

## Behaviour of Stock Returns in the KLSE: A Test of the Random Walk Hypothesis

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### ABSTRACT

*A sample of 224 companies listed in the Kuala Lumpur Stock Exchange was taken for the period 1991-96. The serial correlations tests of varying lags and the runs tests were employed to test for the random walk theory. The bulk of the results tilts towards the rejection of non-randomness, lending weight to the argument that the stock market has no memory, and casting doubt upon the usefulness of technical analysis.*

### ABSTRAK

*Sampel daripada 224 buah syarikat yang tersenarai dalam Bursa Saham Kuala Lumpur bagi tempoh 1991-1996 telah diambil. Ujian korelasi dan ujian larian digunakan untuk menguji teori perjalanan rawak. Sebahagian besar keputusan menyokong teori rawak dan juga idea bahawa harga saham sebelumnya tidak boleh digunakan untuk meramal harga semasa.*

### INTRODUCTION

The behaviour of stock returns (or prices) has been an important area of investigation for a long time. In the developed free-market economies, a huge amount of theoretical and empirical research has been conducted to study the behaviour of stock returns. Despite the volume of work in this area, opinion remains divided on whether previous patterns of stock returns can be used to make equity investment decisions. One group, commonly referred to as technicians, is of the opinion that "history repeats itself" so that stock price/return tends to have some identifiable patterns. More often than not, the patterns are not easily identifiable so experts are often employed to try to identify them. In contrast with the technicians, the random theorists maintain that movement in stock price/return is completely random, and the stock market has no memory. For the random-walk theorists, it is a waste of scarce resources to employ "experts" and to collect

data in order to identify stock price patterns. Despite the volume of research effort expended in the United States and Europe, the issue has yet to be completely resolved, even though according to Fama (1970) the evidence tilts towards support for the random walk hypothesis. In the developing countries with emerging stock exchanges, there has been a relative paucity of research evidence on the behaviour of stock price. Nassir Lanjong (1983), Othman Yong (1993, 1997), Fauzias (1992), Annuar, Mohamed Ariff & Shamsheer (1993) and Mansor & Kam (1996) have been in the forefront in the quest for understanding the behaviour of the stock price in the KLSE. Their findings, though, have not been unanimous concerning the weak-form efficiency tests. This study seeks to examine the stock return behaviour in the KLSE with a view to lending empirical support to either of the two rival positions. The findings will also help to answer the question: Is the random walk theory valid for Malaysia?

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## LITERATURE REVIEW

Othman Yong (1987) has provided a good review of the theory of the random walk. In this review, Othman Yong emphasizes that the random walk model is based on a number of assumptions namely, (1) expectations are rational, and (2) the stock market is efficient. According to Yong, expectations are rational if all information believed to be relevant is used by the forecaster to predict the variable under investigation. The assumption is concerned about the speed at which the market adjusts to the arrival of new information. Othman Yong stresses that the assumptions of rationality and efficiency have an important implication: no abnormal profit could consistently be earned on the basis of information already available to the public because the market instantaneously absorbs any relevant information into current prices.

In reviewing the literature on the factors affecting a stock market's level of predictability efficiency, Dawson (1984) highlights the role of frequency of trading and market size. His review suggests that the greater the number of active traders the more efficient the market will be. The review also suggests that the greater the size of the market, the greater the level of efficiency. Dawson, however, emphasizes the absence of any unanimity regarding the factors affecting a stock market's efficiency.

In his study of the efficiency of the Hong Kong stock exchange, Dawson (1984) found "mixed" results, with some periods exhibiting recognizable trends, and others showing no such trends. In view of the lack of any definite conclusion regarding the efficiency of the Hong Kong bourse, Dawson wondered whether the efficiency of the market will in the future resume, or whether the exceptions would occur again. He therefore posed a challenge for further investigation.

The challenge appears to have been taken up by several researchers, though using different stock exchanges. For example, Jegadeesh (1990) and Annuar, Mohamed Ariff, & Shamsher (1993) have conducted further

investigations into the predictable properties of stock returns at the New York and Kuala Lumpur. Using data from the New York Stock Exchange, Jegadeesh found evidence of significant "negative first-order serial correlation in monthly stock returns" (p.886). Annuar, Mohamed Ariff, and Shamsher (1993) used monthly and weekly closing prices of all KLSE indices over the period January 1977 to May 1989 to investigate the extent of the market's predictability. They used unit root analysis as well as the correlation method and reported results that implied that "the KLSE is weak-form efficient though there are pockets of inefficiency for some indices" (p.57). Fauzias (1992) studied the efficiency of the KLSE by investigating the response of the market to take-over announcements. She found that the KLSE was "reasonably efficient in its response to takeover bids that are subsequently successful" (p.93). Chee and Gupta (1996) used data on 30 KLSE-listed companies, as well as the composite indices of the KLSE, Singapore, Dow Jones Industrial Average, and the Nikkei to investigate the efficiency hypothesis. They reported results that led them to conclude that "the findings... support the usefulness of technical analysis and the fundamental approach to stock pricing, and reject the EMH in Malaysia" (p.49).

From the foregoing review, it is clear that the evidence is far from a consensus. Even if previous studies had reached a consensus, there are at least four reasons warranting further investigation. First, statistical models and their success must be measured over a long period of time. Secondly, it is possible that structural changes in the operation of the economy or the stock market could occur and cause the identified relationships to be no longer valid. Thirdly, a shift in the method of calculation of the composite index could cause a deterioration in the performance of the model. Finally, the very success of a model could be its own undoing. If a significant group of investors began to utilize the models as the primary determinant of investment strategy, their usefulness would vanish.

## DATA AND METHODOLOGY

The data used for this study covers a sample of 224 companies listed on the main board of the KLSE. The sample consists of weekly stock return data for the period January 1990 to December 1996. Sample selection was determined by data availability. The serial correlation test was conducted as follows. Let  $U_1, U_2, U_3, \dots, U_n$  be any time series. The serial correlation coefficient  $\rho_k$  of lag  $k$  is defined as:

$$\rho_k = \frac{\frac{1}{n-k} \sum_{i=1}^{n-k} \left[ u_i - \frac{1}{n-k} \sum_{i=1}^{n-k} u_i \right] \left[ u_{i+k} - \frac{1}{n-k} \sum_{i=1}^{n-k} u_{i+k} \right]}{\left\{ \frac{1}{n-k} \sum_{i=1}^{n-k} \left[ u_i - \frac{1}{n-k} \sum_{i=1}^{n-k} u_i \right]^2 \left[ u_{i+k} - \frac{1}{n-k} \sum_{i=1}^{n-k} u_{i+k} \right]^2 \right\}^{\frac{1}{2}}}$$

$$= \frac{COV(u_i, u_{i+k})}{\sigma_{u_i} \sigma_{u_{i+k}}}$$

The above formula was implemented by computing the serial correlation coefficient at various lags ranging from 1 to 11 for each of the 224 stocks. The results are reported in Appendix 1. Cooper (1974) shows that if the distribution of  $U_i$  has finite variance, then for large samples, the standard error of  $r_k$  may be computed as:

$$\left\{ \frac{1}{N-k} \right\}^{\frac{1}{2}}$$

A run is defined as a sequence of consecutive stock price changes of the same sign. Clearly, for stock price changes there are three possible types of price change, positive, negative and zero, and therefore three possible types of run. Under the assumption of independence, the total expected number of runs for all three types for a stock may be computed as:

$$m = \left[ \frac{N(N+1) + \sum_{i=1}^3 n_i^2}{N} \right]$$

where  $N$  = total number of price changes,  $n_i$  =

the number of price changes of each type. The standard deviation of  $m$  is,

$$\sigma_m = \left\{ \frac{\sum_{i=1}^3 n_{sub,i}^2 \left[ \sum_{i=1}^3 n_i^2 + N(N+1) - 2N \sum_{i=1}^3 n_i^3 - N^3 \right]}{N^2 (N-1)} \right\}^{\frac{1}{2}}$$

For large  $N$ , the sampling distribution of  $m$  is approximately normal and the standard variable may be written as:

$$Z = \frac{R - m \pm 0.5}{\sigma_m}$$

where  $R$  is the total number of runs actually observed and where the sign of the adjustment 0.5 is negative if  $R > m$  and plus otherwise.

## RESULTS

Appendix 1 shows the results of the serial correlation tests. Current returns were correlated with previous returns ranging from first to eleventh lags. The correlation results shown in Appendix 1 are summarized in Table 1.

