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THE IMPACT OF CREDIT WATCH & BOND RATING CHANGES ON ABNORMAL STOCK RETURNS FOR NON-USA DOMICILED CORPORATIONS

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i. ABSTRACT

In this paper, we investigate whether credit watches and bond rating changes issued by Moodys' and S&P Credit Rating Agencies provide significant new information to investors for Non-USA domiciled corporations. We also examine whether the stock related cumulative abnormal return (CAR) differs according to the classification of the country of domicile (emerging or developed) of the corporation, and varies by state of the local stock market during the time of the rating event.

We find that on average, negative credit watches as well as long term rating downgrades result in significant stock related CAR for Non-USA domiciled

corporations. However, positive credit watches and long term rating upgrades generally do not result in significant stock related CAR. On average, we find that negative credit watches result in a stock related CAR of -1.37% within the (-1, +1) window centered around the watch issuance, while long term rating downgrades result in a stock related CAR of -1.33% within the (-1, +1) window centered around the downgrade. Developed markets generally exhibit a stronger reaction. Negative watch in developed markets have a stock related CAR of -1.44%, compared to only -0.88% for emerging markets. The picture is similar for long term rating downgrades. Downgrades in developed markets have a stock related CAR of -1.47%, compared to only -0.76% for emerging markets. This paper provides evidence that credit rating agencies are able to provide new information to investors outside of companies domiciled in the USA.

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1. INTRODUCTION

Credit rating agencies (CRAs) such as Moody's and Standard and Poor's play an important credit monitoring role within financial markets. Bond ratings issued by these 2 agencies dominate the market, accounting for 90 – 95% of the world market share[1], and are used by investors to determine the credit worthiness, and hence, required return on bond issues.

The number of credit watch and bond rating changes issued by CRAs for companies domiciled outside of the USA has increased since 1990. From our dataset, the annual frequency of issues on credit watch for companies domiciled outside of the USA increased from 29 in 1992 to 330 in 2006. The annual frequency of issues on long term rating changes increased from 86 in 1992 to 300 in 2006. Nevertheless, to the best of our knowledge, there has not been any study that examines the informational value of bond rating changes for corporations domiciled outside of the USA. Whether these ratings provide significant informational value to investors therefore remains to be seen – our study seeks to determine this. We note that over 98.4% (or substantially all) of

[1] *Credit Ratings of Long Term Bonds. Hilliard Lyons*

the events in our sample are therefore related to companies with equity traded outside of the United States.

2. LITERATURE REVIEW

2.1 Value and Effect of Credit Ratings

The value of credit ratings have been debated within academic literature. Ederington and Yawitz (1987) find that most ratings can be predicted from publicly available information. Wakeman (1990) argue that rating agencies summarize existing public information, lowering information costs, but not expanding information availability. However, Jorion, Liu and Shi (2004) find that the informational effects of downgrades and upgrades are greater in the post-FD period (after 23 Oct 2000) because credit analysts at rating agencies still retain access to confidential information that is no longer available to equity analysts.

The effect of credit rating changes issued by the CRAs have a mixed track record within the academic literature. Prior work have used both bond and stock prices to examine the effect of rating changes. Weinstein (1977) (monthly bond returns) and Wakeman (1978) (monthly stock and weekly bond returns) do not find a price reaction at the time of rating changes. Katz (1974) (monthly changes in bond yields), Grier and Katz (1976) (average monthly bond prices) and Ingram, Brooks and Copeland (1983) (monthly changes in municipal bond yields) find significant bond price reactions. Griffin and Sanvicente (1982), Wansley and

Clauretie (1985), Cornell et al (1989) generally find a significant negative reaction to bond downgrades. They do not generally find a significant reaction to upgrades. Wansley and Clauretie (1985) and Holthausen and Leftwich (1986) also observe significant negative returns prior to the actual downgrades. Similarly, Ederington and Goh (1998) examine trends in earnings before and after rating changes, and find that downgrades both precede and portent declines in earnings. However, upgrades bear little relation to earnings (both before and after).

Holthausen and Leftwich (1986) use a sample of 1,014 rating changes by Moody's and S&P over the 1977 – 1982 period. They report a statistically significant two-day abnormal average return of -2.66%. Other than Wansley and Clauretie (1985) and Hand et el (1992), these papers examine only equity market reactions. This is likely due to difficulty in obtaining reliable daily bond data. Hand, Holthausen and Leftwich (1992) (daily data on bond and stock prices) find significant excess bond returns for unexpected additions (using an expectations model based on bond yields) to creditwatch, although stock returns are only significant for additions to negative creditwatch. For rating changes, the paper finds significant bond and stock price reaction to downgrades, but little evidence

on effect of upgrades on bond and stock prices. Dichev and Piotroski (2001) use all of Moody's bond rating changes announcements from 1970 – 1997, representing a larger sample of 4,727 observations. They also find a significant three-day price effect of -1.97% for downgrades, and 0.48% for upgrades. Both results are significant, partially due to the increased power from the sample size.

2.2 Differentiation of Downgrades by Deterioration in Firm's Prospects and Increase in Leverage

Goh and Ederington (1993) also categorize rating downgrades into those that are due to a deterioration in the financial prospects of the firm, and those that result from an increase in leverage. The authors find that the former have negative implications for stockholders, while the latter, positive. The authors also find that the first class of rating changes reflect the rating agency's (Moody, in this case) projections of the firm's future prospects, while the latter is based on past leverage increases. Consequently, there is an observed significant negative stock reaction to the first class of downgrades, but not the second.

3. CONTRIBUTION OF CURRENT STUDY

3.1 Global Scope of Credit Watch and Bond Rating Changes

The aforementioned studies are based on the effect of bond rating changes and credit watch for companies that are domiciled (or incorporated) in the United States (US). To the best of our knowledge, there has not been any study on the effect of bond rating changes in international markets, outside of the US. However, with the advent of globalization, many non-US corporations are also turning to bond issuance as a means of raising capital. Consequently, the number of bond rating and credit watch events issued by the S&P and Moodys rating agencies on non-US domiciled companies have also increased. Within our dataset, which reflects long-term bond rating changes as well as credit watches for fixed interest rate bonds and debentures for non-USA domiciled firms[2] between May 1991 and Jul 2007 for both credit watch as well as long term ratings, there are a total of 4,039 long-term bond rating events within the time period under observation as well as 3,287 credit watch events. The number of long-term bond rating events each year increased from 47 events per year in

[2] Excluding bonds issued by Supra-National organisations (e.g. Asian Development Bank, IMF) as well as bonds issued by governments.

1991 and 86 events per year in 1992 to 300 events per year in 2006. The number of credit watches increased from 29 in 1992 to 330 in 2006.

3.2 Differences in National Regulatory Contexts

Equity reactions to bond rating changes and credit watches issued by S&P and Moodys for non-US domiciled firms may differ from reactions by US domiciled firms. As this is the first study focusing on non-US firms, it remains to be established whether S&P and Moodys ratings and credit watches provide significant new information for investors in the stock of non-US domiciled firms.

One reason for any differences is that corporate governance and regulatory contexts vary globally. One prominent example is Regulation Fair Disclosure (FD), which prohibits US domiciled firms from sharing private information with stock analysts, amongst other parties; post Reg FD, US domiciled firms are however still able to share private information with CRAs, therefore resulting in bond ratings and credit watches having a greater relative informational value over stock analysts' upgrades / downgrades. While this would tend to increase the post Reg FD stock price reaction to bond rating changes / credit watches for US-domiciled firms, a similar effect may not be present for non-US domiciled companies as Reg FD does not apply to firms that are not regulated by the US Securities and Exchange Commission (SEC).

