CHAPTER 4 : RESULTS

4.1 Significance of Beta Forecast

An essential prerequisite for using beta to forecast future portfolio risk and return is a reasonable degree of predictability in the future. The study of the reliability of beta forecast for the stocks listed on the Second Board of the KLSE would be a meaningful effort if the beta coefficients of the securities at a later period could be predicted with a good degree of accuracy from those obtained at an earlier period. It would provide an important ingredient in investment decision making such as portfolio revision decisions. Empirical results are needed to see which forecasting method performs the best in the prediction of the future beta coefficients of stocks listed on the Second Board of the KLSE. To evaluate a forecasting method, we compare the forecasted and actual computed values of the beta coefficients and then obtain their MSE in a certain period.

However, efforts to forecast beta coefficients accurately have proven to be not so successful, especially for individual securities. For instance, Blume (1971) and Levy (1971) discovered that beta coefficients of single securities of one period were not good predictors of the corresponding beta coefficients of the subsequent period. However, as portfolio size increased, the prediction improved significantly.

4.2 Distribution Of Beta Coefficients

The profile and the distribution of the beta coefficients of the 31 stocks chosen for this study is given in Table 4.1. The mean of the beta coefficients for each period is almost one (1.0) , except for period 3 (1994), which has the largest mean of 1.2373. Period 2 (1993) has the smallest mean of 0.9759.

The variability of beta coefficients is smallest in period 3 (1994), followed by period 2, (1993). This is evident by the variance of beta coefficients which is 0.1668 and 0.1880 for period 3 and period 2 respectively. Both these periods give almost similar range of minimum and maximum values. For period 3, the range is 1.6190 while the range for period 2 is 1.6079. In addition, both these periods have a negative minimum value of beta coefficient.

The largest variance of beta coefficient (0.7045) is obtained from period 1 (1992), which also has the largest range of beta values (2.6075). This is followed by the period 4 (1995) which has a variance of 0.3917 and a range of 2.3360. It is also interesting to note that the maximum (2.5943) and minimum (-0.0132) values of beta coefficients computed in period 1 is also the maximum and minimum values of beta coefficients computed throughout the four periods. This has contributed to the large variance of betas for the period.

TABLE 4.1 : Summary Statistics Of Betas Of Second Board Stocks, 1992-1995

STOCK	1992 Beta	1993 Beta	1994 Beta	1995 Beta
Autoways	0.7976	0.9252	0.927	0.3485
Pantai	0.8698	0.6494	0.4511	-0.1347
CFM	0.1683	0.9694	1.4635	1.1135
CICB	0.7009	1.0194	1.2623	0.1072
Long Huat	4.3536	1.6826	1.3918	1.3756
RCI	0.4722	1.6863	1.2631	0.4108
Maypak	0.0853	0.4459	0.9359	1.2464
UPHB	1.7884	1.1057	1.472	1.7258
Poly	0.2752	0.616	1.2937	0.911
Daibochi	1.2598	0.3333	1.1904	0.0654
PSCI	-0.0132	0.4429	0.7242	0.4022
UCI	1.2809	0.9154	1.5544	1.6167
Acta	1.432	1.3545	1.1249	0.0519
Denko	1.4029	1.3159	1.2878	1.0312
Setegap	1.0362	1.5377	1.7097	1.3851
Mercury	0.1655	0.9827	1.2012	0.959
Sanda	0.8149	0.0887	1.9032	1.4384
CP	0.7008	0.431	0.5249	2.0129
Repco	0.8476	1.2243	1.6426	1.059
SCK	1.0885	1.4273	0.2842	1.1663
KOI	0.7426	0.8381	1.0478	0.58
CCP	0.7826	0.9546	1.0882	0.8814
Public	0.7624	0.8799	1.6513	0.8975
GFB	1.2915	1.0845	1.7402	1.5815
KFM	0.4098	0.8351	1.8796	0.7911
Tajo	0.7609	1.1553	1.6176	2.097
D Prep	1.8187	1.5142	1.6501	1.3306
Anakku	0.4705	1.6966	1.1622	2.2013
Jaya	0.9482	0.2348	0.9965	1.3182
P.Pulp	0.4867	1.054	0.9101	0.1235
Metacorp	2.5943	0.8524	1.0046	1.1705
Mean	0.986948	0.975906	1.237294	1.008542
Variance	0.704537	0.187983	0.166799	0.391694
Maximum	2.5943	1.6966	1.9032	2.2013
Minimum	-0.0132	0.0887	0.2842	-0.1347

4.3 Prediction Of Beta Coefficients For Period 2

We first study the use of computed beta coefficients of securities for period 1 and Vasicek's estimated beta coefficients for forecasting the corresponding beta coefficients of securities for period 2. The values of the predictors' mean squared errors (MSE) and its components are given in Table 4.2.

