The Stock Market Impact of Corporate Bond Rating Changes: New Evidence from the UK and Australian Stock Markets

Hasniza Mohd Taib[a]
Amalia Di Iorio[b]
Terrence Hallahan[a]
Emawtee Bissoondoyal-Bheenick[c]

[a] School of Economics, Finance and Marketing, RMIT University, Australia
[b] Graduate School of Business and Law, RMIT University, Australia
[c] Department of Accounting and Finance, Monash University, Australia.

Correspondence: Amalia DiIorio
Graduate School of Business and Law,
RMIT University
GPO Box 2476V
Melbourne, Victoria, 3001
Australia

Tel: +61-3-9925 5900
Fax: +61-3-9925 5986
E-mail address: amalia.diiorio@rmit.edu.au

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Abstract

This paper examines the stock market impact of announcements of corporate bond rating revisions for companies in the United Kingdom (UK) and in Australia. Investigating the market reaction to bond rating changes by Moody's and Standard & Poor's, our findings reveal similar results for downgrade announcements but not upgrade announcements. Using daily data from 1997 to 2006 we find a significant announcement affect to downgrades both in the UK and Australia markets. In contrast, evidence of stock price reaction during upgrade announcements is weak. Subperiod analysis supports these results. Finally, an investigation of the market reaction to a rating change for different bond grades reveals similar results for the UK and Australia in the case of downgrade announcements only.

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1. INTRODUCTION

This study investigates whether corporate bond revision announcements by rating agencies contain useable information to market participants. Recent literature has examined this question[1], in particular whether, and to what extent, bond rating upgrades or downgrades can be significant in signalling usable information for market participants. Other aspects of the research have focused on whether the market may react differently to revisions announced by different ratings agencies, whether reactions are uniform across different markets, and whether there are differential reactions for investment grade bonds and speculative grade bonds.

Our paper contributes to the literature in several ways. First, although the UK is among the largest bond market in the world, only a limited number of studies have analysed UK data. Similarly, the Australian markets have not been extensively examined. In this study, we investigate the impact of corporate bond rating revisions based on 299 events in the United Kingdom and 107 events in Australia. The announcement data is obtained from Moody's, and Standard & Poor's for the period 1997 to 2006. Our analysis begins by testing the full sample period and is extended to include subperiod investigations. Further, we test the impact on stock prices for: (i) bonds that remain speculative grade after a revision; (ii) bonds that remain investment grade; (iii) speculative grade bonds that are upgraded to investment grade; and (iv) investment grade bonds that are downgraded to speculative grade. Second, our study on the UK bond market contributes to a stream of research focussing on corporate bond rating using a large sample of rating revision announcements by two rating agencies - Moody's and Standard & Poor's. Previous research on UK bonds, for example Barron et al. (1997), generally examine relatively shorter sample periods. Barron et al. (1997) test the impact of rating revision announcements based on 23 long-term bond rating changes announced by Standard and Poor's. Third, we undertake a comparative analysis of two developed capital markets – the UK and the Australian markets.

This brings us to the main objective of this paper, that is, to examine the market reaction during bond upgrade and bond downgrade announcements in the United Kingdom and in Australia for the period

[1] Norden and Weber(2004) provide an overview and summary of earlier research on the impact of credit rating announcements on stock prices, bond prices or both.

January 1997 to December 2006. Specifically, we compare stock price reactions during the rating revision announcements by Standard & Poor's and Moody's. We also undertake a comparative analysis of market reactions in the UK and Australia during bond rating revision announcements.

Our choice of capital markets for this analysis is supported by a number of factors. First, both the UK and Australia are developed countries with well functioning financial markets. Note that, the capital market in UK is bigger than Australia. The World Economic Forum's second annual Financial Development Report (2009) ranked Australia as the second in the world after UK[2] in terms of the strength of the financial systems and capital markets. In fact, the private debt market in UK is three times bigger and the equity market is two times bigger than Australia.[3] In addition, historically Australia and the UK have shared a strong economic and political relationship. Moreover, both countries have similar business practices, common legal systems, language and structures of society. Australia and the UK are also important trading partners. According to Australian Government Department of Foreign Affairs and Trade (DFAT), the UK is ranked Australia's fifth most important two-way trading partner.

Our analysis provides evidence that both the UK and the Australian markets react in a similar manner to bond downgrade announcements. However, there are differences in terms of share price reaction in the UK and Australia during bond upgrade announcements. Further, our results support prior findings that Standard & Poor's does not outperform Moody's in terms of signalling 'good' news or 'bad' news to market participants. We do not find any evidence of differences in the market reaction to announcements by the two credit rating agencies.

The remainder of this paper is organized as follows. Section 2 provides a brief review of relevant literature. Section 3 outlines the relevant hypotheses that underpin our analysis of bond rating revision

[2] Refer to Table 1: Financial Development Index 2009 Ranking in page 10 of The Financial Development Report 2009 by the World Economic Forum

[3] In 2007, the private debt market in UK is USD 2914.6 billion and Australia is USD 1160.7 billion; and the equity market in UK is USD 3858.5 billion while the Australian equity is USD 1298.4 billion. (The Financial Development Report 2009, page 56 and 256)

announcements on stock prices. Section 4 describes the data sources employed in this investigation and presents the event study methodology. Section 5 presents the results of the full sample and subperiod analysis of the impact on stock prices of rating changes announcements. Finally, Section 6 provides some concluding remarks**.**

2. LITERATURE REVIEW

Typically, every publicly traded debt issue is rated by one or more credit rating agencies that assign ratings reflecting the quality of the debt securities. Credit ratings represent the creditworthiness of the borrower and provide a statistically-based estimate of the company's likelihood of default[4]. Credit ratings are publicly available information, and are subject to revision over time in response to changes in the assessment of the issuer's financial health and, consequently, the changing assessment of its ability to make timely payments of interest and repay the principal.

The fundamental research question is whether corporate bond revision announcements by rating agencies contain useable information to market participants. Two major findings are reported in the empirical literature that examines the most intensely studied market in this area of research, the Unites States. The first finding reveals evidence of the existence of information content during bond downgrade announcements. (see, for example, Akhigbe et al. ; Dichev and Piotroski 2001; Goh and Ederington 1993; 1999; and Hsueh and Liu 1992). A possible explanation for this finding is the private information effect, whereby announcements of bond rating revisions may contain both public and private information about the bond issuer since rating agencies use both sources of information in their risk assessment of companies.

[4] A credit rating can be in respect of a company's overall capacity to meet its financial obligations, or it can be an "issue-specific credit rating' restricted to a particular debt issue. See Crouhy et al. (2001) for a description and analysis of the rating systems of Standard and Poor's, and Moody's.