3.3 Effectiveness of Rating Methodology outside USA

Another reason is that it rating agencies need to establish an effective relationship with the issuer in order to obtain non-public information for the rating process. It remains to be seen whether S&P and Moodys have been able to achieve this effectively with non-US domiciled firms. According to Jorion (2005), rating agencies typically begin the process of ratings following a request by corporations for ratings issuance in advance of issuing debt. Agencies then assign a team with relevant industry expertise, and there is also one primary analyst who takes the lead in making regular contact, establishing a relationship with the issuer and overseeing the rating process. The actual ratings are based on both public information (e.g. accounting ratios) and nonpublic information (profit breakdowns, product plans, financial projections, etc). The efficacy of the rating process may therefore vary between emerging and developed markets, as rating agencies may take time to familiarize themselves with the operations, organizational culture and senior management of firms in emerging markets. Additionally, the composition of 'public information' may differ between developed and emerging markets. It is likely that more information is 'public' in developed markets because of more established regulatory authorities as well as deeper

capital markets. We therefore segregate our results by developed / emerging markets, using the Morgan Stanley Capital Index country classification as a guide.

3.4 Linkages between Credit Watch and Bond Rating Changes

Additionally, we also examine stock reactions after both credit watches and long term bond rating changes, and also the difference between bond rating changes that were previously foreshadowed by credit watches (collectively termed “expected” bond rating changes), versus bond rating changes that were not foreshadowed (collectively termed “unexpected” bond rating changes). To the best of our knowledge, this is the first study of its kind that considers the linkage between credit watch as well as bond rating changes. Our study is otherwise global in nature, but excludes US-domiciled companies as there is already a large volume of research on the impact of bond rating changes and credit watches on these firms.

3.5 Summary of Significant Empirical Findings

We find that on average, negative credit watch as well as long term rating downgrades induce significant stock price reactions over a (-1, +1) period with day 0 being the event day itself. Negative credit watches induce an average stock related CAR of -1.37% (t-statistic of –7.15) while long term rating downgrades induce a reaction of -1.33% (t-statistic of –7.11) over the 3 day period for the entire sample. The average stock-related CAR associated with positive credit watch is 0.13% (t-statistic of 0.90) while the stock related CAR associated with long term rating upgrades is 0.07% (t-statistic of 0.75). Both stock-related CARs for positive credit watch and upgrades are not significant at the 2.5% level of significance (1-tail test). Hence, it appears that negative events result in a significant stock price reaction, while positive events do not. Additionally, the act of being put on credit watch is itself an informative event.

We also find that stock-related CAR in developed markets is stronger than stock-related CAR in emerging markets, for negative credit watch and long term rating downgrades. Stock-related CAR associated with a negative credit watch in developed markets is -1.44% (t-statistic of –6.79), compared to -0.88% for negative credit watch in emerging markets (t-statistic of –2.27). Additionally,

stock-related CAR associated with long term ratings downgrades in developed markets is –1.47% (t-statistic of –6.84), compared to only –0.76% (t-statistic of –2.08) for long term ratings downgrades in emerging markets. Regression analysis (Table 13) confirms that being domiciled in a developed market results in a more negative reaction to long term rating downgrades; reactions are more negative by -1.11% on average, compared to companies domiciled in emerging markets. Also, being domiciled in a developed market results in the reaction to negative credit watch being more negative by -0.63% compared to emerging markets.

The results for upgrades when partitioned between developed / emerging markets are mixed and not significant at the 2.5% level of significance (1-tailed test). Positive credit watch in developed markets result in a 0.10% stock-related CAR, compared to 0.30% for emerging markets. Additionally, long term rating upgrades in developed markets result in a 0.08% CAR, and a 0.03% CAR in emerging markets.

Goh and Edderington (’98) argue that good news is typically released more readily by corporations relative to bad news. Hence, positive credit

watches / long term rating upgrades represent minimal new information to investors compared to negative credit watches / long term rating downgrades. This could explain why negative credit watches / downgrades result in a more significant stock price reaction compared to positive credit watches / upgrades.

Moreover, the greater stock-related CAR to negative credit watches and rating downgrades in developed markets compared to emerging markets indicates that the credit watches and ratings generally provide investors with more new information in developed markets. The greater efficacy of the ratings process in developed markets may be due to enhanced disclosure standards; rating agencies may base their decisions partially on publicly available information, which are fed into proprietary models. Additionally, laws governing insider trading / other corporate governance measures may be more stringent in developed markets. Hence, information leakage in emerging markets may be more pronounced, therefore resulting in a smaller reaction upon rating changes.

Furthermore, when the results are further segregated by whether the credit watches are eventually resolved by long term rating changes (termed ‘informative’ credit watches and ‘expected’ rating changes respectively), or not

resolved (termed ‘uninformative’ credit watches, with unlinked rating changes termed ‘unexpected’ rating changes), we find that informative credit watches and surprised rating changes generally have more significant reactions.

Informative negative credit watches in developed (emerging) markets have an average reaction of –1.82% (-1.76%) during the 3 day window, compared to –1.11% (-0.38%) for non-informative negative credit watches. The t-statistics for uninformative negative credit watch in emerging markets are not significant at the 2.5% level of significance. Additionally, surprise long term ratings downgrades in developed (emerging) markets have an average reaction of –2.09% (-0.85%) during the 3 day window, compared to –0.85% (-0.49%) during the 3 day window for expected long term ratings downgrades. The t-statistics for the emerging markets surprise and expected downgrades are not significant. This may also be due to the smaller number of observations for events in the emerging markets, which reduces the power of the test.

Positive credit watches / upgrades generally resulted in insignificant stock-related CARs, except in the case of expected long term rating upgrades in emerging markets, which resulted in an average reaction of 1.33% (t-statistic of

2.86 significant at the 2.5% level of significance). This is likely due to the fact that most of the rating events in this category occurred during months where the broader stock indices for those countries exhibited strongly positive returns. The average MSCI country index return during expected long term rating upgrades in emerging markets was 2.23%, compared to 1.13% on average for all long term rating upgrades. We subsequently demonstrate that the local MSCI country index return has a significant impact on the returns associated with long term rating upgrades but not with long term rating downgrades. A 1 percentage pt increase in local MSCI country index return results in an additional 3.89% percentage pt increase in stock-related CAR after long term rating upgrades. The effect is not significant for bond downgrades. An explanation for this is that investors consider the broader macroeconomic context in tempering CRAs' opinion of a corporation's improved prospects going forward. However, they react negatively to news of a corporation's declining prospects regardless of how the economy is performing, indicating that investors may "assume the worst" after long term rating downgrades.

The remainder of this study is organized as follows. Section 4 - 6 describes background to credit rating agencies, data and sample characteristics,

Section 7 - 8 discussed the empirical methodologies and the Welch t-test which we use to compare sample means, Section 9 presents overall empirical findings and also partitions results by various characteristics (e.g. country of domicile, etc), Section 10 investigates the possibility of insider trading by examining preannouncement trading effects, Section 11 performs cross section analysis and further discusses the possibility of insider trading, and lastly, Section 12 provides concluding remarks and future directions for research.

4. BACKGROUND

Table 1 shows the distribution of bond rating changes released by the 2 major rating agencies, Moody's and S&P. Together, these 2 agencies account for over 90 – 95% of the global market. The table shows long term bond ratings, which also incorporates the rating agencies' opinion of the firm's future prospects. The ratings range from Aaa (for Moodys) and AAA (for S&P), which denotes the most credit worthy issues, to C (for Moodys) and D (for S&P) for the least credit worthy issues (already in default).