Based on the MSE, Vasicek's estimated beta coefficients are more superior than the computed beta coefficients of period 1 in predicting the beta coefficients of individual securities for period 2. The MSE is 0.249. For both predictors, bias is the smallest component of the MSE, constituting less than 3 % of the total MSE.

For Vasicek's estimated beta coefficients, the random error component is the largest, followed by the inefficiency component, each accounting for 69.8 % and 27.29 % of the total MSE, respectively. For the computed beta coefficients, the inefficiency component is the largest, followed by the random error component, each accounting for 74.07 % and 25.91 % of the total MSE, respectively.

4.4 Prediction Of Beta Coefficients For Period 3

In period 2 (1993), the computed beta coefficients of period 2 , Vasicek's estimated beta coefficients and Blume's estimated beta coefficients are used for the prediction of beta coefficients for period 3. Judging from the results given in Table 4.2, it is evident that Blume's estimated beta coefficients (MSE= 0.231103) are the best predictors, followed by Vasicek's estimated beta coefficients (MSE=0.248269). The computed beta coefficients of period 2 are the worst predictors (MSE=0.3603).

TABLE 4.2 : Forecast Errors Of Beta Coefficients

	OLS		Blume's		Vasicek's	
PERIOD 2 :1993						
Mean Square Error (MSE)	0.633702		—		0.24937	
Components of MSE :						
Bias	0.000122	(0.02%)			0.007275	(2.92%)
Inefficiency	0.469389	(74.07%)	—		0.068043	(27.29%)
Random Error	0.164191	(25.91%)			0.174052	(69.80%)

	OLS		Blume's		Vasicek's	
PERIOD 3 : 1994						
Mean Square Error (MSE)	0.3603		0.231103		0.248269	
Components of MSE :						
Bias	0.068323	(18.96%)	0.069388	(30.02%)	0.079286	(31.94%)
Inefficiency	0.130425	(36.20%)	0.000063	(0.03%)	0.010768	(4.34%)
Random Error	0.161552	(44.84%)	0.161652	(69.95%)	0.158215	(63.73%)

	OLS		Blume's		Vasicek's	
PERIOD 4 : 1995						
Mean Square Error (MSE)	0.460527		0.444583		0.418419	
Components of MSE :						
Bias	0.052327	(11.36%)	0.074426	(16.74%)	0.043358	(10.36%)
Inefficiency	0.033218	(7.21%)	0.015311	(3.44%)	0.00142	(0.34%)
Random Error	0.374982	(81.42%)	0.354845	(79.82%)	0.373641	(89.30%)

	OLS	Blume's	Vasicek's
Mean of MSE	0.484843	0.337843	0.305353

An examination of the components of the MSE reveals results which differ from those obtained in the previous period. For both the Blume's and Vasicek's betas, the random error component is still the largest component of the MSE, constituting 69.95% and 63.73% of the total MSE of Blume's and Vasicek's estimated beta coefficients, respectively. However, there is a significant departure from the results of the previous period in that the bias component has increased markedly, accounting for 30.02% and 31.94% of the total MSE for Blume's and Vasicek's estimated beta coefficients, respectively. On the other hand, the smallest component of MSE for both predictors is the inefficiency component which constitutes less than 5% of the total MSE.

Significant changes can also be observed from the components of MSE for the computed beta coefficients. While bias is still the smallest component (18.96%), the rank-order of performance in the other two error components in terms of magnitude differs from the results of the previous period. Here, the random error is the largest component (44.84%) , followed by the inefficiency component (36.20%). Also, it is interesting to note that the spread of error among the three components are somewhat more evenly distributed (18.96% ; 36.20% ; 44.84%).

