3.571**	1.959
13 TNTT	3.122**	2.786**	3.826
14 KKELLAS	4.008**	2.816**	2.235
15 MECHMAR	3.314**	2.940**	0.855
16 ILB	3.314**	3.395**	0.339
17 MFCB	3.912**	2.642**	0.775
18 SJA	2.996**	2.678**	0.286
19 SRIWANI	3.104**	2.507**	0.338
20 NCK	3.762**	2.757**	0.192
<b>LARGE COMPANIES</b>			
1 TENAGA	3.553**	2.735**	8.932**
2 TELEKOM	2.884**	2.539**	2.193
3 SIME	2.828**	2.366**	7.007**
4 RESORTS	2.122**	2.242**	0.532
5 GENTING	2.751**	2.180**	0.247
6 BJTOTO	2.751**	3.023**	0.545
7 TANJONG	2.716**	2.210**	1.361
8 MAGNUM	2.455**	1.599*	0.717
9 MAS	3.433**	3.098**	1.603
10 MALAKOFF	4.013**	3.539**	2.008
11 TRI	2.781**	2.279**	11.534**
12 TIME	3.815**	2.649**	1.260
13 SARAWAK	2.953**	2.020**	4.060*
14 PETDAG	3.931**	3.927**	1.171
15 EON	3.416**	2.981**	1.372
16 NSTP	3.674**	3.071**	2.460
17 HAPSENG	4.814**	4.017**	1.830
18 MUIIND	3.467**	2.691**	7.150**
19 NALURI	3.473**	2.678**	3.018
20 MPHB	2.652**	2.742**	5.048*

Note: \* statistically significant at 5% level of significance

\*\* statistically significant at 1% level of significance

**Table 14: Descriptive Statistics of Returns of the First and Second Halves of a Month  
for Whole Period: Jan. 1995 to Nov. 2000**

		First Half			Second Half			Total Obs.
		Mean	Std. Dev.	n	Mean	Std. Dev.	n	
<b>SMALL COMPANIES</b>								
1	PERNAS	-0.0001	0.0320	616	-0.0014	0.0313	613	1229
2	MULPHA	-0.0012	0.0524	616	-0.0033	0.0451	613	1229
3	MMOSAICS	-0.0009	0.0381	615	-0.0002	0.0395	612	1227
4	KAMUNTG	0.0009	0.0525	613	-0.0031	0.0432	610	1223
5	METPLEX	0.0010	0.0441	616	-0.0037	0.0391	613	1229
6	PMIND	-0.0002	0.0479	611	-0.0038	0.0424	608	1219
7	TV3	0.0015	0.0458	616	-0.0031	0.0442	613	1229
8	KEMAS	0.0015	0.0528	610	-0.0035	0.0435	607	1217
9	ANTAH	-0.0002	0.0477	616	-0.0023	0.0411	613	1229
10	DKMAT	-0.0014	0.0411	616	-0.0030	0.0371	613	1229
11	JOHAN	-0.0007	0.0437	616	-0.0029	0.0361	613	1229
12	TSTORE	-0.0010	0.0385	611	-0.0009	0.0367	609	1220
13	TNTT	0.0016	0.0394	608	-0.0011	0.0446	606	1214
14	KKELLAS	0.0010	0.0518	610	-0.0039	0.0440	607	1217
15	MECHMAR	0.0003	0.0469	611	-0.0041	0.0426	608	1219
16	ILB	-0.0006	0.0460	605	-0.0014	0.0425	602	1207
17	MFCB	0.0009	0.0470	616	-0.0040	0.0442	613	1229
18	SJA	-0.0008	0.0454	610	-0.0022	0.0467	607	1217
19	SRIWANI	0.00003	0.0497	614	-0.0053	0.0495	611	1225
20	NCK	0.0016	0.0512	603	-0.0047	0.0460	600	1203
<b>LARGE COMPANIES</b>								
1	TENAGA	0.0011	0.0367	616	-0.0008	0.0259	613	1229
2	TELEKOM	0.0007	0.0298	616	-0.0002	0.0262	613	1229
3	SIME	0.0002	0.0319	609	-0.0009	0.0252	606	1215
4	RESORTS	0.0003	0.0314	615	-0.0026	0.0323	612	1227
5	GENTING	-0.0007	0.0255	615	-0.0008	0.0244	612	1227
6	BJTOTD	0.0011	0.0346	615	-0.0014	0.0324	612	1227
7	TANJONG	-0.0005	0.0335	614	-0.0006	0.0295	611	1225
8	MAGNUM	-0.0001	0.0331	616	-0.0021	0.0292	613	1229
9	MAS	-0.0003	0.0411	618	-0.0009	0.0314	613	1229
10	MALAKOFF	0.0007	0.0364	610	0.0001	0.0300	607	1217
11	TRI	0.0017	0.0546	618	-0.0042	0.0412	613	1229
12	TIME	0.0012	0.0678	611	-0.0026	0.0547	608	1219
13	SARAWAK	0.0001	0.0402	614	-0.0028	0.0307	611	1225
14	PETDAG	-0.0003	0.0264	605	-0.00027	0.0242	602	1207
15	EON	0.0006	0.0335	612	-0.0030	0.0272	609	1221
16	NSTP	0.0018	0.0380	616	-0.0027	0.0325	613	1229
17	HAPSENG	-0.0013	0.0350	609	0.0007	0.0253	606	1215
18	MUIIND	-0.0004	0.0501	615	-0.0028	0.0388	612	1227
19	NALURI	-0.0006	0.0516	616	-0.0030	0.0448	613	1229
20	MPHB	0.0004	0.0467	613	-0.0022	0.0411	610	1223

Note: Std. Dev. refers to standard deviation,  
Total Obs. refers to the number of observations, and  
n is the sample size.

**Table 15: Tests of Equality of Mean Returns of the First and Second Halves of a Month  
for Whole Period: Jan, 1995 to Nov, 2000**

	Two Independent Samples Test		Mann-Whitney Test	
	t-statistic	P-value	Z-statistic	P-value
<b>SMALL COMPANIES</b>				
1 PERNAS	0.762	0.446	-0.396	0.692
2 MULPHA	0.726	0.468	-0.281	0.779
3 MMOSAICS	-0.310	0.757	-0.307	0.759
4 KAMUNTG	1.472	0.141	-1.605	0.108
5 METPLEX	1.985	0.047*	-1.476	0.140
6 PMIND	1.369	0.171	-0.409	0.683
7 TV3	1.798	0.072	-2.228	0.026*
8 KEMAS	1.799	0.072	-0.484	0.628
9 ANTAH	0.817	0.414	-0.906	0.365
10 DKMAT	0.699	0.484	-0.056	0.955
11 JOHAN	0.976	0.329	-0.432	0.666
12 TSTORE	-0.063	0.950	-1.033	0.302
13 TNTT	1.138	0.255	-1.050	0.294
14 KKELLAS	1.752	0.080	-0.751	0.453
15 MECHMAR	1.733	0.083	-1.116	0.265
16 ILB	0.311	0.756	-0.429	0.668
17 MFCB	1.869	0.062	-1.957	0.050*
18 SJA	0.559	0.576	-0.603	0.546
19 SRIWANI	1.862	0.063	-1.679	0.093
20 NCK	2.246	0.025*	-1.698	0.089
<b>LARGE COMPANIES</b>				
1 TENAGA	1.054	0.292	-0.986	0.324
2 TELEKOM	0.578	0.564	-0.157	0.875
3 SIME	0.630	0.529	-0.241	0.810
4 RESORTS	1.570	0.117	-1.380	0.168
5 GENTING	0.026	0.979	-0.571	0.568
6 BJTOTO	1.288	0.198	-0.442	0.659
7 TANJONG	0.028	0.978	-0.428	0.668
8 MAGNUM	1.110	0.267	-0.585	0.559
9 MAS	0.272	0.785	-0.495	0.621
10 MALAKOFF	0.320	0.749	-0.648	0.517
11 TRI	2.123	0.034*	-1.518	0.129
12 TIME	1.078	0.281	-0.353	0.724
13 SARAWAK	1.461	0.144	-1.046	0.295
14 PETDAG	-0.017	0.986	-0.296	0.768
15 EON	2.056	0.040*	-2.357	0.018*
16 NSTP	2.229	0.026*	-2.379	0.017*
17 HAPSENG	-1.180	0.238	-1.051	0.293
18 MUIIND	0.925	0.355	-0.011	0.991
19 NALURI	0.855	0.393	-0.108	0.914
20 MPHB	1.051	0.293	-0.955	0.339

Note: \* statistically significant at 5% level of significance

**Table 16: Tests of Equality of Mean Returns of the First and Second Halves of a Month for Whole Period: Jan. 1995 to Nov. 2000 Controlling for the Month-of-the-Year Effect**

		Two-way ANOVA					
		F <sub>MONTHLY</sub> statistic	P-value	F <sub>MONTH</sub> statistic	P-value	F <sub>INTERACTION</sub> statistic	P-value
<b>SMALL COMPANIES</b>							
1	PERNAS	0.500	0.480	0.677	0.761	0.633	0.801
2	MULPHA	0.494	0.482	0.833	0.607	1.025	0.421
3	MMOSAICS	0.096	0.757	0.642	0.793	1.130	0.333
4	KAMUNTG	2.225	0.136	0.678	0.760	0.724	0.716
5	METPLEX	3.972	0.046*	0.643	0.793	1.070	0.382
6	PMIND	2.133	0.144	0.524	0.888	1.056	0.394
7	TV3	3.391	0.066	0.474	0.920	0.611	0.821
8	KEMAS	3.515	0.061	0.954	0.487	0.780	0.660
9	ANTAH	0.767	0.381	0.606	0.825	0.917	0.523
10	DKMAT	0.517	0.472	0.594	0.835	0.760	0.681
11	JOHAN	0.928	0.335	0.746	0.695	1.018	0.428
12	TSTORE	0.000	0.993	0.713	0.727	0.884	0.556
13	TNTT	1.671	0.196	1.299	0.219	0.934	0.507
14	KKELLAS	3.284	0.070	0.629	0.805	0.749	0.691
15	MECHMAR	2.875	0.090	0.684	0.754	1.243	0.253
16	ILB	0.118	0.731	1.101	0.357	1.430	0.153
17	MFCB	3.769	0.052	0.793	0.648	0.930	0.510
18	SJA	0.399	0.528	0.613	0.819	1.008	0.437
19	SRIWANI	3.783	0.052	1.359	0.186	0.780	0.660
20	NCK	5.197	0.023*	1.357	0.188	0.703	0.736
<b>LARGE COMPANIES</b>							
1	TENAGA	1.096	0.295	2.127	0.016*	0.472	0.921
2	TELEKOM	0.345	0.557	2.141	0.015*	0.800	0.641
3	SIME	0.228	0.633	1.252	0.248	0.734	0.706
4	RESORTS	2.396	0.122	1.228	0.263	0.970	0.472
5	GENTING	0.014	0.905	0.839	0.601	1.249	0.249
6	BJTOTO	1.430	0.232	0.915	0.525	0.768	0.672
7	TANJONG	0.000	0.990	1.527	0.116	1.093	0.363
8	MAGNUM	1.272	0.260	0.920	0.520	1.389	0.172
9	MAS	0.090	0.764	0.723	0.717	1.281	0.230
10	MALAKOFF	0.155	0.694	2.442	0.005**	0.899	0.541
11	TRI	4.429	0.036*	1.070	0.382	1.326	0.204
12	TIME	1.202	0.273	0.559	0.862	0.944	0.497
13	SARAWAK	2.099	0.148	1.003	0.441	1.004	0.441
14	PETDAG	0.000	0.996	1.265	0.240	0.463	0.926
15	EON	4.546	0.033*	1.710	0.066	2.859	0.001**
16	NSTP	5.394	0.020*	0.626	0.808	0.722	0.718
17	HAPSENG	1.506	0.220	1.025	0.421	0.880	0.560
18	MUIIND	1.028	0.311	0.404	0.955	0.925	0.515
19	NALURI	0.838	0.360	0.506	0.901	0.300	0.986
20	MPHB	1.197	0.274	0.865	0.585	1.224	0.266

Note: \* statistically significant at 5% level of significance,

\*\* statistically significant at 1% level of significance,

F<sub>MONTHLY</sub> refers to the F-statistic for testing the half-monthly effect,

F<sub>MONTH</sub> refers to the F-statistic for testing the month-of-the-year effect, and

F<sub>INTERACTION</sub> refers to the F-statistic for testing the interaction between these two effects.