There are 2 main bands of ratings, investment grade and non-investment grade. The bandings are significant because the yield to maturity required of the issues increase dramatically between rating bands. Additionally, some pension / mutual funds and other investment houses may be prohibited by their mandates from holding non-investment grade rated debt, or prohibited from holding equity in firms that are non-investment grade rated. The lowest investment grade rating is Baa3 for Moodys and BBB- for S&P.

Table 1

The list of bond ratings released by Moodys and S&P are mapped to ordinal values based on equivalence classes between the 2 rating agencies.

Rating Agency		Type of Rating	Band	Ordinal Value
Moodys	S&P			
Aaa	AAA	Highest	Investment Grade	1
Aa1	AA+	High	Investment Grade	2
Aa2	AA	High	Investment Grade	3
Aa	NA	High	Investment Grade	3
Aa3	AA-	High	Investment Grade	4
A1	A+	Upper	Investment Grade	5
A2	A	Upper	Investment Grade	6
A	NA	Upper	Investment Grade	6
A3	A-	Upper	Investment Grade	7
Baa1	BBB+	Medium	Investment Grade	8
Baa2	BBB	Medium	Investment Grade	9
Baa	NA	Medium	Investment Grade	9
Baa3	BBB-	Medium	Investment Grade	10
Ba1	BB+	Lower	Speculative	11
Ba2	BB	Lower	Speculative	12
Ba	NA	Lower	Speculative	12
Ba3	BB-	Lower	Speculative	13
B1	B+	Spec	Speculative	14
B	NA	Spec	Speculative	14
B2	B	Spec	Speculative	15
B3	B-	Spec	Speculative	16
Caa	NA	Poor	Speculative	16
Caa1	CCC+	Poor	Speculative	17
Caa2	CCC	Poor	Speculative	18
Caa3	CCC-	Poor	Speculative	19
Ca	CC	Hspec	Speculative	20
C	C	Lowest	Speculative	21
NA	D	Def	Speculative	23

5. DATA SOURCES

We use four databases in the current study: S&P Rating Changes database, Moody's Default Risk Service database, Bloomberg Investors Service and daily stock price data from DataStream.

Specifically, we have access to a large sample of credit watch placements (from May 1991 to Jul 2007) and bond rating changes (from Apr 1982 to Jul 2007) from Moody's Default Risk Service database, and also S&P Rating Changes database. Both databases provide information on the beginning date and credit watch indications of a bond (i.e. at the issue level) as well as subsequent long term rating changes dates, and also the specific ratings. We confine our sample to fixed rate non-ABS/CDO bonds issued by companies (i.e. excluding sovereign and supra-national entities such as the Asia Development Bank, the International Monetary Fund, etc) domiciled outside the US, and examine only positive / negative credit watches, as well as upgrades / downgrades for long term rating changes. Over 98.4% (or substantially all) of the events in our sample are therefore related to companies with equity traded outside of the United States.

Secondly, we map the bond ISINs[3] to stock ISINs for the parent companies involved by using Bloomberg Investors Service. The parent companies' stock ISIN is then used to retrieve daily stock price history from DataStream. In total, over 919 unique companies are considered in our analysis. Companies without bond to stock ISIN mapping in Bloomberg Investors Service, or without price data history available in DataStream are not considered.

In cases where credit watches are issued for several of a company's bonds on the same day, we consider this as only one observation. Similarly, where several of a company's bonds are issued with upgrades / downgrades on the same day, we also consider this as a single observation. In cases where some of a company's bonds experience expected rating changes, while others do not on the same day, we consider the stock-related CAR as due to an expected rating change. Thirdly, for the case where multiple bond rating changes related to the same issuer happen on the same day, we consider the

[3] An International Securities Identifying Number (ISIN) uniquely identifies a security (e.g bond / stock) with a structure as outlined in ISO 6166. ISINs may cover bonds, commercial paper, equities and warrants. The general structure of the ISIN code is a 12-character alpha-numerical code that does not contain information regarding the characteristics of the financial instrument but serves for uniform identification of a security at trading and settlement.

issue with the highest rating change magnitude, as this particular issue is likely to impact stock prices the most.

6. SAMPLE CHARACTERISTICS FOR CREDIT WATCH PLACEMENT AND BOND RATING CHANGES

Table 2 reports statistics on the number of credit watch placements and bond rating changes. Table 3 reports the breakdown of informative / uninformative credit watches, and expected / unexpected rating changes. We note that the number of rating changes as well as credit watches for international firms have increased steadily over time. The annual frequency of issues on credit watch increased from 29 in 1992 to 330 in 2006. The annual frequency of issues on long term rating changes increased from 86 in 1992 to 300 in 2006. Additionally, the total number of credit watches and bond rating changes are negatively skewed. Of the total sample, 73.7% (60.3%) are negative watches (bond downgrades). 30.0% (44.7%) of long term rating upgrades (downgrades) are preceded by a positive (negative) credit watch. Also, 51.9% (44.9%) of positive (negative) watches are resolved by upgrades (downgrades).

Table 2

Distribution of Long Term Rating Changes and Credit Watches from Moody's Investor's Service and S&P Rating Agency for a Sample of 1604 upgrades, 2435 downgrades, 864 positive watches and 2423 negative watches from 1991 to 2007

The combined sample of long term rating changes and credit watches from both Moody's Investor's Service and S&P Rating Agency from 1991 to 2007 for companies domiciled outside the United States is given below. Only fixed rate bonds issued by corporations (i.e. excluding sovereign bonds and supranational organisations) are considered. For cases where a corporation has several rating events / credit watches on the same day, only 1 event is considered - for rating changes, this is the event with the largest rating change magnitude. The sample in 1991 begins from May, and ends in Jul in 2007.

Year	Number of Upgrades	Number of Downgrades	Number of Positive Watches	Number of Negative Watches	Total
1991	0	28	0	1	29
1992	2	84	0	29	115
1993	7	75	7	52	141
1994	19	39	9	29	96
1995	38	53	19	58	168
1996	54	45	25	62	186
1997	76	138	52	163	429
1998	70	272	55	341	738
1999	94	202	67	200	563
2000	131	147	88	186	552
2001	119	396	60	316	891
2002	99	346	47	258	750
2003	103	221	55	174	553
2004	184	104	99	125	512
2005	253	104	94	132	583
2006	179	122	126	204	631
2007 (until Jul)	176	59	61	93	389
Total	1,604	2,435	864	2,423	7,326

Fig 1: Number of Rating Events from Moodys and S&P for Non-US Domiciled Companies

