CHAPTER 5 : DATA ANALYSIS

Chapter five will discuss the results formulated from the analysis. The hypothesis drawn will be tested and interpreted accordingly. Hypothesis one will deal with the market efficiency where else hypothesis two will deal with the cumulative abnormal return by the individual category i.e reaffirmations, initial assignments, downgrades and upgrades.

5.1 Summary Statistics of Responsibilities

The sample that consists of 142 bond-rating announcements has been categorized into 4 types i.e Initial assignment (31), Reaffirmation (50), Upgrades (21) and Downgrade (40). The above- mentioned category were sub-categorized into investment class and speculative class for further analysis. The hypothesis was tested using the t-statistic while the observed t value at confidence level of 95% was used in deciding to accept or reject H null. The absolute value of t and $AR_{Nt\ has}$ been when discussing the analysis.

5.2 Analysis of Measures / Testing of Hypothesis

5.2.1 Market Efficiency

Hypothesis 1

H_0 : *Ratings announcement has no significant impact on market efficiency during the window period*

H_1 : *Ratings announcement has significant impact on market efficiency during the window period*

Initial Assignment

On the announcement day the AR_{Nt} reading was 2.213 which is the highest among the investment group occurred. Where else the lowest reading captured on the day –4 was – 0.01536. The reading shows a mixture of positive and negative figures and there is no consistent pattern. The critical value at the confidence level of 95% is 1.708. The results show that the observed t value on the announcement day is 0.5265, which is very much

lower than the threshold figure of 2.473. This indicate that there is no significant changes in AR_{Nt} and as such we can define the market as efficient.

The AR_{Nt} on the announcement day for speculative group is –4.454 with observed t value of –0.10766. The highest AR_{Nt} captured is –18.9019 on day +3 and the lowest is –2.4534 on day +2. The AR_{Nt} figure is negative throughout the window period. The critical t-value at 95% confidence level is 6.965 where the highest observed t value is -.1077 that means we can strongly conclude that there is no significant return throughout the window period and the market is efficient.

The result is similar for the overall initial assignment category. The AR_{Nt} on the announcement day is 0.495, highest –1.5233 and the lowest is 0.06583. The value does not show any consistent pattern. In the case of observed t value the highest value computed is 0.1138 that is far lesser than the critical value of 1.697. Overall the announcement does not contribute to any significant return and the market can be defined as efficient.

Reaffirmation

The AR_{Nt} of investment group on the announcement day is 11.7304, which are the highest throughout the window period, and all reading shows positive value throughout this period. However there is no any definite pattern observed because the AR_{Nt} value was not consistently up or down before or after the announcement day. The expectation of the market player built up before the announcement and keep increasing and the correction mechanism does not occurred immediately. The observed t value for this group is 2.3177 which is the highest and the critical t value is 1.684. Generally the return is significant throughout the window period and the market is not efficient.

AR_{Nt} on announcement day for the speculative grade is 18.35612 which is the second highest within the window period. It was the highest during day +5. The observed t value is during the windows period is between 1.9358 and 3.6122 which is more than the critical t value of 1.895. There is no definite pattern observed in term of the returns.

Generally we could derive that the return is significant and the market is not efficient for speculative grade. The event on day +5, which recorded extraordinary return compared to the rest of the days in window period, could be due to other events.

The reaffirmation category as a whole recorded an AR_{Nt} reading of 12.7905 with observed t value of 2.1398. The critical t value is 21.678 and this result is in line with the finding for the above subcategory where the return is significant and the market is not efficient.

Repeating the above test at 98% or 99% confidence level will has produced contradict result here the return is not significant and the market is efficient.

Downgrades

On the announcement day the AR_{Nt} for the investment grade recorded was at 0.1660. The highest reading of 2.6461was recorded on the day –2 during the window period. The AR_{Nt} readings show a mixture of positive and negative value and there is no definite pattern observed. The observed t value on the announcement day is 0.00221 and the critical t value is 1.746. None of the observed t value during the window period which is between 0.221 and 0.3521 exceeds 2.583 and this implies that there is no significant return and the market is efficient. The market has not reacted at all on the announcement of downgrades on Investment Grade.