#### **4.5 The Half-Monthly Effect for Subperiod 1: 3 January 1995 to 30 June 1997**

From the Kolmogorov-Smirnov statistic in Table 17, we can deduce that the majority of the trading/services stock returns are not normally distributed in the first period. Thus, the nonparametric statistical test is the appropriate test to be employed in this period.

The Table 17 also shows the results of the Levene test for the first period. This indicates that only 7.5% (3 stocks), namely 2 stocks of the small companies and 1 stock of a large company, have unequal population variances. Thus, we can infer that majority of the stocks have equal population variances in the first period, i.e., the variances of returns for the first and second halves of a trading month are equal.

Table 18 provides the descriptive statistics of returns for the first and second halves of a trading month for the first period. It contains the mean, standard deviation, and size of the sample for forty stocks. From this table, we note that 11 stocks (55%) from the small companies and 9 stocks (45%) from the large companies have higher mean returns in the first half of a trading month. Furthermore, 9 stocks from the small companies and 13 stocks from the large companies indicate a higher standard deviation in returns for the first half of a trading month compared to the returns for the second half of a trading month.

The results for the two independent sample t-test and Mann-Whitney test are summarized in Table 19. These statistical tests are used to test the half-monthly effect in the first period. The results of both the t-test and Mann-Whitney test exhibit that the mean returns between the first and second halves of a trading month are not statistically different at five per cent level. Thus, we can conclude that there is no half-monthly effect in the first period of the study.

Table 20 reports the results of the two-way ANOVA for the first period. This tests the equality of mean returns after controlling for the month-of-the-year effect. We find that all the F-statistics for testing the presence of half-monthly and month-of-the-year effects are not significant. From this table, only 3 stocks (15%) from the small companies and a stock of large company (5%) have a significant interaction between half-monthly and month-of-the-year effects in this period. Thus, we can deduce that the conclusion remains the same after controlling for the month-of-the-year effect, i.e., there is no half-monthly effect and month-of-the-year effect in the first period.

**Table 17: Results of Kolmogorov-Smirnov Test for Normality and Levene Test for Equality of Variances for Returns of the First and Second Halves of a Month of Subperiod 1: Jan. 1995 to Jun. 1997**

	Kolmogorov-Smirnov Statistic		Levene Statistic
	First Half	Second Half	
<b>SMALL COMPANIES</b>			
1 PERNAS	2.102**	2.357**	0.811
2 MULPHA	1.946**	2.045**	1.809
3 MMOSAICS	2.429**	1.771**	0.636
4 KAMUNTG	1.825**	1.524*	1.402
5 METPLEX	1.921**	1.515*	0.648
6 PMIND	2.028**	1.685**	1.092
7 TV3	2.781**	2.399**	0.046
8 KEMAS	1.992**	1.378*	0.173
9 ANTAH	1.861**	1.716**	0.068
10 DKMAT	2.205**	2.358**	0.139
11 JOHAN	2.702**	2.202**	0.448
12 TSTORE	2.524**	2.180**	0.750
13 TNTT	1.819**	2.588**	3.122
14 KKELLAS	1.738**	1.634**	5.408*
15 MECHMAR	1.960**	1.834**	0.020
16 ILB	2.229**	2.276**	0.014
17 MFCB	2.177**	1.594*	0.611
18 SJA	1.854**	1.981**	0.793
19 SRIWANI	1.907**	2.402**	4.900*
20 NCK	2.726**	2.200**	0.642
<b>LARGE COMPANIES</b>			
1 TENAGA	2.114**	2.395**	4.036*
2 TELEKOM	1.640**	1.801**	0.422
3 SIME	1.727**	2.279**	2.819
4 RESORTS	2.114**	1.580*	0.242
5 GENTING	2.214**	1.408*	0.524
6 BJTOTO	2.296**	2.800**	0.015
7 TANJONG	1.577*	1.751**	0.459
8 MAGNUM	1.656**	1.983**	0.127
9 MAS	1.856**	2.381**	0.002
10 MALAKOFF	2.708**	2.538**	1.714
11 TRI	1.287	1.505*	2.915
12 TIME	2.127**	1.387*	0.252
13 SARAWAK	2.632***	1.740**	0.180
14 PETDAG	2.812**	2.293**	0.221
15 EON	2.465**	1.724**	0.002
16 NSTP	2.161**	2.433**	0.306
17 HAPSENG	3.194**	2.779**	0.000
18 MUIIND	2.239**	1.771**	0.008
19 NALURI	2.020**	1.959**	0.143
20 MPHOB	1.474*	1.596*	2.846

Note: \* statistically significant at 5% level of significance

\*\* statistically significant at 1% level of significance

**Table 18: Descriptive Statistics of Returns of the First and Second Halves of a Month  
for Subperiod 1: Jan. 1995 to Jun. 1997**

	Small Companies	First Half			Second Half			Total Obs.
		Mean	Std. Dev.	n	Mean	Std. Dev.	n	
<b>LARGE COMPANIES</b>								
1	PERNAS	-0.0004	0.0276	262	0.0004	0.0240	261	523
2	MULPHA	-0.0013	0.0245	262	-0.0009	0.0277	261	523
3	MMOSAICS	0.0008	0.0256	262	-0.0022	0.0234	261	523
4	KAMUNTG	0.0004	0.0237	262	-0.0021	0.0220	261	523
5	METPLEX	0.0014	0.0235	262	-0.0004	0.0285	261	523
6	PMIND	-0.0005	0.0235	262	-0.0018	0.0222	261	523
7	TV3	0.0025	0.0220	262	-0.0002	0.0218	261	523
8	KEMAS	-0.0005	0.0293	262	-0.0018	0.0260	261	523
9	ANTAH	0.0009	0.0252	262	-0.0003	0.0256	261	523
10	DKMAT	-0.0015	0.0215	262	-0.0007	0.0222	261	523
11	JOHAN	-0.0012	0.0208	262	0.00002	0.0226	261	523
12	TSTORE	-0.0013	0.0240	262	0.0007	0.0236	261	523
13	TNTT	0.0007	0.0302	262	0.0027	0.0376	261	523
14	KKELLAS	-0.0002	0.0237	262	-0.0015	0.0189	261	523
15	MECHMAR	-0.0003	0.0268	262	-0.0018	0.0270	261	523
16	ILB	0.00002	0.0284	262	0.00003	0.0292	261	523
17	MFCB	-0.0009	0.0239	262	-0.0018	0.0244	261	523
18	SJA	-0.0009	0.0318	262	0.0003	0.0378	261	523
19	SRIWANI	-0.0012	0.0251	262	-0.0010	0.0389	261	523
20	NCK	0.0019	0.0320	262	-0.0022	0.0252	261	523

Note: Std. Dev. refers to standard deviation,  
Total Obs. refers to the number of observations, and  
n is the sample size.

**Table 19: Tests of Equality of Mean Returns of the First and Second Halves of a Month  
for Subperiod 1: Jan. 1995 to Jun. 1997**

	Two Independent Samples Test		Mann-Whitney Test	
	t-statistic	P-value	Z-statistic	P-value
<b>SMALL COMPANIES</b>				
1 PERNAS	-0.337	0.736	-0.796	0.426
2 MULPHA	-0.163	0.871	-0.228	0.819
3 MMOSAICS	1.417	0.157	-0.754	0.451
4 KAMUNTG	1.220	0.223	-0.533	0.594
5 METPLEX	0.795	0.427	-0.663	0.507
6 PMIND	0.609	0.543	-0.012	0.991
7 TV3	1.412	0.159	-1.592	0.111
8 KEMAS	0.558	0.577	-0.180	0.857
9 ANTAH	0.531	0.595	-0.587	0.557
10 DKMAT	-0.381	0.704	-0.320	0.749
11 JOHAN	-0.665	0.506	-1.089	0.276
12 TSTORE	-0.941	0.347	-1.517	0.129
13 TNTT	-0.649	0.516	-0.001	0.999
14 KKELLAS	0.680	0.497	0.000	1.000
15 MECHMAR	0.639	0.523	-0.011	0.991
16 ILB	-0.003	0.998	-0.068	0.946
17 MFCB	0.442	0.659	-0.130	0.896
18 SJA	-0.385	0.700	-0.202	0.840
19 SRIWANI	-0.070	0.944	-0.052	0.958
20 NCK	1.608	0.108	-0.899	0.369
<b>LARGE COMPANIES</b>				
1 TENAGA	0.084	0.933	-0.224	0.823
2 TELEKOM	-0.444	0.657	-0.474	0.635
3 SIME	-0.531	0.596	-0.074	0.941
4 RESORTS	1.155	0.249	-0.723	0.470
5 GENTING	0.201	0.841	-0.213	0.831
6 BJTOTO	-0.254	0.800	-0.233	0.816
7 TANJONG	-0.894	0.372	-0.530	0.596
8 MAGNUM	0.192	0.847	-0.549	0.583
9 MAS	0.565	0.572	-0.903	0.366
10 MALAKOFF	-0.534	0.593	-0.971	0.332
11 TRI	-0.085	0.933	-0.177	0.860
12 TIME	-0.692	0.489	-0.997	0.319
13 SARAWAK	-0.558	0.577	-0.358	0.720
14 PETDAG	0.123	0.902	-0.109	0.913
15 EON	1.333	0.183	-1.096	0.273
16 NSTP	0.771	0.441	-1.120	0.263
17 HAPSENG	-0.174	0.862	-0.345	0.730
18 MUIIND	-0.919	0.358	-1.516	0.129
19 NALURI	-0.067	0.946	-0.667	0.505
20 MPHB	1.369	0.172	-1.014	0.311

**Table 20: Tests of Equality of Mean Returns of the First and Second Halves of a Month for Subperiod 1: Jan. 1995 to Jun. 1997 Controlling for the Month-of-the-Year Effect**

