CHAPTER 5

RESULTS AND ANALYSIS OF MARKET TIMING MODELS WITH CORRECTION FOR ARCH

5.1 Introduction

The results from Chapter 4 show that all market models have ARCH effect. The purpose of this chapter is to reestimate each market model with correction for ARCH in order to examine the relationship between the systematic risk and market timing ability in the presence of ARCH. The empirical analysis continues with an assessment of the similar framework adopted in Chapter 4. The different market timing models with correction for ARCH are used to examine the performance of the sample of 15 finance stocks chosen randomly from the Main Board of KLSE.

5.2 Results for the Market Timing Models with Correction for ARCH

The standard excess returns market model is estimated with the ARCH effect taken into account. The GARCH (1,1) model is used to assess the performance of the sample of 15 finance stocks that are listed on the Main Board of KLSE. The results are reported in Table 5.1.

Lets refer to the estimates of beta across all samples in the context of the linear market model or the standard returns market model with correction for ARCH. All the betas for the 15 finance stocks are significantly different from zero at the 1% level and all the coefficients are positive. The estimated betas fall in the range of 0.29

to 1.51. HANCOCK has the lowest systematic risk with a beta estimate of 0.2925, while MGIC has the highest systematic risk with a beta estimate of 1.5060. Comparing the results to the standard return market model without correction for ARCH, the beta estimates are very close to those reported in Table 4.1 and the findings on systematic risk are similar. HANCOCK has the lowest systematic risk, whilst MGIC has the highest systematic risk.

There are 8 cases of estimated betas that are greater than unity, whilst 7 cases of less than unity. The betas of AMMB, COMMERZ, IDRIS, MAA, MGIC, OSK, RHBCAP and TA are greater than one, while the others are less than one. The stocks that have beta estimates close to unity are MAYBANK and OSK. This analysis shows that the returns of the finance stocks are systematically related to the market returns. The results are not affected by the modelling of ARCH. The relationship between the stock returns and market returns is positive and statistically significant.

The performance of each stock is reflected by their alpha estimates as reported in Table 5.1. The value of α_i is a measure of the abnormal performance of stock *i*. All the α_i estimates are insignificantly different from zero, except IDRIS and MAA which are significant at the 1% level and 5% level, respectively. The abnormal return is positive for MAA but negative for IDRIS. A strong pattern that emerges from this analysis is that most of the stocks analyzed do not exhibit abnormal performance in terms of returns.

Table 5.1 Results for the Standard Returns Market Model with Correction for ARCH

$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it}$

Stocks	α_i	β_i	a_0	a_1	a_2	R^2	D-W
AMMB	0.0003 (0.0005)	1.1979** (0.0296)	0.0000**	0.1796**	0.7869**	0.465	2.000
APEX	-0.0011 (0.0006)	0.5945** (0.0218)	0.0000**	0.0717**	0.8954**	0.198	2.065
COMMERZ	0.0006 (0.0005)	1.2385** (0.0212)	0.0000**	0.1118**	0.8511**	0.569	2.001
HANCOCK	0.0001 (0.0003)	0.2925** (0.0137)	0.0001**	0.2996**	0.5820**	0.146	2.018
IDRIS	-0.0023** (0.0006)	1.3762** (0.0279)	0.0001**	0.4151**	0.6529**	0.356	1.998
MAA	0.0014* (0.0006)	1.1909** (0.0283)	0.0000**	0.1921**	0.7839**	0.445	2.028
MAYBANK	0.0005 (0.0003)	0.9967** (0.0151)	0.0000**	0.0872**	0.8859**	0.626	2.261
MBSB	-0.0004 (0.0005)	0.7958** (0.0205)	0.0001**	0.2681**	0.6366**	0.262	2.422
MGIC	-0.0002 (0.0008)	1.5060** (0.0495)	0.0000**	0.1096**	0.8765**	0.383	2.219
MIDF	-0.0001 (0.0005)	0.9473** (0.0227)	0.0000**	0.0985**	0.8884**	0.349	2.131
OSK	0.0002 (0.0005)	1.0312** (0.0219)	0.0001**	0.1761**	0.7674**	0.328	2.165
PBFIN	-0.0001 (0.0004)	0.7920** (0.0196)	0.0000**	0.1051**	0.8973**	0.352	1.991
PHILEO	-0.0002 (0.0006)	0.7930** (0.0232)	0.0000**	0.1063**	0.8552**	0.276	2.057
RHBCAP	0.0001 (0.0005)	1.4118** (0.0257)	0.0000**	0.0951**	0.8915**	0.565	2.028
TA	-0.0007 (0.0006)	1.3450** (0.0304)	0.0000**	0.0814**	0.9125**	0.397	2.134

