

Chapter 5

Research Results

5.1 Summary Statistics of Sample

The data sample analysed comprises 39 upgrades and 30 downgrades. The OLS results for the full sample upgrades and downgrades are reported in Panels A and B respectively of Table 5.1. The graphical interpretations of these data are presented in Charts 5.1 and 5.2 respectively.

5.2 Analyses of Measures and testing of Hypotheses

5.2.1 First model

Upgrades

Considering all 39 ratings as one sample, the majority of stocks show negative abnormal returns on and nearby the announcement date i.e. days t_2 and t_1 (56%), t_0 and t_{+1} (62%). The AAR_t on the announcement date (t_0) of -0.5974 with a corresponding t-statistic value of -2.2332 is statistically significant using 95% level of confidence. As for the pre- and post-announcement days, the positive AAR_t values range between a minimum of 0.0313 with a t-statistic value of 0.0948 (t_{+2}) which is statistically insignificant up to a maximum of 0.5271 with a corresponding t-statistic value of 2.4347 (t_{-3}) which is significant based on 95% level of confidence. Negative AAR_t values

Table 5.1

OLS Market Model for Full Sample

	t ₅	t ₄	t ₃	t ₂	t ₁	t ₀	t ₋₁	t ₋₂	t ₋₃	t ₋₄	t ₋₅
Panel A : Upgrades (n = 39)											
% negative	51.28%	61.54%	35.90%	56.41%	56.41%	61.54%	61.54%	48.72%	51.28%	38.46%	46.15%
AAR t	-0.1695	-0.5695	0.5271	-0.0078	-0.0168	-0.5974	-0.3163	0.0313	-0.0322	0.4536	0.1467
CAAR Nn	-0.1695	-0.3695	-0.0706	-0.0549	-0.0473	-0.1390	-0.1643	-0.1399	-0.1279	-0.0698	-0.0501
σ	1.8489	1.9420	1.3519	1.9966	1.5628	1.6706	1.7957	2.0611	2.6468	2.6227	1.3083
t-statistics	-0.5724	-1.8313 *	2.4347 **	-0.0243	-0.0673	-2.2332 **	-1.0999	0.0948	-0.0761	1.0801	0.7002
Panel B : Downgrades (n = 30)											
% negative	56.67%	43.33%	40.00%	40.00%	56.67%	46.67%	43.33%	56.67%	76.67%	40.00%	53.33%
AAR t	-0.3200	-0.0903	0.5261	0.0962	-0.2274	0.2345	0.0343	-0.9841	-0.6527	-0.3465	-0.6851
CAAR Nn	-0.3200	-0.2052	0.0386	0.0530	-0.0031	0.0365	0.0362	-0.0913	-0.1537	-0.1730	-0.2196
σ	1.5730	2.4369	1.4910	1.9054	2.3615	1.8749	2.5229	2.2229	1.6352	2.2573	2.6228
t-statistics	-1.1143	-0.2030	1.9325 *	0.2764	-0.5275	0.6851	0.0746	-2.4248 **	-2.1864 **	-0.8407	-1.4308

Notes : ***, ** and * denote statistical significance at 1, 5 and 10% levels respectively

on the other hand are recorded between -0.0078 with a t-statistic value of -0.0243 (t_2) (statistically insignificant) up to -0.5695 with a corresponding t-statistic value of -1.8313 (t_4) which is significant at 90% level of confidence. As such, the computed t-statistic values are significant during the pre-announcement (t_4 and t_3) and on the announcement day itself.

Downgrades

As for downgrade announcements, by taking all 30 ratings as one sample, the majority of stocks showed negative abnormal returns on day t_{+3} (77%). The AAR_t on the announcement date (t_0) of 0.2345 with a corresponding t-statistic value of 0.6851 is statistically insignificant basing on 95% level of confidence. As for the pre- and post-announcement days, the positive AAR_t values are recorded within a range of minimum of 0.0343 with corresponding 0.0746 t-statistic value (t_{+1}) (statistically insignificant) up to a maximum of 0.5261 with a t-statistic value of 1.9325 (t_3), which is significant at 90% level of confidence. The lowest negative AAR_t value is computed at -0.0903 (t_4) with a corresponding t-statistic value of -0.2030. Two of the negative AAR_t s computed are tested to be statistically significant at 95% level of confidence by recording t-statistic values of -2.4248 and -2.1864. The AAR_t values are -0.9841 for day t_{+2} and -0.6527 for day t_{+3} respectively. Both of them fall within the post-announcement date segment.