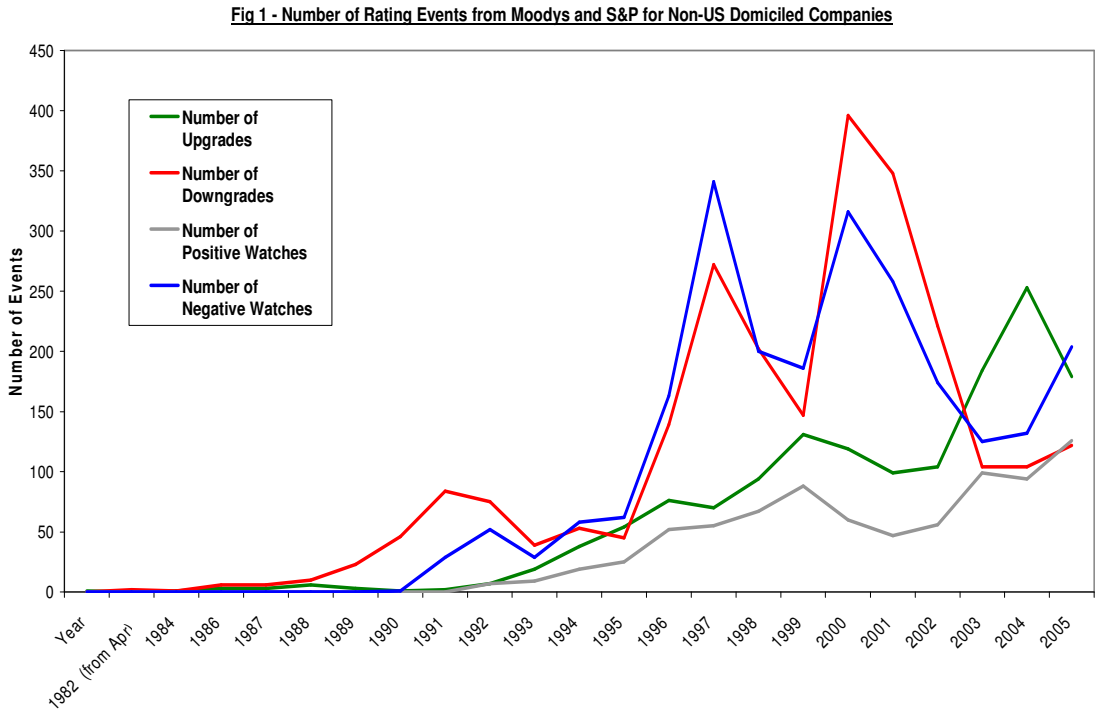


Table 3
Distribution of Informative / Uninformative Credit Watches and Expected / Unexpected Long Term Rating Changes

Informative Credit Watches are defined as either negative credit watches that are resolved by a long term rating downgrade, or positive credit watches that are resolved by a long term rating upgrade within a year. Conversely, uninformative credit watches are not resolved by a long term rating change in the correct direction, and unexpected rating changes are not preceded by a corresponding credit watch. In the case where only some of the bonds associated with a stock experience an 'expected' downgrade or upgrade on a particular day while other bonds that are downgraded or upgraded on the same day are not preceded by credit watches, the long term rating event for that stock is classfied as "expected"

Panel A:	Positive Watch	Negative Watch	Total
Informative Credit Watches:	449	1,088	1,537
Uninformative Credit Watches:	415	1,335	1,750
Total:	864	2,423	3,287

Panel B:	Upgrades	Downgrades	
Expected Rating Changes:	449	1,088	1,537
Unexpected Rating Changes:	1,155	1,347	2,502
Total:	1,604	2,435	4,039

7. METHODOLOGY

We present our empirical findings in 3 stages. First, we examine overall stock-related CAR arising from the company's bonds being included on credit watch and subsequent bond rating changes. This allows us to compare our findings to prior research on US firms, and also test for significance in the market reactions to credit watch emplacement and bond rating changes.

Secondly, we present different partitions for our results – specifically, we analyze the stock-related CAR to credit watch emplacements and bond rating changes according to classification of country of domicile (whether developed or emerging, according to the Morgan Stanley Capital Index classification), and whether the credit watch / bond rating change is linked or unlinked. Additionally, we also compare stock related CAR for rating change events that result in a change in rating bands (i.e. from investment grade to non-investment grade, and vice versa) with rating change events that do not result in a change in rating bands. We also compare stock related CAR by state of the country's MSCI index ("up" or "down") to determine if CAR varies according to the state of the broader

market. To the best of our knowledge, this latter partition has not been attempted by prior literature. As a robustness check, we also examine consistency of our results at the country level.

Thirdly, we utilize cross sectional regressions to determine the significance of various variables in explaining stock related CAR to credit watches and bond rating changes.

8. THE WELCH T - TEST

In order to test for significant differences between sample means, we use the Welch t test, which is intended for use with two samples that may have unequal variances. The Welch t test is therefore an approximate solution to the Behrens-Fisher problem[4], which is the problem of hypothesis testing of the difference between the means of separate normally distributed independent populations where the variances of the populations are not assumed to be equal.

The t statistic is therefore defined by the following formula:

$$t = \frac{\overline{X1} - \overline{X2}}{\sqrt{\left(S_1^2 / N1 + \boldsymbol{S}_s^s / N2 \right)}}$$

The degrees of freedom v associated with this variance estimate is also approximated using the Welch-Satterthwaite equation:

[4] See Appendix A

$$v = \frac{\left(\frac{s_1^2}{N1} + \frac{s_2^2}{N2}\right)^2}{\frac{s_1^4}{N_1^2.v_1} + \frac{s_2^4}{N_2^2.v_2}}$$

The statistics are then used with the t-distribution to test the null hypothesis that the two means are equal.

9 INFORMATION CONTENT OF CREDIT WATCH PLACEMENT AND BOND RATING CHANGES

9.1 Stock Related CAR for (-1, +1) for Entire Sample

In order to determine whether credit watch emplacements as well as long term rating changes are informative events, we examine stock related CAR for a 3 day (-1, +1) window around the events using a standard event study methodology.

Culmulative Abnormal Returns (CARs) are calculated as the cumulative difference between the daily raw stock return and the concurrent local market index for each of the 42 countries in our sample, as defined in DataStream. As a robustness check, we also repeat all analyses using an alternative window period of (-3, +3). The choice of event window does not appear to alter the significance of our results.

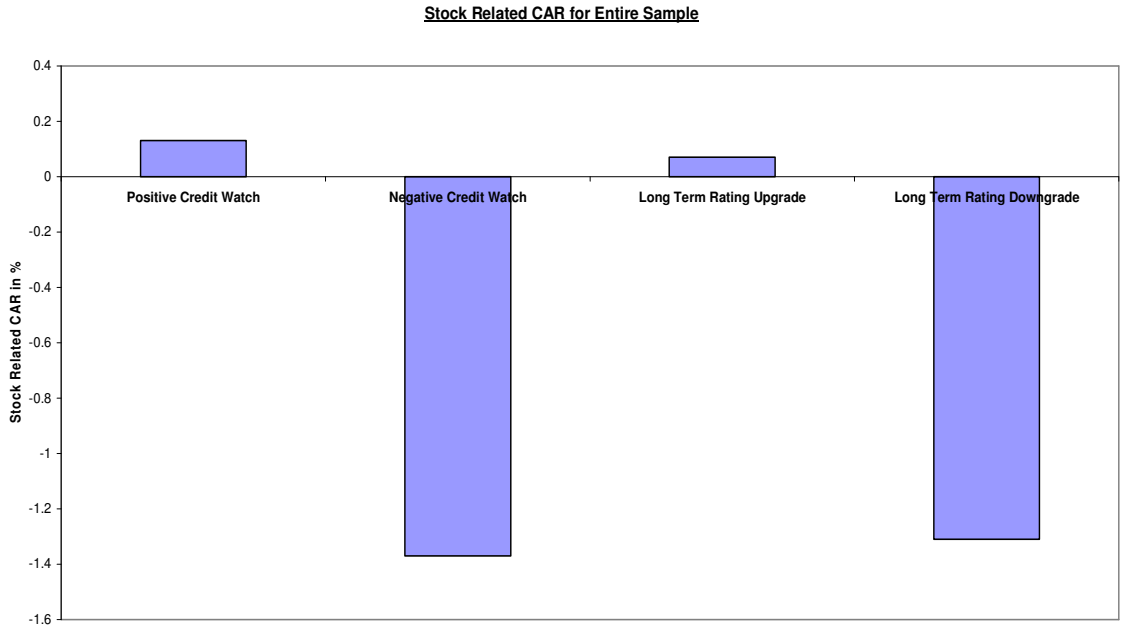
Table 4

Average Stock Related CAR for (-1, +1) for Entire Sample for Positive / Negative Credit Watch and Long Term Rating Upgrade / Downgrades

Average Stock Related Culmulative Abnormal Return (CAR) for 3 day period in window (-1, +1) centered around the credit event at day 0 is calculated as the difference between the daily raw stock return and the concurrent local market index (as defined in DataStream).