	Two-way ANOVA					
	F <sub>MONTHLY</sub> statistic	P-value	F <sub>MONTH</sub> statistic	P-value	F <sub>INTERACTION</sub> statistic	P-value
<b>SMALL COMPANIES</b>						
1 PERNAS	0.129	0.720	0.522	0.889	0.288	0.988
2 MULPHA	0.010	0.920	0.929	0.512	0.912	0.528
3 MMOSAICS	2.003	0.158	0.338	0.977	1.656	0.080
4 KAMUNTG	1.850	0.174	0.826	0.614	1.684	0.074
5 METPLEX	0.721	0.396	0.259	0.992	0.735	0.705
6 PMIND	0.543	0.462	0.408	0.954	1.086	0.370
7 TV3	1.956	0.163	0.751	0.689	2.517	0.004**
8 KEMAS	0.502	0.479	1.112	0.349	0.973	0.470
9 ANTAH	0.415	0.520	0.508	0.898	2.010	0.026*
10 DKMAT	0.132	0.716	1.563	0.106	0.700	0.739
11 JOHAN	0.266	0.606	0.548	0.870	0.823	0.617
12 TSTORE	0.545	0.461	0.835	0.605	1.524	0.119
13 TNTT	0.411	0.522	1.067	0.386	1.565	0.106
14 KKELLAS	0.381	0.537	1.281	0.232	1.232	0.262
15 MECHMAR	0.294	0.588	0.913	0.528	2.245	0.011*
16 ILB	0.017	0.895	0.585	0.842	1.475	0.137
17 MFCB	0.328	0.567	1.339	0.199	1.265	0.241
18 SJA	0.063	0.803	0.464	0.925	1.221	0.269
19 SRIWANI	0.022	0.882	0.527	0.886	0.978	0.469
20 NCK	2.105	0.147	1.204	0.281	1.712	0.068
<b>LARGE COMPANIES</b>						
1 TENAGA	0.023	0.879	0.806	0.634	0.977	0.466
2 TELEKOM	0.125	0.724	0.585	0.841	1.001	0.445
3 SIME	0.226	0.635	0.473	0.920	0.469	0.922
4 RESORTS	1.265	0.261	0.656	0.780	0.455	0.930
5 GENTING	0.189	0.664	0.391	0.959	0.695	0.744
6 BJTOTO	0.031	0.861	0.660	0.777	0.677	0.760
7 TANJONG	0.602	0.438	0.418	0.948	1.199	0.285
8 MAGNUM	0.037	0.847	1.197	0.286	1.697	0.071
9 MAS	0.583	0.445	0.997	0.448	1.120	0.343
10 MALAKOFF	0.144	0.705	0.774	0.667	0.570	0.853
11 TRI	0.004	0.948	0.903	0.537	0.764	0.677
12 TIME	0.585	0.445	0.518	0.892	1.418	0.161
13 SARAWAK	0.283	0.595	1.198	0.287	0.787	0.653
14 PETDAG	0.096	0.757	0.564	0.858	1.538	0.114
15 EON	1.982	0.160	1.064	0.389	1.201	0.283
16 NSTP	1.130	0.288	0.448	0.934	0.745	0.695
17 HAPSENG	0.001	0.974	0.656	0.865	1.068	0.385
18 MUIIND	0.667	0.415	0.330	0.979	0.534	0.881
19 NALURI	0.002	0.963	0.273	0.990	0.940	0.501
20 MPHB	2.261	0.133	1.153	0.318	1.967	0.030*

Note: \* statistically significant at 5% level of significance,

\*\* statistically significant at 1% level of significance,

F<sub>MONTHLY</sub> refers to the F-statistic for testing the half-monthly effect,

F<sub>MONTH</sub> refers to the F-statistic for testing the month-of-the-year effect, and

F<sub>INTERACTION</sub> refers to the F-statistic for testing the interaction between these two effects.

#### **4.6 The Half-Monthly Effect for Subperiod 2: 1 July 1997 to 2 November 2000**

The results of the Kolmogorov-Smirnov test of normality are summarized in Table 21. This table shows that most of the trading/services stocks are not normally distributed in the second period at five percent level of significance. Therefore, the nonparametric statistical test is useful for testing the hypothesis in this study.

From the Levene statistic in Table 21, we note that 2 stocks from the small companies and 6 stocks from the large companies show significant results at five per cent level of significance, i.e., they have unequal population variances. Other than this, no rejection is found in majority of the cases.

The descriptive statistics of returns are shown in Table 22, which details the mean, standard deviation, and size of the sample for the first and second halves of a trading month for the second period. For majority of the stocks in the second period, the first half of a trading month generates higher mean returns than the second half of a trading month. From the results, 95% (19 stocks) of the small companies and 85% (17 stocks) of the large companies have higher mean returns in the first half of a trading month. In addition, 17 stocks (85%) from the small companies and 19 stocks (95%) from the large companies show that higher standard deviation in the returns for the first half of a trading month than the returns for the second half of a trading month.

The results of the statistical test of equality of mean returns between the first and second halves of a trading month in the second period, are presented in Table 23, i.e., the two independent sample t-test and Mann-Whitney test. For the parametric test, 5% (1 stock) of the small companies and 15% (3 stocks) of the large companies show significantly different mean returns between the first and second halves of a trading month. However, from the results of the nonparametric test, we notice that only the stock of a small company (5%) and 2 stocks (10%) from the large companies have significantly different mean returns between the first and second halves of a trading month. Only 1 stock reports a significant result for both statistical tests. Therefore, we can conclude that there is no persistent half-monthly effect in the second period. This result is consistent with the result obtained for the whole period. The results also indicate that the firm size effect does not exist.

The statistical tests of equality of mean returns after controlling for the month-of-the-year effect, i.e., the F-statistics for the two-way ANOVA are presented in Table 24. From the F-statistics, we can see that only 5% (1 stock) of the small companies and 15% (3 stocks) of the large companies show rejection of the null hypothesis, i.e., the mean returns between the first and second halves of a trading month are not equal. Thus, we can infer that there is no persistent half-monthly effect in the second period after controlling for the month-of-the-year effect. The results also show that there are 15% (3 stocks) of the large companies that show significant result in the month-of-the year effect. We also see that only 1 stock from the large companies has a significant interaction between the half-monthly and

month-of-the-year effects in this period. We can conclude that there appears to be no persistent half-monthly effect before and after controlling for the month-of-the-year effect.

The patterns of the half-monthly effect remain the same for the different periods of study. In fact, the half-monthly effect appears to be absent generally during the whole period, and the first and second subperiods of study.

**Table 21: Results of Kolmogorov-Smirnov Test for Normality and Levene Test for Equality of Variances for Returns of the First and Second Halves of a Month of Subperiod 2: Jul. 1997 to Nov. 2000**

		Kolmogorov-Smirnov Statistic		Levene Statistic
		First Half	Second Half	
<b>SMALL COMPANIES</b>				
1	PERNAS	2.380**	2.239**	0.143
2	MULPHA	2.710**	2.511**	2.788
3	MMOSAICS	2.440**	2.356**	0.000
4	KAMUNTG	2.469**	2.266**	2.398
5	METPLEX	1.743**	1.593*	3.886*
6	PMIND	2.668**	2.559**	3.557
7	TV3	2.032**	1.947**	0.069
8	KEMAS	2.612**	1.806**	3.231
9	ANTAH	2.317**	2.313**	3.117
10	DKMAT	2.390**	1.371*	0.162
11	JOHAN	2.464**	2.380**	4.172*
12	TSTORE	2.339**	2.601**	1.324
13	TNTT	2.562**	1.823**	2.055
14	KKELLAS	2.769**	1.877**	1.156
15	MECHMAR	2.160**	2.341**	0.961
16	ILB	2.484**	2.651**	0.576
17	MFCB	2.732**	1.851**	0.379
18	SJA	2.325**	2.054**	0.005
19	SRIWANI	1.939**	1.397*	0.561
20	NCK	2.520**	1.771**	0.046
<b>LARGE COMPANIES</b>				
1	TENAGA	2.850**	1.571*	6.302*
2	TELEKOM	2.009**	1.727**	1.930
3	SIME	2.171**	1.688**	4.826*
4	RESORTS	1.218	1.854**	0.387
5	GENTING	1.661**	1.761**	0.978
6	BJTOTD	1.945**	1.885**	0.685
7	TANJONG	2.036**	1.518*	2.556
8	MAGNUM	1.682**	0.976	1.431
9	MAS	2.395**	1.993**	1.953
10	MALAKOFF	3.446**	3.085**	0.839
11	TRI	1.936**	1.627**	10.785**
12	TIME	2.510**	1.745**	2.268
13	SARAWAK	1.760**	1.319	8.703**
14	PETDAG	3.415**	3.408**	1.052
15	EON	2.440**	2.158**	1.726
16	NSTP	2.360**	2.177**	4.198*
17	HAPSENG	3.406**	2.882**	2.062
18	MUIIND	1.975**	1.844**	9.760**
19	NALURI	2.059**	1.727**	3.337
20	MPHB	1.793**	2.178**	3.669

Note: \* statistically significant at 5% level of significance

\*\* statistically significant at 1% level of significance

**Table 22: Descriptive Statistics of Returns of the First and Second Halves of a Month  
for Subperiod 2: Jul. 1997 to Nov. 2000**

	First Half			Second Half			Total Obs.
	Mean	Std. Dev.	n	Mean	Std. Dev.	n	
<b>SMALL COMPANIES</b>							
1 PERNAS	0.0002	0.0349	354	-0.0028	0.0357	352	706
2 MULPHA	-0.0012	0.0659	354	-0.0050	0.0548	352	706
3 MMOSAICS	-0.0022	0.0452	353	0.0013	0.0481	351	704
4 KAMUNTG	0.0013	0.0663	351	-0.0039	0.0539	349	700
5 METPLEX	0.0007	0.0547	354	-0.0062	0.0453	352	706
6 PMIND	0.00002	0.0600	349	-0.0053	0.0527	347	696
7 TV3	0.0008	0.0575	354	-0.0053	0.0552	352	706
8 KEMAS	0.0030	0.0651	348	-0.0047	0.0531	346	694
9 ANTAH	-0.0010	0.0590	354	-0.0037	0.0495	352	706
10 DKMAT	-0.0014	0.0510	354	-0.0046	0.0451	352	706
11 JOHAN	-0.0002	0.0548	354	-0.0051	0.0434	352	706
12 TSTORE	-0.0008	0.0465	349	-0.0020	0.0441	348	697
13 TNTT	0.0023	0.0451	346	-0.0040	0.0491	345	691
14 KKELLAS	0.0018	0.0654	348	-0.0057	0.0559	346	694
15 MECHMAR	0.0008	0.0577	349	-0.0059	0.0513	347	696
16 ILB	-0.0010	0.0559	343	-0.0024	0.0503	341	684
17 MFCB	0.0022	0.0584	354	-0.0055	0.0544	352	706
18 SJA	-0.0006	0.0535	348	-0.0041	0.0523	346	694
19 SRIWANI	0.0010	0.0620	352	-0.0084	0.0560	350	702
20 NCK	0.0014	0.0622	341	-0.0067	0.0570	339	680
<b>LARGE COMPANIES</b>							
1 TENAGA	0.0020	0.0454	354	-0.0012	0.0312	352	706
2 TELEKOM	0.0015	0.0371	354	-0.0005	0.0321	352	706
3 SIME	0.0003	0.0388	347	-0.0022	0.0300	345	692
4 RESORTS	0.0009	0.0375	353	-0.0026	0.0392	351	704
5 GENTING	-0.0005	0.0293	353	-0.0003	0.0280	351	704
6 BJTOTO	0.0005	0.0427	353	-0.0041	0.0379	351	704
7 TANJONG	-0.0001	0.0401	352	-0.0015	0.0334	350	702
8 MAGNUM	-0.0002	0.0402	354	-0.0034	0.0339	352	706
9 MAS	-0.0007	0.0521	354	-0.0010	0.0383	352	706
10 MALAKOFF	0.0010	0.0447	348	-0.0008	0.0366	346	694
11 TRI	0.0041	0.0681	354	-0.0063	0.0504	352	706
12 TIME	0.0035	0.0866	349	-0.0044	0.0683	347	696
13 SARAWAK	0.0019	0.0449	352	-0.0044	0.0342	350	702
14 PETDAG	-0.0007	0.0314	343	-0.0005	0.0286	341	684
15 EON	0.0006	0.0418	350	-0.0042	0.0331	348	698
16 NSTP	0.0023	0.0476	354	-0.0046	0.0398	352	706
17 HAPSENG	-0.0023	0.0422	347	0.0011	0.0294	345	692
18 MUIIND	0.0007	0.0636	353	-0.0047	0.0472	351	704
19 NALURI	-0.0001	0.0652	354	-0.0043	0.0560	352	706
20 MPHB	-0.0004	0.0576	351	-0.0029	0.0508	349	700

Note: Std. Dev. refers to standard deviation,  
Total Obs. refers to the number of observations, and  
n is the sample size.