From the table, it can be seen that 78.7 per cent of stock returns in the sample were uncorrelated with first-period lag values of stock returns. This means that 21.3 per cent of stock returns are significantly correlated with stock returns of immediate past week. This correlation is divided into 9.3% negative and 12.0 per cent positive signs. This means that for a stock whose price rose during the previous week, there is a 9.3% chance that it will fall this week; it also means that for a stock whose price rose during the previous week, there is a 12.0% chance that it will rise above this.

For the second-period lag, the explanation is similar in that 5.4 per cent of stock returns are negatively correlated with returns that prevailed in the previous fortnight; and 8.9 per cent are positively correlated. This implies that if price of a stock rises today, there

**Table 1**  
Serial Correlation Results: Various Lags

	Sig at 1%		Sig at 5%		Total 1% &		Not
	-ve	+ve	-ve	+ve	-ve	+ve	
Lag 1	2.2	1.3	7.1	10.7	9.3	12.0	78.7
Lag 2	0.9	3.1	4.5	5.8	5.4	8.9	85.7
Lag 3	7.6	15.6	0.4	0.4	8.0	16.0	76.0
Lag 4	3.1	6.7	0.4	0.9	3.5	7.6	88.9
Lag 5	3.1	5.8	1.3	0.9	4.4	6.7	88.9
Lag 6	0.9	0.0	5.0	8.9	5.9	8.9	85.2
Lag 7	0.0	0.0	2.7	10.7	2.7	10.7	86.6
Lag 8	0.4	1.8	2.2	4.5	2.6	6.3	91.1
Lag 9	0.9	0.9	4.5	3.6	5.4	4.5	90.1
Lag 10	2.7	2.7	0.4	2.7	3.1	5.4	91.5
Lag 11	0.9	5.4	0.0	0.4	0.9	5.8	93.3
Average	2.1	3.9	2.6	4.5	4.7	8.4	86.9

is a 5.4 per cent chance that it will fall in the next two weeks, and a 8.9 per cent chance that it will rise.

The last row of the table gives the average levels of correlation. This row shows that 86.9 per cent of movements in stock price are not correlated with previous price. Thus, based on the correlation test, there is a preponderant absence of significant correlation.

Appendix 2 shows the detailed results of the runs tests, as well as those of tests for normality. A summary of the results for the tests for normality is given in Table 2. From the table, it is clear that only 19 out of the 224 stocks in the sample exhibited evidence for normality. The remaining, an overwhelming 91.5% of the stocks showed evidence of non-normality.

The runs test was conducted three times: the first test uses data for the first half of the sample; the second test uses data for the second half of the sample period; while the third tests uses data for the entire sample period. This would help gauge the extent to

which the results are sensitive to changes in the sample period. The results, detailed in Appendix 2, are summarized in Table 3. The sample period was divided into two sub periods. The results obtained from the first, second, and combined period are given in columns 3 through 5 respectively. For the first period, 89.7 per cent of the stocks are random, with only 10.3 per cent of them showing signs of non-randomness. The result for the second sub-period has a greater proportion of stocks that deviate from randomness 18.3 per cent. The combined period has a greater proportion of stocks with evidence of non-randomness. When the whole sample was used to test for randomness, it turned out that 27.7 per cent of stocks deviated from randomness, a rather high proportion in comparison with those for the two sub-periods. Thus, the runs test results appear to be in tandem with those of the correlation test as the evidence tilts towards randomness, though, when the whole period was used, there are pockets of non-randomness.

## CONCLUDING REMARKS

The evidence presented tilts towards randomness, though there were pockets of nonrandomness when the entire sample period was used. The overwhelming evidence of randomness was corroborated by the correlation tests which showed a preponderant absence of significant correlations. In line with earlier findings reported by Jegadeesh (1990), the data showed remarkable departure from normality. The findings reported here have major implications for traders who trade for profit taking. There is a segment of the investment community that believes that previous stock returns are correlated with current returns so that technical analysis is meaningful. The results of this study are an emphatic rejection of the usefulness of technical analysis. These findings, though in agreement with the works of Fauzias (1992) and Annuar, Mohamed Ariff & Shamsher (1993), are at variance with those of Chee and Gupta (1996) who found evidence for the usefulness of technical analysis.

Othman Yong (1987) used weekly data for the period January 1977 to May 1985 and found a high degree of independence in price changes. An important limitation of Othman Yong's study is that it is weakened by its inability to control for thin trading. Though he did not control for thin trading, Othman Yong obtained results that do not differ markedly from those reported in the weak-form tests of this study. In another study, Othman Yong (1993) conducted tests on the inter-relationship between Malaysian and selected stock markets in the Far East and New York and found that "the co-movement among these markets is not stable with time which means that it is difficult to construct an optimal investment strategy" (p. 65).

Annuar and Shamsher (1993) used monthly data on 260 companies for the period January 1975 to December 1989. They constructed an equally weighted index to represent market return, in addition to using the KLSE and the New Straits Times Industrial Index. Using Box-Pierce Q-statistics as well as correlation tests, the authors found that "for

the whole period, the null hypothesis of zero correlations was accepted for only two out of the six equally weighted sector portfolios... the null hypothesis was also accepted for the NST Industrial Index and the KLSE Composite Index" (p. 60). In conclusion, the authors noted that "investors in general cannot consistently beat the market by using past market information... However this does not preclude the possibility of investors earning abnormal gains based on insider information, which in the long run moves the market towards efficiency" (p. 66). The results reported on the correlation tests of this study appear to echo those of Annuar and Shamsher just cited. Annuar and Shamsher's sample did not include the data for the 1990s. The results reported in this study therefore represent an attempt to find out whether or not the weak-form efficiency of the KLSE was upheld up until the 1990s. The 1990s represented a significant period for the KLSE. The early 1990s saw a dramatic increase in the level of activity in the market, perhaps unparalleled in its entire history. By the end of the 1980s, the KLSE composite index stood at 562. From that point, the index rose sharply to reach a peak of 1332 on January 5, 1994. This period of unprecedented change was not covered by many earlier studies including that of Annuar and Shamsher (1993). The contribution of this study therefore lies not in the employment of sophisticated statistical techniques, but rather in addressing two major shortcomings of earlier studies: using newer data that covers more than half of the 1990s, and basing analysis upon weekly, rather than monthly observations as utilized by Annuar and Shamsher (1993).

Though the majority of earlier studies on the KLSE have not utilized data for the 1990s, there are others that have. The results reported from the serial correlation tests do not agree with those of Chee and Gupta (1996). In their study, Chee and Gupta used weekly data for the period 1977 to 1994, covering 30 Malaysian stocks, as well as data for the Straits Times Industrial index of Singapore, the Dow Jones Industrial Average of the United States, and Japan's Nikkei index. The authors used correlation analysis, multiple regression

**Table 2**  
Normal Test Results

	frequency	percent
Non-normal 1 %	178	79.5
Non-normal 5 %	27	12.1
Normal	19	8.5
Total	224	100.0

**Table 3**  
Runs Test Results

	First Period		Second Period		Combined Period	
	Freq	%	Freq	%	Freq	%
Sig 1 %	9	4.0	19	8.5	32	14.3
Sig 5 %	14	6.3	22	9.8	30	13.4
Not Sig.	201	89.7	183	81.7	162	72.3
Total	224	100.0	224	100.0	224	100.0

and time series analysis and found evidence of weak-form inefficiency. The results of this study therefore show a remarkable deviation from those of Chee and Gupta. What could account for this difference? There are two main reasons for the divergent findings of this study and those of Chee and Gupta: differences in data and in methodology. Chee and Gupta used a sample of 30 companies of the KLSE. The authors themselves do not claim that their sample is representative of the population from which it was non-randomly drawn. Though this study is also based upon a non-random sample, the fact that it contains 224 stocks implies that there is probably a greater level of representa-

tion of the population in this than in Chee and Gupta's study. Thus, the issue of the usefulness of technical analysis is far from settled and further research is required to help resolve this raging controversy.