Event Type	Avg Stock Related CAR in (-1, +1)	t-statistic	# of observations
Negative Credit Watch	-1.37%	-7.15	2,423
Positive Credit Watch	0.13%	0.90	864
Long Term Rating Downgrade	-1.33%	-7.11	2,435
Long Term Rating Upgrade	0.07%	0.75	1,604
		Total:	7,326

Fig 2: Stock Related CAR for Entire Sample



In Table 4 (also show in Fig 2), we consider four subsets of our sample. These are positive / negative credit watch placements, and long term bond rating upgrades / downgrades. If bond rating agencies are able to provide new information to investors through credit watch placements or long term bond rating

events, then we should observe a significant stock-related CAR corresponding to the credit watches / rating events. We find that stock-related CAR to negative credit watch and bond rating downgrades are statistically significant. CAR associated with negative credit watch is statistically significant at –1.37% (t-statistic of –7.15). CAR associated with bond rating downgrades are also statistically significant at –1.33% (t-statistic of –7.11).

Conversely CAR associated with upgrades are generally not significant. There is only a 0.13% CAR associated with positive credit watch, and a 0.07 % CAR associated with bond rating upgrades (both with t-statistics that are not significant at the 2.5% level of significance). Our findings are consistent with the bulk of academic literature on bond rating changes, e.g. Hand, Holthausen & Leftwich (1992), Goh & Ederington (1993 and 1998) and Hite & Warga (1997), which find that on the whole, bond rating downgrades are significant, while bond rating upgrades do not result in a significant price reaction, and therefore by extension, are not informative. One possible explanation for this is that firms tend to disseminate good news aggressively, while withholding bad news; hence, a bond rating downgrade provides more new information to investors (see Goh & Ederington, 1993).

9.2 Stock Related CAR for (-1, +1) by Economy Classification

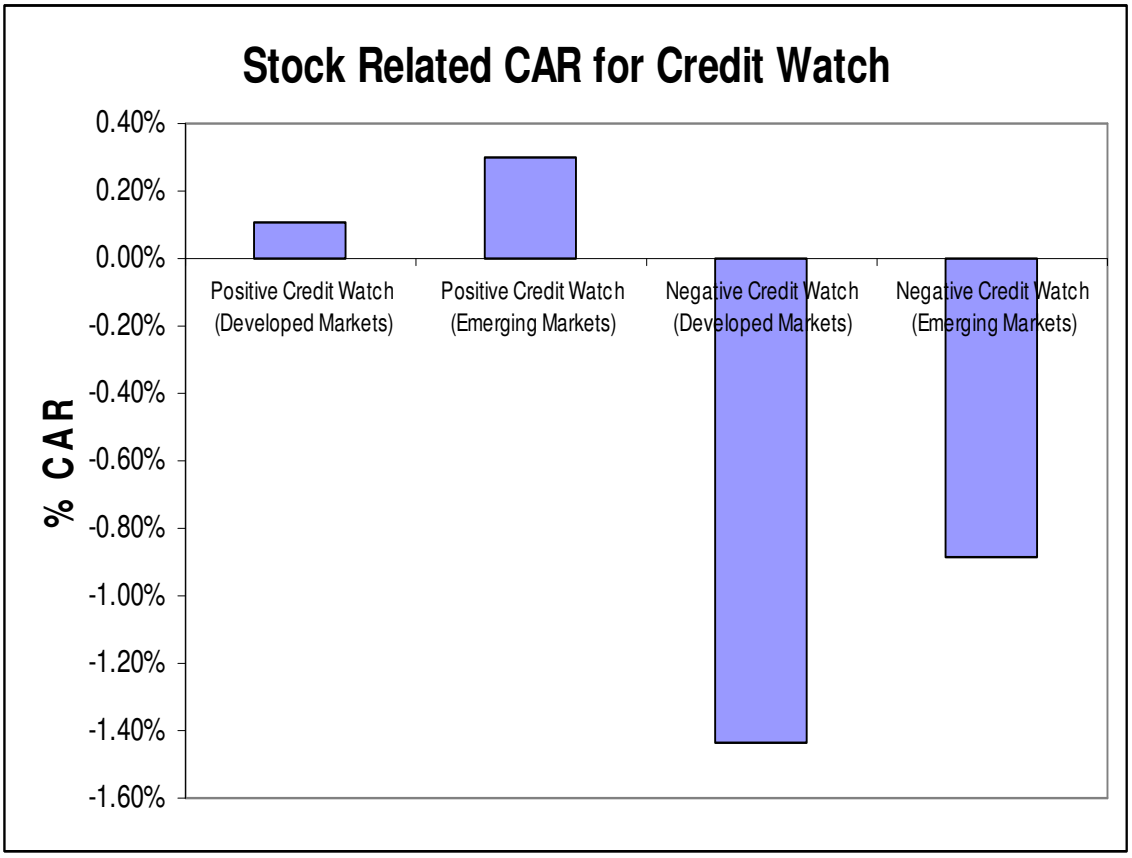
Table 5

Average Stock Related CAR for (-1, +1) for Entire Sample of Positive / Negative Credit Watches partitioned by Classification of Country of Domicile

Average Stock Related Culmulative Abnormal Return (CAR) for 3 day period in window (-1, +1) centered around the credit event at day 0 is calculated as the difference between the daily raw stock return and the concurrent local market index (as defined in DataStream).

	Avg Stock Related CAR in (-1, +1)	t-statistic	# of observations
Negative Credit Watch (Developed Markets)	-1.44%	-6.79	2,105
Negative Credit Watch (Emerging Markets)	-0.88%	-2.27	318
Welch t-test for difference in sample means		***t-statistic = 1.2521 df = 524***	
Positive Credit Watch (Developed Markets)	0.10%	0.70	770
Positive Credit Watch (Emerging Markets)	0.30%	0.76	94
Welch t-test for difference in sample means		***t-statistic = 0.4592 df = 121***	
		Total:	3,287

Fig 3: Stock Related CAR for Credit Watch by Classification of Economy



Comparing market reactions to negative credit watch emplacement and bond rating downgrades between developed markets and emerging markets in Table 5, we find that developed markets generally exhibit a larger reaction to negative credit watch and bond rating downgrades compared to emerging markets. Developed markets have an average stock-related CAR of -1.44% (t-statistic of –6.79) for negative credit watch emplacements, compared to only -0.88% (t-statistic of –2.27) for emerging markets. Additionally, developed

markets have an average stock related CAR of -1.47% (t-statistic of –6.84) for bond rating downgrades, compared to only -0.76% (t-statistic of –2.08) for emerging markets (Table 6). Results for positive credit watch / upgrades when segregated by classification of economy are not significant. These results indicate that rating agencies' announcements for companies domiciled in developed markets carry greater new information content compared to announcements related to companies domiciled in emerging markets. This could be due to greater information leakage in emerging markets due to fewer restrictions against insider trading, etc. We investigate preannouncement trading effects as a proxy of insider trading in subsequent sections.