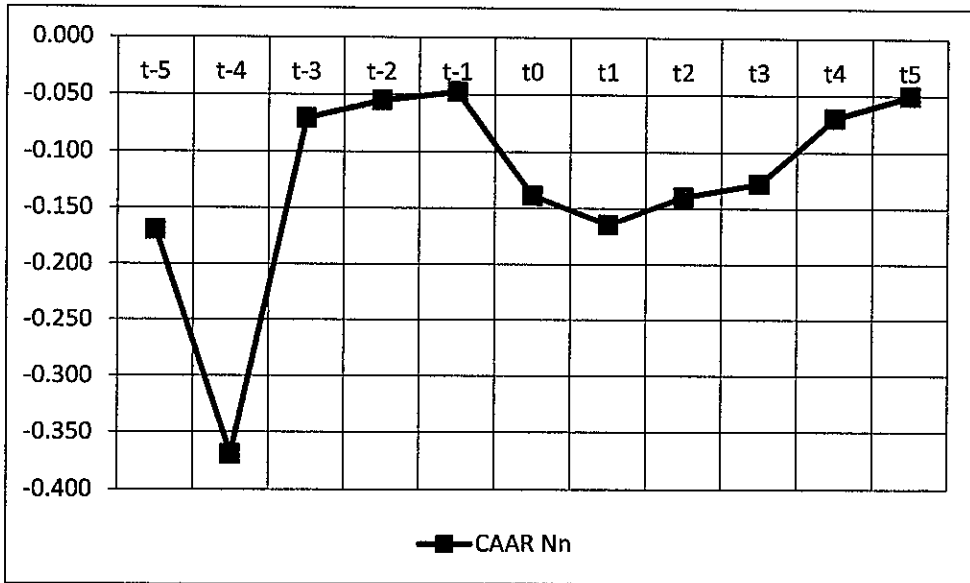


Figure 5.1

CAAR_{Nn} during bond rating upgrade announcement

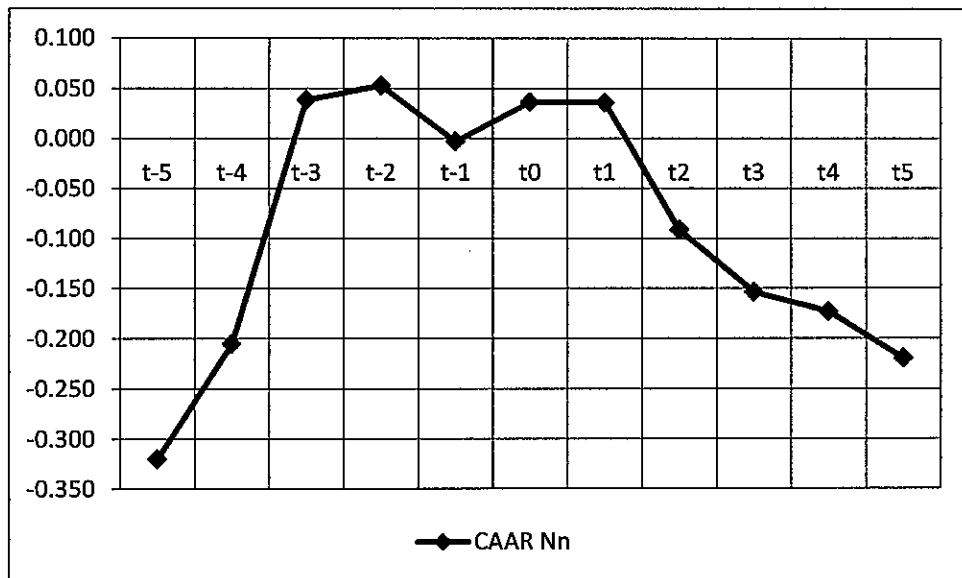


Figure 5.2

CAAR_{Nn} during bond rating downgrade announcement

Basing on the analysis done for the first model above, both rating categories of upgrade and downgrades yielded mixed stock returns on the announcement day. Further analysis on the pre- and post-announcement days also revealed mixed statistical significance in terms of stock returns. Therefore, hypotheses H_0 of the first model are rejected; that is; corporate bond rating upgrade announcements significantly impact stock returns. Also, corporate bond rating downgrade announcements significantly impact stock returns.

5.2.2 Second model

Both upgrade and downgrade ratings are then broken down to form sub-samples of small upgrade, big upgrade, small downgrade and big downgrade and re-tested again for significance. The OLS results for these sub-samples are reported in Panels A, B, C and D respectively of Table 5.2. Graphical interpretations of $CAAR_{Nn}$ are shown in Charts 5.3, 5.4, 5.5 and 5.6 respectively.

Upgrades

Combining 27 small upgrade ratings as one sample, the average stocks are recording negative abnormal returns between days t_2 up to t_{+3} with an average of about 60%. The AAR_t on the announcement date (t_0) is -0.6843. Its t-statistic value of -1.9828 is also statistically significant at 90% level of confidence. Further analysis on pre- and post-announcement days

Table 5.2

OLS Market Model for Sub-Sample

	t_5	t_4	t_3	t_2	t_1	t_0	t_1	t_2	t_3	t_4	t_5
Panel A : Small Upgrades (n = 27)											
% negative	55.56%	55.56%	25.93%	59.26%	62.96%	62.96%	62.96%	55.56%	55.56%	33.33%	40.74%
AAR t	-0.3111	-0.3230	0.6896	-0.2067	-0.1830	-0.6843	-0.2861	-0.0452	-0.3655	1.0012	0.1023