**Coefficient is statistically significant at 1% level.

*Coefficient is statistically significant at 5% level.

$e_{it} = v_{it}\sqrt{h_{it}}$ and $E(e_{it}^2 \mid I_{t,t-1}) = h_{it} = a_0 + a_1 e_{t,t-1}^2 + a_2 h_{t,t-1}$

Figures in parentheses are standard errors.

As explained earlier, the standard alpha performance discussed above may not provide complete information. To look for evidence of market timing ability, a few different models are used for further investigation.

We continue with the analysis using the quadratic market model with correction for ARCH. Table 5.2 shows the outcome of this further analysis with correction for ARCH. Note that all the coefficients in the variance equation are highly significant. As can be seen, all the beta estimates are significantly different from zero at the 1% level. They are positive in value and fall in the range of 0.29 to 1.51. The values are very close to those reported in Table 5.1.

The γ_i estimates are important for indicating the market timing behaviour. There are 7 (8) cases for which evidence of market timing is detected at the 1% (5%) level. The sample stocks that show evidence of market timing performance at the 1% level are AMMB, COMMERZ, HANCOCK, MAA, MAYBANK, MIDF and OSK, whilst at the 5% level is IDRIS. All the eight cases show that the quadratic term is positive indicating favourable market timing behaviour. As for the security selection performance, all the α_i estimates for all the cases above are insignificantly different from zero, except IDRIS which is significant at the 1% level.

Again as in Chapter 4, the results above do not show the positive association between the security selection and market timing performance, as documented by Bello and Janjigian (1997), or the negative association as documented by Sinclair (1990). For the cases above, there is evidence that the managers have had significant market timing ability although there is no stock selection ability. AMMB, COMMERZ, HANCOCK, IDRIS, MAA, MAYBANK and MIDF are common to the two sets of significant results as reported in Table 4.2 and Table 5.2. Only 3

cases, PBFIN, PHILEO and RHBCAP do not exhibit market timing ability after the ARCH effect is taken into account in the quadratic returns market model.

Table 5.2 Results for the Quadratic Returns Market Model with Correction for ARCH