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APPENDIX 1: CORRELATION COEFFICIENTS (\*SIGNIFICANT AT 5 PER CENT, \*\*SIGNIFICANT AT 1 PER CENT)

	LAG1	LAG2	LAG3	LAG4	LAG5	LAG6	LAG7	LAG8	LAG9	LAG10	LA
INDUS	-.0735	.0081	.0199	-.0176	-.0353	-.0086*	.1241	.0018	-.0287	.0051	-.0
BLAND	-.0209	-.0398	-.0142	-.0137	-.0731	.0726	.0421	-.0595	.0374	-.0075	-.0
C&CBIN	.0287	-.0461	.1247*	.0335	-.0461	.0270	-.0196	.0418	-.0192	.0201	-.0
C'BERG	.1258*	-.0013	-.0417	-.1186*	-.0762	.0401	.0730	.0416	.0640	-.1374*	-.0
CHOC	-.0363	-.0893	-.0728	-.0429	-.0120	-.0367	.0624	.0169	.0423	-.0264	-.0
DNP	.0980	-.0420	-.1703**	-.0681	-.0253	.0182	.0661	.0423	.1013	.0719	-.0
HOLD	-.0230	.0960	-.0810	.0383	-.0828	.0717	.0451	-.0394	.0427	-.0608	-.0
FFM	.0779	-.0422	-.1099*	-.0806	.0565	.0257	.0197	.0003	.0119	-.0848	-.0
GCOIN	.0622	.0769	-.0493	-.0570	-.1733**	-.0311	-.0316	-.0837	.0034	.0319	-.0
GADEK	.0213	-.0067	-.0614	.0362	-.0289	.0954	.0882	-.0906	-.0211	.0360	-.0
GUINES	-.0064	-.1172*	-.0538	-.1225	-.0043	.0393	-.0064	.0947	.0951	-.1033	.0
HLIND	.1286*	-.0743	-.0695	-.1676**	-.0692	.1217*	.0766	.0535	.0670	-.1206*	-.1
KELMAS	.1240*	.0628	-.0277	-.0628	-.0362	.0648	.0763	.0232	.0060	-.0540	-.0
KGHLDG	.1844**	.0497	-.0173	-.0681	-.0647	.1400**	.0359	.1077*	.0389	-.0132	-.0
MFLOUR	.0091	.0468	-.1056*	.0225	-.1121*	-.0255	.0679	-.1072*	.0855	.0979	-.0
M'SHITA	.0286	.0246	.0054	-.0951	-.0216	.0026	.0147	.1217*	.0297	-.0375	-.0
MTC	-.0821	-.0759	-.0411	.0700	-.1844*	.0301	.0667	.0422	-.0217	.0606	-.0
MWE	.0373	-.0197	-.0960	-.0681	-.0413	-.0108	.0894	.0087	-.0404	-.1099*	-.1
ORIENTAL	.0166	.0025	-.1292*	-.0244	-.0040	.1014	.0727	.0912	-.0240	-.0838	.0
OYLIND	-.0371	-.1212*	.0392	.0023	-.0598	-.0040	.1051*	-.0051	-.0481	-.0077	.0
PERDANA	-.1468**	.1066*	-.1163*	.0280	-.0344	.0306	.0860	-.0087	.1412**	-.0835	-.0
PERLIS	-.0009	-.1241*	-.1117*	-.0452	.0164	-.0625	.0523	.0300	.0781	-.0246	-.0
ROTHM	.0783	-.0691	-.0991	-.0836	-.1048*	.0449	.1188*	.1023	.0508	-.0102	-.0
SANYO	.0391	.0145	.0190	.0549	-.0375	.0351	.0196	-.0394	-.0517	-.0341	-.0
SETRON	.0579	.0081	-.0841	-.0409	-.0891	.0487	.1032	-.0104	-.1214*	-.0387	.0
SHCHAN	.0045	.1384**	-.0002	-.0100	.0665	-.0003	-.0619	.0289	.0136	-.0051	.0
TCHONG	-.0667	.0670	-.0655	.0061	-.0279	.0497	.0680	.0380	-.0982	-.0699	-.0
YHSBHD	.0956	.0597	-.0236	.0067	.0478	.1596**	.0421	.0135	-.0460	-.1444**	-.1
ABRCORP	.0003	.0017	.0053	.0715	-.0226	.0328	.0915	.1916**	.0345	-.0221	.0

APPENDIX 1: CORRELATION COEFFICIENTS (\*SIGNIFICANT AT 5 PER CENT, \*\*SIGNIFICANT AT 1 PER CENT)

	LAG1	LAG2	LAG3	LAG4	LAG5	LAG6	LAG7	LAG8	LAG9	LAG10	LA
GCORP	.0454	.0041	-.1397**	.0189	-.0261	.0617	-.0291	.0031	.0206	.0406	-.0
LJM	-.0140	-.1169*	-.0927	-.0817	-.0305	.0312	.0327	.0654	-.0514	.0391	.0
INTRIA	.0079	.1808**	.0146	.0123	-.0394	.1588**	-.0628	.0504	-.0232	-.0143	-.0
PILECON	-.0586	.0418	-.0845	-.0404	.0493	-.0448	.1257*	.0205	.0323	-.0550	-.0
PJDEV	-.0238	-.0722	-.1141*	-.0002	-.0660	.0703	.0241	-.0055	-.0016	.0860	-.1
PROMET*	.0801	.0275	-.1145*	-.0187	-.0308	.1238*	.1043	.0348	-.0430	.0527	-.0
RENONG	-.0268	.1159*	-.0043	-.0191	-.0088	.1419**	.0450	-.0314	.0396	.0623	-.0
SGWAY	-.0302	-.0332	.0242	-.0591	-.0501	.1203*	.0114	-.0101	.0782	-.1333*	.0
UE	-.0070	-.0564	-.0208	.0087	-.0049	.1326*	.0839	-.0298	-.0241	.0394	-.0
YTL	-.0724	.0147	.0282	-.0134	.0882	-.0565	.0243	-.0082	-.0234	-.0164	.0
AMCORP	-.0372	-.0174	-.0040	-.0861	-.0020	.0981	.0785	-.0206	.1045	-.0887	-.0
AMMB	-.0021	-.0651	-.1168*	.0455	-.0096	-.0517	.0291	.0692	.0584	-.0313	-.0
COMMERZ	-.0646	-.0516	-.1463**	-.0064	.0247	.0998	.0583	.0345	.0675	-.1716**	-.0
HANCOCK	.0552	-.0229	-.0482	-.0566	-.0288	.1383**	.0390	-.0072	.0466	.0471	-.0
HLCRED	.1502**	.1058*	.0037	-.0658	.0442	.0584	.0057	-.0385	.0017	-.0733	-.0
IDRIS	.0566	.0534	-.0947	.0043	-.0670	.1043	.0459	.0643	.0168	-.0332	-.0
INSAS	-.0174	.0438	-.1080*	-.0002	-.0761	.0892	.0437	.0259	.0270	.0310	-.0
KHALL	.1076*	.0771	-.0146	-.0344	-.1174*	.0128	.1282*	-.0055	.0413	-.0998	.0
MAA	.0728	.0359	-.0449	-.0783	-.0134	.1098*	.0936	.0268	.0252	-.0419	-.14
MAYBK	-.0914	-.0470	-.0118	-.1232*	-.0653	.1334*	.0846	-.0409	.1260*	-.0614	-.0
MBA	.1267*	-.0072	-.1302*	-.1151*	.0010	-.0303	.1321*	.0205	-.0421	.0100	.0
MBFCAP	-.0711	-.0053	-.0021	-.0239	-.0766	.0297	.1112*	-.0926	.0181	-.0132	-.0
MBF	-.0122	-.0927	-.0117	.0650	-.0217	.0769	.0423	-.0534	-.0323	-.0029	-.0
MBSB	-.0771	.0032	-.1426**	-.1206*	-.0149	-.0219	.0149	-.0300	.0817	.0355	.0
MGIG	.1178*	-.0082	.0084	.0001	-.0696	.1145*	.0426	-.0036	-.0271	-.0415	-.0
MINI	.0274	.1465**	-.0539	.0035	-.1039	.0077	.0434	.0964	.0896	.1346*	-.0
PGKALE	-.0428	-.0284	.0021	-.0019	-.0450	-.0341	.1379*	-.0140	.0449	-.0094	-.0
PBB	.0903	.0934	-.0036	-.1483**	.0304	.0821	.0341	.0555	-.0187	.0154	.0
PHILEO	-.0100	.0754	-.0038	-.0423	-.1521**	.0047	.1500**	.0155	.0592	.0825	.0

APPENDIX 1: CORRELATION COEFFICIENTS (\* SIGNIFICANT AT 5 PER CENT; \*\* SIGNIFICANT AT 1 PER CENT)

