**FIN567 HW6**

Question 1, a~d:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Alpha | Beta | Sigma | Sigma1 |
| a | 0.177703369 | 0.716739078 | 0.008012912 | 0.005874963 |
| b | 0.179316653 | 0.716203117 | 0.008057502 | 0.005894347 |
| c | 0.18078955 | 0.711309495 | 0.008021406 | 0.008057502 |
| d | 0.1822276 | 0.7107855 | 0.008057502 | 0.008057502 |

Question 1, e:

|  |  |  |  |
| --- | --- | --- | --- |
| a | b | c | d |
| 0.005945627 | 0.005950754 | 0.005957725 | 0.00596125 |
|  |  |  |  |

Question 2, a~b:

|  |  |  |
| --- | --- | --- |
|  | Var\_forecast | Annualized STDEV |
| a | 0.001345243 | 0.1270548 |
| b | 0.001360143 | 0.1277565 |
| c | 0.001348262 | 0.1271973 |
| d | 0.001360333 | 0.1277654 |

Question 3, a:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Alpha | Beta | Sigma | Sigma1 | Theta |
| 0.226322794 | 0.727348515 | 0.014447663 | 0.006169932 | 0.23034472 |

Question 3,b:

The log likelihood of the GARCH(1, 1) model is 4404.589.

The log likelihood of the NGARCH(1, 1) model is 4405.235

The Chi-square test value with the null hypothesis theta = 0 is: 0.0002935826.

The 5% quantile of the Chi-square distribution is 0.00393214; the 1% quantile of the Chi-square distribution is 0.0001570879. Therefore, we are able to reject the null hypothesis at 5% level but not at 1% level.