$R_{it} = \alpha_i + \beta_i R_{mt} + \gamma_i R_{mt}^2 + e_{it}$

Stocks	α_i	β_i	γ_i	a_0	a_1	a_2	R^2	D-W
AMMB	0.0000 (0.0006)	1.1824** (0.0295)	1.1940** (0.2815)	0.0000**	0.1772**	0.7889**	0.473	2.008
APEX	-0.0011 (0.0006)	0.5936** (0.0225)	0.3182 (0.2068)	0.0000**	0.0719**	0.8948**	0.198	2.067
COMMERZ	0.0004 (0.0005)	1.2261** (0.0249)	0.9081** (0.2022)	0.0000**	0.1152**	0.8458**	0.575	2.025
HANCOCK	-0.0001 (0.0004)	0.2943** (0.0145)	0.6642** (0.1362)	0.0001**	0.3045**	0.5780**	0.150	2.015
IDRIS	-0.0023** (0.0007)	1.3386** (0.0317)	1.0560* (0.5083)	0.0001**	0.3924**	0.6726**	0.358	2.008
MAA	0.0011 (0.0006)	1.1968** (0.0291)	1.5207** (0.4417)	0.0000**	0.1957**	0.7794**	0.455	2.034
MAYBANK	0.0003 (0.0004)	0.9923** (0.0158)	0.7366** (0.2044)	0.0000**	0.0874**	0.8849**	0.629	2.254
MBSB	-0.0004 (0.0005)	0.7961** (0.0205)	0.1076 (0.2694)	0.0001**	0.2686**	0.6355**	0.262	2.422
MGIC	-0.0001 (0.0009)	1.5108** (0.0503)	-0.4980 (0.8522)	0.0000**	0.1091**	0.8772**	0.386	2.222
MIDF	-0.0003 (0.0005)	0.9471** (0.0232)	0.8149** (0.2660)	0.0000**	0.1000**	0.8865**	0.350	2.149
OSK	0.0000 (0.0005)	1.0177** (0.0217)	0.7696** (0.2029)	0.0001**	0.1753**	0.7668**	0.328	2.154
PBFIN	-0.0002 (0.0004)	0.7890** (0.0201)	0.5314 (0.2872)	0.0000**	0.1028**	0.8993**	0.355	2.002
PHILEO	-0.0003 (0.0006)	0.7918** (0.0235)	0.3947 (0.3503)	0.0000**	0.1040**	0.8581**	0.278	2.054
RHBCAP	0.0000 (0.0005)	1.4120** (0.0259)	0.1722 (0.2052)	0.0000**	0.0948**	0.8920**	0.565	2.030
TA	-0.0008 (0.0006)	1.3435** (0.0304)	0.3556 (0.3633)	0.0000**	0.0820**	0.9118**	0.397	2.137

**Coefficient is statistically significant at 1% level.

*Coefficient is statistically significant at 5% level.

$e_{it} = v_{it}\sqrt{h_{it}}$ and $E(e_{it}^2 \mid I_{t,t-1}) = h_{it} = a_0 + a_1 e_{i,t-1}^2 + a_2 h_{i,t-1}$

Figures in parentheses are standard errors.

Table 5.3 examines the overall performance of the stocks using the standard market model with correction for ARCH to quantify the component attributable to market timing, although not significantly so. The cases that exceed 0.03% per day are AMMB and MAA, whilst MGIC shows a negative value. Thus, AMMB and MAA have the highest value for the abnormal return specific to market timing ability among all stocks. AMMB has an overall daily abnormal performance of 0.03%, of which all is due to market timing ability. MAA has an overall daily abnormal performance of 0.14%, which decomposes into 0.11% of abnormal return specific to stock selection and 0.03% of abnormal return specific to market timing ability.

The evidence of market timing ability across our sample using the quadratic market model with correction for ARCH is rather strong since 53% of the sample shows positive results. Our concern is whether this conclusion is sensitive to the market timing model.

The results are estimated for the dual-beta market model outlined earlier with correction for ARCH and reported in Table 5.4. The coefficients of the variance equation for the error term are all significant. There are seven cases for which the evidence of market timing is detected based on the dual-beta specification at the 1% level. The sample stocks that show evidence of market timing performance are COMMERZ, HANCOCK, IDRIS, MAA, OSK, PHILEO and RHBCAP. The only case that shows evidence of market timing performance at 5% level is TA.

Table 5.3 Abnormal Returns Specific to Market Timing Ability for the Quadratic Returns Market Model with Correction for ARCH

Stocks	Abnormal return specific to stock selection (α_i from Table 5.2)	Abnormal performance (α_i from Table 5.1)	Abnormal return specific to market timing activity
AMMB	0.0000	0.0003	0.0003
APEX	-0.0011	-0.0011	0.0000
COMMERZ	0.0004	0.0006	0.0002
HANCOCK	-0.0001	0.0001	0.0002
IDRIS	-0.0023**	-0.0023**	0.0000
MAA	0.0011	0.0014*	0.0003
MAYBANK	0.0003	0.0005	0.0002
MBSB	-0.0004	-0.0004	0.0000
MGIC	-0.0001	-0.0002	-0.0001
MIDF	-0.0003	-0.0001	0.0002
OSK	0.0000	0.0002	0.0002
PBFIN	-0.0002	-0.0001	0.0001
PHILEO	-0.0003	-0.0002	0.0001
RHBCAP	0.0000	0.0001	0.0001
TA	-0.0008	-0.0007	0.0001

**Coefficient is statistically significant at 1% level.

*Coefficient is statistically significant at 5% level.