**Table 23: Tests of Equality of Mean Returns of the First and Second Halves of a Month  
for Subperiod 2: Jul. 1997 to Nov. 2000**

		Two Independent Samples Test		Mann-Whitney Test	
		t-statistic	P-value	Z-statistic	P-value
<b>SMALL COMPANIES</b>					
1	PERNAS	1.114	0.266	-0.156	0.876
2	MULPHA	0.835	0.404	-0.278	0.781
3	MMOSAICS	-0.982	0.327	-0.943	0.346
4	KAMUNTG	1.149	0.251	-1.507	0.132
5	METPLEX	1.821	0.069	-1.321	0.186
6	PMIND	1.237	0.217	-0.510	0.610
7	TV3	1.426	0.154	-1.589	0.112
8	KEMAS	1.714	0.087	-0.598	0.550
9	ANTAH	0.667	0.505	-0.677	0.498
10	DKMAT	0.900	0.368	-0.423	0.673
11	JOHAN	1.297	0.195	-1.150	0.250
12	TSTORE	0.359	0.720	-0.182	0.855
13	TNTT	1.755	0.080	-1.369	0.171
14	KKELLAS	1.625	0.105	-1.047	0.295
15	MECHMAR	1.612	0.107	-1.350	0.177
16	ILB	0.345	0.730	-0.547	0.584
17	MFCB	1.829	0.068	-2.305	0.021*
18	SJA	0.864	0.388	-0.912	0.362
19	SRIWANI	2.100	0.036*	-1.952	0.051
20	NCK	1.758	0.079	-1.428	0.153
<b>LARGE COMPANIES</b>					
1	TENAGA	1.102	0.271	-1.030	0.303
2	TELEKOM	0.778	0.437	-0.433	0.665
3	SIME	0.936	0.349	-0.317	0.751
4	RESORTS	1.201	0.230	-1.063	0.288
5	GENTING	-0.084	0.933	-0.554	0.580
6	BJTOTD	1.527	0.127	-0.740	0.459
7	TANJONG	0.500	0.617	-0.095	0.925
8	MAGNUM	1.138	0.255	-0.566	0.571
9	MAS	0.096	0.924	-0.022	0.982
10	MALAKOFF	0.566	0.572	-0.090	0.929
11	TRI	2.291	0.022*	-1.715	0.086
12	TIME	1.335	0.182	-0.954	0.340
13	SARAWAK	2.087	0.037*	-1.615	0.106
14	PETDAG	-0.081	0.936	-0.248	0.804
15	EON	1.693	0.091	-2.060	0.039*
16	NSTP	2.094	0.037*	-2.047	0.041*
17	HAPSENG	-1.229	0.220	-1.102	0.271
18	MUIIND	1.288	0.198	-0.863	0.388
19	NALURI	0.919	0.358	-0.399	0.690
20	MPHB	0.603	0.547	-0.455	0.649

Note: \* statistically significant at 5% level of significance

**Table 24: Tests of Equality of Mean Returns of the First and Second Halves of a Month for Subperiod 2: Jul. 1997 to Nov. 2000 Controlling for the Month-of-the-Year Effect**

	Two-way ANOVA					
	F <sub>MONTHLY</sub> statistic	P-value	F <sub>MONTH</sub> statistic	P-value	F <sub>INTERACTION</sub> statistic	P-value
<b>SMALL COMPANIES</b>						
1 PERNAS	0.654	0.419	0.938	0.503	0.649	0.787
2 MULPHA	0.350	0.554	0.516	0.893	0.866	0.574
3 MMOSAICS	2.237	0.135	0.646	0.790	1.759	0.058
4 KAMUNTG	1.057	0.304	0.452	0.932	0.640	0.795
5 METPLEX	2.344	0.126	0.469	0.923	0.829	0.611
6 PMIND	1.430	0.232	0.408	0.953	1.450	0.146
7 TV3	1.606	0.206	0.467	0.924	0.645	0.791
8 KEMAS	2.401	0.122	0.573	0.851	0.497	0.905
9 ANTAH	0.251	0.617	0.637	0.798	0.952	0.489
10 DKMAT	0.615	0.433	0.228	0.996	0.608	0.823
11 JOHAN	1.022	0.312	0.565	0.858	0.778	0.662
12 TSTORE	0.078	0.780	0.815	0.817	0.632	0.803
13 TNTT	3.111	0.078	0.770	0.671	0.527	0.886
14 KKELLAS	2.082	0.149	0.392	0.959	0.717	0.723
15 MECHMAR	1.639	0.201	0.454	0.931	0.963	0.479
16 ILB	0.014	0.906	0.950	0.491	1.773	0.055
17 MFCB	2.854	0.092	0.458	0.929	0.878	0.562
18 SJA	0.577	0.448	0.387	0.981	0.907	0.533
19 SRIWANI	4.322	0.038*	1.388	0.174	0.976	0.467
20 NCK	2.564	0.110	0.898	0.542	0.521	0.890
<b>LARGE COMPANIES</b>						
1 TENAGA	0.903	0.342	1.703	0.069	0.413	0.950
2 TELEKOM	0.277	0.599	2.055	0.022*	1.103	0.356
3 SIME	0.335	0.563	1.343	0.196	0.920	0.520
4 RESORTS	0.978	0.323	1.397	0.169	1.111	0.349
5 GENTING	0.007	0.934	1.347	0.194	1.568	0.104
6 BJTOTO	1.441	0.230	1.061	0.391	0.725	0.715
7 TANJONG	0.212	0.646	1.814	0.090	0.930	0.511
8 MAGNUM	0.963	0.327	0.514	0.894	0.885	0.555
9 MAS	0.021	0.884	0.556	0.865	1.426	0.156
10 MALAKOFF	0.199	0.656	2.058	0.021*	0.994	0.450
11 TRI	4.168	0.042*	0.873	0.567	1.201	0.283
12 TIME	1.444	0.230	0.572	0.852	0.793	0.648
13 SARAWAK	4.159	0.042*	0.839	0.601	0.589	0.839
14 PETDAG	0.064	0.801	1.361	0.187	0.637	0.798
15 EON	1.599	0.207	2.059	0.021*	3.459	0.000**
16 NSTP	4.597	0.032*	0.651	0.785	0.892	0.548
17 HAPSENG	2.170	0.141	0.717	0.723	0.801	0.639
18 MUIIND	1.536	0.216	0.322	0.981	0.741	0.699
19 NALURI	0.723	0.396	0.439	0.939	0.243	0.994
20 MPH	0.206	0.650	0.568	0.858	0.845	0.595

Note: \* statistically significant at 5% level of significance,

\*\* statistically significant at 1% level of significance,

F<sub>MONTHLY</sub> refers to the F-statistic for testing the half-monthly effect,

F<sub>MONTH</sub> refers to the F-statistic for testing the month-of-the-year effect, and

F<sub>INTERACTION</sub> refers to the F-statistic for testing the interaction between these two effects.

#### **4.7 The Time-of-the-Month Effect for Whole Period: 3 January 1995 to 2 November 2000**

As presented in Table 25, the results for Kolgomorov-Smirnov statistic indicate that the null hypothesis of normality is rejected at five per cent level of significance for all the stock returns in the whole period. This means that all of the trading/services stock returns in this period are not normally distributed. Thus, the nonparametric test is utilized in the whole period of the study.

The results of the Levene test for equality of variances in the whole period are also provided in Table 25. The results indicate that for the majority of stocks, the variance of returns for each one third of a month are equal. We note that only 1 stock from the small companies and 2 stocks from the large companies have unequal population variances.

Table 26 details the descriptive statistics of returns for each one third of a month in the whole period. The mean, standard deviation, and size of the sample for forty stocks are summarized in this table. Kohers and Patel (1999) have shown that the returns were highest in the first third of a month, dropped in the second third of a month, and were lowest and negative in the last third of a month. The results reveal that 40% (8 stocks) of the small companies and 55% (11 stocks) of the large companies show this pattern in the whole period. Furthermore, 50% (10 stocks) of the small companies and 25% (5 stocks) of the large companies indicate that the returns are highest in the second third of a month and are lowest and negative in the last third of a

month. Only a minority of stocks show mixed results, that is, the returns are highest in the last third of a month and are lowest and negative in the first third of a month, or the returns are highest in the second third of a month and are lowest and negative in the first third of a month.

Both the one-way ANOVA and Kruskal-Wallis test results are shown in the Table 27. These are for testing the equality of mean returns between the first third of a month, second third of a month, and last third of a month. The F-test shows that only 1 stock (5%) from the large companies indicates a statistically significant difference between the mean returns for the first third of a month, second third of a month, and last third of a month. The Duncan's test is carried out to identify which specific segments of a month, i.e., first third, second third, and last third have caused these significantly different returns. The result indicates that the mean returns for the first third and last third are significantly different. The H-statistic suggests that 3 stocks (15%) from the small companies have significant difference in mean returns between each one third of a month. Thus, a further analysis, i.e., the Mann-Whitney test is performed and the results are reported in Table 27. It shows that 3 stocks indicate have mean returns for the second third of a month that differ significantly from the mean returns for the last third of a month. This test also reports that there are 2 stocks where the mean returns are statistically significant different between the first third and second third of a month. From the results, we can infer that there is no obvious time-of-the-month effect in this period.

Table 28 summarizes the results of the statistical test of equality of mean returns after controlling for the month-of-the-year effect, i.e., the two-way ANOVA. From the results, we notice that only 1 stock from the large companies has the same significant result, i.e., the mean returns for the first third and last third are significantly different. Therefore, there appears to be no persistent time-of-the month effect for the entire period. Furthermore, 1 stock from the large companies shows significant result in the month-of-the-year effect. This table also reports a significant interaction between the time-of-the-month and month-of-the-year effects in this period for 1 stock from the small and large companies, respectively.

**Table 25: Results of Kolmogorov-Smirnov Test for Normality and Levene Test for Equality of Variances for Returns of Time-of-the-Month Effect of Whole Period: Jan. 1995 to Nov. 2000**

	Kolmogorov-Smirnov Statistic			Levene Statistic
	First Third	Second Third	Last Third	
<b>SMALL COMPANIES</b>				
1 PERNAS	2.728**	2.453**	2.584**	0.599
2 MULPHA	3.325**	2.950**	3.007**	0.213
3 MMOSAICS	2.742**	2.599**	2.421**	0.469
4 KAMUNTG	2.814**	2.604**	2.757**	1.147
5 METPLEX	2.416**	2.139**	1.981**	0.120
6 PMIND	3.274**	2.926**	2.609**	0.135
7 TV3	3.168**	2.970**	2.741**	0.859
8 KEMAS	3.209**	2.672**	2.226**	0.886
9 ANTAH	2.993**	2.175**	2.293**	0.480
10 DKMAT	3.436**	2.903**	2.356**	0.238
11 JOHAN	3.836**	2.695**	2.803**	0.099
12 TSTORE	3.349**	2.432**	3.077**	0.337
13 TNTT	2.566**	2.715**	2.595**	3.030*
14 KKELLAS	3.403**	3.214**	2.768**	0.176
15 MECHMAR	2.855**	2.404**	2.723**	0.852
16 ILB	3.199**	2.840**	2.889**	0.237
17 MFCB	3.267**	2.711**	2.597**	2.260
18 SJA	2.658**	2.464**	2.337**	0.673
19 SRIWANI	2.840**	2.107**	2.417**	0.913
20 NCK	2.624**	3.018**	2.579**	0.623
<b>LARGE COMPANIES</b>				
1 TENAGA	2.701**	2.751**	2.448**	3.085*
2 TELEKOM	2.489**	2.527**	2.362**	0.828
3 SIME	2.472**	2.522**	1.904**	0.887
4 RESORTS	1.776**	2.316**	1.921**	1.289
5 GENTING	2.037**	2.517**	1.729**	0.422
6 BJTOTO	2.544**	2.128**	2.586**	1.119
7 TANJONG	2.484**	2.084**	1.856**	0.884
8 MAGNUM	2.293**	1.705**	1.664**	1.286
9 MAS	2.447**	3.342**	2.929**	1.282
10 MALAKOFF	3.420**	3.201**	3.108**	0.365
11 TRI	2.534**	3.028**	1.964**	2.932
12 TIME	3.311**	2.897**	2.414**	0.575
13 SARAWAK	2.406**	2.895**	1.573**	3.201*
14 PETDAG	3.149**	3.651**	3.597**	0.775
15 EON	2.600**	3.255**	2.907**	1.271
16 NSTP	2.938**	2.808**	2.703**	0.496
17 HAPSENG	3.733**	4.043**	3.331**	0.461
18 MUIIND	2.834**	2.996**	2.555**	0.998
19 NALURI	3.383**	2.561**	2.324**	0.859
20 MPHB	2.184**	2.440**	2.191**	0.998