CAAR Nn	-0.3111	-0.3171	0.0185	-0.0378	-0.0668	-0.1697	-0.1864	-0.1687	-0.1906	-0.0714	-0.0556
σ	1.8627	1.8009	1.2984	1.5205	1.7347	1.7933	1.7692	1.7285	1.5941	2.1352	1.3478
t-statistics	-0.8679	-0.9319	2.7598 **	-0.7063	-0.5482	-1.9828 *	-0.8402	-0.1358	-1.1914	2.4366 **	0.3946
Panel B : Big Upgrades (n = 12)											
% negative	41.67%	75.00%	58.33%	50.00%	41.67%	58.33%	58.33%	33.33%	41.67%	50.00%	58.33%
AAR t	0.1492	-1.1241	0.1613	0.4398	0.3571	-0.4018	-0.3842	0.2033	0.7176	-0.7786	0.2465
CAAR Nn	0.1492	-0.4874	-0.2712	-0.0934	-0.0033	-0.0697	-0.1147	-0.0749	0.0131	-0.0660	-0.0376
σ	1.8353	2.2710	1.4941	2.8075	1.1209	1.3634	1.8549	2.6653	4.1727	3.6155	1.2173
t-statistics	0.2817	-1.7146	0.3739	0.5427	1.1035	-1.0209	-0.7176	0.2642	0.5957	-0.7460	0.7014
Panel C : Small Downgrades (n = 18)											
% negative	55.56%	50.00%	38.89%	27.78%	61.11%	33.33%	38.89%	55.56%	72.22%	27.78%	55.56%
AAR t	-0.6392	-0.0967	0.3273	0.7420	-0.5184	0.6377	0.4148	-1.1734	-0.5313	0.2179	-0.4204
CAAR Nn	-0.6392	-0.3680	-0.1362	0.0833	-0.0370	0.0754	0.1239	-0.0383	-0.0930	-0.0619	-0.0945
σ	1.6950	2.7480	1.3858	1.6786	2.5234	1.9430	1.5318	2.4700	1.9686	0.9736	2.6687
t-statistics	-1.6000	-0.1493	1.0019	1.8755 *	-0.8717	1.3923	1.1489	-2.0155 *	-1.1450	0.9495	-0.6683
Panel D : Big Downgrades (n = 12)											
% negative	58.33%	33.33%	41.67%	58.33%	50.00%	66.67%	50.00%	58.33%	83.33%	58.33%	50.00%
AAR t	0.1588	-0.0807	0.8242	-0.8726	0.2091	-0.3702	-0.5363	-0.7001	-0.8349	-1.1930	-1.0822
CAAR Nn	0.1588	0.0391	0.3008	0.0074	0.0478	-0.0219	-0.0954	-0.1710	-0.2447	-0.3396	-0.4071
σ	1.4597	1.8759	1.6660	2.4276	2.1452	1.8792	3.5713	1.8142	0.9529	3.4803	2.5866
t-statistics	0.3769	-0.1491	1.7138	-1.2452	0.3377	-0.6825	-0.5202	-1.3368	-3.0351 **	-1.1875	-1.4494