The second major finding in the US data is that corporate bond upgrade announcements do not signal any information to the market participants. These studies are based on monthly data (Hite and Warga 1997; Pinches and Singleton 1978), weekly data (Zaima and McCarthy 1988), and daily data (Goh and Ederington 1993; Kliger and Sarig 2000). Possible explanations for this finding are either the efficient market hypothesis or the wealth redistribution hypothesis. For example, Weistein (1977) attributes the insignificance of bond rating changes on stock price reaction to the efficient market hypothesis, whereby market participants do not earn abnormal returns because share prices adjust instantaneously to new information entering the market.

Studies that have examined markets outside of the United States report similar findings. For instance, Matolcsy and Lianto (1995) investigate the impact of rating revision announcements in Australia. Based on rating change announcements by Standard & Poor's (S&P) for the period 1982 to 1991, and using weekly stock price data, they find that only bond rating downgrades (and not bond rating upgrades) hold additional information content. Further, a UK study by Barron et al. (1997) examines the impact of (i) long and short-term ratings changes, (ii) new ratings, and (iii) CreditWatch changes on the stock prices from 1984 to 1992. They report a significant reaction during bond downgrade announcements. These findings seem to indicate a private information effect. Interestingly, Barron et al. (1997) do not find evidence of a significant share price impact during bond upgrade announcements.

Abad-Romero and Robles-Fernandez (2006) investigate the Spanish capital market and report a significant negative excess return during bond upgrades but no excess reaction during bond downgrade announcements. Their sample period extends from 1990 to 2003 and includes 155 news announcements by Standard & Poor's, Moody's and Fitch IBCA. In contrast, a recent Australian study by Creighton et al. (2007) reports evidence that contradicts these findings. Based on daily stock and bond reactions from January 1990 to July 2003, they find a significant bond and share price reaction to Moody's and Standard & Poor's bond rating changes (both upgrade and downgrade). According to Barron et al. (1997) possible reasons for these mixed results may include bond market coverage,

differences in the frequency of observations (daily, weekly or monthly), contamination of data with other firm-specific news, and differing sample periods.

3. OVERVIEW OF HYPOTHESES

There are numerous studies that investigate the impact of bond rating revision announcements on stock prices with the aim of assessing if these announcements convey usable information to market participants. Many of these studies are framed in the context of hypotheses that have been developed to explain the movement of prices in global financial markets. First, according to the efficient market hypothesis (EMH), if rating agencies use public information to decide on rating changes, there should be no abnormal stock price reaction upon the arrival of the information into the market. Consequently, if bond rating revision announcements released by rating agencies lead to abnormal returns for the issuer's stock, this may be suggestive of the semi-strong form of the EMH or the influence of private information which is available only to rating agencies.

The private information hypothesis implies that in order for a rating agency to make a decision about bond rating changes, the agency has not only used public information about the bond issuer, but it has also had access to information which is only known by insiders. According to the private information hypothesis, any rating changes announced by the rating agencies will reflect the current ability of the bond issuer to fulfil its financial obligation to the public. Hence, according to the private information hypothesis, announcements of a bond rating upgrade may create a positive reaction on the stock price whilst a negative market reaction may be observed during bond downgrade announcements. The private information hypothesis is also known as the 'information asymmetry and signalling hypothesis' and has been discussed extensively in previous literature (Abad-Romero and Robles-Fernandez 2006; Hsueh and Liu 1992)

Another hypothesis addressed in the literature is the wealth redistribution hypothesis. According to this hypothesis, if shareholders are viewed as holding a call option on the value of the firm, then an increase in the variance of the firm's cash flows would redistribute wealth from bondholders to shareholders. A bondholder has the priority to claim on the assets of a company in the case of liquidation. In contrast, stockholders are considered to be residual claimants on the company's assets. However, stockholders have limited liability in the case of liquidation, and should the company's assets not be sufficient to pay its creditors, stockholders are only liable for the unpaid portion of their investment in that company. There is no obligation for a stockholder to pay the company's debt using his or her personal assets. Based on these characteristics, stockholders have the opportunity to decide on the company's future projects at the expense of bondholders. Specifically, shareholders could potentially assume riskier business opportunities, resulting in an increase of the company's bond default risk and subsequently a bond rating downgrade. Therefore, according to the wealth redistribution hypothesis, during a bond downgrade the bond will decrease in value while the share price of the respective issuer may increase, transferring wealth from the bondholders to shareholders. Conversely if a bond is upgraded, the value of a company's bonds will increase while its share price will decrease, and therefore a shift of wealth from shareholder to bondholder results. Zaima and McCarthy (1988) investigate the wealth redistribution effect during the announcement of bond rating changes by Standard and Poor's in the US. Based on weekly data, they find that stock and bond reactions during bond upgrades provide some evidence of the wealth redistribution effect.

3. DATA AND EMPIRICAL METHOD

3.1 Data

3.1.1 United Kingdom

The data employed in this analysis were obtained from Standard & Poor's and Moody's for the period 1 January 1997 to 31 December 2006. The study examines rating revisions of bonds, issued by UK companies listed on the London Stock Exchange (LSE), and sold in the local market. All daily stock

prices and market index data were obtained from DataStream. We used two indices, FTSE All Share and Morgan Stanley Capital International Europe Index (MSCI Europe Index) as proxies to the UK market. This enables us to examine whether using different market proxies on the same sample of observations will yield the same pattern of stock market reaction.

The original database from Moody's contained 3135 announcements while Standard & Poor's had 1086 announcements from 1997 to 2006. In order to limit the sample to rating revisions, a comprehensive filtering process was applied and the following data was eliminated:

i. All initial bond rating announcements;
ii. Companies that had a double rating revision in the same year for the same bond issue;
iii. Issuing companies categorized as private companies;
iv. Announcements related to companies that issued different type of bonds on the same date.

As pointed out by previous researchers [see, for example, Barron et al. (1997), Holthausen and Leftwich (1986) and Hand et al. (1992)] abnormal performance can be explained by the release of other information around the time of the rating revision announcement. Hence, in order to obtain an uncontaminated sample, we investigated other firm-specific announcements (i.e. dividend announcements, and profit and loss announcements) using Factiva across a two week window around the rating revision events. If the firm-specific announcement occurred in this two-week period, the event was eliminated from the sample. Panel A of Table 1 reports the results of our filtering process in UK.