Note: \* statistically significant at 5% level of significance

\*\* statistically significant at 1% level of significance

**Table 26: Descriptive Statistics of Returns of Time-of-the-Month Effect for Whole Period:  
Jan. 1995 to Nov. 2000**

	First Third			Second Third			Last Third			Total Obs.
	Mean	Std. Dev.	n	Mean	Std. Dev.	n	Mean	Std. Dev.	n	
<b>SMALL COMPANIES</b>										
1 PERNAS	-0.0003	0.0321	442	-0.0006	0.0307	469	-0.0015	0.0301	464	1375
2 MULPHA	-0.0010	0.0499	442	-0.0012	0.0500	472	-0.0030	0.0455	464	1378
3 MMOSAICS	0.0008	0.0382	438	-0.0015	0.0380	472	-0.0007	0.0373	462	1372
4 KAMUNTG	-0.0004	0.0462	436	-0.0011	0.0520	472	-0.0020	0.0435	457	1365
5 METPLEX	0.0011	0.0416	442	-0.0006	0.0411	472	-0.0038	0.0406	464	1378
6 PMIND	-0.0010	0.0469	433	0.00002	0.0445	465	-0.0039	0.0439	454	1352
7 TV3	0.0005	0.0418	442	0.0007	0.0449	470	-0.0032	0.0464	464	1376
8 KEMAS	0.0009	0.0524	441	-0.0002	0.0446	464	-0.0032	0.0440	456	1361
9 ANTAH	-0.0015	0.0446	442	0.0019	0.0449	472	-0.0030	0.0414	464	1378
10 DKMAT	-0.0012	0.0405	442	-0.0002	0.0401	477	-0.0029	0.0385	459	1378
11 JOHAN	-0.0011	0.0440	442	-0.0011	0.0377	472	-0.0024	0.0370	464	1378
12 TSTORE	-0.0010	0.0357	426	0.0004	0.0373	460	-0.0011	0.0383	461	1347
13 TNTT	-0.0010	0.0381	430	0.0036	0.0391	463	-0.0019	0.0462	449	1342
14 KKELLAS	-0.0001	0.0500	433	-0.0004	0.0482	469	-0.0029	0.0454	451	1353
15 MECHMAR	-0.0013	0.0441	435	0.0011	0.0462	467	-0.0043	0.0431	459	1361
16 ILB	-0.0017	0.0454	418	-0.0003	0.0418	465	-0.0005	0.0440	451	1334
17 MFCB	-0.0007	0.0443	442	0.0004	0.0440	472	-0.0038	0.0467	464	1378
18 SJA	-0.0006	0.0444	438	-0.0008	0.0451	465	-0.0017	0.0482	456	1359
19 SRIWANI	-0.0020	0.0477	442	0.0015	0.0484	472	-0.0047	0.0514	460	1374
20 NCK	-0.0021	0.0455	432	0.0024	0.0506	458	-0.0052	0.0483	447	1337
<b>LARGE COMPANIES</b>										
1 TENAGA	0.0009	0.0347	442	-0.0005	0.0326	470	-0.0007	0.0261	464	1376
2 TELEKOM	0.0013	0.0289	438	0.0001	0.0287	472	-0.0008	0.0263	464	1374
3 SIME	0.0003	0.0314	433	-0.0002	0.0281	459	-0.0013	0.0259	461	1353
4 RESORTS	-0.0009	0.0331	442	-0.0007	0.0324	470	-0.0020	0.0309	464	1376
5 GENTING	-0.0007	0.0249	442	-0.0006	0.0252	470	-0.0008	0.0254	464	1376
6 BJTOTO	-0.00001	0.0361	441	0.0009	0.0328	471	-0.0004	0.0309	464	1376
7 TANJONG	0.00001	0.0325	440	0.0002	0.0328	471	-0.0009	0.0279	464	1375
8 MAGNUM	0.0003	0.0316	442	-0.0012	0.0331	468	-0.0016	0.0292	464	1374
9 MAS	-0.0003	0.0369	442	-0.0010	0.0407	472	-0.0002	0.0315	464	1378
10 MALAKOFF	0.0009	0.0341	433	0.0001	0.0329	462	-0.0002	0.0296	454	1349
11 TRI	-0.0002	0.0519	442	-0.0005	0.0606	472	-0.0024	0.0398	464	1378
12 TIME	0.0032	0.0677	441	-0.0025	0.0608	461	-0.0011	0.0530	460	1362
13 SARAWAK	-0.0009	0.0355	442	0.0004	0.0432	470	-0.0025	0.0297	462	1374
14 PETDAG	0.0003	0.0253	432	-0.0010	0.0249	461	-0.0003	0.0243	452	1345
15 EON	0.0020	0.0305	433	-0.0013	0.0346	463	-0.0034	0.0261	456	1352
16 NSTP	0.0012	0.0351	442	-0.0004	0.0366	470	-0.0024	0.0344	464	1376
17 HAPSENG	-0.0006	0.0320	438	-0.0005	0.0326	461	0.0013	0.0253	457	1356
18 MUIIND	-0.0003	0.0437	440	-0.0014	0.0488	471	-0.0021	0.0405	463	1374
19 NALURI	-0.0002	0.0495	442	-0.0012	0.0507	472	-0.0026	0.0454	464	1378
20 MPHB	-0.0004	0.0436	436	-0.0011	0.0454	468	-0.0022	0.0419	457	1361

Note: Std. Dev. refers to standard deviation,  
 Total Obs. refers to the number of observations, and  
 n is the sample size.

**Table 27: Tests of Equality of Mean Returns for Time-of-the-Month Effect for Whole Period:  
Jan. 1995 to Nov. 2000**

	One-way ANOVA		Duncan's Test	Kruskal-Wallis		Mann-Whitney Test
	F-statistic	P-value		H-statistic	P-value	
<b>SMALL COMPANIES</b>						
1 PERNAS	0.198	0.821		0.015	0.993	
2 MULPHA	0.241	0.786		2.022	0.364	
3 MMOSAICS	0.410	0.664		0.094	0.954	
4 KAMUNTG	0.200	0.819		1.787	0.409	
5 METPLEX	1.619	0.198		3.742	0.154	
6 PMIND	0.908	0.404		0.838	0.658	
7 TV3	1.151	0.317		2.740	0.254	
8 KEMAS	0.946	0.389		1.066	0.587	
9 ANTAH	1.601	0.202		8.534	0.014*	1 & 2 ; 2 & 3 significantly different
10 DKMAT	0.567	0.567		0.955	0.620	
11 JOHAN	0.165	0.848		1.107	0.575	
12 TSTORE	0.232	0.793		3.929	0.140	
13 TNTT	2.341	0.097		6.404	0.041*	1 & 2 ; 2 & 3 significantly different
14 KKELLAS	0.462	0.630		0.454	0.797	
15 MECHMAR	1.675	0.188		3.904	0.142	
16 ILB	0.126	0.882		1.482	0.477	
17 MFCB	1.008	0.365		4.566	0.102	
18 SJA	0.074	0.929		0.085	0.958	
19 SRIWANI	1.821	0.162		5.992	0.050*	2 & 3 significantly different
20 NCK	2.904	0.055		3.939	0.140	
<b>LARGE COMPANIES</b>						
1 TENAGA	0.374	0.688		0.885	0.643	
2 TELEKOM	0.662	0.516		0.022	0.989	
3 SIME	0.397	0.673		0.062	0.970	
4 RESORTS	0.214	0.807		0.281	0.869	
5 GENTING	0.026	0.975		0.085	0.958	
6 BJTOTO	0.203	0.817		0.847	0.655	
7 TANJONG	0.171	0.843		0.421	0.810	
8 MAGNUM	0.443	0.642		0.326	0.849	
9 MAS	0.068	0.935		0.345	0.842	
10 MALAKOFF	0.143	0.867		0.107	0.948	
11 TRI	0.238	0.789		1.487	0.475	
12 TIME	1.072	0.343		1.084	0.582	
13 SARAWAK	0.690	0.502		0.966	0.617	
14 PETDAG	0.327	0.721		0.431	0.806	
15 EON	3.586	0.028*	1 & 3 significantly different	5.734	0.057	
16 NSTP	1.174	0.309		2.835	0.242	
17 HAPSENG	0.556	0.574		3.631	0.163	
18 MUIIND	0.186	0.830		0.414	0.813	
19 NALURI	0.266	0.766		0.002	0.999	
20 MPHOB	0.208	0.812		0.299	0.861	

Note: \* statistically significant at 5% level of significance

**Table 28: Tests of Equality of Mean Returns for Time-of-the-Month Effect for Whole Period:  
Jan. 1995 to Nov. 2000 Controlling for the Month-of-the-Year Effect**

	Two-way ANOVA						Duncan's Test
	F <sub>TIME</sub> statistic	P-value	F <sub>MONTH</sub> statistic	P-value	F <sub>INTERACTION</sub> statistic	P-value	
<b>SMALL COMPANIES</b>							
1 PERNAS	0.273	0.761	0.418	0.949	0.765	0.771	
2 MULPHA	0.475	0.622	0.927	0.514	1.339	0.135	
3 MMOSAICS	0.572	0.564	0.616	0.817	0.734	0.808	
4 KAMUNTG	0.536	0.585	0.836	0.604	1.167	0.269	
5 METPLEX	2.099	0.123	0.637	0.798	1.130	0.306	
6 PMIND	1.367	0.255	0.628	0.806	1.218	0.222	
7 TV3	1.384	0.251	0.449	0.934	1.145	0.291	
8 KEMAS	1.500	0.223	1.081	0.373	1.040	0.410	
9 ANTAH	1.464	0.232	0.632	0.802	1.202	0.236	
10 DKMAT	0.692	0.501	0.626	0.808	0.982	0.485	
11 JOHAN	0.212	0.809	0.555	0.866	1.577	0.044*	
12 TSTORE	0.186	0.830	0.569	0.855	0.731	0.810	
13 TNTT	2.423	0.089	1.521	0.118	0.965	0.507	
14 KKELLAS	0.770	0.463	0.785	0.656	1.183	0.253	
15 MECHMAR	1.748	0.175	0.722	0.718	1.164	0.271	
16 ILB	0.016	0.984	1.075	0.378	0.890	0.609	
17 MFCB	1.299	0.273	0.941	0.500	1.193	0.244	
18 SJA	0.169	0.844	0.610	0.822	1.392	0.107	
19 SRIWANI	1.738	0.176	1.133	0.331	0.833	0.685	
20 NCK	2.800	0.061	1.250	0.249	0.787	0.745	
<b>LARGE COMPANIES</b>							
1 TENAGA	0.407	0.665	1.777	0.053	1.307	0.155	
2 TELEKOM	0.740	0.477	1.699	0.068	1.061	0.385	
3 SIME	0.354	0.702	0.895	0.544	0.810	0.716	
4 RESORTS	0.228	0.796	0.762	0.689	1.312	0.152	
5 GENTING	0.071	0.931	0.673	0.765	1.466	0.076	
6 BJTOTO	0.191	0.826	0.863	0.576	1.048	0.400	
7 TANJONG	0.198	0.820	1.228	0.263	1.199	0.238	
8 MAGNUM	0.813	0.444	0.711	0.729	0.936	0.546	
9 MAS	0.180	0.835	0.393	0.959	1.288	0.167	
10 MALAKOFF	0.277	0.758	2.501	0.004**	1.511	0.061	
11 TRI	0.338	0.713	1.324	0.205	0.757	0.781	
12 TIME	1.980	0.138	0.692	0.747	1.306	0.156	
13 SARAWAK	0.718	0.488	0.828	0.612	1.068	0.375	
14 PETDAG	0.339	0.712	1.023	0.423	0.823	0.698	
15 EON	3.652	0.026*	1.599	0.093	1.484	0.069	1 & 3 significantly different
16 NSTP	1.541	0.215	0.423	0.947	0.661	0.880	
17 HAPSENG	0.545	0.580	0.878	0.562	0.875	0.629	
18 MUIIND	0.389	0.678	0.540	0.877	0.898	0.598	
19 NALURI	0.734	0.480	0.635	0.800	0.901	0.594	
20 MPHOB	0.657	0.519	1.147	0.320	1.570	0.045*	

Note: \* statistically significant at 5% level of significance,

\*\* statistically significant at 1% level of significance,

F<sub>TIME</sub> refers to the F-statistic for testing the time-of-the-month effect,

F<sub>MONTH</sub> refers to the F-statistic for testing the month-of-the-year effect, and

F<sub>INTERACTION</sub> refers to the F-statistic for testing the interaction between these two effects.