	LAG1	LAG2	LAG3	LAG4	LAG5	LAG6	LAG7	LAG8	LAG9	LAG10
RHB	.0271	.0980	-.0612	-.0028	.0189	.0599	.0005	-.0620	.0498	-.0456
RHBCAP	-.0945	-.0090	-.0863	-.0116	-.0221	.1340*	.0822	-.0130	.0186	-.0628
SBANK	-.0440	.0538	-.0209	-.0285	.0048	.0564	.0687	.0670	-.0154	-.0668
SEADDEV	.0134	.1322*	-.1766**	-.0157	-.1356*	.0625	.0269	-.0124	.0481	.0471
UCB	.1097*	.0456	-.0597	-.0995	-.0489	.0386	.0020	.0681	-.0179	-.0104
BJUNTAI	.1509**	.1240*	-.0800	-.0329	-.1193*	-.0266	-.0013	.1286*	.0518	.1490**
GPLUS	.1654**	.1004	-.1533**	-.0310	-.0383	.0526	.0688	-.0465	-.0008	-.0341
KUCHAI	-.0181	.1225*	.0981	.0342	-.1069*	.0421	.0340	.0625	.0490	.0736
MFCB	.1252*	-.0021	-.1256*	-.0551	-.0580	.0998	.1327*	.0172	.0216	.0135
MMC	-.0901	.1372*	-.0130	.0007	-.0227	.0361	.0158	-.1148*	.1487**	-.1049
TIN	.0629	-.0358	.0253	.0569	.0512	.0173	-.0559	.0198	.0454	-.1547**
RAHMAN	.1391**	-.0147	.0144	.0437	-.0794	.0977	.0948	.1023	-.0352	.0733
TRONOH	.0072	.0067	-.0214	-.0050	.0261	.0152	-.0191	.0485	.1515**	-.0167
AHPLNT	.0512	.0842	-.0655	.1761**	-.0300	-.0310	-.1016	-.0227	.0122	.0454
ASIATIC	.1227*	.1533**	.0378	-.0223	-.0013	.0444	.0432	-.0267	.0219	-.0529
AUSTENT	.1265*	.0223	-.1459**	-.0299	.0889	.0357	.1506**	-.0970	-.0655	-.0861
BKATIL	.0408	.1234*	.1715**	-.0428	-.0606	.0766	.0388	-.0029	.1615**	.0403
BKAWAN	.0556	.0109	-.1389**	-.1778**	-.0159	-.0138	.1116*	.0527	.1167*	.0601
BWORLD	.0444	.0545	-.0498	.0101	-.0354	.0530	.0651	.0069	-.0965	.0136
CTECK	.0676	.0358	-.0955	-.0304	-.1358*	.0915	.0890	.1448**	-.0035	.1246*
GHOPE	-.0420	-.0258	.0012	-.0069	-.0023	.0143	.0268	.1256*	.0225	.0138
GPERAK	.0511	.0076	-.1272*	-.0640	-.0799	.0538	.0708	-.1221*	.0061	.0834
GNEALY	-.0300	-.0094	-.0214	-.0096	.0590	-.0901	.0049	.1968**	.2057**	-.0076
GUTHRIE	.0764	-.0101	-.1038	-.0053	-.0284	-.0871	-.0631	.1390**	.0826	-.0447
INCHEN	-.0080	.1149*	.0468	.0358	-.0003	.0403	-.0386	.0925	.0297	-.0568
IOI	.0420	.0666	-.1156*	-.0129	-.0196	.0600	.0401	.0347	.0073	-.0090
KSIDIM	.2316**	.0726	-.0005	.0241	.0942	.0560	.0057	-.0373	.0269	-.0171
KLK	.0663	-.0867	-.0048	-.1335*	-.0080	-.0258	-.0013	.0905	.0606	-.1133*
KLUANG	-.2447**	-.0819	-.0185	.0134	-.1040	.0313	.0333	-.0418	.0239	-.0875

	LAG1	LAG2	LAG3	LAG4	LAG5	LAG6	LAG7	LAG8	LAG9	LAG10	LA
KRETAM	.1124*	.0119	-.0369	.0473	-.0816	.0578	.0167	-.0135	.0590	.0304	-.0
KULIM	.0963	-.0351	-.0975	-.1124*	-.0326	.0029	.0603	.1056*	.1249*	.0258	-.0
LINGUI	-.0001	.0890	.0310	.0002	.0578	.1457**	.0671	.0347	-.0715	-.0599	-.1
MPLANT	.1359*	.0214	-.0524	.0152	-.0302	-.0713	.0266	.0521	.0066	-.0090	-.0
NBT	.1476**	-.0289	-.1071*	-.0317	-.0587	.0518	.1004	-.0265	-.0240	.0145	-.0
NSOP	-.0096	.0484	.0347	-.0439	-.0761	-.0227	.0478	-.0064	.0367	.0701	.0
PPERAK	-.0097	.0328	-.0085	-.0123	-.1337*	-.0076	.0493	.2303**	.1730**	-.0296	.0
RVIEW	.0296	.0014	.0951	-.0066	-.0667	.0194	.1449**	.0081	.0954	.0389	.0
SBAGAN	.0763	-.1678**	.0559	-.0071	-.0881	-.0395	.1152*	.0211	-.0187	.0476	.0
SCBDEV	.1431**	.0483	-.0524	.0030	.0097	.1108*	.0755	.0035	.0529	.0814	.0
TDM	-.0214	.0547	-.0715	.0065	-.0576	.0473	-.0174	-.0449	-.0393	.0082	-.0
MCCA	.1281*	.0020	-.0774	.0091	.0635	.0469	.0239	.0438	.0364	.0212	-.0
UTDPLT	.0048	-.0674	-.1251*	.0263	-.0099	.0297	.0174	.0321	-.0780	-.0685	-.0
WESLAND	.0900	.0583	-.0702	.0311	-.0434	.0590	.0460	-.0319	.0082	.0431	-.1
KULIM-A	.0900	.0583	-.0702	.0311	-.0434	.0590	.0460	-.0319	.0082	.0431	-.1
AIMS	.0232	.0437	-.1268*	-.1120*	-.1085*	-.0208	.1137*	.0621	-.0133	.0606	-.16
ALCOM	-.0071	.0031	-.0664	-.0348	-.0922	.1675**	.1075*	.0748	.0182	.0009	-.1
AOKAM	-.0150	.1049*	-.0579	-.0154	.0877	.0250	.0698	.0238	.0293	-.0066	-.0
CASH	.0193	.1004	-.0089	-.0562	-.0680	.0455	.0338	.0286	.0370	.0943	-.0
CCM	-.1122*	.0674	.0575	-.0380	-.0549	.0867	.0791	-.2196**	.1665**	-.0120	-.0
CIHLDG	.0410	-.0167	-.0506	-.0368	-.1115*	.1034	.0755	.0106	.0362	-.0160	-.0
CIMA	-.0927	-.0408	-.0345	.0678	-.0747	.0495	.0210	-.0040	.0322	-.0200	-.0
CMSB	.0600	.0444	-.0309	.1061*	.1641**	.1337*	.0445	.0734	.0806	.0600	.0
DMIB	-.0047	-.0395	-.1759**	.0075	-.1740**	.0908	.0601	.0585	.0431	.0750	-.1
ESSO	-.0160	-.0983	-.1127*	-.1039	-.0696	.0257	.0508	.0700	.0856	.0107	-.0
DRB	.0526	.0147	-.0152	-.0198	-.0230	.1002	-.0516	-.0081	-.1388**	.0748	.0
GBH	-.0263	-.0151	-.0089	.0301	-.0596	.0205	-.0021	.0321	-.0748	-.0387	-.0
GOPENG	.1113*	.0095	-.1215*	-.0319	-.0202	.0610	.0186	.0197	-.0267	.0037	-.0
GUH	.4250**	-.0899	-.1107*	-.0852	-.0072	.1057*	.0850	-.0377	-.0514	-.0577	-.0