Notes : ***, ** and * denote statistical significance at 1, 5 and 10% levels respectively

revealed that the positive AAR_t values range between a minimum of 0.1023 (t_{+5}) up to a maximum of 1.0012 (t_{+4}). The t-statistic value for the former at 0.3946 is statistically insignificant. The latter recorded a t-value of 2.4366 which is statistically significant at the confidence level of 95%. Day t_3 also recorded a significant t-statistical value of 2.7598 (95% level of confidence) with a corresponding AAR_t value of 0.6896. As for the negative AAR_t values computed, the lowest value is obtained from t_{+2} at -0.0452 with a t-statistic value of -0.1358. The highest negative AAR_t is computed at -0.3655 with a corresponding t-statistic value of -1.914 (t_{+3}). As such, the computed t-statistics are found mixed.

The remaining 12 big upgrade ratings are grouped and tested separately. Most of the stocks have recorded negative abnormal returns on day t_4 (75%). On the announcement day (t_0), the computed AAR_t of -0.4018 is statistically insignificant as its t-statistic value of -1.0209 is lesser than that of 95% confidence level. Readings on the pre- and post- announcement periods reveal all insignificant statistical values with the positive AAR_t s ranging between 0.1492 (t_5) and 0.7176 (t_{+3}) and the negative AAR_t s between -0.3842 (t_{+1}) and -1.1241 (t_4).

Downgrades

Similar steps are taken to segregate the small downgrades from the big downgrades. The sample size for the small downgrades is 18.