The AR_{Nt} for the speculative grade on the announcement day viscosity is –1.0042 while the absolute value of 10.05398 on the day –3 recorded as the highest. The readings are a mix in nature and no definite pattern emerges. The highest observed t-value computed is 0.1336 and this is far below the critical t-value of 1.860. This implies that there is no significant return and the market reacts efficiently to the news announcements of downgrades.

At the summary level combining both grades, AR_{Nt} of –0.0786 was recorded. Highest absolute value recorded on day –5 was 3.0870. The highest observed t-value of 0.4884

was computed on day –5 and the lowest is 0.0124 . This value is far below the critical t-value of 1.684 which implies that the returns are not significant and the market is efficient.

Upgrades

The AR_{Nt} of 1.0486 was recorded on the announcement day for the investment grade category. The highest AR_{Nt} of –1.6265 was recorded on day +2. The pattern observed is not definite. The highest t value of 0.5413 was computed on the day +2 and this is far below the critical t-value of 1.774. This being the case, we can convincingly postulate that investment grade returns are insignificant and the market is reacting efficiently to the announcement of upgrades.

The AR_{Nt} on announcement day was 1.0486 for the speculative grade and the highest was recorded on the day –5 at 2.6209. Meanwhile the lowest AR_{Nt} of –2.7074 was recorded on day –5. It shows no consistent pattern. The observed t-value on the announcement day was 0.4278 and the highest observed was 1.0694. This is far below the critical t-value of 6.314 and as such we can infer that the returns are very much insignificant and the market is efficiently reacting to the announcement.

The aggregate impact of AR_{Nt} inclusive of both the grades on the announcement day was 1.2633. The highest reading of 1.3073 was recorded on day +4. The AR_{Nt} values produced are indeterminate and has produced no consistent pattern. The observed t-value on announcement day was 0.4502 while the highest at 0.4661was on day +4. The critical t-value was 1.725 and the overall observed t-value did not exceed the critical value. As such, we could conclude that an upgrade announcement in the market produces no significant return during the window period and the market reacts efficiently to the upgrading announcement.

The above analysis shows that there is no any significant return among the initial assignment, upgrade and downgrade categories of bond rating announcements. The market reacts efficiently to the bond-rating announcement. There is no clear evidence of

any consistent abnormal return occurrences for this categories. The overall testing produces t-test results that support the conclusion to accept the H null which outlines that there is no significant abnormal return among the above mentioned three categories of bond rating and also the sub category of two grades investment and speculative.

However the result is vary for the reaffirmation bond ratings. It shows the market is not efficient at 95% confidence level. The result is inline for both categories of investment and speculative grades. However testing at slightly higher confidence level of 98% or 99% produce result inline with initial assignment, downgrade and upgrade.

5.2 .2 Impact on abnormal return

The objective of this part of the study is to analyze further the impact of bond rating announcements on abnormal returns throughout the 11 day window period. $CAAR_{Nn}$ will be the measure selected to observe the total impact on abnormal return. Four type of ratings will be tested separately for each category of bond ratings. Discussion will concentrate on individual stocks, investment grade, speculative grade and a summary, which covers the cumulative impact of both. The critical t-value will be fixed throughout the section because the degree of freedom will be fixed at 10 (n-1) where n is the number of days in window period. The critical t value is 1.833 at 95% confidence level.

Hypothesis Ho: Rating announcements provide significant abnormal returns over event window period.

Hypothesis H_1: Rating announcements provide no significant abnormal returns over event window period.

Initial Announcement

The lowest $CAAR_{Nn}$ recorded in initial assignment grade is –7.2201 by Park May and highest is 5.9596 by Mitra. The observed t-value for the respective counters is –0.1011 and 0.8001. The overall observed t value is lower than the critical t-values and it appears insignificant.