All the 8 cases show that the values of β_{1i} are positive and fall in the range of 0.37 to 1.55. All the 8 cases show that the values of β_{2i} are positive, except PHILEO. The values of β_{2i} fall in the range of 0.15 to 0.35, but for PHILEO the value is -0.14. Superior market timing behaviour is suggested in all the cases where the 'down-market' beta term is positive.

Of these 8 stocks, the value of αi is negative for 7 cases. However, PHILEO has a positive value of α_i. These results show the negative association between the security selection and market timing performance as documented by Sinclair (1990), but we must note that only IDRIS and RHBCAP have α_i that is significant.

Table 5.4 Results for the Dual-Beta Market Model with Correction for ARCH

$R_{it} = \alpha_i + \beta_{1i}R_{mt} + \beta_{2i}DR_{mt} + e_{it}$

Stocks	α_i	β_{1i}	β_{2i}	a_0	a_1	a_2	R^2	D-W
AMMB	-0.0003 (0.0007)	1.2492** (0.0445)	0.1168 (0.0662)	0.0000**	0.1789**	0.7867**	0.468	1.997
APEX	-0.0013 (0.0007)	0.6156** (0.0360)	0.0433 (0.0547)	0.0000**	0.0722**	0.8947**	0.198	2.066
COMMERZ	-0.0004 (0.0006)	1.3276** (0.0294)	0.1941** (0.0600)	0.0000**	0.1165**	0.8430**	0.573	2.014
HANCOCK	-0.0007 (0.0005)	0.3702** (0.0233)	0.1537** (0.0321)	0.0001**	0.3101**	0.5713**	0.144	2.006
IDRIS	-0.0034** (0.0009)	1.4774** (0.0499)	0.3370** (0.0939)	0.0001**	0.3821**	0.6872**	0.359	2.007
MAA	-0.0003 (0.0007)	1.3477** (0.0463)	0.3460** (0.0743)	0.0000**	0.1984**	0.7786**	0.452	2.028
MAYBANK	0.0001 (0.0004)	1.0260** (0.0224)	0.0642 (0.0429)	0.0000**	0.0873**	0.8855**	0.624	2.261
MBSB	-0.0002 (0.0007)	0.7763** (0.0343)	-0.0378 (0.0555)	0.0001**	0.2687**	0.6363**	0.262	2.422
MGIC	-0.0009 (0.0011)	1.5818** (0.0820)	0.1564 (0.1310)	0.0000**	0.1099**	0.8761**	0.379	2.212
MIDF	-0.0006 (0.0007)	0.9929** (0.0364)	0.0920 (0.0589)	0.0000**	0.0990**	0.8881**	0.350	2.134
OSK	-0.0013 (0.0007)	1.1647** (0.0336)	0.2950** (0.0533)	0.0001**	0.1809**	0.7639**	0.326	2.153
PBFIN	0.0000 (0.0006)	0.7862** (0.0388)	-0.0140 (0.0591)	0.0000**	0.1054**	0.8971**	0.351	1.991
PHILEO	0.0006 (0.0008)	0.7313** (0.0307)	-0.1403** (0.0520)	0.0000**	0.1077**	0.8528**	0.276	2.065
RHBCAP	-0.0013* (0.0006)	1.5528** (0.0391)	0.3006** (0.0666)	0.0000**	0.0915**	0.8948**	0.573	2.035
TA	-0.0016* (0.0007)	1.4402** (0.0485)	0.1868* (0.0770)	0.0000**	0.0816**	0.9122**	0.397	2.137

**Coefficient is statistically significant at 1% level.

*Coefficient is statistically significant at 5% level.