## APPENDIX 1: CORRELATION COEFFICIENTS (\*SIGNIFICANT AT 5 PER CENT, \*\*SIGNIFICANT AT 1 PER CENT)

	LAG1	LAG2	LAG3	LAG4	LAG5	LAG6	LAG7	LAG8	LAG9	LAG10	LA
HEXZA	.0006	.0450	-.0840	-.0162	-.0496	.0695	.0812	-.0465	-.0190	.0384	-.0
HICOM	.0505	.0095	-.0264	.0187	.0668	.1324*	.0742	.0144	.0899	.0499	-.0
HUME	.0449	-.0369	-.0759	-.0925	.0345	.0506	.0639	-.0633	.0288	-.1315*	-.0
JTASA	.0078	.1808**	.0147	.0123	-.0395	.1588**	-.0628	.0504	-.0232	-.0143	-.0
KJOO	-.0722	-.0550	-.0775	.0310	-.0027	.0613	.0254	-.0295	.0272	.0037	-.0
KSENG	.0422	-.0857	-.0809	.0188	-.0264	-.0769	.1289*	.0248	.0078	-.0049	.0
KRAMAT	-.0652	-.0683	-.0429	-.0546	-.0033	.0861	.0850	.0174	-.0682	-.0798	.1
LEADER	-.0282	-.0937	-.1086*	.0925	.0119	.0941	.0753	-.0266	-.0165	.0018	.0
LION	-.0383	.0252	-.0981	-.0743	-.0182	.0327	.0570	.0142	.1085*	-.0222	-.0
LKHH	.0034	-.1622**	-.1067*	-.0217	-.0271	.0805	-.0133	.1275*	.0034	.0049	-.0
MAICA	.1044*	.0239	-.1651**	-.0192	-.0978	.1000	.0301	.0725	-.0611	-.0817	-.0
MWATA	.0303	-.0554	-.0356	-.1041*	-.0316	.0389	.0281	.0434	.0318	.0110	-.0
MALEX	-.1014	-.0231	.0942	-.0246	-.1325*	.0247	.0147	.0119	.0222	.1151*	.0
MAURICH	.0035	.0541	-.0288	-.0399	-.0006	.0279	.0984	.0225	.0053	.1189*	-.0
MCEMENT	-.0632	-.0909	-.0289	-.0395	.0076	.0197	.0506	.1016	.0457	-.1597**	-.0
MOX	-.0878	-.0627	-.0020	.0360	.0346	-.0204	-.0327	-.1047*	.0990	-.0200	.0
MPI	.1237*	.0247	-.0419	-.0117	.0083	.1187*	.0225	.0347	.0317	-.0061	-.0
MUDA	.1146*	-.0392	-.0525	-.0695	-.0675	.0860	.0622	.0077	.1130*	.0192	-.0
MUIB	-.1009	-.0330	-.0559	-.0451	-.0627	.0858	.0099	.0108	.0612	-.0921	-.0
PCHEM	.1148*	-.0520	.0194	-.0789	.0215	.0067	.0284	.0279	-.0979	-.0363	-.0
PALMCO	.0968	.0823	-.0075	-.0330	-.0109	.0246	.0865	-.0369	.0031	-.0532	-.0
PMCW	-.0321	.0611	-.0048	-.0022	.1078*	.1041	.0257	-.0963	-.0133	.0675	-.1
FMI	.0093	-.0104	-.0503	.0486	.0062	.0079	.0165	-.0213	-.0936	.0102	-.0
SAMANDA	-.0136	-.0223	-.0408	-.0115	.0112	-.0181	.0631	-.0602	.0463	-.0145	.0
SEAL	.0630	.0218	-.0645	.0261	-.0452	.0365	.0325	.0299	-.1308*	-.0080	-.0
SHELL	-.0609	-.0617	-.0164	-.0811	.1154*	.0502	.0347	-.0415	-.0123	-.0069	-.0
SITATT	.0098	.0899	-.0918	-.0483	-.1423**	.0561	.0559	.0565	.0423	-.0056	-.0
TASEK	-.0351	-.1131*	-.0769	-.0309	.0487	.0249	.0312	-.0105	-.0230	.0702	.0
TONGKAH	-.0404	-.0321	-.1556**	-.0019	-.0190	.0642	.0780	.0314	-.0288	.0265	-.0

APPENDIX 1: CORRELATION COEFFICIENTS (\*SIGNIFICANT AT 5 PER CENT, \*\*SIGNIFICANT AT 1 PER CENT)

	LAG1	LAG2	LAG3	LAG4	LAG5	LAG6	LAG7	LAG8	LAG9	LAG10	LA
TRACTOR	-.0317	-.0619	-.0573	-.0660	-.0569	-.0070	.0572	.0552	-.0288	.0147	-.0
UAC	.0863	-.0015	-.0484	.1118*	.0166	.0318	-.0860	.0027	-.0344	.0535	-.0
AAMAL	2.425**	.0483	-.0425	-.0021	.0101	.0210	.0241	-.0350	-.0587	.0143	.0
AHTIN	.0264	-.0557	-.0586	-.0286	-.0596	-.0353	.0923	.0689	-.0032	.0532	-.0
AMDB	.0683	-.0984	-.1331*	.0483	.0359	.1243*	.0531	-.0207	-.0547	.0018	-.0
APLAND	.0098	-.0029	-.0450	-.0422	-.0529	.0168	-.0129	.0480	-.0507	-.0547	-.0
BRAYA	.0182	-.0061	-.1053*	-.0321	-.0769	.0625	.1278*	-.0279	-.0422	-.0739	-.0
BOLTON	.0586	-.0915	-.0610	-.0370	.0061	-.0116	.0312	.0145	.0196	-.0600	.0
DBHD	.0198	.0463	-.0405	-.0871	-.0413	.1051*	.0156	-.0635	-.0424	-.0706	.0
E&O	.0992	.0753	-.0328	-.0017	.0035	.0114	.0897	-.0126	.0000	-.0259	-.0
FACB	.0051	-.0184	-.0387	.0229	-.0279	.0426	.0012	.0131	-.0503	-.0146	-.0
FIMA	-.0052	-.0146	.0447	.0494	-.0779	-.0727	.1261*	.0184	.0308	-.0100	-.0
HLPB	.0357	.0477	-.0999	.0186	.0080	.0805	.1334*	-.0798	-.0063	-.0731	-.0
IVEST	.1025	-.0652	-.0941	-.0369	.0562	-.0261	-.0953	.0305	.0067	.0240	-.0
IGB	.0762	-.0071	-.0979	-.0071	-.0166	.0944	-.0469	-.0052	.0535	-.0699	.0
IOIPB	.0006	.1441**	-.0813	.0020	-.0794	.1296*	.1068*	.0682	.0355	-.0622	-.1
IS & PEN	-.0216	-.0254	-.0396	-.1478**	-.0927	-.0757	.0617	.1227*	.1184*	.0389	.0
JERAK	.1914**	.0474	-.0913	-.0010	.0029	-.0391	.0748	-.0268	.1285*	.1335*	.0
KEMAYAN	.1283*	.0401	-.1396*	-.0841	-.0872	.0183	-.0242	.0857	.0124	.0562	-.0
KLIH	.0179	.0616	-.0490	.0000	.0076	.1185*	-.0054	-.0005	-.0623	.0225	-.0
L & G	-.1162*	.0456	-.0708	.0381	.0460	.0352	-.0005	-.0495	.0216	-.0177	-.0
LARUT	.0193	.0198	-.0896	.0257	-.0312	.0287	.0661	.0016	.0050	-.0428	-.1
LIEHOE	.0911	-.0749	-.0898	.0401	-.0289	.1612**	.1181*	.0240	-.0756	.0127	-.0
LI.B	.0342	.0133	-.0882	-.0453	.0714	.0678	.0491	.0232	.0479	.0506	.0
MBFLAND	.1114*	.0030	-.0404	-.0271	.0664	.0662	.0012	.0583	-.0163	-.0029	-.0
MCBH	.0534	-.1194*	-.1653**	-.0206	-.0030	.0541	.0440	.0239	.0011	.0394	-.0
MENANG	.0275	.0167	-.1692**	-.0317	-.0223	.0687	.0649	.0388	-.0853	.0780	-.0
METPLX	-.0413	.0218	-.0811	-.0493	-.0364	.0604	.0947	.0373	-.0653	.0365	-.0
MUIPROP	-.0141	-.0123	-.0728	-.1100*	.0954	.0245	.0709	.0055	-.0032	-.0245	-.0

APPENDIX 1: CORRELATION COEFFICIENTS (\*SIGNIFICANT AT 5 PER CENT; \*\*SIGNIFICANT AT 1 PER CENT)