#### **4.8 The Time-of-the-Month Effect for Subperiod 1: 3 January 1995 to 30 June 1997**

From the results of Kolgomorov-Smirnov statistic in Table 29, we can deduce that most of the trading/services stock returns in the first period are not normally distributed. Thus, we have to employ an alternative test, i.e., nonparametric test to test the hypothesis in this period.

Table 29 details the results of the Levene statistic, i.e., it is used to test the equality of variances in the first period. The results imply that most of the stocks in this period have equal population variances. There are 3 stocks from the large companies with unequal variances of returns for each one third of a month.

The mean, standard deviation, and size of the sample for each one third of a month for the first period are summarized in Table 30. For 6 stocks (30%) from the small companies and 5 stocks (25%) from the large companies, the returns are highest in the first third of a month, dropped in the second third of a month, and are lowest and negative in the last third of a month. Besides that, 4 stocks (20%) for the small companies and 11 stocks (55%) from the large companies reveal that the returns are highest in the first third of a month and are lowest and negative in the second third of a month. In addition, we note that 3 stocks (15%) from the small companies and 1 stock (5%) from the large companies have the highest returns in the last third of a month and have lowest and negative returns in the first third of a month. Other stocks show mixed results.

Table 31 details the results of the statistical tests of equality of mean returns between the first third of a month, second third of a month, and last third of a month. Both the one-way ANOVA and Kruskal-Wallis tests are utilized for this period. Significant results imply that at least two of the mean returns are different at five per cent level of significance. But from the F-statistic and H-statistic, we cannot identify any significant results in the first period. This means that there is no statistically significant difference between the mean returns for the first third of a month, second third of a month, and last third of a month. From the results, we can deduce that there is no time-of-the-month effect in the first period.

The results of the two-way ANOVA in the first period are presented in Table 32. This test is used to test the equality of mean returns after controlling for the month-of-the-year effect. From this table, 3 stocks from the large companies show a significant interaction between the time-of-the-month and month-of-the-year effects in the first period. Thus, the result remains the same when we control for the month-of-the-year effect, i.e., no time-of-the month effect and month-of-the-year effect can be found for the first period of the study.

**Table 29: Results of Kolmogorov-Smirnov Test for Normality and Levene Test for Equality of Variances for Returns of Time-of-the-Month Effect of Subperiod 1; Jan. 1995 to Jun. 1997**

	Kolmogorov-Smirnov Statistic			Levene Statistic
	First Third	Second Third	Last Third	
<b>SMALL COMPANIES</b>				
1 PERNAS	1.795**	1.843**	1.903**	1.362
2 MULPHA	1.912**	1.533*	1.657**	1.598
3 MMOSAICS	2.030**	1.616*	1.654**	0.171
4 KAMUNTG	1.642**	1.470*	1.329	0.157
5 METPLEX	1.802**	1.177	1.656**	0.120
6 PMIND	1.782**	1.357*	1.580*	1.791
7 TV3	2.274**	2.388**	2.278**	1.530
8 KEMAS	1.725**	1.235	1.160	1.848
9 ANTAH	1.690**	1.687**	1.422*	1.317
10 DKMAT	2.177**	1.689**	1.889**	0.735
11 JOHAN	2.718**	1.893**	1.858**	2.261
12 TSTORE	2.164**	1.727**	1.949**	0.033
13 TNTT	1.555*	1.917**	2.157**	2.079
14 KKELLAS	1.106	1.899**	1.418*	1.973
15 MECHMAR	2.223**	1.062	1.452*	0.076
16 ILB	1.932**	1.898**	2.046**	2.311
17 MFCB	1.355	1.734**	1.505*	1.461
18 SJA	1.530*	1.747**	1.891**	2.333
19 SRIWANI	1.298	1.243	2.392**	2.688
20 NCK	1.996**	2.129**	2.087**	0.930
<b>LARGE COMPANIES</b>				
1 TENAGA	1.796**	1.438*	2.216**	2.214
2 TELEKOM	1.200	1.811**	1.607*	1.603
3 SIME	1.522*	1.493*	1.906**	0.154
4 RESORTS	1.651**	1.857**	1.423*	3.127*
5 GENTING	1.751**	1.902**	1.075	3.421*
6 BJTOTO	1.899**	1.784**	2.599**	0.924
7 TANJONG	1.794**	1.630**	1.483*	0.265
8 MAGNUM	2.023**	1.375*	1.538*	0.494
9 MAS	1.624**	1.832**	2.197**	0.772
10 MALAKOFF	2.249**	2.171**	2.432**	2.562
11 TRI	1.504*	0.999	1.297	0.369
12 TIME	2.047**	1.555*	1.432*	0.177
13 SARAWAK	2.314**	2.173**	0.975	2.377
14 PETDAG	2.223**	2.559**	2.082**	3.245*
15 EON	1.838**	2.015**	1.731**	1.195
16 NSTP	2.066**	2.312**	2.133**	0.667
17 HAPSENG	2.848**	2.247**	2.125**	0.366
18 MUIIND	1.436*	1.903**	1.947**	0.831
19 NALURI	2.010**	1.448*	1.691**	0.494
20 MPHB	1.483*	1.203	1.185	1.202

Note: \* statistically significant at 5% level of significance

\*\* statistically significant at 1% level of significance

**Table 30: Descriptive Statistics of Returns of Time-of-the-Month Effect for Subperiod 1:  
Jan. 1995 to Jun. 1997**

		First Third			Second Third			Last Third			Total Obs.
		Mean	Std. Dev.	n	Mean	Std. Dev.	n	Mean	Std. Dev.	n	
<b>SMALL COMPANIES</b>											
1	PERNAS	0.0002	0.0260	187	-0.0011	0.0287	200	-0.0004	0.0217	196	583
2	MULPHA	-0.0005	0.0262	187	-0.0009	0.0225	200	-0.0018	0.0288	196	583
3	MMOSAICS	0.0014	0.0252	187	-0.0006	0.0239	200	-0.0019	0.0248	196	583
4	KAMUNTG	0.0003	0.0230	187	0.0002	0.0231	200	-0.0022	0.0230	196	583
5	METPLEX	0.0034	0.0228	197	-0.0010	0.0233	200	-0.0006	0.0305	196	583
6	PMIND	-0.0002	0.0218	187	-0.0003	0.0242	200	-0.0022	0.0228	196	583
7	TV3	0.0007	0.0209	187	0.0014	0.0197	200	0.0012	0.0238	196	583
8	KEMAS	0.00004	0.0305	187	-0.0016	0.0231	200	-0.0014	0.0271	196	583
9	ANTAH	-0.0001	0.0236	187	0.0030	0.0298	200	-0.0015	0.0249	196	583
10	DKMAT	-0.0005	0.0208	187	-0.0012	0.0228	200	-0.0010	0.0226	196	583
11	JOHAN	-0.0009	0.0194	187	-0.0015	0.0195	200	0.00001	0.0243	196	583
12	TSTORE	-0.0018	0.0230	187	0.0004	0.0222	200	0.0009	0.0251	196	583
13	TNTT	-0.0009	0.0299	187	0.0033	0.0290	200	0.0026	0.0399	196	583
14	KKELLAS	0.0003	0.0226	187	-0.0011	0.0220	200	-0.0017	0.0189	196	583
15	MECHMAR	0.0011	0.0279	187	-0.0011	0.0257	200	-0.0026	0.0265	196	583
16	ILB	-0.0009	0.0295	187	-0.0001	0.0234	200	0.0020	0.0319	196	583
17	MFCB	-0.0014	0.0218	187	-0.0001	0.0254	200	-0.0019	0.0255	196	583
18	SJA	-0.0006	0.0288	187	0.0005	0.0394	200	0.0015	0.0392	196	583
19	SRIWANI	-0.0012	0.0233	187	0.0009	0.0279	200	-0.0004	0.0415	196	583
20	NCK	0.0007	0.0318	187	0.0008	0.0304	200	-0.0015	0.0237	196	583
<b>LARGE COMPANIES</b>											
1	TENAGA	0.0008	0.0201	187	-0.0012	0.0182	200	0.0004	0.0162	196	583
2	TELEKOM	0.0008	0.0155	187	-0.0015	0.0141	200	0.0005	0.0150	196	583
3	SIME	0.0012	0.0184	187	-0.0009	0.0178	200	0.0006	0.0181	196	583
4	RESORTS	-0.0003	0.0227	187	-0.0039	0.0176	200	-0.0010	0.0193	196	583
5	GENTING	0.0004	0.0205	187	-0.0020	0.0161	200	-0.0015	0.0188	196	583
6	BJTOTD	0.0019	0.0191	187	0.0009	0.0185	200	0.0032	0.0230	196	583
7	TANJONG	0.0015	0.0220	187	-0.0012	0.0228	200	-0.0003	0.0218	196	583
8	MAGNUM	0.0026	0.0199	187	-0.0012	0.0208	200	-0.0012	0.0206	196	583
9	MAS	0.0004	0.0188	187	-0.0006	0.0165	200	-0.0008	0.0181	196	583
10	MALAKOFF	0.0023	0.0211	187	-0.0005	0.0169	200	0.0012	0.0184	196	583
11	TRI	-0.0010	0.0266	187	-0.0014	0.0248	200	-0.0015	0.0241	196	583
12	TIME	-0.0002	0.0284	187	-0.0024	0.0255	200	-0.0003	0.0274	196	583
13	SARAWAK	0.00004	0.0218	187	-0.0013	0.0375	200	-0.0024	0.0248	196	583
14	PETDAG	0.0013	0.0197	187	-0.0005	0.0154	200	-0.0002	0.0155	196	583
15	EON	0.0013	0.0171	187	-0.0007	0.0160	200	-0.0010	0.0157	196	583
16	NSTP	0.0007	0.0177	187	0.0001	0.0185	200	0.0012	0.0184	196	583
17	HAPSENG	0.0001	0.0237	187	-0.00003	0.0172	200	0.0015	0.0196	196	583
18	MUIIND	-0.0016	0.0202	187	-0.0006	0.0209	200	-0.0002	0.0250	196	583
19	NALURI	0.0003	0.0240	187	-0.0031	0.0216	200	-0.0011	0.0216	196	583
20	MPHB	0.0016	0.0245	187	-0.0012	0.0263	200	-0.0007	0.0225	196	583

Note: Std. Dev. refers to standard deviation,  
 Total Obs. refers to the number of observations, and  
 n is the sample size.