$e_{it} = v_{it}\sqrt{h_{it}}$ and $E(e_{it}^2 \mid I_{i,t-1}) = h_{it} = a_0 + a_1 e_{i,t-1}^2 + a_2 h_{i,t-1}$

Figures in parentheses are standard errors.

A comparison with Table 5.2 shows that COMMERZ, HANCOCK, IDRIS, MAA and OSK have also been identified as market timing performers according to the quadratic market model. A comparison between Table 4.4 and Table 5.4 shows that COMMERZ, IDRIS, MAA and RHBCAP are common to the two sets of significant results as reported. Only AMMB, MAYBANK and MGIC lose their

evidence of market timing ability after ARCH is taken into account. Another interesting observation is that the perverse market timing ability of MGIC no longer holds for the models corrected for ARCH.

Table 5.5 Abnormal Returns Specific to Market Timing Ability for the Dual-Beta Market Model with Correction for ARCH

Stocks	Abnormal return specific to stock selection (α_i from Table 5.4)	Abnormal performance (α_i from Table 5.1)	Abnormal return specific to market timing activity
AMMB	-0.0003	0.0003	0.0006
APEX	-0.0013	-0.0011	0.0002
COMMERZ	-0.0004	0.0006	0.0010
HANCOCK	-0.0007	0.0001	0.0008
IDRIS	-0.0034**	-0.0023**	0.0011
MAA	-0.0003	0.0014*	0.0017
MAYBANK	0.0001	0.0005	0.0004
MBSB	-0.0002	-0.0004	-0.0002
MGIC	-0.0009	-0.0002	0.0007
MIDF	-0.0006	-0.0001	0.0005
OSK	-0.0013	0.0002	0.0015
PBFIN	0.0000	-0.0001	-0.0001
PHILEO	0.0006	-0.0002	-0.0008
RHBCAP	-0.0013*	0.0001	0.0014
TA	-0.0016*	-0.0007	0.0009

**Coefficient is statistically significant at 1% level.

*Coefficient is statistically significant at 5% level.

Table 5.5 shows that IDRIS, RHBCAP and TA are the sample stocks that show evidence of significant market timing ability that has been offset by significantly poor stock selection ability. Specifically, IDRIS has an overall abnormal performance of -0.23% which decomposes into -0.34% of abnormal return specific to security selection and 0.11% of abnormal return specific to market timing activity. Similarly, RHBCAP has an overall abnormal performance of 0.01% which

decomposes into -0.13% of abnormal return specific to security selection and 0.14% of abnormal return specific to market timing activity. TA had an overall abnormal performance of -0.07% which decomposes into -0.16% of abnormal return specific to security selection and 0.09% of abnormal return specific to market timing activity.

The results suggest that there is evidence of market timing ability in slightly more than half of the sample stocks regardless of the timing model applied.

5.3 Results for the Specification Tests with Correction for ARCH

Now lets consider the cubic model which is one of the specification tests of the market timing models with correction for ARCH, following the suggestions of Jagannathan and Korajczyk (1986). The cubic term is the augmented variable. The results of this analysis are reported in Table 5.6.

The sample stocks that have significant cubic term are OSK and PHILEO at the 1% level, and RHBCAP and TA at the 5% level. There are two cases (13.3%) and four cases (27%) of the sample that reveal a significant cubic term at the 1% level and 5% level respectively. This suggests some degree of misspecification of the quadratic market model. The result shows that all the significant cubic terms produce an estimated parameter which is negative. Interestingly, only OSK coincide with the significant result modeled by the quadratic specification in Table 5.2. This means that the other 7 stocks that exhibit significant market timing performance is not misspecified.