	LAG1	LAG2	LAG3	LAG4	LAG5	LAG6	LAG7	LAG8	LAG9	LAG10	LA
NEGARA	.0396	.0170	-.0401	.0494	.0274	-.0385	.0713	.0409	.1646**	-.0666	.0
PMOUNT	-.0058	.0000	-.1148*	-.0221	-.0162	.0388	.0179	.0119	.0498	.0360	-.0
PELANGI	.1410**	-.0995	-.0657	-.0649	-.0541	-.0290	.0321	.1252*	.0703	-.0644	-.1
PGARDEN	-.0230	-.0147	-.0964	-.0655	.0421	.1017	.1118*	.0171	-.0330	-.0511	-.0
PHILAND	.0036	.0681	-.0459	-.0597	-.0427	.0064	-.0379	.0241	-.0204	-.0174	.0
SDRED	.0439	-.0025	-.1313*	-.0566	-.0835	.0789	.0198	.0466	-.0621	.0283	-.0
SPROP	.1320*	.0126	-.0584	-.0674	.0560	.0767	.0240	.0466	-.0670	-.0026	-.0
SUEP	.0270	.0344	-.1275*	-.0474	-.0669	.1054*	.1371*	.0580	.0385	-.0271	-.0
SATERAS	-.0455	-.0457	-.1331*	-.0122	-.0467	.1610**	.0547	-.0258	-.0302	.0205	-.0
SMI	.0643	.0014	-.1787**	-.0475	-.1518**	-.0248	.0563	-.0664	.0152	.1267*	-.0
SPK	-.0405	.0286	-.0513	.0275	-.0701	.0665	.1210*	.0285	-.0350	.0090	-.0
TAIPIN	.1051*	-.0346	-.0456	.0131	-.1090*	-.0800	.0537	-.0479	.0121	-.0078	-.0
TALAM	.0736	-.0265	-.1101*	-.0686	-.0817	.1017	.0720	.0104	-.0995	-.0237	-.0
UMLAND	.0032	-.0016	-.1045*	-.0383	-.0356	-.0586	.0770	-.0242	.0419	.0597	-.0
ANTAH	.0801	-.0653	-.0988	-.1715**	-.0243	.0727	.0567	.0357	.0058	-.0148	-.0
ASIAPAC	-.0267	-.0163	-.1370**	-.0233	-.0533	.0874	.1097*	-.0385	.0112	.0234	-.1
BTEAD	.0024	-.0141	-.1240*	.0059	-.0012	-.0254	.0275	.0180	.0730	.0527	-.0
BGROUP	.0576	.0095	-.0337	-.1111*	-.0332	.0394	-.0035	.0299	.0267	.0300	-.0
BOTO	.0364	.0222	-.0502	-.0088	.0177	-.1373*	-.0432	.0106	.0981	.0121	-.0
GKENT	.0429	-.0386	-.1056*	.0153	.0201	.0391	.0263	.0253	.0902	-.0877	-.0
GDOWN	.0456	.0311	-.0879	-.0216	.0348	.1751**	.0469	-.0869	.0092	.0690	.1
GENTIN	-.1227*	-.0192	-.0294	-.1296*	.0161	.0520	.0824	-.0360	.1724**	-.1335*	-.1
GRANITE	.1233*	.0901	.0010	.0844	.0447	.0694	.0428	-.0389	-.0333	-.0711	-.1
HAPSENG	.1359**	.1493**	.0231	.0268	-.1225*	-.0052	-.0825	-.0803	-.1672**	.0066	-.1
JOHAN	.0065	.0250	-.1053*	.0196	.0188	.0172	.0212	-.0208	.0453	.0047	-.1
KEMA	.0881	.0602	-.0908	-.0547	-.0515	-.0578	.0249	-.0536	.0747	.0866	-.1
KCB	.0859	-.0405	-.0337	-.0472	-.0615	.0616	.0259	-.0167	-.0457	.0220	-.1
KKELLAS	-.0254	.0134	-.0340	-.1174*	-.0510	-.0046	.0983	-.0347	.0544	.0329	-.1
MAGNUM	.0744	-.1177*	-.0578	.0675	-.0651	.1023	.0695	-.0398	.0411	-.0257	-.1

APPENDIX 1: CORRELATION COEFFICIENTS (\*SIGNIFICANT AT 5 PER CENT, \*\*SIGNIFICANT AT 1 PER CENT)

	LAG1	LAG2	LAG3	LAG4	LAG5	LAG6	LAG7	LAG8	LAG9	LAG10	LA
MALAKOF	.1005	.1736**	.0701	.0734	.1522**	.1575**	.1185*	.0375	.0976	.0285	.0
MAS	.0016	.0495	-.0737	-.0914	-.0212	.1049*	.0823	.1183*	.0207	-.1658**	-.0
MECHIMAR	.2092**	-.0437	-.1856**	-.1741**	-.1408**	.0481	.1051*	.0424	.0754	.0929	-.0
MHS	.1591**	.1331*	-.0161	-.0121	.0924	.0044	.1099*	-.0709	.0568	-.0230	-.1
MISC	-.1457**	.1061*	-.1169*	.0283	-.0333	.0298	.0860	-.0080	.1414**	-.0834	-.0
MMCE	.0431	-.0419	.0415	.0812	.0139	-.2086**	-.0090	.0328	.0440	-.0281	-.0
MOSAIC	.0408	.0013	-.0695	-.0460	-.0400	.1390**	.0135	.0327	.0063	.0452	.0
MPHB	.1048*	.0146	-.0650	.0292	-.0520	.0937	.0516	-.0015	-.0707	-.0566	-.0
MRCB	-.0898	.0338	-.0228	-.1479**	.1441**	.0835	.0219	-.0375	.0605	.0338	-.0
MULPHA	.0779	.0685	-.1287*	-.0325	.0002	.1089*	.0613	.0195	-.0396	.0022	-.1
MYCOM	-.0075	.0299	-.0519	-.1051*	.0415	-.0284	-.0518	-.0233	.0018	.0568	-.0
NANYANG	.0272	-.0028	-.0318	-.0435	-.0123	.0031	-.0081	.0388	.0568	-.0432	-.0
NSTP	.0052	-.0397	.0294	.0618	.0219	.0720	-.0568	-.0273	.0452	.0465	-.0
RESORT	-.1422**	.0368	-.0469	-.0560	-.0020	.0076	.0180	-.0182	.1096*	-.0758	-.0
SARAWAK	.1231*	.0103	-.0297	-.0214	.0362	.0727	.0490	.0582	.0383	-.0244	-.0
SDARBY	-.1772**	-.0371	-.0164	-.1175*	.0309	.0293	.0404	.0732	-.0316	-.0512	-.0
SJA	-.0517	.1270*	-.1321*	-.0047	-.1039	.0046	-.0364	.1291*	-.0896	.0832	.0
TIME	.0343	.0727	-.0202	-.0188	-.0027	.0769	.0479	-.0086	.0651	.0104	-.0
TRIND	.0472	.1412**	-.0217	-.0262	.0238	.1020	.1389**	.0103	.0467	.0542	-.0
TV3	-.0250	.1077*	-.0146	-.0620	-.0574	.0057	.0028	-.0669	.0584	-.0409	-.0
UNIPHONE	.0154	-.0458	-.0027	-.0712	-.0114	.0248	.0311	.0523	.0924	.0378	-.0