**Table 31: Tests of Equality of Mean Returns for Time-of-the-Month Effect for Subperiod 1:  
Jan. 1995 to Jun. 1997**

	One-way ANOVA		Duncan's Test	Kruskal-Wallis		Mann-Whitney Test
	F-statistic	P-value		H-statistic	P-value	
<b>SMALL COMPANIES</b>						
1 PERNAS	0.109	0.896		0.417	0.812	
2 MULPHA	0.123	0.885		0.907	0.635	
3 MMOSAICS	0.871	0.419		0.573	0.751	
4 KAMUNTG	0.729	0.483		0.763	0.683	
5 METPLEX	1.715	0.181		2.794	0.247	
6 PMIND	0.489	0.614		0.378	0.828	
7 TV3	0.052	0.950		0.767	0.681	
8 KEMAS	0.209	0.811		0.048	0.976	
9 ANTAH	1.512	0.221		3.419	0.181	
10 DKMAT	0.052	0.949		0.076	0.963	
11 JOHAN	0.258	0.773		0.811	0.666	
12 TSTORE	0.730	0.482		5.335	0.069	
13 TNTT	0.873	0.418		1.064	0.587	
14 KKELLAS	0.477	0.621		0.936	0.626	
15 MECHMAR	0.919	0.399		0.480	0.787	
16 ILB	0.536	0.585		0.884	0.643	
17 MFCB	0.297	0.743		0.178	0.915	
18 SJA	0.163	0.850		0.222	0.895	
19 SRIWANI	0.208	0.812		0.558	0.757	
20 NCK	0.379	0.685		0.285	0.867	
<b>LARGE COMPANIES</b>						
1 TENAGA	0.692	0.501		0.739	0.691	
2 TELEKOM	1.372	0.254		2.036	0.361	
3 SIME	0.672	0.511		2.221	0.329	
4 RESORTS	1.871	0.155		4.114	0.128	
5 GENTING	0.908	0.404		1.524	0.467	
6 BJTOTO	0.668	0.513		1.276	0.528	
7 TANJONG	0.713	0.491		0.402	0.818	
8 MAGNUM	2.156	0.117		2.210	0.331	
9 MAS	0.248	0.781		1.212	0.546	
10 MALAKOFF	1.104	0.332		0.650	0.722	
11 TRI	0.018	0.983		0.328	0.849	
12 TIME	0.400	0.671		0.796	0.672	
13 SARAWAK	0.340	0.712		0.377	0.828	
14 PETDAG	0.644	0.525		1.806	0.405	
15 EON	1.091	0.337		1.112	0.574	
16 NSTP	0.173	0.841		0.380	0.827	
17 HAPSENG	0.310	0.733		1.706	0.426	
18 MUIIND	0.195	0.823		0.092	0.955	
19 NALURI	1.163	0.313		1.482	0.477	
20 MPHIB	0.677	0.509		0.862	0.650	

**Table 32: Tests of Equality of Mean Returns for Time-of-the-Month Effect for Subperiod 1:  
Jan. 1995 to Jun. 1997 Controlling for the Month-of-the-Year Effect**

	Two-way ANOVA						Duncan's Test
	F <sub>TIME</sub> statistic	P-value	F <sub>MONTH</sub> statistic	P-value	F <sub>INTERACTION</sub> statistic	P-value	
<b>SMALL COMPANIES</b>							
1 PERNAS	0.025	0.975	0.457	0.929	0.910	0.582	
2 MULPHA	0.137	0.872	0.977	0.467	0.849	0.664	
3 MMOSAICS	0.963	0.382	0.375	0.966	0.998	0.464	
4 KAMUNTG	0.613	0.542	0.865	0.575	1.201	0.240	
5 METPLEX	1.708	0.182	0.348	0.974	0.722	0.818	
6 PMIND	0.538	0.584	0.458	0.928	0.867	0.640	
7 TV3	0.000	1.000	0.990	0.454	1.351	0.132	
8 KEMAS	0.208	0.812	1.007	0.439	0.912	0.579	
9 ANTAH	1.196	0.303	0.504	0.901	1.395	0.109	
10 DKMAT	0.096	0.908	1.306	0.217	0.436	0.989	
11 JOHAN	0.162	0.851	0.584	0.843	0.944	0.535	
12 TSTORE	0.503	0.605	0.732	0.708	1.183	0.257	
13 TNTT	0.662	0.516	1.198	0.285	1.118	0.322	
14 KKELLAS	0.702	0.496	1.346	0.195	1.550	0.053	
15 MECHMAR	0.759	0.469	0.938	0.503	1.545	0.054	
16 ILB	0.456	0.634	0.648	0.789	0.838	0.678	
17 MFCB	0.179	0.836	1.355	0.191	0.667	0.873	
18 SJA	0.161	0.851	0.706	0.733	0.841	0.675	
19 SRIWANI	0.222	0.801	0.424	0.946	0.879	0.624	
20 NCK	0.377	0.686	1.150	0.320	1.342	0.137	
<b>LARGE COMPANIES</b>							
1 TENAGA	0.944	0.390	0.853	0.587	1.006	0.455	
2 TELEKOM	1.217	0.297	0.683	0.755	1.027	0.428	
3 SIME	0.616	0.540	0.521	0.890	0.499	0.974	
4 RESORTS	2.133	0.120	0.488	0.911	0.735	0.805	
5 GENTING	1.145	0.319	0.491	0.909	1.023	0.433	
6 BJTOTO	0.918	0.400	0.445	0.935	1.662	0.030*	
7 TANJONG	0.679	0.508	0.357	0.971	1.932	0.007**	
8 MAGNUM	2.416	0.090	0.683	0.755	1.838	0.012*	
9 MAS	0.412	0.662	1.047	0.404	0.808	0.718	
10 MALAKOFF	1.161	0.314	0.818	0.622	0.686	0.856	
11 TRI	0.008	0.992	0.786	0.654	0.788	0.742	
12 TIME	0.398	0.672	0.363	0.970	1.024	0.432	
13 SARAWAK	0.344	0.709	1.087	0.369	1.043	0.409	
14 PETDAG	1.093	0.336	0.877	0.761	1.348	0.134	
15 EON	1.010	0.365	0.872	0.568	1.045	0.406	
16 NSTP	0.163	0.849	0.652	0.784	0.579	0.938	
17 HAPSENG	0.275	0.759	0.644	0.791	0.822	0.699	
18 MUIIND	0.103	0.903	0.314	0.983	0.693	0.849	
19 NALURI	1.479	0.229	0.512	0.895	1.147	0.292	
20 MPHOB	1.151	0.317	1.262	0.243	1.114	0.327	

Note: \* statistically significant at 5% level of significance,

\*\* statistically significant at 1% level of significance,

F<sub>TIME</sub> refers to the F-statistic for testing the time-of-the-month effect,

F<sub>MONTH</sub> refers to the F-statistic for testing the month-of-the-year effect, and

F<sub>INTERACTION</sub> refers to the F-statistic for testing the interaction between these two effects.

#### **4.9 The Time-of-the-Month Effect for Subperiod 2: 1 July 1997 to 2 November 2000**

Table 33 details the results for the Kolgomorov-Smirnov test for normality in the second period. The null hypothesis of normality is rejected at five per cent level of significance for all the returns. Therefore, we can conclude that the majority of the trading/services stock returns are not normally distributed. Thus, the nonparametric test is useful for analysis.

The Levene test is used for testing the homogeneity of variances in the second period. The results can be obtained from the Table 33. We can see that only 2 stocks from the large companies show rejection of the null hypothesis at five per cent level of significance, i.e., the variance of returns for each one third of a month is not equal. It reveals that majority of the stocks have equal population variances in this period.

The descriptive statistics of returns for each one third of a month in the second period are given in Table 34. It lists the mean, standard deviation, and size of the sample for forty stocks. For 20% (4 stocks) of the small companies and 30% (6 stocks) of the large companies, the returns are highest in the first third of a month, dropped in the second third of a month, and are lowest and negative in the last third of a month. Besides that, 70% (14 stocks) of the small companies and 45% (9 stocks) of the large companies report that the returns are highest in the second third of a month and are lowest and negative in the last third of a month. Only a minority of stocks show mixed results. This includes cases where the returns are highest

in the first third of a month and are lowest and negative in the second third of a month, or the returns are highest in the last third of a month and are lowest and negative in the first third of a month.

To test the equality of mean returns between the first third, second third, and last third of a month in the second period, both the one-way ANOVA and Kruskal-Wallis tests are performed and the results are reported in Table 35. From the parametric test, we cannot find any significant results. From the nonparametric test, only 5% (1 stock) of the small companies show significantly different mean returns between each one third of a month. Thus, the Mann-Whitney test is performed for this case to identify which of the two mean returns are different at five per cent level of significance. This result shows that there is a statistically significant difference between the mean returns for the second third and last third of a month. Generally, we can conclude that there appears to be no persistent time-of-the-month effect in the second period.

Table 36 reports the results of the two-way ANOVA in the second period. It details the statistical tests of equality of mean returns after controlling for the month-of-the-year effect. Only 2 stocks from the large companies display significant month-of-the-year effect. In addition, this result also reveals that there are 5 stocks that show a significant interaction between the time-of-the-month and month-of-the-year effects in this period, namely 3 stocks from the small companies and 2 stocks from the large companies.

Therefore, after controlling for the month-of-the-year effect, there is no persistent time-of-the-month effect for the second period.

The patterns of the time-of-the-month effect remain the same with the different periods of study. Thus, we can deduce that there appears to be no persistent time-of-the-month effect during the whole period, and the first and second subperiods of study.

**Table 33: Results of Kolmogorov-Smirnov Test for Normality and Levene Test for Equality of Variances for Returns of Time-of-the-Month Effect of Subperiod 2: Jul. 1997 to Nov. 2000**

	Kolmogorov-Smirnov Statistic			Levene Statistic
	First Third	Second Third	Last Third	
<b>SMALL COMPANIES</b>				
1 PERNAS	2.111**	1.641**	1.963**	0.039
2 MULPHA	2.442**	1.997**	2.525**	0.778
3 MMOSAICS	2.123**	2.180**	1.904**	0.442
4 KAMUNTG	1.742**	2.091**	2.337**	1.038
5 METPLEX	1.887**	1.270	1.534*	0.332
6 PMIND	2.496**	2.274**	2.078**	0.265
7 TV3	1.868**	1.792**	1.683**	0.396
8 KEMAS	2.728**	2.017**	1.578*	0.251
9 ANTAH	2.553**	1.475*	2.081**	0.499
10 DKMAT	2.254**	1.872**	1.387*	0.066
11 JOHAN	2.644**	1.770**	2.196**	1.039
12 TSTORE	2.640**	1.528*	2.211**	0.529
13 TNTT	1.965**	2.052**	1.723**	1.633
14 KKELLAS	2.639**	2.103**	1.703**	0.007
15 MECHMAR	2.015**	1.620**	2.306**	1.205
16 ILB	2.409**	2.122**	2.225**	0.013
17 MFCB	2.634**	1.977**	1.744**	1.759
18 SJA	2.207**	2.007**	1.738**	0.234
19 SRIWANI	2.109**	1.468*	1.517*	0.067
20 NCK	1.807**	2.115**	1.690**	0.740
<b>LARGE COMPANIES</b>				
1 TENAGA	2.171**	2.042**	1.640**	1.883
2 TELEKOM	1.957**	1.541*	1.587*	0.646
3 SIME	2.051**	1.880**	1.202	1.143
4 RESORTS	1.237	1.643**	1.474*	0.692
5 GENTING	1.391*	1.473*	1.483*	0.100
6 BJTODO	2.134**	1.289	1.635**	1.822
7 TANJONG	2.104**	1.459*	1.308	0.890
8 MAGNUM	1.486*	1.168	0.917	1.069
9 MAS	1.625**	2.361**	1.880**	1.062
10 MALAKOFF	3.030**	2.577**	2.777**	0.424
11 TRI	1.849**	2.371**	1.307	3.307*
12 TIME	2.539**	1.819**	1.629**	0.613
13 SARAWAK	1.305	2.072**	1.312	4.116*
14 PETDAG	2.845**	3.166**	3.254**	0.225
15 EON	1.952**	2.185**	1.900**	1.742
16 NSTP	2.239**	1.677**	2.197**	1.234
17 HAPSENG	2.723**	2.887**	2.594**	1.110
18 MUIIND	2.181**	1.846**	1.774**	2.027
19 NALURI	2.326**	1.611*	1.394*	0.891
20 MPHB	1.786**	1.559*	1.904**	0.551