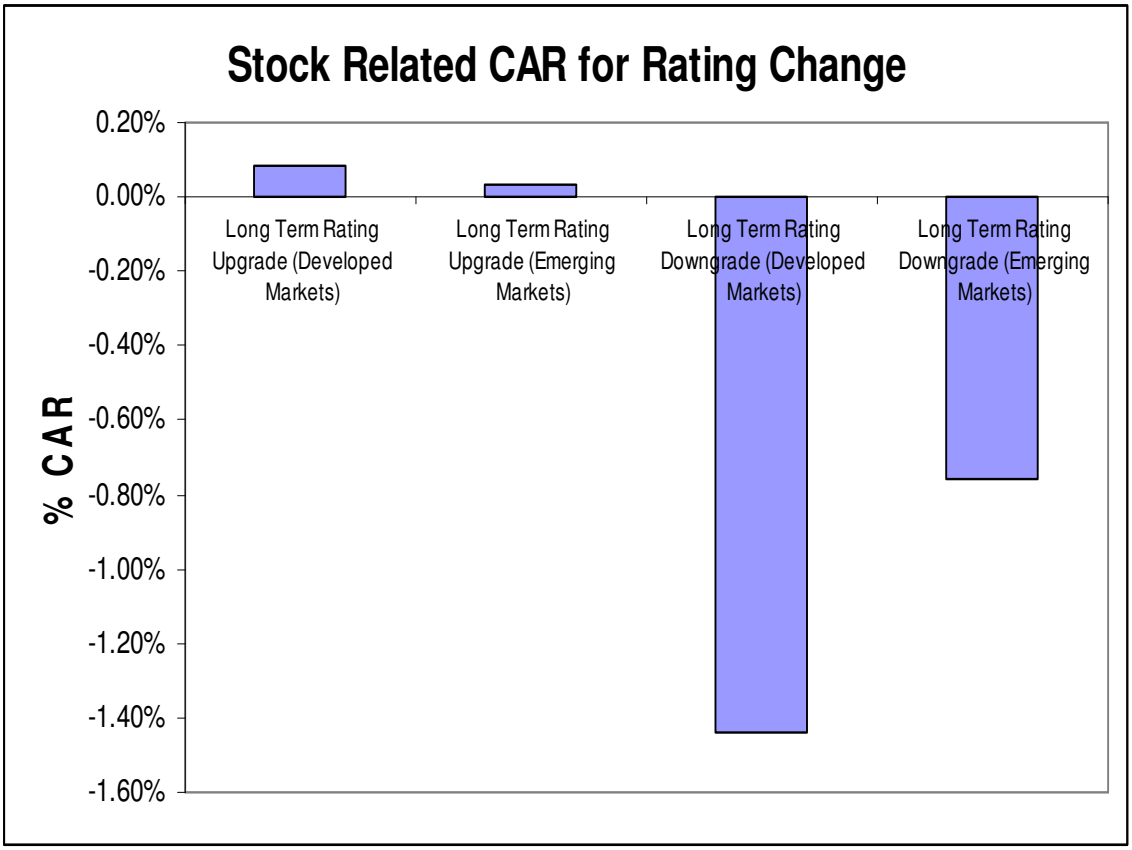
Table 6

Average Stock Related CAR for (-1, +1) for Entire Sample of Long Term Rating Upgrades / Downgrades partitioned by Classification of Country of Domicile

Average Stock Related Culmulative Abnormal Return (CAR) for 3 day period in window (-1, +1) centered around the credit event at day 0 is calculated as the difference between the daily raw stock return and the concurrent local market index (as defined in DataStream).

	Avg Stock Related CAR in (-1, +1)	t-statistic	# of observations
Long Term Rating Downgrade (Developed Markets)	-1.47%	-6.836782681	1,954
Long Term Rating Downgrade (Emerging Markets)	-0.76%	-2.083303349	481
Welch t-test for difference in sample means		***t-statistic = 1.6853 df = 848***	
Long Term Rating Upgrade (Developed Markets)	0.08%	0.774759269	1,205
Long Term Rating Upgrade (Emerging Markets)	0.03%	0.147906626	399
Welch t-test for difference in sample means		***t-statistic = 0.2644 df = 690***	
		Total:	4,039

Fig 4: Stock Related CAR for Rating Change by Classification of Economy



9.3 Stock Related CAR for (-1, +1) by Linkage between CW and RC

Table 7 and 8 reports results that are additionally segregated by informative / uninformative credit watch, and expected / unexpected bond rating changes. Our results indicate that being put on credit watch is an effective tool to reduce stock price volatility around actual bond rating changes. In developed markets, the stock related CAR surrounding a surprise long term rating downgrade is -2.09%, compared to -0.85% in the case of an expected long term rating downgrade. Similarly, for emerging markets, the stock related CAR surrounding a surprise long term rating downgrade is -0.85%, compared to -0.49% for expected long term rating downgrades (t-statistics for the emerging market average reactions are not significant at the 2.5% level of significance). The maller difference for emerging markets could be that information leakage has reduced the informational advantage that unexpected downgrades have over expected downgrades.

Table 7

Average Stock Related CAR for Entire Sample, Partitioned by whether Rating Change is Surprised or Expected (i.e. preceded by corresponding credit watch)

Average Stock Related CAR for 3 day period in window (-1, +1) centered around long term rating event on day 0 partitioned by whether the rating event was preceded by a credit watch or not in the correct direction within a year.

Event Type	Average Stock Related CAR (t-statistics in parantheses)	# of observations
Panel A: Overall Sample		
Surprise Long Term Downgrades	-1.76% (-5.97)	1,347
Expected Long Term Downgrades	-0.81% (-3.89)	1,088
Welch t-test for difference in sample means	***t-statistic = 2.6304 df = 2312***	
Surprise Long Term Upgrades	0.02% (0.18)	1,155
Expected Long Term Upgrades	0.19% (1.28)	449
Welch t-test for difference in sample means	***t-statistic = 0.9277 df = 974***	
Panel B: Downgrades by Market Type		
Surprise Long Term Downgrades (Developed Markets)	-2.09% (-5.74)	983
Expected Long Term Downgrades (Developed Markets)	-0.85% (-3.75)	971
Welch t-test for difference in sample means	***t-statistic = 2.9038 df = 1636***	
Surprise Long Term Downgrades (Emerging Markets)	-0.85% (-1.85)	364
Expected Long Term Downgrades (Emerging Markets)	-0.49% (-1.06)	117
Welch t-test for difference in sample means	***t-statistic = 0.5355 df = 343***	
Panel C: Upgrades by Market Type		
Surprise Long Term Upgrades (Developed Markets)	0.12% (0.92)	824
Expected Long Term Upgrades (Developed Markets)	-0.01% (-0.08)	381
Welch t-test for difference in sample means	***t-statistic = 0.6693 df = 950***	
Surprise Long Term Upgrades (Emerging Markets)	-0.24% (-1.26)	331
Expected Long Term Upgrades (Emerging Markets)	1.33% (2.86)	68
Welch t-test for difference in sample means	***t-statistic = 3.1209 df = 91***	
		Total: 4,039

Table 8

Average Stock Related CAR for Entire Sample, Partitioned by whether Credit Watch was Informative or Uninformative

Average Stock Related CAR for 3 day period in window (-1, +1) centered around credit watch on day 0 partitioned by whether the credit watch was resolved by a rating event or not in the correct direction within a year.