## APPENDIX 2: RUNS AND NORMAL TEST RESULTS

Company	R U N S T E S T			Normal TESTS
	First Period Significance Level	Second Period Significance Level	Combined Period Significance Level	WHOLE PERIOD
BINDUS	Not sig	Not sig	Not sig	Non-normal 1%
BLAND	Not sig	Not sig	Not sig	Non-normal 1%
CCBIN	Not sig	Not sig	Not sig	Normal
CBERG	Not sig	Not sig	Not sig	Non-normal 1%
CHOC	Not sig	Not sig	Not sig	Non-normal 5%
DNP	Not sig	Not sig	Sig 5%	Normal
HOLD	Not sig	Not sig	Not sig	Non-normal 1%
FFM	Not sig	Not sig	Not sig	Non-normal 1%
GCOIN	Not sig	Not sig	Not sig	Non-normal 1%
GADEK	Not sig	Sig 5%	Not sig	Non-normal 1%
GUINES	Not sig	Not sig	Not sig	Non-normal 5%
HLIND	Not sig	Not sig	Sig 5%	Non-normal 1%
KELMAS	Not sig	Not sig	Not sig	Non-normal 1%
KGHLDG	Not sig	Sig 1%	Sig 1%	Non-normal 1%
MFLOUR	Not sig	Not sig	Not sig	Non-normal 1%
MSHITA	Not sig	Not sig	Not sig	Non-normal 1%
MTC	Not sig	Not sig	Not sig	Non-normal 1%
MWE	Not sig	Not sig	Not sig	Non-normal 1%
ORIENTAL	Not sig	Not sig	Not sig	Non-normal 5%
OYLIND	Not sig	Not sig	Sig 5%	Non-normal 1%
PERDANA	Not sig	Not sig	Not sig	Non-normal 1%
PERLIS	Not sig	Not sig	Not sig	Non-normal 1%
ROTHM	Not sig	Not sig	Not sig	Non-normal 1%
SANYO	Not sig	Not sig	Not sig	Non-normal 1%
SETRON	Not sig	Not sig	Not sig	Non-normal 1%
SHCHAN	Not sig	Sig 1%	Sig 1%	Non-normal 1%
TCHONG	Not sig	Not sig	Not sig	Non-normal 5%
YHSBHD	Not sig	Not sig	Not sig	Non-normal 1%
ABRCORP	Not sig	Sig 1%	Not sig	Non-normal 1%
GCORP	Not sig	Not sig	Sig 5%	Non-normal 1%
IJM	Not sig	Not sig	Not sig	Normal
INTRIA	Not sig	Not sig	Not sig	Non-normal 1%
PILECON	Not sig	Not sig	Not sig	Non-normal 5%
PJDEV	Not sig	Not sig	Not sig	Non-normal 1%
PROMET	Not sig	Not sig	Not sig	Non-normal 1%
RENONG	Not sig	Not sig	Not sig	Non-normal 1%
SGWAY	Not sig	Not sig	Not sig	Non-normal 5%
UE	Sig 5%	Not sig	Not sig	Non-normal 5%
YTL	Not sig	Not sig	Not sig	Non-normal 5%

## APPENDIX 2: RUNS AND NORMAL TEST RESULTS

Company	R U N S T E S T			Normal TESTS
	First Period Significance Level	Second Period Significance Level	Combined Period Significance Level	WHOLE PERIOD
AMCORP	Not sig	Not sig	Not sig	<b>Normal</b>
AMMB	Sig 5%	Not sig	Sig 5%	Non-normal 5%
COMMERZ	Not sig	Not sig	Not sig	Non-normal 5%
HANCOCK	Not sig	Not sig	Not sig	Non-normal 1%
HLCRED	Not sig	Not sig	Sig 5%	<b>Normal</b>
IDRIS	Not sig	Not sig	Not sig	Non-normal 1%
INSAS	Not sig	Not sig	Not sig	Non-normal 1%
KHALL	Not sig	Sig 5%	Sig 5%	Non-normal 1%
MAA	Not sig	Not sig	Not sig	Non-normal 5%
MAYBK	Not sig	Not sig	Not sig	Non-normal 5%
MBA	Sig 1%	Not sig	Sig 1%	Non-normal 1%
MBFCAP	Not sig	Not sig	Not sig	Non-normal 1%
MBF	Not sig	Not sig	Not sig	Non-normal 1%
MBSB	Not sig	Not sig	Not sig	Non-normal 1%
MGIG	Not sig	Not sig	Not sig	Non-normal 5%
CHOC	Not sig	Sig 5%	Sig 1%	Non-normal 1%
PGKALE	Not sig	Sig 5%	Sig 5%	Non-normal 1%
PBB	Not sig	Not sig	Not sig	Non-normal 1%
PHILEO	Not sig	Not sig	Not sig	Non-normal 1%
RHB	Not sig	Sig 1%	Not sig	Non-normal 1%
RHBCAP	Not sig	Not sig	Not sig	Non-normal 1%
SBANK	Not sig	Not sig	Not sig	<b>Normal</b>
SEADEV	Not sig	Not sig	Not sig	Non-normal 1%
UCB	Sig 1%	Not sig	Sig 1%	Non-normal 1%
BJUNTAI	Not sig	Not sig	Not sig	Non-normal 1%
GPLUS	Not sig	Sig 1%	Sig 1%	Non-normal 1%
KUCHAI	Not sig	Not sig	Not sig	Non-normal 1%
MFCB	Sig 1%	Sig 1%	Sig 1%	Non-normal 1%
MMC	Not sig	Not sig	Not sig	<b>Normal</b>
TIN	Not sig	Not sig	Not sig	Non-normal 1%
RAHMAN	Not sig	Not sig	Not sig	Non-normal 1%
TRONOH	Not sig	Not sig	Not sig	Non-normal 1%
AHPLNT	Not sig	Not sig	Sig 5%	Non-normal 1%
ASIATIC	Not sig	Not sig	Not sig	Non-normal 1%
AUSTENT	Sig 5%	Not sig	Sig 5%	Non-normal 1%
BKATIL	Not sig	Not sig	Sig 1%	Non-normal 1%
BKAWAN	Not sig	Not sig	Not sig	Non-normal 1%
BWORLD	Not sig	Sig 5%	Sig 1%	Non-normal 1%
CTECK	Sig 5%	Not sig	Sig 1%	Non-normal 1%
GHOPE	Not sig	Sig 5%	Not sig	Non-normal 1%
GPERAK	Not sig	Not sig	Not sig	Non-normal 1%

## APPENDIX 2: RUNS AND NORMAL TEST RESULTS

Company	R U N S T E S T			Normal TESTS
	First Period Significance Level	Second Period Significance Level	Combined Period Significance Level	WHOLE PERIOD
GNEALY	Not sig	Not sig	Not sig	Non-normal 1%
GUTHRIE	Not sig	Not sig	Not sig	Non-normal 1%
INCHEN	Not sig	Not sig	Sig 5%	Non-normal 1%
IOI	Not sig	Sig 5%	Sig 5%	Non-normal 1%
KSIDIM	Not sig	Sig 1%	Sig 5%	Non-normal 1%
KLK	Not sig	Not sig	Not sig	Non-normal 1%
KLUANG	Not sig	Not sig	Sig 5%	Non-normal 1%
KRETAM	Not sig	Not sig	Not sig	Non-normal 1%
KULIM	Not sig	Not sig	Not sig	Non-normal 1%
LINGUI	Not sig	Not sig	Not sig	Non-normal 1%
MPLANT	Not sig	Not sig	Not sig	Non-normal 1%
NBT	Not sig	Sig 1%	Sig 5%	Non-normal 1%
NSOP	Not sig	Not sig	Not sig	Non-normal 1%
PPERAK	Not sig	Sig 5%	Sig 1%	Non-normal 1%
RVIEW	Not sig	Not sig	Not sig	Non-normal 1%
SBAGAN	Not sig	Not sig	Sig 1%	Non-normal 1%
SCBDEV	Not sig	Not sig	Not sig	Non-normal 1%
TDM	Not sig	Not sig	Not sig	Non-normal 1%
UMCCA	Not sig	Not sig	Not sig	Non-normal 1%
UTDPLT	Not sig	Not sig	Not sig	Non-normal 1%
WESLAND	Not sig	Sig 5%	Sig 5%	Non-normal 1%
KULIM-A	Not sig	Sig 5%	Sig 5%	Non-normal 1%
AISM	Not sig	Sig 5%	Not sig	Non-normal 1%
ALCOM	Not sig	Not sig	Not sig	Normal
AOKAM	Not sig	Not sig	Not sig	Non-normal 5%
CASH	Not sig	Sig 1%	Sig 5%	Non-normal 1%
CCM	Not sig	Not sig	Not sig	Non-normal 1%
CIHLDG	Not sig	Not sig	Not sig	Non-normal 1%
GCOIN	Not sig	Not sig	Not sig	Non-normal 5%
CMSB	Not sig	Not sig	Not sig	Non-normal 1%
DMIB	Not sig	Not sig	Not sig	Non-normal 1%
ESSO	Not sig	Not sig	Not sig	Non-normal 1%
DRB	Not sig	Not sig	Not sig	Non-normal 1%
GBH	Not sig	Not sig	Not sig	Non-normal 1%
GOPENG	Not sig	Not sig	Not sig	Non-normal 1%
GUH	Not sig	Sig 1%	Sig 1%	Non-normal 1%
HEXZA	Not sig	Not sig	Not sig	Non-normal 1%
HICOM	Sig 1%	Not sig	Not sig	Non-normal 1%
HUME	Not sig	Not sig	Not sig	Non-normal 5%
JTIASA	Not sig	Not sig	Not sig	Non-normal 1%
KJOO	Not sig	Not sig	Not sig	Non-normal 5%