Note: \* statistically significant at 5% level of significance

\*\* statistically significant at 1% level of significance

**Table 34: Descriptive Statistics of Returns of Time-of-the-Month Effect for Subperiod 2:  
Jul. 1997 to Nov. 2000**

		First Third			Second Third			Last Third			Total Obs.
		Mean	Std. Dev.	n	Mean	Std. Dev.	n	Mean	Std. Dev.	n	
<b>SMALL COMPANIES</b>											
1	PERNAS	-0.0006	0.0360	255	-0.0002	0.0321	269	-0.0024	0.0351	268	792
2	MULPHA	-0.0013	0.0618	255	-0.0014	0.0630	272	-0.0039	0.0546	268	795
3	MMOSAICS	0.0003	0.0456	251	-0.0021	0.0456	272	0.00002	0.0443	266	789
4	KAMUNTG	-0.0003	-0.0021	272	-0.0021	0.0657	272	-0.0019	0.0540	261	782
5	METPLEX	-0.0007	0.0512	255	-0.0003	0.0503	272	-0.0061	0.0465	268	795
6	PMIND	-0.0017	0.0593	246	0.0002	0.0551	265	-0.0051	0.0548	258	769
7	TV3	0.0004	0.0521	255	0.0001	0.0568	270	-0.0065	0.0574	268	793
8	KEMAS	0.0016	0.0639	254	0.0008	0.0557	264	-0.0046	0.0534	260	778
9	ANTAH	-0.0026	0.0552	255	0.0012	0.0534	272	-0.0042	0.0502	268	795
10	DKMAT	-0.0017	0.0504	255	0.0005	0.0489	277	-0.0044	0.0470	263	795
11	JOHAN	-0.0013	0.0556	255	-0.0008	0.0469	272	-0.0041	0.0439	268	795
12	TSTORE	-0.0003	0.0431	239	0.0004	0.0456	260	-0.0025	0.0457	265	764
13	TNTT	-0.0010	0.0435	243	0.0039	0.0453	263	-0.0054	0.0503	253	759
14	KKELLAS	-0.0005	0.0634	246	0.0002	0.0607	269	-0.0038	0.0581	255	770
15	MECHMAR	-0.0031	0.0531	248	0.0027	0.0569	267	-0.0055	0.0521	263	778
16	ILB	-0.0023	0.0551	231	-0.0005	0.0515	265	-0.0025	0.0514	255	751
17	MFCB	-0.0002	0.0553	255	0.0008	0.0538	272	-0.0049	0.0575	268	795
18	SJA	-0.0006	0.0532	251	-0.0018	0.0490	265	-0.0042	0.0539	260	776
19	SRIWANI	-0.0025	0.0595	255	0.0019	0.0592	272	-0.0079	0.0575	264	791
20	NCK	-0.0042	0.0536	245	0.0036	0.0619	258	-0.0081	0.0581	251	754
<b>LARGE COMPANIES</b>											
1	TENAGA	0.0010	0.0424	255	0.0001	0.0402	270	-0.0016	0.0314	268	793
2	TELEKOM	0.0017	0.0358	251	0.0012	0.0358	272	-0.0018	0.0321	268	791
3	SIME	-0.0003	0.0385	246	0.0003	0.0340	269	-0.0028	0.0304	265	770
4	RESORTS	-0.0013	0.0391	255	0.0018	0.0398	270	-0.0027	0.0372	268	793
5	GENTING	-0.0016	0.0277	256	0.0007	0.0302	270	-0.0004	0.0294	268	793
6	BJTOTD	-0.0014	0.0447	254	0.0010	0.0402	271	-0.0031	0.0354	268	793
7	TANJONG	-0.0011	0.0384	253	0.0012	0.0386	271	-0.0013	0.0317	268	792
8	MAGNUM	-0.0014	0.0379	255	-0.0012	0.0400	268	-0.0019	0.0342	268	791
9	MAS	-0.0009	0.0459	255	-0.0013	0.0518	272	0.0003	0.0385	268	795
10	MALAKOFF	-0.0001	0.0414	248	0.0006	0.0411	262	-0.0012	0.0359	258	766
11	TRI	0.0004	0.0645	255	0.0001	0.0770	272	-0.0031	0.0482	268	795
12	TIME	0.0056	0.0858	254	-0.0027	0.0777	261	-0.0017	0.0660	264	779
13	SARAWAK	-0.0016	0.0429	255	0.0016	0.0471	270	-0.0025	0.0329	266	791
14	PETDAG	-0.0005	0.0288	245	-0.0014	0.0302	261	-0.0004	0.0294	256	762
15	EON	0.0026	0.0377	246	-0.0018	0.0437	263	-0.0053	0.0316	260	769
16	NSTP	0.0017	0.0436	255	-0.0008	0.0457	270	-0.0049	0.0423	268	793
17	HAPSENG	-0.0011	0.0370	251	-0.0009	0.0406	261	0.0012	0.0288	261	773
18	MUIIND	0.0007	0.0550	253	-0.0021	0.0619	271	-0.0035	0.0489	267	791
19	NALURI	-0.0006	0.0620	255	0.0002	0.0642	272	-0.0037	0.0569	268	795
20	MPHB	-0.0018	0.0537	249	-0.0011	0.0555	268	-0.0034	0.0519	261	778

Note: Std. Dev. refers to standard deviation,  
 Total Obs. refers to the number of observations, and  
 n is the sample size.

**Table 35: Tests of Equality of Mean Returns for Time-of-the-Month Effect for Subperiod 2:  
Jul. 1997 to Nov. 2000**

	One-way ANOVA		Duncan's Test	Kruskal-Wallis		Mann-Whitney Test
	F-statistic	P-value		H-statistic	P-value	
<b>SMALL COMPANIES</b>						
1 PERNAS	0.298	0.742		0.235	0.889	
2 MULPHA	0.159	0.853		1.492	0.474	
3 MMOSAICS	0.242	0.785		0.542	0.763	
4 KAMUNTG	0.074	0.928		0.738	0.691	
5 METPLEX	1.129	0.324		3.229	0.199	
6 PMIND	0.604	0.547		1.193	0.551	
7 TV3	1.301	0.273		2.308	0.315	
8 KEMAS	0.900	0.407		1.986	0.370	
9 ANTAH	0.724	0.485		4.882	0.087	
10 DKMAT	0.674	0.510		1.573	0.455	
11 JOHAN	0.369	0.692		2.317	0.314	
12 TSTORE	0.306	0.736		0.616	0.735	
13 TNTT	2.555	0.078		6.482	0.039*	2 & 3 significantly different
14 KKELLAS	0.319	0.727		0.917	0.632	
15 MECHMAR	1.600	0.203		4.276	0.118	
16 ILB	0.120	0.887		1.152	0.562	
17 MFCB	0.800	0.450		5.106	0.078	
18 SJA	0.306	0.736		0.508	0.776	
19 SRIWANI	1.846	0.159		5.667	0.059	
20 NCK	2.697	0.068		4.232	0.121	
<b>LARGE COMPANIES</b>						
1 TENAGA	0.317	0.728		1.906	0.386	
2 TELEKOM	0.776	0.460		1.089	0.580	
3 SIME	0.590	0.554		0.988	0.610	
4 RESORTS	0.928	0.396		3.231	0.199	
5 GENTING	0.399	0.671		1.069	0.586	
6 BJTOTO	0.695	0.499		2.545	0.280	
7 TANJONG	0.404	0.668		1.473	0.479	
8 MAGNUM	0.026	0.974		0.637	0.727	
9 MAS	0.084	0.920		1.286	0.526	
10 MALAKOFF	0.132	0.876		0.665	0.717	
11 TRI	0.233	0.792		1.249	0.535	
12 TIME	0.897	0.408		0.503	0.778	
13 SARAWAK	0.712	0.491		0.680	0.712	
14 PETDAG	0.094	0.911		0.238	0.888	
15 EON	2.728	0.066		5.654	0.059	
16 NSTP	1.515	0.220		3.820	0.148	
17 HAPSENG	0.313	0.732		2.920	0.232	
18 MUIIND	0.366	0.694		0.298	0.862	
19 NALURI	0.292	0.747		0.522	0.770	
20 MPHB	0.125	0.883		0.681	0.711	

Note: \* statistically significant at 5% level of significance

**Table 36: Tests of Equality of Mean Returns for Time-of-the-Month Effect for Subperiod 2:  
Jul. 1997 to Nov. 2000 Controlling for the Month-of-the-Year Effect**

	Two-way ANOVA						Duncan's Test
	F <sub>TIME</sub> statistic	P-value	F <sub>MONTH</sub> statistic	P-value	F <sub>INTERACTION</sub> statistic	P-value	
<b>SMALL COMPANIES</b>							
1 PERNAS	0.220	0.803	0.631	0.803	1.236	0.209	
2 MULPHA	0.196	0.822	0.647	0.789	1.638	0.033*	
3 MMOSAICS	0.236	0.790	0.567	0.856	0.889	0.610	
4 KAMUNTG	0.160	0.852	0.574	0.851	1.343	0.135	
5 METPLEX	1.069	0.344	0.466	0.925	1.478	0.073	
6 PMIND	1.178	0.309	0.639	0.796	1.471	0.076	
7 TV3	1.498	0.224	0.479	0.917	1.102	0.337	
8 KEMAS	1.188	0.305	0.687	0.752	1.020	0.436	
9 ANTAH	0.625	0.536	0.602	0.828	1.243	0.203	
10 DKMAT	0.668	0.513	0.268	0.991	0.912	0.579	
11 JOHAN	0.276	0.759	0.416	0.949	1.623	0.036*	
12 TSTORE	0.286	0.751	0.391	0.960	0.630	0.905	
13 TNTT	2.950	0.053	0.882	0.558	1.136	0.301	
14 KKELLAS	0.329	0.719	0.485	0.913	1.303	0.160	
15 MECHMAR	1.319	0.268	0.440	0.938	1.449	0.084	
16 ILB	0.065	0.937	1.078	0.376	1.212	0.229	
17 MFCB	0.893	0.410	0.517	0.892	1.234	0.210	
18 SJA	0.404	0.668	0.472	0.921	1.752	0.018*	
19 SRIWANI	1.829	0.161	1.325	0.205	1.214	0.227	
20 NCK	2.350	0.096	0.832	0.608	0.721	0.821	
<b>LARGE COMPANIES</b>							
1 TENAGA	0.203	0.816	1.413	0.162	1.425	0.094	
2 TELEKOM	0.528	0.590	1.578	0.100	1.248	0.199	
3 SIME	0.405	0.867	1.164	0.309	1.282	0.174	
4 RESORTS	1.048	0.351	0.862	0.578	1.523	0.059	
5 GENTING	0.381	0.684	1.025	0.422	1.779	0.015*	
6 BJTOTO	0.930	0.395	1.053	0.398	1.265	0.186	
7 TANJONG	0.651	0.522	1.436	0.152	1.258	0.191	
8 MAGNUM	0.036	0.964	0.423	0.946	0.751	0.787	
9 MAS	0.093	0.911	0.362	0.970	1.229	0.214	
10 MALAKOFF	0.140	0.870	2.042	0.022*	1.759	0.017*	
11 TRI	0.266	0.766	1.220	0.269	0.944	0.536	
12 TIME	1.879	0.154	0.915	0.525	1.475	0.074	
13 SARAWAK	0.788	0.455	0.624	0.809	1.424	0.094	
14 PETDAG	0.048	0.953	0.971	0.471	0.886	0.615	
15 EON	2.528	0.080	2.145	0.016*	1.441	0.087	
16 NSTP	1.636	0.195	0.360	0.971	0.636	0.900	
17 HAPSENG	0.544	0.581	0.549	0.870	0.953	0.524	
18 MUIIND	0.524	0.592	0.510	0.897	0.898	0.598	
19 NALURI	0.598	0.550	0.547	0.871	0.870	0.636	
20 MPHB	0.272	0.762	0.675	0.763	1.490	0.069	

Note: \* statistically significant at 5% level of significance,

F<sub>TIME</sub> refers to the F-statistic for testing the time-of-the-month effect,

F<sub>MONTH</sub> refers to the F-statistic for testing the month-of-the-year effect, and

F<sub>INTERACTION</sub> refers to the F-statistic for testing the interaction between these two effects.