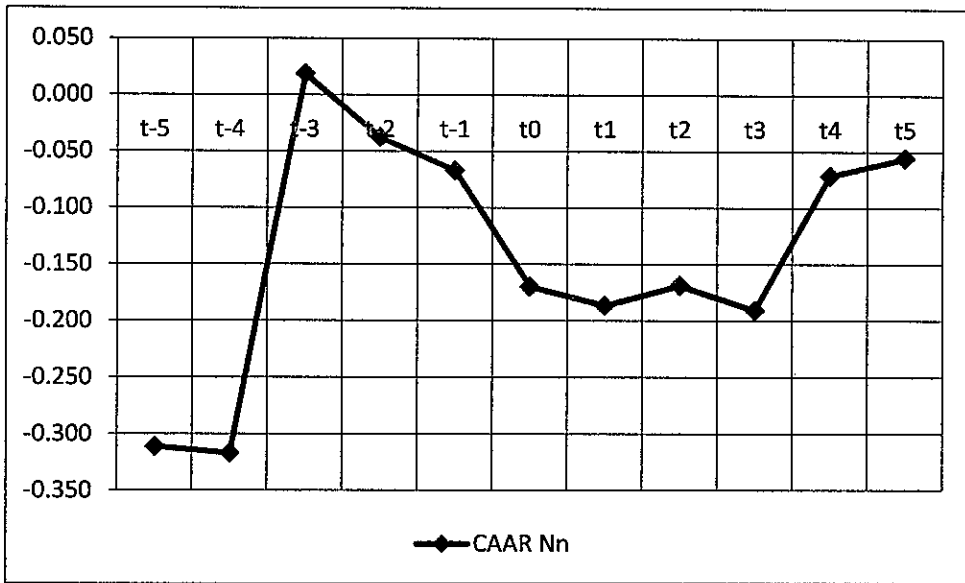


Figure 5.3
CAAR_{Nn} during bond rating small upgrade announcement

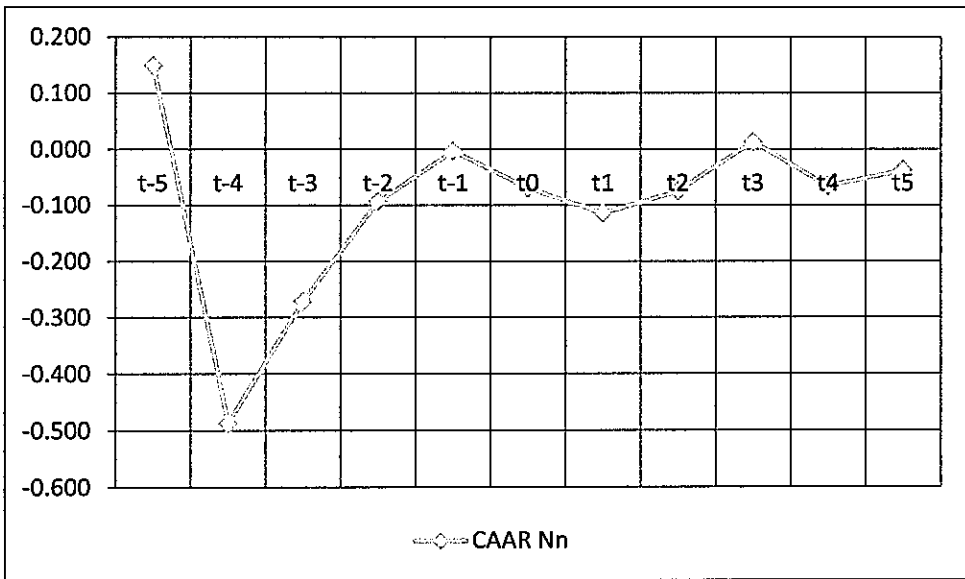


Figure 5.4
CAAR_{Nn} during bond rating big upgrade announcement

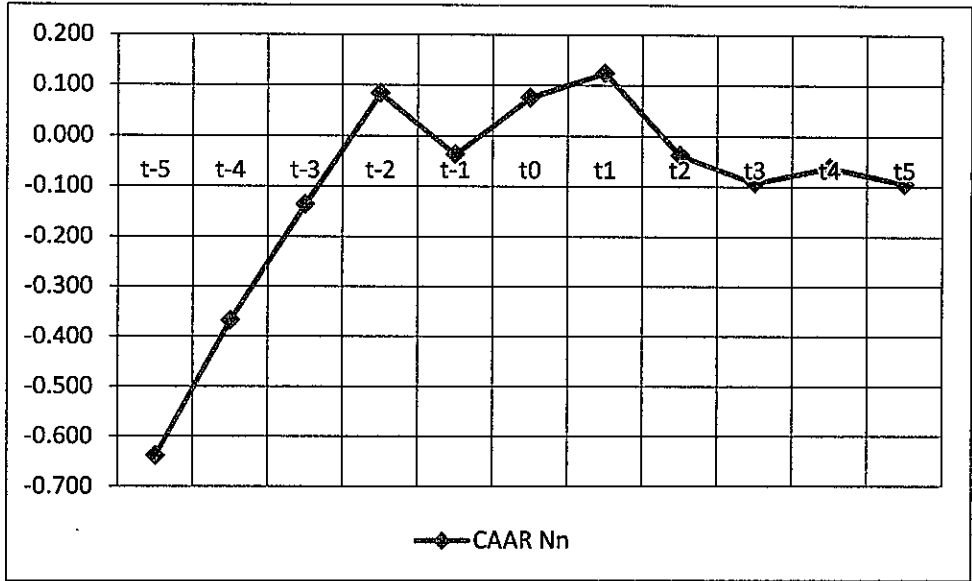


Figure 5.5

CAAR N_n during bond rating small downgrade announcement

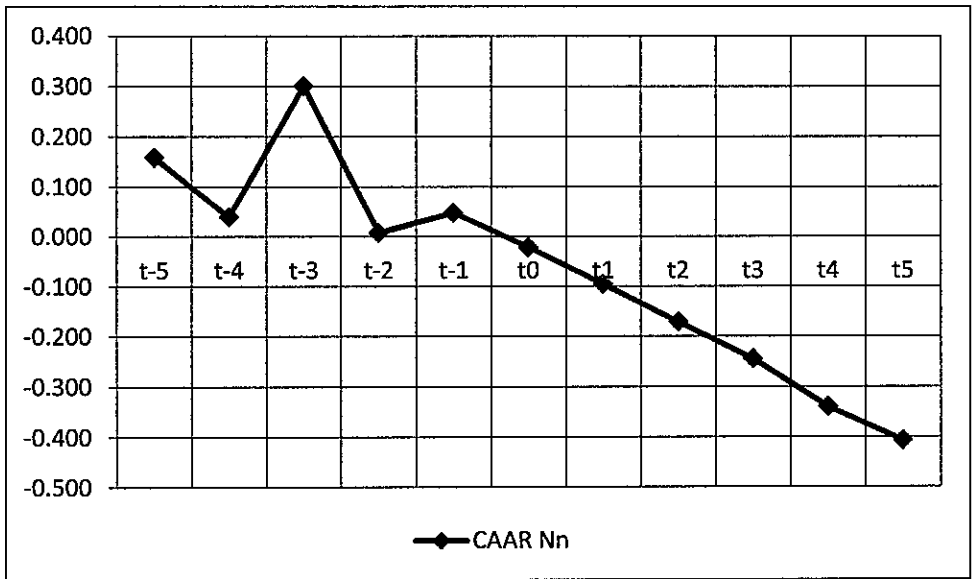


Figure 5.6

CAAR N_n during bond rating big downgrade announcement

A majority of stocks are recording negative abnormal returns on days t_{-1} (61%) and t_{+3} (72%). On the announcement day, the AAR_t is recorded at 0.6377 with a t-statistic value of 1.3923. By testing against 95% level of confidence, the value is concluded as being statistically insignificant. Readings for the pre- and post-announcement days generally revealed similar trends except for day t_{-2} which recorded a AAR_t value of 0.7420 with a corresponding t-statistic value of 1.8755 and day t_{+2} whereby the computed AAR_t value is at -1.1734 with a corresponding t-statistic value of -2.0155. Both of the values are statistically significant at 90% level of confidence.

As for the big downgrades which comprise 12 ratings, A majority of stocks are recording negative abnormal returns on days t_0 (61%) and t_{+3} (83%). The AAR_t on announcement day is computed at 0.3702 with a t-stat value of 0.6825. By testing against 95% level of confidence, the value is also concluded as being statistically insignificant. Readings for pre- and post-announcement days also revealed statistically insignificant except for day t_{+3} with its AAR_t at -0.835 with a corresponding t-statistic value of -3.202 which are significant when tested at 95% level of confidence.

Findings on the second model above revealed that the magnitude of change in the ratings, both upgrades and downgrades, does to a certain degree induced mixed results in stock returns. Only small upgrade

announcements seem to significantly provide abnormal stock returns on the announcement day (t_0). Pre- and post-announcement period analysis however yielded mixed results as abnormal returns are computed in all except for big upgrade types of rating announcements. Hence, hypotheses H_0 of the second model is rejected except that for big rating upgrade announcements; that is, small rating announcements for bond upgrades and big and small rating announcements for bond downgrades does provide significant abnormal stock returns.