[Table 1 about here]

3.1.2 Australia

The announcement dates of Australian bond upgrade and downgrade announcements for our sample period from 1 January 1997 to 31 December 2006 were obtained from Standard & Poor's, and Moody's. Market Index and daily share prices were obtained from DataStream and all companies are listed on the Australia Securities Exchange (ASX). The original databases provided by Moody's and Standard & Poor contained 1274 and 840 announcements of corporate bond rating revisions respectively. The same process used to filter the UK sample was applied to the Australian data. The uncontaminated Australian sample (see Panel B of Table 1) consists of 107 bond rating revisions. We used ASX 200 as a proxy to the Australian market.

3.2 Empirical Method

We use standard event study methodology, assuming an equilibrium market model representation of the return generating function. To allow for eveny-induced volatility, we adopt the approach of Boehmer, Musumeci and Poulsen (1991) and standardize the event-period returns by the estimation-period standard deviation, and the cross-sectional mean of the standardized returns is divided by their cross-sectional standard deviation to generate a test statistic. Details of the empirical method are contained in the Appendix.

4. RESULTS

4.1 Announcement Effects

4.1.1 Moody's Vs Standard & Poor's: SubperiodAnalysis on UK Corporate Bond Market

Does the market react differently for corporate bond rating revisions announced by different rating agencies? In order to test this possibility, we undertake a comparative analysis of stock price reactions during corporate bond upgrades and downgrades based on observations announced by Moody's and Standard & Poor's for the ten years period from 1 January 1997 to 31 December 2006. Our analysis

considers the reaction of both the UK and Australian markets. We employ the market model based on two market proxies – the FTSE All Share and the MSCI Europe Index – for the UK analysis and one market proxy - the ASX 200 – for Australia.

We divide the sample period into three phases. The first phase is the pre-announcement phase that contains 3 subperiods: (a) t=-20 to t=-1; (b) t=-20 to t= -15 and; (c) t=-10 to t=-1. The second phase covers the days surrounding the event announcement which extends from t=-1 to t=0. The final phase contains 2 subperiods (a) from t=+1 to t=+20; and (b) from t=+*1* to t=+20. Therefore we attempt to explore whether the impact on the share price occurs before, during or after the date of a rating revision announcement.

Table 2 reports the results of our analysis of the UK market reaction and the Australian market reaction during the corporate bond upgrade and downgrade announcements by Moody's and Standard & Poor's from 1 January 1997 to 31 December The results of the market reaction for rating upgrades announced by Standard & Poor's are reported in Panels A and B of Table 2. Although there is no significant evidence of a market reaction, positive or negative, in the results of our Moody's sample, we find significant positive evidence at 1% level in subperiod -1 to day 0 when using the FTSE All Share market proxy (Panel A), consistent with the private information hypothesis. The other two significant results are negative((i) subperiod -20 to -15 of Standard & Poor's announcements in Panel A and (ii) subperiod -20 to-15 as announced by Moody's in Panel B) and therefore contrary to theoretical expectations. Further, there is no evidence of significant CAR values in any of the subperiods.

We extend our study by investigating stock price reaction during bond rating downgrade announcements in the UK market and find a more pronounced market reaction than that we observed in the upgrade analysis. The CAR results are presented in Table 2. Interestingly, the Standard & Poor's results in Panels D and E of Table 2 report some evidence of a negative market reaction to downgrade announcements. Regardless of which market proxy we employ, we note a negative market reaction for

the subperiod -1 to 0. In addition, in our MSCI Europe study we also observe a negative reaction in the -10 to -1 subperiod (Panel E). Similarly in Panel E, the results seem to suggest that the UK market also reacts negatively to downgrade announcements by Moody's in the subperiods -20 to -15 (at the 1% confidence level), and -20 to -1 (at the 10% confidence level). These results are consistent with the expectation that 'bad' news has a negative impact on the market. Conversely, we note two significant results in Panel D but with an unfavourable positive sign. These findings are contrary to the private information hypothesis.

Finally, several insights are provided by this subperiod analysis of the UK market. First, there isn't sufficient evidence to suggest that upgrade announcements result in a positive reactions in stock prices. In contrast, when considering downgrades, three of the four analyses indicate that downgrade announcements are considered to be significant by the market during the subperiod -1 to 0. In terms of rating agencies, there is no significant evidence to suggest that data from Standard & Poor's outperforms Moody's in terms of signalling information to the public. These findings are consistent with the results of Kish et al. (1999) who compare the market reactions to Standard & Poor's and Moody's bond rating change announcements but find no significant evidence indicating that the public values information provided by one agency over that provided by the other.

4.2. Comparative Analysis – UK vs. Australian Market Reaction

Based on subperiod observations, we undertake a comparative analysis of market reaction both in Australia and in the UK to corporate bond rating revision announcements by Standard & Poor's and Moody's. CAR results are presented in Table 2. These findings report the market reaction during the UK and Australian corporate bond rating upgrade and downgrade announcements respectively.

In the event of a corporate bond upgrades, the market reaction is significantly larger in Australia when compared to the United Kingdom. As is reported in Panel C of Table 2, our evidence suggests that the

Australian market reacts positively during upgrade events in the subperiod -1 to 0 in the analysis of both Standard & Poor's and Moody's data. Conversely, when we consider the UK results, we note that although there is evidence of a positive market reaction to upgrades announced by Standard and Poor's when using the FTSE All Share as our market proxy during this same subperiod. Additional evidence of a positive Australian market reaction is noted in the subperiod +1 to +20 in the Standard & Poor's analysis. Hence although neither the UK nor the Australian markets exhibit a strong reaction to upgrade announcements, the significant Australian results are all of the expected sign.

Similar to our upgrade announcement results, the CAR findings for downgrade announcements presented in Panel F of Table 2 indicate a stronger reaction in Australia than in the United Kingdom (Panels D and E). The Standard & Poor's sample for Australia (Panel F) indicates that there is a significant negative response over two subperiods. These are: (i) the pre-announcement period (-20 to -15); and (ii) during the announcement period (-1 to 0). Two additional significant results are observed in our Standard and Poor's results in Australia - subperiod +1 to +10; and subperiod +1 to +20. However these are positive and contrary to our expectations. No significant response is observed for Moody's announcements in Australia.

Thus, in summary, it seems that there is some evidence to support the private information hypothesis during corporate bond upgrade announcements in Australia, but not in the United Kingdom. Nevertheless, we find sufficient evidence that both the UK and Australian markets perceive corporate bond downgrades as having some information value, and signal bad news about the bond issuer.

4.3 Market Reaction based on Bond Grade

Bond ratings can be classified into two major grades: investment grade and speculative grade. Investment grade bonds are more desirable than speculative grade bonds since they have a lower

default risk attached to them, and range between AAA and BBB- for Standard and Poor's and between Aaa to Baa3 for Moody's. Any bond below these ratings is classified as speculative.