Event Type	Average Stock Related CAR (t-statistics in parantheses)	# of observations
Panel A: Overall Sample		
Informative Negative Credit Watch	-1.81% (-6.61)	1,088
Uninformative Negative Credit Watch	-1.00% (-3.79)	1,335
Welch t-test for difference in sample means	***t-statistic = 2.1183 df = 2377***	
Informative Positive Credit Watch	0.14% (0.75)	449
Uninformative Positive Credit Watch	0.11% (0.52)	415
Welch t-test for difference in sample means	***t-statistic = 0.1079 df = 840***	
Panel B: Negative Watch		
Informative Negative Credit Watch (Developed Markets)	-1.82% (-6.15)	972
Uninformative Negative Credit Watch (Developed Markets)	-1.11% (-3.71)	1,133
Welch t-test for difference in sample means	***t-statistic = 1.6661 df = 2096***	
Informative Negative Credit Watch (Emerging Markets)	-1.76% (-2.55)	116
Uninformative Negative Credit Watch (Emerging Markets)	-0.38% (-0.81)	202
Welch t-test for difference in sample means	***t-statistic = 1.6524 df = 217***	
Panel C: Positive Watch		
Informative Positive Credit Watch (Developed Markets)	0.08% (0.38)	381
Uninformative Positive Credit Watch (Developed Markets)	0.13% (0.60)	389
Welch t-test for difference in sample means	***t-statistic = 0.1806 df = 763***	
Informative Positive Credit Watch (Emerging Markets)	0.49% (1.02)	68
Uninformative Positive Credit Watch (Emerging Markets)	-0.21% (-0.32)	26
Welch t-test for difference in sample means	***t-statistic = 0.8571 df = 53***	
		Total: 3,287

Fig 5: Stock Related CAR for Credit Watch by Informativeness

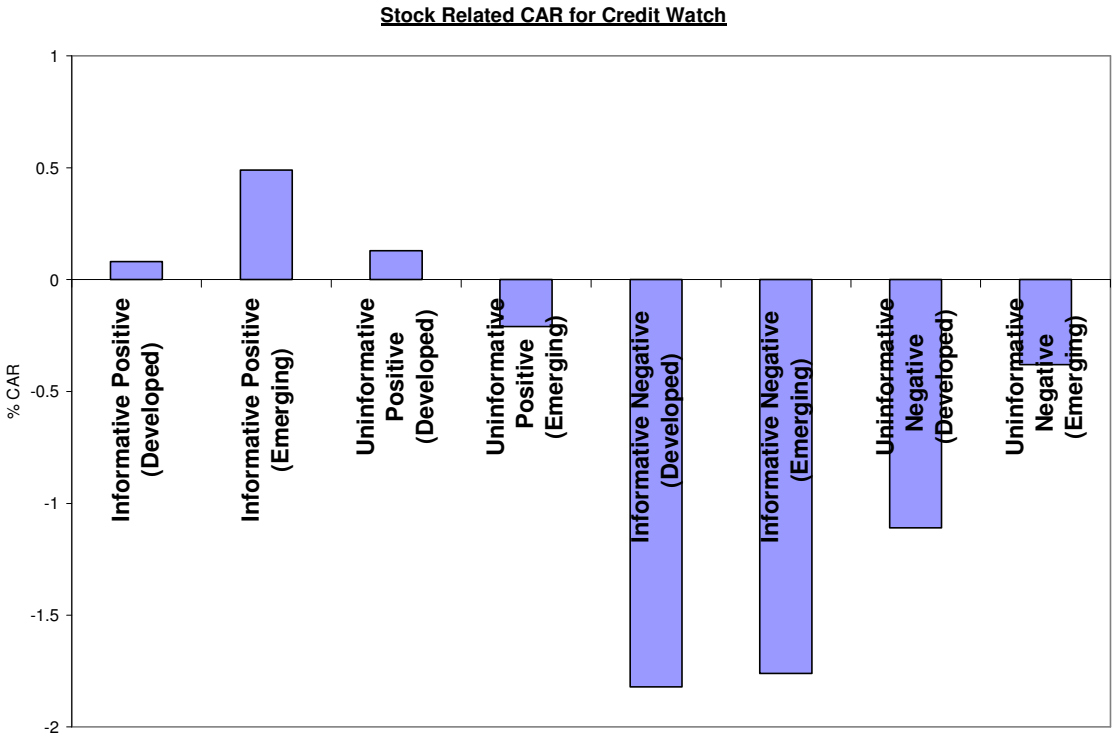
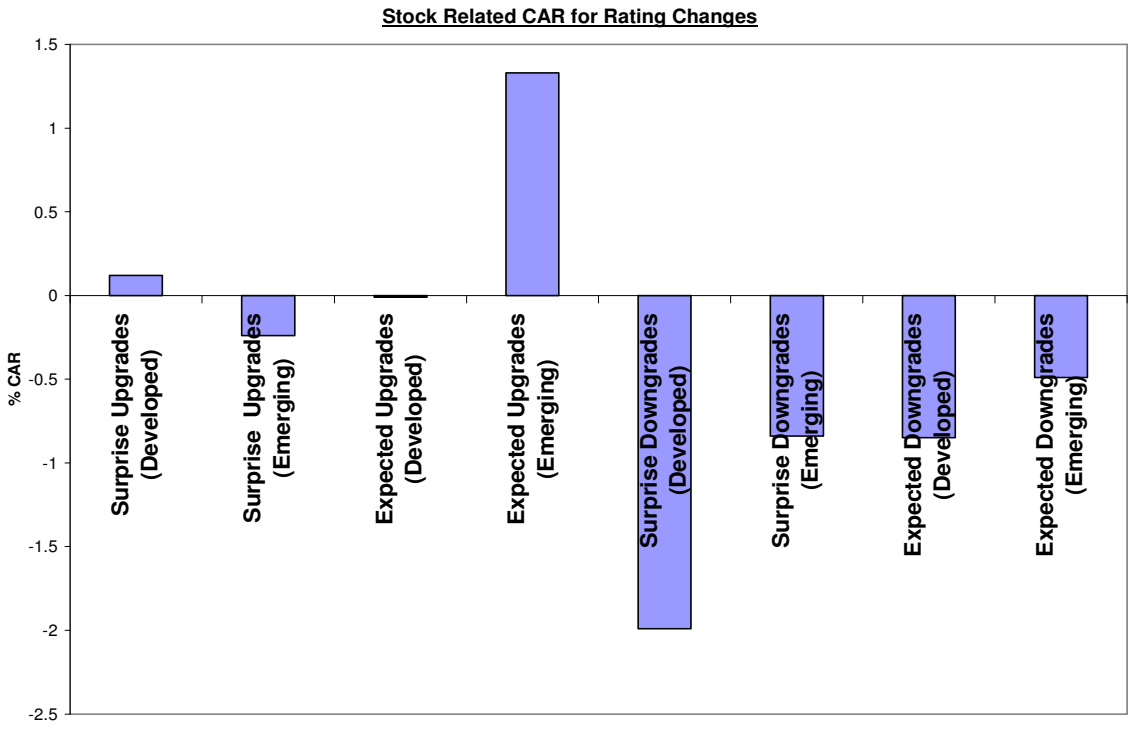


Fig 6: Stock Related CAR for Rating Change by Linkage with CW



We note that the results for upgrades, segregated by expected or unexpected are also not significant, except for the case of expected upgrades in emerging markets. In developed markets, the stock related CAR surrounding an expected long term rating upgrade is -0.01%, compared to 0.12% in the case of an unexpected long term rating upgrade (t-statistics not significant at 2.5% level). Similarly, for emerging markets, the stock related CAR surrounding an expected long term rating upgrade is 1.33% (t-statistic of 2.86 is significant), compared to -0.24% for unexpected long term rating upgrades. We note that the significant

results for expected upgrades in emerging markets may be due to the fact that a majority of events in this category occur when the country MSCI indices exhibit strongly positive returns. The average MSCI country index returns during the month of expected upgrade events in emerging markets is 2.23%, compared to 1.13% on average for upgrades in general. Cross sectional regression analysis (Table 13) shows that the state of the MSCI country index (as a proxy for the macroeconomic environment in the corporation's country of domicile) is significant in explaining variation in reactions to upgrades in general. However, the same variable is not significant in explaining variation in reactions to downgrades. This could be because investors weigh the strength of a corporation's macroeconomic environment in tempering expectations of future positive prospects by rating agencies.