Table 5.6 Results for the Specification Tests on the Quadratic Returns Market Model with Correction for ARCH

$R_{it} = \alpha_i + \beta_i R_{mt} + \gamma_i R_{mt}^2 + \delta_i R_{mt}^3 + e_{it}$

Stocks	α_i	β_i	γ_i	δ_i	a_0	a_1	a_2	R^2	D-W
AMMB	0.0000 (0.0006)	1.1828** (0.0354)	1.1926** (0.3036)	-0.0440 (2.1780)	0.0000**	0.1771**	0.7889**	0.473	2.008
APEX	-0.0011 (0.0006)	0.6390** (0.0330)	0.2086 (0.2852)	-4.1027 (2.6336)	0.0000**	0.0702**	0.8946**	0.203	2.059
COMMERZ	0.0004 (0.0005)	1.2130** (0.0276)	0.9158* (0.3921)	1.2029 (2.2099)	0.0000**	0.1129**	0.8500**	0.575	2.025
HANCOCK	-0.0001 (0.0004)	0.3082** (0.0175)	0.6664** (0.1647)	-1.6124 (1.2303)	0.0001**	0.3029**	0.5761**	0.154	2.006
IDRIS	-0.0025** (0.0007)	1.3749** (0.0321)	1.2591* (0.6289)	-4.5301 (3.6486)	0.0001**	0.4096**	0.6565**	0.359	2.004
MAA	0.0010 (0.0006)	1.1510** (0.0324)	1.8324** (0.5852)	4.2629 (3.9160)	0.0000**	0.2034**	0.7725**	0.453	2.032
MAYBANK	0.0003 (0.0004)	0.9663** (0.0204)	0.8106** (0.2629)	3.8591 (2.4821)	0.0000**	0.0867**	0.8858**	0.632	2.230
MBSB	-0.0004 (0.0005)	0.8266** (0.0236)	0.0257 (0.3507)	-4.4456 (2.718)	0.0001**	0.2662**	0.6350**	0.267	2.415
MGIC	-0.0002 (0.0009)	1.5302** (0.0585)	0.2513 (1.0000)	-9.7266 (11.1699)	0.0000**	0.1087**	0.8776**	0.386	2.218
MIDF	-0.0003 (0.0006)	0.9309** (0.0266)	0.8010 (0.5423)	2.5399 (3.3822)	0.0000**	0.1007**	0.8853**	0.349	2.159
OSK	0.0001 (0.0005)	1.0943** (0.0249)	0.2755 (0.3334)	-15.8423** (2.0742)	0.0000**	0.1564**	0.7856**	0.360	2.112
PBFIN	-0.0002 (0.0004)	0.8102** (0.0230)	0.4384 (0.3559)	-3.1182 (2.7220)	0.0000**	0.1045**	0.8975**	0.356	1.985
PHILEO	-0.0003 (0.0006)	0.8797** (0.0332)	0.3749 (0.3392)	-7.2225** (1.2955)	0.0000**	0.0988**	0.8628**	0.289	2.043
RHBCAP	0.0000 (0.0005)	1.4418** (0.0304)	0.2264 (0.2078)	-3.9963* (1.9879)	0.0000**	0.0943**	0.8923**	0.566	2.006
TA	-0.0007 (0.0006)	1.3848** (0.0353)	0.2476 (0.4149)	-5.5371* (2.7832)	0.0000**	0.0776**	0.9167**	0.402	2.125

**Coefficient is statistically significant at 1% level.

*Coefficient is statistically significant at 5% level.

$e_{it} = v_{it}\sqrt{h_{it}}$ and $E(e_{it}^2 \mid I_{i,t-1}) = h_{it} = a_0 + a_1 e_{i,t-1}^2 + a_2 h_{i,t-1}$

Figures in parentheses are standard errors.

Finally, we consider the results of augmenting dual-beta market model with a quadratic term and the model is corrected for ARCH as shown in Table 5.7. The table reveals there are 2 (3) cases in which the coefficient of the augmented variable is significant at the 1% (5%) level.