In this section, we analysis the market reaction to rating revision announcements where the bonds (i) remain as investment grade; (ii) remain as speculative grade; and (iii) move up from speculative to investment, or drop from investment to speculative, for both the UK and Australia. Once again, we investigate announcements made by Standard & Poor's, as well as Moody's, and partition the data into three phases:

i. the pre-announcement period [(-20 day to -15 day), (-20 day to -1 day) and (-10 day to-1 day)];
ii. during the event announcements (-1 day to 0 day); and
iii. following the announcement [(+1 day to +10 day) and (+1 day to +20 day)].

4.3.1 Investment Grade Vs Speculative Grade: UK market reaction

Table 3 presents the results of our analysis of upgrade announcements by both Standard & Poor's and Moody's. The results of the UK investigation are outlined in Panels A and B (the bond's classification remains investment grade); Panels D and E (the bond's classification remains speculative grade): and Panels G and H (the bond's classification moves from speculative to investment).

The results in Panels A and B of Table 3 reveal that, following upgrade announcements by Standard & Poor's and Moody's, UK bonds that remain as investment grade have a significant negative market reaction during the preannouncement period -20 to -15 in three out of four cases. This is contrary to the private information hypothesis. The only positive CAR result is observed in Panel B - during the post-announcement period (+1 to +10) for upgrade announcements by Moody's where the bond grade remains classified as investment (using the MSCI Europe as proxy of the market). A negative market response is also observed for UK bonds that remain as speculative grade following an upgrade

announcement by Moody's. In this case, the reaction, albeit unfavourable, is noted in the subperiod -1 to 0 in Panels D and E.

For UK bonds that are upgraded from speculative grade to investment grade our findings provide some favourable results. Panels G and H report that upgrade announcements by Standard & Poor's result in a positive market reaction for bonds that move from speculative to investment grade in only two cases: (i) during the pre-announcement period (-10 to -1) for the analysis using the MSCI Europe as market proxy (Panel H); and (ii) during the post-announcement period (+1 to +10) for the analysis using the FTSE All Share to represent the market (Panel G). Thus, our results for upgrade announcements when considering different rating grades are mixed and inconclusive.

Table 4 presents the findings of our analysis relating to the impact of UK corporate bond downgrade announcements on stock prices. Comparable to the presentation of results in Table 3, in Table 4 we report our findings for bonds that (i) remain as investment grade (Panes A and B), (ii) remain as speculative grade (Panels D and E), and (iii) bonds that move from investment grade to speculative grade (Panel G and H).

To begin with, a negative significant result is observed for the samples in Panel A and B during the announcement of a downgrade (-1 to 0). Similar favourable results are observed for downgrade announcements of bonds that experience a change in grade from investment to speculative[5]. In Panel G (FTSE market proxy), we observe a negative market reaction for the subperiods -10 to -1; and +1 to +20 when using Standard & Poor's data, and for subperiods -20 to -15; and -1 to 0 when analysing the Moody's sample. In Panel H (MSCI Europe market proxy) we note a negative market reaction to Standard and Poor's downgrade announcements in the subperiod +1 to +20; and to Moody's downgrade announcements in subperiods -20 to -15; -20 to -1 ; and -1 to 0..

[5] A bond that experiences a drop below the investment grade is also known as 'fallen angel'.

In Panels D and E of Table 4, however, we observe inconclusive results for speculative bonds that are affected by a downgrade announcement. No significant negative reaction is observed for the analyses using Standard and Poor's data. In Panel D (FTSE market proxy), downgrade announcements by Moody's also result in significant and positive CAR results for bonds that remain as speculative grade, although we note some evidence of a negative market reaction in the results presented in Panel E (MSCI market proxy) where we observe significant negative CAR during the announcement (-1 to 0) and the post-announcement phase (+1 to +20).

In conclusion, when considering upgrade announcements, the results for both bonds that remain as speculative and those that remain as investment grade are unfavourable and not consistent with the theoretical expectations. For bonds that have been upgraded from speculative to investment grade, however, only the results of the analyses using Moody's data exhibit significant positive reactions. In contrast, when considering bond downgrade announcements, there is some evidence of a significant negative impact on the respective stock price for bonds that remain as investment grade compared to bonds that remain as speculative. These findings are not consistent with the results reported by Hand et al. (1992) and Goh and Ederington (1999). Both studies report downgrade announcements on bonds that remain as speculative grade have a greater impact on stock prices than such announcements about bonds that remain as investment grade. In the case of 'fallen angels', our event study reveals a significant negative reaction when the downgrade moves the bond from investment grade to speculative grade. This result supports the evidence presented by Holthausen and Leftwich (1986), who report that the downgrades from investment grade to speculative grade have a greater impact on stock prices than downgrades that remain within investment grade.

4.3.2 UK vs Australia: A Comparative Analysis on Different Bond Grades

Table 3 and Table 4 also report the results of the Australian market response to bond rating revisions where the bonds (i) remain as investment grade; (ii) remain as speculative grade; and (iii) move up from speculative to investment, or drop from investment to speculative.

Panel C and Panel I of Table 3 report favourable positive CAR in both samples of Standard and Poor's and Moody's during the Australian bond upgrade announcements. In Panel C we note that both the Standard & Poor's and the Moody's analyses provide evidence of a positive market reaction in the subperiod -1 to 0. Hence, it would seem that the Australian market reacts favourably to upgrade announcements by both credit rating agencies when the bond rating remains classified in the investment range. This is also observed in the +1 to +10 subperiod for the Standard & Poor's results. These findings are strongly supported by the results presented in Panel I, where we find significant evidence of positive market reaction to upgrade announcements that eventuate in bonds moving up from speculative to investment grade. Once again, this market reaction is observed for both Standard & Poor's (in subperiods _20 to -15; -20 to -1; and -1 to 0); and Moody's (in subperiods +1 to +10; and +1 to +20). The evidence is not so strong when bonds remain speculative (Panel F). Here the only significant positive market reaction is found in the Moody's analysis and in subperiods -20 to -15; and -1 to 0.

Panels C, F and I of Table 4 present and the results of the Australian market reaction during the bond downgrade announcements. In this case, we find that the market reaction is not as strong as that towards upgrade announcements. Specifically, the evidence suggests that the Australian market reacts primarily to downgrade announcements by Standard & Poor's, whether the bond remains investment grade (Panel C) or remains speculative (Panel F). In both panels we observe a significant negative market reaction in subperiods -1 to 0; and -20 to -1. In Panel F we observe an additional significant CAR in subperiod -20 to -15. In contrast, when we consider the down grade of bonds from investment

to speculative, the Australian market seems to react primarily to Moody's announcements (Panel I). In this panel we observe a negative market reaction in subperiods -10 to -1; and -20 to -1.