## APPENDIX 2: RUNS AND NORMAL TEST RESULTS

RUNS TEST				Normal TESTS
Company	First Period Significance Level	Second Period Significance Level	Combined Period Significance Level	WHOLE PERIOD
KSENG	Not sig	Not sig	Not sig	Non-normal 1%
KRAMAT	Not sig	Sig 1%	Sig 1%	Non-normal 1%
LEADER	Not sig	Not sig	Not sig	<b>Normal</b>
LION	Not sig	Not sig	Not sig	Non-normal 1%
LKHH	Not sig	Not sig	Not sig	Non-normal 1%
MAICA	Not sig	Sig 1%	Not sig	Non-normal 1%
MWATA	Not sig	Sig 5%	Sig 5%	Non-normal 1%
MALEX	Not sig	Not sig	Not sig	Non-normal 1%
MAURICH	Not sig	Not sig	Not sig	Non-normal 1%
MCEMENT	Not sig	Not sig	Not sig	<b>Normal</b>
MOX	Sig 5%	Not sig	Not sig	Non-normal 1%
MPI	Sig 1%	Not sig	Sig 1%	Non-normal 5%
MUDA	Sig 5%	Not sig	Sig 5%	Non-normal 1%
MUIB	Not sig	Not sig	Not sig	Non-normal 1%
PCHEM	Not sig	Sig 1%	Sig 1%	Non-normal 1%
PALMCO	Not sig	Not sig	Sig 5%	Non-normal 1%
PMCW	Not sig	Not sig	Not sig	Non-normal 5%
PMI	Not sig	Not sig	Not sig	Non-normal 1%
SAMANDA	Sig 1%	Not sig	Sig 1%	Non-normal 1%
SEAL	Not sig	Not sig	Not sig	Non-normal 1%
SHELL	Not sig	Not sig	Not sig	Non-normal 5%
SITATT	Not sig	Not sig	Not sig	Non-normal 1%
TASEK	Not sig	Not sig	Not sig	Non-normal 1%
TONGKAH	Not sig	Not sig	Not sig	Non-normal 5%
TRACTOR	Not sig	Not sig	Not sig	Non-normal 5%
UAC	Not sig	Not sig	Not sig	Non-normal 1%
AAMAL	Sig 1%	Not sig	Sig 1%	Non-normal 1%
AHTIN	Not sig	Sig 5%	Sig 1%	Non-normal 1%
AMDB	Not sig	Not sig	Not sig	Non-normal 1%
APLAND	Not sig	Not sig	Sig 5%	Non-normal 1%
BRAYA	Not sig	Not sig	Not sig	Non-normal 1%
BOLTON	Not sig	Not sig	Not sig	Non-normal 5%
DBHD	Sig 5%	Sig 1%	Sig 1%	Non-normal 1%
E&O	Not sig	Not sig	Not sig	Non-normal 1%
FACB	Not sig	Not sig	Not sig	Non-normal 1%
FIMA	Not sig	Not sig	Not sig	Non-normal 1%
HLPB	Not sig	Not sig	Sig 5%	Non-normal 1%
IVEST	Sig 5%	Not sig	Sig 1%	Non-normal 1%
IGB	Not sig	Not sig	Not sig	<b>Normal</b>
IOIPB	Sig 5%	Not sig	Sig 1%	Non-normal 1%
IS&PEN	Not sig	Not sig	Not sig	Non-normal 1%

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## APPENDIX 2: RUNS AND NORMAL TEST RESULTS

RUNS TEST				Normal TESTS
Company	First Period Significance Level	Second Period Significance Level	Combined Period Significance Level	WHOLE PERIOD
JERAK	Not sig	Sig 5%	Sig 1%	Non-normal 1%
KEMAYAN	Not sig	Sig 1%	Sig 1%	Non-normal 1%
KLIH	Not sig	Sig 1%	Sig 1%	Non-normal 1%
L&G	Not sig	Not sig	Not sig	Non-normal 5%
LARUT	Not sig	Not sig	Not sig	Normal
LIEHOE	Sig 1%	Not sig	Sig 1%	Non-normal 1%
LLB	Not sig	Not sig	Sig 1%	Non-normal 1%
MBFLAND	Not sig	Not sig	Sig 5%	Non-normal 1%
MCBH	Not sig	Not sig	Not sig	Non-normal 1%
MENANG	Not sig	Not sig	Not sig	Non-normal 1%
METPLX	Not sig	Sig 5%	Sig 5%	Non-normal 1%
MUIPROP	Not sig	Not sig	Not sig	Non-normal 1%
NEGARA	Sig 5%	Sig 5%	Sig 1%	Non-normal 1%
PMOUNT	Not sig	Not sig	Not sig	Non-normal 1%
PELANGI	Sig 1%	Not sig	Sig 1%	Non-normal 1%
PGARDEN	Not sig	Not sig	Not sig	Non-normal 5%
PHILAND	Not sig	Sig 1%	Sig 1%	Non-normal 1%
SDRED	Not sig	Not sig	Not sig	Non-normal 1%
SPROP	Not sig	Not sig	Not sig	Non-normal 1%
SUEP	Not sig	Not sig	Not sig	Non-normal 1%
SATERAS	Not sig	Not sig	Not sig	Non-normal 1%
SMI	Not sig	Not sig	Not sig	Non-normal 1%
SPK	Not sig	Not sig	Not sig	Non-normal 1%
TAIPIN	Not sig	Not sig	Sig 5%	Non-normal 1%
TALAM	Not sig	Sig 5%	Sig 5%	Non-normal 1%
UMLAND	Not sig	Not sig	Not sig	Non-normal 1%
ANTAH	Not sig	Sig 1%	Not sig	Normal
ASIAPAC	Not sig	Not sig	Not sig	Non-normal 1%
BTEAD	Not sig	Not sig	Not sig	Non-normal 1%
BGROUP	Not sig	Not sig	Not sig	Non-normal 1%
BTOTO	Not sig	Not sig	Not sig	Non-normal 1%
GKENT	Sig 5%	Not sig	Not sig	Normal
GTOWN	Not sig	Sig 1%	Not sig	Non-normal 1%
GENTIN	Not sig	Not sig	Not sig	Non-normal 5%
GRANITE	Not sig	Sig 5%	Sig 5%	Non-normal 1%
HAPSENG	Not sig	Not sig	Not sig	Non-normal 1%
JOHAN	Not sig	Not sig	Not sig	Non-normal 1%
KEMA	Not sig	Not sig	Not sig	Non-normal 1%
KCB	Not sig	Sig 5%	Not sig	Non-normal 1%
KKELLAS	Not sig	Not sig	Not sig	Normal
MAGNUM	Not sig	Not sig	Not sig	Normal

## APPENDIX 2: RUNS AND NORMAL TEST RESULTS

Company	R U N S   T E S T			Normal TESTS
	First Period Significance Level	Second Period Significance Level	Combined Period Significance Level	WHOLE PERIOD
MALAKOF	Not sig	Not sig	Not sig	Non-normal 1%
MAS	Sig 5%	Not sig	Not sig	Non-normal 1%
MECHMAR	Not sig	Sig 5%	Sig 5%	Non-normal 1%
MHS	Sig 5%	Not sig	Not sig	Non-normal 1%
MISC	Not sig	Not sig	Not sig	Non-normal 1%
MMCE	Not sig	Not sig	Sig 5%	Non-normal 1%
MOSAIC	Not sig	Not sig	Not sig	Non-normal 1%
MPHB	Not sig	Not sig	Not sig	Non-normal 1%
MRCB	Not sig	Not sig	Not sig	Non-normal 1%
MULPHA	Not sig	Sig 5%	Not sig	Non-normal 1%
MYCOM	Not sig	Not sig	Not sig	Non-normal 1%
NANYANG	Not sig	Not sig	Not sig	Non-normal 1%
NSTP	Not sig	Not sig	Not sig	Normal
RESORT	Not sig	Not sig	Not sig	Normal
SARAWAK	Not sig	Not sig	Sig 1%	Non-normal 1%
SDARBY	Not sig	Sig 5%	Not sig	Normal
SJA	Not sig	Not sig	Not sig	Non-normal 1%
TIME	Not sig	Not sig	Not sig	Non-normal 1%
TRIND	Not sig	Not sig	Not sig	Non-normal 5%
TV3	Not sig	Not sig	Not sig	Non-normal 1%
UNIPHONE	Sig 5%	Not sig	Sig 1%	Non-normal 1%