The investment grade of companies showed $CAAR_{Nn}$ of –0.1242 with the t-value of -0.07. At 95% confidence level the return appears statistically insignificant. About 53.57% of the counters in investment grade produce positive returns.

On the other hand, the speculative grade of companies showed $CAAR_{Nn}$ of 0.04949 and the observed t-value of 0.1196. The return is not statistically significant. Only about 33.3% of the counters produced positive return. Generally speculative grade recorded return lower than the investment grade.

The summary statistics combining both grades give a $CAAR_{Nn}$ of 0.041226 and a t-value of 0.003059. Hence H_0 is accepted for initial assignment category and it can be concluded that the initial assignment bond rating news is not creating any significant impact on the abnormal return.

Reaffirmations

The lowest $CAAR_{Nn}$ recorded for reaffirmation grade was –0.7179 by AKN and highest is 45.6244 by YTL Cement. The observed t-values for the respective counters are –0.2444 and 9.0567 respectively.

Within the investment grade, out of 42 ratings only three ratings (YTL Cement, YTL Corporation and PK Resources) showed $CAAR_{Nn}$ value of more than 20. Rubberex and AKN are the only two ratings, which produced negative $CAAR_{Nn}$. About 95.2% of the reaffirmation ratings produced positive return. The $CAAR_{Nn}$ for reaffirmation was 10.485 while the observed t-value was 2.072. As such it can be concluded that statistically the return is significant.

On the other hand all eight ratings selected in speculative grade produced positive return. The $CAAR_{Nn}$ recorded was at 15.832 while the observed t-value was 2.764. Hence the return is statistically significant even though the returns are positive.

The aggregate impact of both grades for $CAAR_{Nn}$ was 11.3403 with the observed t-value of 2.1398. This brings us to the conclusion that the reaffirmation ratings are showing statistically significant returns. The overall returns are positive and it is significant enough to reject H_0. The reaffirmation rating announcements add new value to the abnormal return.

Downgrades

The lowest $CAAR_{Nn}$ recorded in downgrade grade was –7.8739 by YCS while the highest was 16.8739 by Renong. The observed t-value for the respective counters are –1.0477 and 2.2452. Generally the $CAAR_{Nn}$ recorded ranges between –7.8739 and 7.3416 with Renong being an exception as its returns may be influenced by occurrences of events beside downgrade ratings. Similarly, the general pattern indicates that the observed t-value is generally below 1.0477 except for Renong ratings.

The investment grades' $CAAR_{Nn}$ is -.0728 while the observed t-value is -.0097. The return is not statistically significant. 70.6% of the ratings within the class produces negative returns.

On the other hand the speculative grade samples showed the $CAAR_{Nn}$ value of 0.0816 and the observed t-value is 0.0109. This informs us that the abnormal return is not statistically significant. About 88.89% of the downgrades ratings in speculative grades produced negative return.

The overall $CAAR_{Nn}$ is 0.0393 and the observed t value is 0.0062. Both the grades discussed produce negative returns. This leads to the question why the aggregate abnormal return is positive. The is due to intra rating announcement. The t-value derived induces us to accept H_0 and to conclude that the abnormal return for downgrade ratings is not significant.

Upgrades

The lowest $CAAR_{Nn}$ recorded within the upgrades grade was –1.4233 by MTD2 and the highest was 1.6229 by Apex. The observed t value for the respective counters was –0.3321 and 0.8912. Both abnormal returns are not significant based on the observed t-value. 38.1% of the ratings generate negative CAAR.

The investment grade samples showed the $CAAR_{Nn}$ value of –0.0940 and the observed t-value is –0.0313. These results allow us to postulate that the abnormal return for upgrade announcement within the investment grade is not statistically significant. 50% of the ratings produce positive return.

On the other hand the speculative grades' $CAAR_{Nn}$ recorded was 0.5703 and the observed t-value was 0.2327. Investment grade consists of only 2 ratings and both produce positive return. However the cumulative abnormal return is not statistically significant at 95% confidence level.