Therefore, when comparing our results for the UK and Australia, we can conclude that there is some evidence of a negative market reaction as a consequence of bond downgrade announcements on all bonds, whether they remain investment, speculative or are downgraded form investment to speculative. There seems to be strong support for the private information hypothesis for bonds that remain as investment grade and bonds that drop from investment to speculative grade after the rating downgrade announcement in both the UK and Australia. However, both markets reveal weak evidence for bonds that remain as speculative grade. Unlike the UK, the Australian market reaction also provides some evidence to support the private information hypothesis during upgrade announcements for all Australian bond grades (bonds that remain as investment grade, bonds that remain as speculative grade and bonds that jump from speculative to investment grade).

4. CONCLUSION

In this paper, we use event study methodology to test whether announcements of bond rating revisions by Moody's and Standard & Poor's have any information value to market participants in the United Kingdom and Australia, with a study period extending from 1 January 1997 to 31 December 2006. In general, we find similar results for both the UK and Australia during the bond downgrade announcements but not for upgrade announcements. Based on daily and subperiod observations, we find that there is no evidence to support the private information hypothesis during corporate bond upgrade announcements in the UK. These results are consistent with the findings of Goh and Ederington (1993) and Dichev and Piotroski (2001). Unlike the UK, however, Australia reveals some evidence of the existence of private information during bond upgrade announcements based on a subperiod analysis. These results support those reported by Creighton et al. (2007) who also investigate the Australian market.

Our results also provide some evidence in support of the private information hypothesis during corporate bond downgrades in both the UK and Australia. We find a significant negative market reaction in both markets in most of our samples. Further, we do not find conclusive evidence to support the argument that one rating agency outperforms another These findings are consistent with those reported by Kish et al. (1999).

To gain further insights into the reaction of market participants to bond rating revision announcements, we extend the analysis to consider different grades of bonds, namely investment grade and speculative grade bonds. We also consider bonds that move from speculative to investment grade or drop from investment to speculative grade following a rating agency's announcement. For bond downgrade announcements, we find that both the UK and the Australian market have similar results. Both markets exhibit strong support for the private information hypothesis for bonds that remain as investment grade and bonds that drop from investment grade to speculative grade, with evidence of negative market reaction to downgrade announcements. However, we find only a weak market reaction in both UK and Australia for bonds that remain as speculative grade. These results are contrary to the findings of previous studies by Hand et al.(1992) and Goh and Ederington (1999) who report that bonds that remain as speculative trigger a greater significant market reaction when compared to bond that remain as investment grade.

For upgrade announcements, Australia shows support for the private information hypothesis in all bond grades (bonds that remain as investment grade, bonds that remain as speculative grade and bonds that jump from speculative to investment grade). Unlike Australia, however, the UK evidence is weak. Except for bonds that jump from speculative grade to investment grade, we do not observe the existence of private information in the market for bonds that remain as investment or speculative bond as a consequence of upgrade announcements.

APPENDIX: EMPIRICAL METHOD

Following previous studies (for example, Pinches and Singleton (1978)) we assume an equilibrium market model representation of the return generating function. Expected returns for security *i* at time *t* is calculated as follows:

$$E(R_{i,t}) = E(\alpha_i) + E(\beta_i)R_{m,t} + \in_{i,t}$$

Where $E(\alpha_i)$ is an expected return of security *i* when the expected return of the market $(E(R_{m,t}))$ is zero and $E(\beta_i)R_{m,t}$ is the systematic component assumed to have a linear relationship between company's security returns and market returns, α and β are estimated using a regression model where the parameters are calculated using the Ordinary least squares (OLS). The term $\in_{i,t}$ indicates the unsystematic risk component or error term (also known as residual) which incorporates the impact of a company specific event announcement (assuming that information signal and return of the market are independent). Measurement of abnormal return is introduced if $\in_{i,t}$ is brought to the left side of the equation:

$$AR_{i,t} = \in_{i,t} = R_{i,t} - E(\alpha_i) - E((\beta_i)R_{m,t}) \quad (1)$$

and *t* is constrained to the period t_{-20} through t_{+20}.

The next step is to compute the daily cross-sectional average abnormal returns (AAR_t) for a specific day, t. This is done by summing all the daily abnormal returns for the period and dividing them into the number of observations.

$$AAR_t = \sum_{i=1}^{N} AR_{i,t} / N_t \quad (2)$$

where N_t is the number of observations on event day t

Finally, we sum the cross-sectional average abnormal return by adding the daily average abnormal returns in time periods t_1 and t_2. The formula is used as follows:

$$CAR_t = \sum_{k=t-T}^{t} AAR_t \quad (3)$$

where T is some numbers of event days prior to day t

The parameter of the market model for this study is 100 days. This is estimated based on six months of daily return observations beginning 120 days through to 21 days before the corporate bond rating revision announced to the public. The event period ranges from 20 days before to 20 days (41-day) after the rating revision. The test statistic for the abnormal return is based on Boehmer et al. (1991).

The computation of the standardized abnormal returns (SAR_t) for a specific day, t, is as follows:

$$SAR_t = AR_{it} / \hat{\sigma}_i \sqrt{1 + \frac{1}{T} + \frac{(R_{mt} - \overline{R}_m)^2}{\Sigma_{E=-120}^{-21} (R_{mt} - \overline{R}_m)^2}} \quad (4)$$

where $\hat{\sigma}_i$ is market *i*'s standard deviation of the risk-adjusted abnormal share price return during the estimation period; T_i is the number of trading days in the estimation period is company *i*; and $\overline{R}_m$ is the average market return (FTSE All Share/ MSCI Europe/ASX200) during the estimation period.

For each day in the event period, the cross-sectional standard deviation of the SARs is calculated and this can be written as

$$\sigma_{SAR_t} = \sqrt{\frac{\Sigma_{i=1}^{N} (SAR_{it} - \Sigma_{i=1}^{N} SAR_{it} / N)^2}{N(N-1)}} \quad (5)$$

Further, the test statistic for the standardised cross-sectional is as follows:

$$Z = \frac{\Sigma_{i=1}^{N} SAR_{it} / N}{\sigma_{SAR_t}} \quad (6)$$

The individual SARs are assumed to be cross-sectionally independent and normally distributed. Based on Greene (2000), the distribution of the sample average SARs will converge to normality by the Lindberg-Levy and Lindberg-Feller central limit theorems.