Table 5.7 Results for the Specification Tests on the Dual-Beta Market Model with Correction for ARCH

$R_{it} = \alpha_i + \beta_{1i}R_{mt} + \beta_{2i}DR_{mt} + \delta_i R_{mt}^2 + e_{it}$

Stocks	α_i	β_{1i}	β_{2i}	δ_i	a_0	a_1	a_2	R^2	D-W
AMMB	0.0012 (0.0008)	1.0585** (0.0699)	-0.2612* (0.1173)	2.0049** (0.5154)	0.0000**	0.1755**	0.7915**	0.475	2.023
APEX	-0.0009 (0.0006)	0.5638** (0.0330)	-0.0598 (0.2852)	0.5041 (2.6336)	0.0000**	0.0706**	0.8966**	0.198	2.066
COMMERZ	0.0003 (0.0007)	1.2399** (0.0557)	0.0280 (0.0983)	0.8248* (0.3534)	0.0000**	0.1155**	0.8452**	0.575	2.024
HANCOCK	-0.0003 (0.0006)	0.3221** (0.0398)	0.0571 (0.0671)	0.4714 (0.2908)	0.0001**	0.3071**	0.5740**	0.148	2.011
IDRIS	-0.0035** (0.0011)	1.4891** (0.0807)	0.3603* (0.1507)	-0.1481 (0.8206)	0.0001**	0.3845**	0.6857**	0.359	2.006
MAA	0.0004 (0.0008)	1.2611** (0.0710)	1.1458 (0.1317)	1.0485 (0.8682)	0.0000**	0.1980**	0.7777**	0.455	2.031
MAYBANK	0.0008 (0.0005)	0.9355** (0.0374)	-0.1192 (0.0770)	1.1725** (0.3568)	0.0000**	0.0872**	0.8854**	0.629	2.251
MBSB	0.0002 (0.0008)	0.7338** (0.0556)	-0.1235 (0.1003)	0.5325 (0.5056)	0.0001**	0.2720**	0.6301**	0.261	2.425
MGIC	-0.0002 (0.0014)	1.8238** (0.1655)	0.5837* (0.2965)	-4.1149 (2.3298)	0.0000**	0.1082**	0.8781**	0.392	2.217
MIDF	-0.0002 (0.0008)	0.9317** (0.0612)	-0.0317 (0.1012)	0.9264* (0.4703)	0.0000**	0.0998**	0.8866**	0.350	2.151
OSK	-0.0016 (0.0008)	1.2053** (0.0488)	0.3711** (0.0914)	-0.4355 (0.3260)	0.0001**	0.1808**	0.7652**	0.326	2.157
PBFIN	0.0006 (0.0007)	0.6958** (0.0550	-0.1967* (0.0951)	1.1745* (0.4891)	0.0000**	0.1071**	0.8955**	0.355	2.009
PHILEO	0.0005 (0.0008)	0.7183** (0.0317)	-0.1658** (0.0549)	0.4868 (0.3261)	0.0000**	0.1055**	0.8554**	0.278	2.063
RHBCAP	-0.0013 (0.0007)	1.5544** (0.0454)	0.3038** (0.0773)	-0.0370 (0.3117)	0.0000**	0.0915**	0.8948**	0.572	2.035
TA	-0.0019* (0.0009)	1.4996** (0.0790)	0.2975* (0.1355)	-0.6873 (0.6333)	0.0000**	0.0802**	0.9138**	0.399	2.134

**Coefficient is statistically significant at 1% level.

*Coefficient is statistically significant at 5% level.

$e_{it} = v_{it}\sqrt{h_{it}}$ and $E(e_{it}^2 \mid I_{t,t-1}) = h_{it} = a_0 + a_1 e_{t,t-1}^2 + a_2 h_{t,t-1}$

Figures in parentheses are standard errors.

The sample stocks that have significant quadratic terms are AMMB and MAYBANK at the 1% level and COMMERZ, MIDF and PBFIN at the 5% level. Only COMMERZ is common to the two sets of significant results in Tables 5.4 and 5.7, indicating that the other 7 stocks which show significant timing ability using the dual-beta model are not misspecified.

In the analysis, we find that 4 and 5 of the cases suffer for misspecification for the quadratic and dual-beta market models, respectively. The corresponding figures reported in Chapter 4 are 10 and 8. This suggests that by taking ARCH into account, the degree of market model misspecification has reduced. Further, only one case for each model that exhibits significant market timing ability is misspecified, compared to 3 cases in Chapter 4 that do not model the ARCH effect.