At the summary level the combined $CAAR_{Nn}$ was 0.1989 and the observed t-value was 0.0709. Hence the H_0 is accepted which indicates that even the upgrade announcement news does not contribute significantly to the abnormal return.

5.3 Summary of Research Results

5.3.1 Market Efficiency

Below is the summary table of the analysis result.

Table a : Summary of market efficiency results

a) Initial Assignment

	t-value	*t-critical at 95%*	*Significant*	*Market Efficiency*
Speculative Grade	0.0593 – 0.4568	2.920	No	**Efficient**
Investment Grade	0.0037 – 0.5265	1.708	No	**Efficient**
Summary	0.0067 – 0.1130	1.697	No	**Efficient**

b) Reaffirmation

	t-value	*t-critical at 95%*	*Significant*	*Market Efficiency*
Speculative Grade	1.9358 – 3.6122	1.895	Yes	**Not Efficient**
Investment Grade	1.9027 – 2.3178	1.684	Yes	**Not Efficient**
Summary	1.9563 - 2.4134	1.678	Yes	**Not Efficient**

c) Downgrade

	t-value	*t-critical at 95%*	*Significant*	*Market Efficiency*
Speculative Grade	0.0533 – 1.3377	1.860	No	**Efficient**
Investment Grade	0.0221 – 0.3521	1.746	No	**Efficient**
Summary	0.0124 – 0.4884	1.684	No	**Efficient**

e) Upgrade

	t-value	*t-critical at 95%*	*Significant*	*Market Efficiency*
Speculative Grade	0.0852 – 1.1047	6.314	No	**Efficient**
Investment Grade	0.0270 – 0.1904	1.771	No	**Efficient**
Summary	0.0001 – 0.4661	1.725	No	**Efficient**

The first hypothesis testing the market efficiency in the semi strong form shows that the market is efficient to bond rating announcements. No significant movement in the abnormal return has been observed within the window period of 11 days for initial announcement, downgrades and upgrades rating announcement. However reaffirmation ratings produced significant result and indicate that the market is not efficient. The result is similar for the sub category of investment grade and the speculative grade within the above-specified type of ratings.

5.3.2 Impact on Stock Returns

Below is the summary table o the analysis result.

Table b : Summary of market efficiency results

Rating type	Investment Grade			Speculative Grade			Summary		
	$CAAR_{NI}$	t-value	*	$CAAR_{NG}$	t-value	*	$CAAR_{N}$	t-value	*
Initial Assignment	-0.1242	-0.07	No	-4.9485	-0.1196	No	0.04123	0.0031	No
Reaffirmation	10.485	2.072	Yes	15.832	2.47	Yes	11.3403	2.1398	Yes
Upgrade	-0.0940	-0.0313	No	0.5703	0.2327	No	0.1989	0.709	No
Downgrade	-0.0728	-0.0047	No	0.0816	0.104	No	0.0393	0.0032	No

*Note : * refers to significant*

The above table showed that the observed t-value, which is, less than the critical t-value except for the reaffirmation ratings. Hence the rating announcement is not caused any significant average abnormal return throughout the type of ratings except for the reaffirmation. The result is similar for the sub category of investment and speculative grade. The results also showed that the reaffirmation ratings announcement produced higher positive abnormal return compared to others types of ratings. The findings are in-line with the previous studies for upgrade rating announcements which concluded that the announcement does not bring any new information to the market and hence no significant movement in the abnormal returns. However the results for downgrade is contradict with the previous finding. Downgrade provides no significant abnormal return observed contradicts the finding by Elayan et al (2000).

Testing the hypothesis at 99% confidence which produce critical t-value of 2.821 will allow us to accept Ho for all the rating announcement and conclude that the rating announcement do not produce any significant abnormal return. Hence reaffirmation will produce similar rating to initial assignment, downgrade and upgrade at above 95% confidence level.