Table 1 Rating Revision Announcements by Standard and Poor's and Moody's from 1997 to 2006 in United Kingdom and Australia

	Standard & Poor's		Moody's		
Panel A: United Kingdom					
	Upgrade	**Downgrade**	**Upgrade**	**Downgrade**	**Total**
Number of Events	30	75	53	141	299
Number of Companies	22	45	38	79	184
Panel B: Australia					
Number of Events	20	40	23	24	107
Number of Companies	12	25	14	16	67

Table 2 Stock Price Reaction during Corporate Bond Rating Changes: Australia vs. UK (1997-2006)

Corporate Bond Upgrade Announcements						
CAR according to subperiod (days)	**UNITED KINGDOM**				**AUSTRALIA**	
	Panel A: Market Proxy: FTSE All Share		**Panel B: Market Proxy: MSCI Europe**		**Panel C: Market Proxy: ASX 200**	
	S&P	**Moody's**	**S&P**	**Moody's**	**S&P**	**Moody's**
-20 to -1	-0.0141 (-0.9881)	-0.0294 (-0.8597)	-0.0289 (-1.22175)	-0.0246 (-0.5220)	-0.0337 (-0.4956)	0.0066 (0.2602)
-20 to -15	-0.0038*** (-3.510)	-0.0103 (-0.8257)	-0.0144*** (-5.0116)	-0.0116 (-1.1828)	-0.0168 (-0.5028)	-0.0045 (-0.3996)
-10 to -1	-0.0063 (-0.2540)	-0.0213 (-0.7076)	-0.0113 (-1.0211)	-0.0207 (-0.2989)	-0.0080 (-0.0030)	0.0066 (1.0772)
-1 to 0	0.0022*** (2.6816)	-0.0095 (-1.3432)	0.0001 (-0.5210)	-0.0041 (-0.3930)	0.0074** (2.1390)	0.0075*** (3.2795)
+1 to +10	-0.0020 (-0.0732)	-0.0021 (0.5800)	-0.0072 (-1.3997)	0.0084 (1.1845)	-0.0006 (1.1768)	0.0064 (0.5072)
+1 to +20	0.0003 (0.3284)	-0.0089 (0.1664)	-0.0027 (0.2093)	0.0140 (1.2552)	0.0101** (2.0677)	0.0053 (-0.0231)
Corporate Bond Downgrade Announcements						
CAR according to subperiod (days)	**UNITED KINGDOM**				**AUSTRALIA**	
	Panel D: Market Proxy: FTSE All Share		**Panel E: Market Proxy: MSCI Europe**		**Panel F: Market Proxy: ASX 200**	
	S&P	**Moody's**	**S&P**	**Moody's**	**S&P**	**Moody's**
-20 to -1	-0.0114 (-0.2105)	0.0206*** (3.8967)	-0.0078 (-0.3472)	-0.0434* (-1.7686)	-0.0564 (-1.5283)	-0.0023 (-0.8510)
-20 to -15	0.0017 (-0.3423)	0.0107*** (2.3590)	0.0024 (0.0987)	-0.0135** (-2.1830)	-0.0248*** (-9.3436)	-0.0064 (-1.0898)
-10 to -1	-0.0251 (-1.2422)	0.0051 (1.1438)	-0.02212** (-2.2263)	-0.0204 (-0.2405)	-0.0442 (-1.3377)	-0.0229 (-1.0142)
-1 to 0	-0.0242*** (-7.9297)	-0.0069 (-1.3047)	-0.02214*** (-6.1274)	-0.0129*** (-6.1829)	-0.0735*** (-8.6714)	0.0034 (-0.3770)
+1 to +10	-0.0018 (-0.9078)	-0.00007 (0.2613)	0.0040 (0.2612)	-0.0069 (-0.2410)	0.0640*** (3.4700)	0.0477 (0.5974)
+1 to +20	0.0125 (0.6118)	0.0041 (0.2780)	0.0161 (1.2209)	-0.0135 (-0.4645)	0.0992*** (2.8277)	0.0502 (-0.0403)

This Table shows Cumulative Average Return (CAR) Over Selected Subperiods. The standard errors are estimated using SARs but only AAR reported. A rating change occurs when S&P and Moody's announce a rating change.

* indicates statistical significance at 10% level of confidence

** indicates statistical significance at 5% level of confidence

*** indicates statistical significance at 1% level of confidence

Table 3 Investment Grade vs. Speculative Grade: Market Reactions to Corporate Bond Upgrades from 1997 to 2006