As for the timeline for information to be incorporated into the stock prices, our results on abnormal returns due to upgrade announcements indicate that information will be considerably absorbed and incorporated into stock prices within the event window period i.e. within three days before the announcement is made. The effects over the cumulative average abnormal returns due to the downward spike on the announcement day reduce by the end of the event window for small upgrades. Interestingly, the cumulative average abnormal stabilises after a large downward jump on day t_4 .

Analysis on the downgrade ratings indicated otherwise as the small downgrades seems to be taking a hike from the early days of the event window (t_5 to t_2) before evening out further expanding by the end of the window. Big downgrades however recorded increasing negative cumulative average abnormal returns from day t_1 onwards. It may be concluded basing

on the scope in study that big downgrades ratings requires longer period of time to fully reflect the change in stock price.

5.3 Summary of Research Results

The first model aims to test whether corporate bond ratings signal the arrival of new information to the investing public. Our findings on rating downgrades within the event window generally coincide with other prior researches (Hand, Holthausen and Leftwich, 1992; Zaima and McCarthy, 1988; May, 2010), that is, the market has reacted negatively towards rating downgrade announcements. Evidence from this study indicates that downgrade announcements do provide new informational content to the investing market.

We also found negative market reaction prior to the actual rating upgrade announcement. Although this has in general deviated from the findings of other researches (Goh and Ederington, 1993; Matolcsy and Lianto, 1995; Dichev and Piotroski, 2001), the results seem to point towards the market's anticipation of the information and hence reacted to it even before the actual announcement itself. As our study has based on the relationship between bond rating announcements and stock returns, market sentiments that a bond upgrade will redistribute tentative gains towards bondholders rather than stockholders as also argued by Kim and Nabar (2003) may be a

possible cause for negative market reactions on the actual rating announcement day itself.

Table 5.3 summarises all results from the hypothesis testing. Except for small upgrade and big downgrades ratings, corporate bond rating announcements in general seem to provide abnormal returns.

Table 5.3
Summary of Research Findings

Hypothesis	CAAR _N	t-value	t-critical at 95%	H ₀
Model 1 - Full Sample				
H1a	-0.0501	-2.2332 - 2.4347	2.0244	Rejected
H1b	-0.2196	-2.4248 - 1.9325	2.0452	Rejected
Model 2 - Sub-Sample				
H2a	-0.0556	-1.9828 - 2.7598	2.0555	Rejected
H2b	-0.0376	-1.7146 - 1.1035	2.2010	Not rejected
H2c	-0.0945	-2.0155 - 1.8755	2.1098	Not rejected
H2d	-0.4071	-3.0351 - 1.7138	2.2010	Rejected

As for the timing for new information to be reflected in the stock prices, basing on the CAAR and t-statistic values from the selected window period, the figures from Model 1 indicated that even though informational content is found in upgrade rating announcements, the CAAR value of -0.0501 is insignificant, that is no excess gains are obtained from the announcement during the event window period. Analysis on downgrade rating announcements also yielded similar findings although the CAAR value is higher at -0.2196.

Further analysis on Model 2 however indicated that both small and big upgrade rating announcements has low CAAR values between -0.0556 and -0.0376, indicating that there are no net excess returns even though new information is perceived in small upgrade rating announcements.

Downgrade announcements however yielded different results. The analysis on small downgrade announcements indicated that the market is informationally efficient with a corresponding CAAR value of -0.0945 that is the new information perceived seems to have been incorporated into the stock prices and hence little net excess returns within the event window period. However, the analysis on big downgrade announcements indicated that the market is not efficient informational-wise. Furthermore, the CAAR value -0.4071 indicated that the investing market has perceived new information from the rating announcement and that net excess returns is obtained, albeit a negative one. It is also noted that there are no net excess returns recorded during the day of the announcement itself.

Basing on this analysis, except for big downgrade announcements, the market generally seems to be able to perceive new information and to incorporate them into the stock pricing within the event window period.