4.5 Prediction Of Beta Coefficients For Period 4

In period 3 (1994), the computed beta coefficients in period 3, Blume's and Vasicek's estimated beta coefficients are used to predict the corresponding beta coefficients of securities for period 4 (1995). The results show that Vasicek's estimated beta coefficients are the most superior predictors (MSE=0.418419), followed by Blume's

estimated betas (MSE=0.444583). The computed betas in period 3 are the least reliable predictors (MSE=0.460527).

It is interesting to note that the error components in all the three predictors have exhibited a similar ascending rank-order in terms of magnitude, beginning with the inefficiency component and ending with the random error component, i.e. random error is the largest component. This result is in line with the rank-order of the MSE components found in Blume's and Vasicek's estimated beta coefficients in the previous period. These findings are also consistent with the results obtained by Kok (1994).

The percentage of random error ranges from 79.82% (Blume's) to 89.3% (Vasicek's), while the percentage of the bias component ranges from 10.36% (Vasicek's) to 16.74% (Blume's). Inefficiency, which is the smallest component accounts for a percentage of MSE which ranges from 0.34% (Vasicek's) and 7.21% (Computed Betas).Also, although the MSE obtained in this period are larger than those of the previous period, there is less variability in the values of MSE among the three predictors.

4.6 Comparison With Other Studies

Throughout the period of this study, the best overall predictor is Vasicek's estimated beta coefficients which has an average MSE value of 0.305353. This is followed by Blume's estimated beta coefficients (MSE= 0.337843) and the computed betas

(MSE= 0.484843). This finding is consistent with those obtained by Klemkosky and Martin (1975). Their study revealed an average MSE value of 0.126007 for Vasicek's beta coefficients, followed by Blume's beta coefficients (MSE= 0.134335) and computed betas (MSE=0.156313).

Similiar results were obtained by Wong (1994), in her study to determine the predictability of beta coefficients of stocks listed on the Main Board of KLSE. The results also showed that for the overall market and the plantation sector, the Vasicek's method proved to be the best predictor (average MSE of 0.0926 and 0.0664 respectively). This is followed by the Blume's method while the OLS method is the worst predictor.

This is different from the findings of Kok (1994) and Lam, Mok and Cheung (1990). In both studies, Vasicek's estimated beta coefficients are still the best predictors, but they are followed by the computed betas. Blume's estimated beta coefficients are the worst predictors.

The magnitude of the MSE obtained from this study is much higher than those reported by Kok (1994), Klemkosky and Martin (1975), and Lam, Mok and Cheung (1990) and Wong (1994). The overall average value of MSE for the 3 predictors over the last three periods from 1993 to 1995 is 0.3808. In Klemkosky and Martin's (1975) study, the overall average value of MSE over three periods is 0.1395. In their study on the predictability and stationarity of beta coefficients of Hong Kong securities, Lam, Mok and Cheung (1990) reported an average MSE value of 0.0488 over 4 periods. Kok's (1994) study reported an average MSE value of 0.0688, while Wong

(1994) obtained an average MSE of 0.1115 for the betas of the overall market.

However, it should be noted that the MSE obtained from this study are not comparable to those of other studies due to several valid reasons. Firstly, the beta coefficients used in this study are yearly coefficients, whereas, in Klemkosky and Martin's (1975) study, the beta coefficients were computed for a five year period. Similarly, Kok's (1994) beta coefficients were computed for a three year period while Lam, Mok and Cheung (1990) used a bi-yearly beta coefficient computation.

Secondly, this study covered only the first 31 stocks that were listed on the Second Board of the KLSE. Like most developing capital market in their infancy stage, the behaviour of the Second Board is very much affected by the thinness in trading. Therefore, its nature can only be described as, at best, volatile and unpredictable. This contrasts greatly to the 800 or so stocks studied by Klemkosky and Martin (1975) . Even Kok's (1994) study covered 77 stocks listed on the KLSE Main Board. Both studies covered a much wider spectrum of the market. Lam,Mok and Cheung (1990) studied only 37 stocks, but they were 'blue chip' stocks in the Hong Kong securities market.The results of their study suggested that stocks with large capitalization and large turnover tend to have beta coefficients which are more predictable and more stationary.

Lastly, we used weekly returns to estimate the beta coefficients as in studies by Kok (1994), Wong (1994) and Lam, Mok and Cheung (1990), whereas Klemkosky and Martin used monthly returns.