CAR according to subperiod (days)	Remain Investment Grade					
	UNITED KINGDOM				AUSTRALIA	
	Panel A: Market Proxy: FTSE All Share		Panel B: Market Proxy: MSCI Europe		Panel C: Market Proxy: ASX 200	
	Standard & Poor's (N=17)	Moody's (N=36)	Standard & Poor's (N=17)	Moody's (N=36)	S& P (N=11)	Moody's (N=17)
-20 to -15	-0.010***	-0.012	-0.027***	-0.019*	-0.013	0.002
	(-4.178)	(-1.111)	-9.966	(-1.714)	(-0.415)	(-0.434)
-20 to -1	-0.021	-0.037	-0.046	-0.048	-0.004	-0.006
	(-1.106)	(-1.340)	(-1.146)	(-0.947)	(-0.244)	(-1.061)
-10 to -1	-0.017	-0.017	-0.022	-0.026	-0.006	0.005
	(-0.461)	(-1.225)	(-1.195)	(-0.720)	(-0.133)	(0.264)
-1 to 0	-0.001	-0.005	-0.002	-0.001	0.008***	0.007***
	(0.171)	(-0.561)	(-0.465)	(-0.132)	(4.564)	(7.083)
+1 to +10	-0.007	0.012	-0.013	0.027*	0.024**	0.003
	(-0.502)	(1.220)	(-0.836)	(1.670)	(2.128)	(0.208)
+1 to +20	0.001	0.010	-0.005	0.041	0.026	-0.005
	(-0.045)	(0.594)	(-0.315)	(1.232)	(1.238)	(-0.535)
	Remain Speculative Grade					
	Panel D: Market Proxy: FTSE All Share		Panel E: Market Proxy: MSCI Europe		Panel F: Market Proxy: ASX 200	
	Standard & Poor's (N=10)	Moody's (N=13)	Standard & Poor's (N=10)	Moody's (N=13)	S& P (N=7)	Moody's (N=2)
-20 to -15	0.004	-0.008	0.003	0.005	-0.1068***	0.017*
	(-0.208)	(-0.189)	(-0.031)	(0.610)	(-4.8759)	(-1.752)
-20 to -1	-0.015	-0.012	-0.015	0.038	-0.0452**	-0.031
	(-0.300)	(0.365)	(-0.124)	(1.422)	(-2.4280)	(-0.643)
-10 to -1	0.009	-0.033	-0.015	-0.005	-0.0387*	0.054
	(-0.167)	(-0.114)	(-0.124)	(0.496)	(-1.7749)	(-0.954)
-1 to 0	0.009	-0.026***	0.005	-0.015***	-0.0180***	0.012***
	(0.614)	(-5.392)	(0.160)	(-5.199)	(-4.0570)	(4.838)
+1 to +10	-0.004	-0.023	-0.006	-0.033	-0.0222	-0.036*
	(0.047)	(-0.361)	(-0.032)	(-1.397)	(-0.9061)	(-1.758)
+1 to +20	-0.019	-0.056	-0.016	-0.051	0.0027	-0.033*
	(-0.250)	(-0.857)	(-0.371)	(-0.419)	(-0.2587)	(-1.709)
	Move from Speculative Grade to Investment Grade					
	Panel G: Market Proxy: FTSE All Share		Panel H: Market Proxy: MSCI Europe		Panel I: Market Proxy: ASX 200	
	Standard & Poor's (N=3)	Moody's (N=4)	Standard & Poor's (N=3)	Moody's (N=4)	S& P (N=2)	Moody's (N=4)
-20 to -15	0.007	-0.006	-0.004	-0.002	0.1076*	0.023
	(0.413)	(-0.659)	(-0.017)	(-0.151)	(1.7359)	(1.534)
-20 to -1	0.029	-0.019	0.018	-0.015	0.0146*	0.014
	(0.863)	(-0.962)	(1.110)	(-0.498)	(1.8594)	(1.336)
-10 to -1	0.006	-0.018	0.008**	-0.027	0.0885	-0.009
	(0.628)	(-1.633)	(2.146)	(-1.031)	(0.5152)	(0.115)
-1 to 0	-0.001	0.000	-0.008	0.001	0.0956***	0.009
	(-0.164)	(0.341)	(-0.480)	(0.797)	(5.7614)	(0.339)
+1 to +10	0.035	-0.036	0.023	-0.028	-0.0605	0.044***
	(1.130)	(-0.051)	(0.377)	(-0.831)	(0.9051)	(3.398)
+1 to +20	0.060***	-0.028	0.053	-0.017	-0.0529	0.067***
	(2.888)	(0.255)	(1.202)	(0.433)	(0.5937)	(5.038)

This Table shows Cumulative Average Return (CAR) Over Selected Subperiods. The standard errors are estimated using SARs but only AAR reported. A rating change occurs when S&P and Moody's announce a rating change.

* indicates statistical significance at 10% level of confidence

** indicates statistical significance at 5% level of confidence

*** indicates statistical significance at 1% level of confidence

Table 4 Investment Bond vs. Speculative Bond: Market Reactions to Corporate Bond Downgrades from 1997 to 2006

CAR according to subperiod (days)	Remain Investment Grade					
	UNITED KINGDOM				AUSTRALIA	
	Panel A: Market Proxy: FTSE All Share		Panel B: Market Proxy: MSCI Europe		Panel C: Market Proxy: ASX 200	
	Standard & Poor's (N=59)	Moody's (N=110)	Standard & Poor's (N=59)	Moody's (N=110)	Standard & Poor's (N=30)	Moody's (N=17)
-20 to -15	-0.003	0.000	-0.002	-0.013	0.008	-0.022
	(-1.436)	(-0.397)	(-0.740)	(-1.156)	(-0.426)	(-0.562)
-20 to -1	0.008	0.013	0.013	-0.014	-0.025***	-0.01
	(0.041)	(0.682)	(-0.463)	(-0.474)	(-4.665)	(-0.587)
-10 to -1	-0.004	0.010	0.001**	0.005	0.005	-0.009
	(-0.299)	(0.525)	(-2.315)	(0.330)	(0.621)	(-1.042)
-1 to 0	-0.028***	-0.004***	-0.027***	-0.006***	-0.003**	-0.002
	(-20.116)	(-4.369)	(-111.928)	(-4.417)	(-1.960)	(-0.105)
+1 to +10	-0.006	-0.015	-0.002	0.001	0.015	0.001
	(-1.004)	(-0.537)	(-1.406)	(0.174)	(0.920)	(0.188)
+1 to +20	0.006	-0.033	0.008	-0.002	0.048	-0.026
	(0.236)	(-1.081)	(0.782)	(0.054)	(0.842)	(-0.582)
	Remain Speculative Grade					
	Panel D: Market Proxy: FTSE All Share		Panel E: Market Proxy: MSCI Europe		Panel F: Market Proxy: ASX 200	
	Standard & Poor's (N=11)	Moody's (N=23)	Standard & Poor's (N=11)	Moody's (N=23)	Standard & Poor's (N=7)	Moody's (N=6)
-20 to -15	0.016	0.083***	0.014	0.012	-0.3516***	-0.008
	(-0.303)	(3.910)	(0.186)	(0.084)	(-2.9952)	(0.108)
-20 to -1	-0.101	0.076***	-0.111	-0.151	-0.0522***	0.032
	(-0.012)	(4.606)	(0.035)	(-1.073)	(-3.0746)	(1.408)
-10 to -1	-0.127	-0.034	-0.134	-0.153	-0.2562	-0.051
	(1.023)	(1.617)	(0.629)	(-0.875)	(-1.5052)	(-0.694)
-1 to 0	-0.019	-0.020	-0.005	-0.053***	-0.2170***	0.020
	(-0.235)	(0.330)	(-1.338)	(-3.996)	(-10.1611)	(-0.134)
+1 to +10	0.031	0.103***	0.039	-0.007	0.2352*	0.174***
	(0.618)	(5.763)	(1.476)	(-1.466)	(1.8913)	(2.752)
+1 to +20	0.073*	0.213***	0.076*	-0.046*	0.3250	0.257
	(1.662)	(8.993)	(1.805)	(-1.807)	(1.0265)	(1.30)
	Drop from Investment to Speculative Grade					
	Panel G: Market Proxy: FTSE All Share		Panel H: Market Proxy: MSCI Europe		Panel I: Market Proxy: ASX 200	
	Standard & Poor's (N=5)	Moody's (N=8)	Standard & Poor's (N=5)	Moody's (N=8)	Standard & Poor's (N=6)	Moody's (N=1)
-20 to -15	0.027	-0.049**	0.033	-0.087***	-0.0126	-0.417
	(1.448)	(-2.283)	(1.373)	(-6.796)	(-0.6184)	(-1.201)
-20 to -1	-0.044	-0.040	-0.027	-0.144***	0.0408***	-0.454***
	(-0.986)	(-0.830)	(-0.718)	(-2.924)	(2.9449)	(-3.816)
-10 to -1	-0.054*	0.044	-0.051	0.015	-0.0449	-0.0994*
	(-1.874)	(0.199)	(-1.614)	(-1.064)	(-0.4355)	(-1.685)
-1 to 0	0.002	-0.004***	-0.005	0.000**	-0.4396	-0.007
	(1.303)	(-27.784)	(0.855)	(2.374)	(-0.0455)	(-0.302)
+1 to +10	-0.020	-0.094	-0.007	-0.110	0.1584	0.082
	(-1.224)	(0.521)	(-1.086)	(0.419)	(1.8210)	(0.676)
+1 to +20	-0.044***	-0.082	-0.020**	-0.086	0.0842	0.097
	(-3.112)	(0.320)	(-2.310)	(0.621)	(0.3475)	(0.600)

This Table shows Cumulative Average Return (CAR) Over Selected Subperiods. The standard errors are estimated using SARs but only AAR reported. A rating change occurs when S&P and Moody's announce a rating change.

* indicates statistical significance at 10% level of confidence

** indicates statistical significance at 5% level of confidence

*** indicates statistical significance at 1% level of confidence

Table 5 Regression results of average returns (ARs) during the rating upgrades and downgrades in the UK and Australia

Independent Variables:	Panel A: Upgrade Announcements in the UK					Panel B: Upgrade Announcements in Australia				
	Dependent Variable =AR (0)					Dependent Variable =AR (0)				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	0.0036	-0.0038	-0.0074	0.0010	0.0057	0.0080	0.0101	0.0251	0.0139	0.0039
	(0.137)	(-0.148)	(-0.336)	(0.0419)	(0.208)	(0.551)	(0.600)	(1.238)	(0.912)	(0.254)
Market Value (LogMV)	-0.0007	-0.0008	0.0004	-0.0007	-0.0008	-0.0012	-0.0012	-0.0025	-0.0015	-0.0006
	(-0.230)	(-0.294)	(0.161)	(-0.232)	(-0.268)	(-0.793)	(-0.785)	(-1.375)	(-1.043)	(-0.424)
Debt to Total Asset (DTA)	0.0014	-0.0024	0.0011	0.0015	0.0017	-0.0036	-0.0032	-0.0015	-0.0034	-0.0028
	(0.567)	(-0.859)	(0.438)	(0.640)	(0.668)	(-0.950)	(-0.792)	(-0.326)	(-0.831)	(-0.727)
$CAR_{-20\ to\ -1}$	0.0110	0.0094	0.0122	0.0090	0.0112	0.0181	0.0170	0.0128	0.0253	0.0131
	(0.222)	(0.194)	(0.250)	(0.183)	(0.225)	(1.010)	(0.934)	(0.684)	(1.213)	(0.711)
S&P dummy (DSP)		0.0123*					-0.0026			
		(1.885)					(-0.454)			
Speculative dummy (DSpec)			0.0057					-0.0122		
			(0.702)					(-1.575)		
Within Class dummy (DWC)				0.0044					-0.0055	
				(0.740)					(-0.959)	
Change Grade dummy (DCG)					-0.0068					0.0060
					(-1.026)					(0.675)
R-squared (%)	0.59	3.89	1.07	1.18	1.08	5.27	5.79	11.31	7.65	6.43
Adjusted R-squared (%)	-3.49	-1.45	-4.42	-4.31	-4.42	-2.21	-4.39	1.72	-2.33	-3.68
F-value for test	0.15	0.73	0.20	0.21	0.20	0.70	0.57	0.34	0.76	0.63
Jarque-Bera	90.19	97.79	101.06	94.14	94.32	3.60	3.02	2.14	2.27	4.46

Independent Variables:	Panel C:Downgrade Announcements in the UK					Panel D: Downgrade Announcements in Australia				
	Dependent Variable =AR (0)					Dependent Variable =AR (0)				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	0.0021	-0.00007	-0.0120	-0.0067	0.0037	-0.1257	-0.0821	-0.2782	-0.0864	-0.0283
	(0.094)	(-0.003)	(-0.523)	(-0.295)	(0.161)	(-1.569)	(-1.301)	(-1.494)	(-1.428)	(-0.790)
Market Value (LogMV)	-0.0004	-0.0007	0.0011	-0.0007	-0.0005	0.0115	0.0104	0.0254	0.0095	0.0002
	(-0.143)	(-0.269)	(0.408)	(-0.252)	(-0.193)	(1.492)	(1.435)	(1.541)	(1.377)	(0.045)
Debt to Total Asset (DTA)	-0.0015	-0.0036	-0.0019	-0.0021	-0.0014	-0.0130	-0.0138	-0.0305	-0.0117	-0.0235
	(-0.680)	(-1.099)	(-0.877)	(-0.906)	(-0.600)	(-0.403)	(-0.440)	(-0.815)	(-0.371)	(-0.646)
$CAR_{-20\ to\ -1}$	-0.0455*	-0.0453*	-0.0454*	-0.0462*	-0.0456*	0.2235***	0.2194***	0.2270***	0.2185***	0.2289***
	(-1.676)	(-1.699)	(-1.721)	(-1.781)	(-1.684)	(3.670)	(3.812)	(3.695)	(3.623)	(3.135)
S&P dummy (DSP)		0.0072					-0.0597*			
		(0.951)					(-1.935)			
Speculative dummy (DSpec)			0.0109					0.1178		
			(1.063)					(1.282)		
Within Class dummy (DWC)				0.0176***					-0.0493	
				(2.827)					(-1.352)	
Change Grade dummy (DCG)					-0.0054					-0.3155
					(-0.741)					(-1.559)
R-squared (%)	8.60	9.03	9.18	12.23	8.67	27.56	30.86	32.34	29.82	50.82
Adjusted R-squared	7.25	7.23	7.38	10.50	6.86	23.53	25.64	27.24	24.53	47.10
F-value for test	6.37***	5.02***	5.10***	7.04***	4.80***	6.84***	5.91***	6.33***	5.63***	13.69***
Jarque-Bera	518.08	506.75	541.06	428.40	525.56	1140.03	1062.55	764.31	992.43	207.45

Note that the value inside the parenthesis is the t-test value.
* indicates statistical significance at 10% level of confidence
** indicates statistical significance at 5% level of confidence
*** indicates statistical significance at 1% level of confidence

Model 1 = Base Model
Model 2 = Base Model + DMoody's
Model 3 = Base Model + DSpec
Model 4 = Base Model + DWC
Model 5 = Base Model + DCG

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