9.4 Stock Related CAR for (-1, +1) by Rating Band Transitions

Table 9
Average Stock Related CAR for Long Term Rating Events, Partitioned by whether Event results in an Investment Grade Transition

Average Stock Related CAR for Long Term Rating Events for 3 day period in window (-1, +1) centered around day 0 partitioned by whether the rating event results in a transition from investment grade to non-investment grade (for downgrades), and vice versa for upgrades

Event Type	Average Stock Related CAR (t-statistics in parantheses)	# of observations
Panel A: Overall Sample		
A1: Downgrades within Investment Grade	-0.30% (-2.22)	1,297
A2: Downgrades to Speculative Grade	-2.01% (-2.81)	271
A3: Downgrades within Speculative Grade	-2.67% (-6.23)	867
Welch t-test for difference in sample means between sample A1 and sample A2	***t-statistic = 2.3543 df = 289***	
Welch t-test for difference in sample means between sample A2 and sample A3	***t-statistic = 0.7872 df = 478***	
A4: Upgrades within Investment Grade	-0.11% (-1.30)	843
A5:Upgrades to Investment Grade	0.23% (1.32)	222
A6: Upgrades within Speculative Grade	0.28% (1.25)	539
Welch t-test for difference in sample means between sample A4 and sample A5	***t-statistic = 1.7542 df = 333***	
Welch t-test for difference in sample means between sample A5 and sample A6	***t-statistic = 0.1760 df = 732***	
		Total: 4,039
Panel B: Developed Markets		
B1: Downgrades within Investment Grade	-0.36% (-2.66)	1,213
B2: Downgrades to Speculative Grade	-2.38% (-2.63)	207
B3: Downgrades within Speculative Grade	-3.65% (-5.84)	534
Welch t-test for difference in sample means between sample B1 and sample B2	***t-statistic = 2.2084 df = 215***	
Welch t-test for difference in sample means between sample B2 and sample B3	***t-statistic = 1.1577 df = 413***	
B4: Upgrades within Investment Grade	-0.07% (-0.85)	747
B5: Upgrades to Investment Grade	0.02% (0.08)	153
B6: Upgrades within Speculative Grade	0.50% (1.48)	305
Welch t-test for difference in sample means between sample B4 and sample B5	***t-statistic = 0.4163 df = 216***	
Welch t-test for difference in sample means between sample B5 and sample B6	***t-statistic = 1.2333 df = 445***	
		Total: 3,159
Panel C: Emerging Markets		
C1: Downgrades within Investment Grade	0.57% (0.80)	84
C2: Downgrades to Speculative Grade	-0.82% (-1.07)	64
C3: Downgrades within Speculative Grade	-1.08% (-2.29)	333
Welch t-test for difference in sample means between sample C1 and sample C2	***t-statistic = 1.3336 df = 139***	
Welch t-test for difference in sample means between sample C2 and sample C3	***t-statistic = 0.2973 df = 117***	
C4: Upgrades within Investment Grade	-0.38% (-1.42)	96
C5: Upgrades to Investment Grade	0.70% (2.11)	69
C6: Upgrades within Speculative Grade	-0.01% (-0.03)	234
Welch t-test for difference in sample means between sample C4 and sample C5	***t-statistic = 2.5315 df = 141***	
Welch t-test for difference in sample means between sample C5 and sample C6	***t-statistic = 1.6614 df = 163***	
		Total: 880

Fig 7: Stock Related CAR for Rating Change by Presence of Investment Grade Transitions

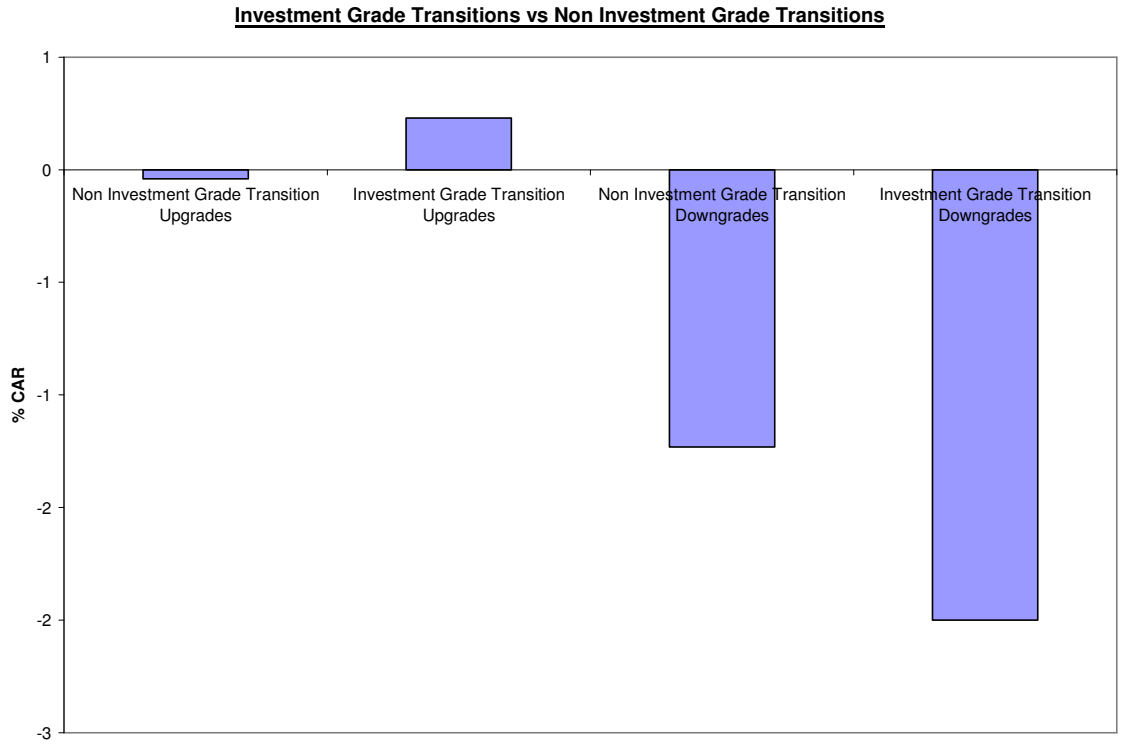


Table 9 shows that rating downgrades which result in a change in rating bands (i.e. from investment grade to non-investment grade) result in a stronger stock-related CAR compared to rating changes. In developed markets, rating downgrades that result in a change in rating bands (from investment grade to non-investment grade) have an average stock-related CAR of -2.38%, compared to -0.36% for rating downgrades that stay within the investment grade band (t-statistics are –2.63 and –2.66 respectively). In emerging markets, rating downgrades that result in a change to non-investment grade have an average stock-related CAR of -0.82%, compared to 0.57% for rating downgrades that stay

within the investment grade band – we note that for emerging markets, neither t-statistic is significant at the 2.5% level of significance.

We note that these results are consistent with findings from US markets, which show that downgrades within speculative grade result in the largest stock related CAR compared to downgrades within investment grade, and from investment grade to speculative grade. This is because the largest increases in required yield to maturity of the bonds result from downgrades within the speculative grade.

In developed markets, rating upgrades that result in a change in rating bands have an average stock-related CAR of 0.02%, compared to -0.07% for rating upgrades that stay within the investment grade band (both t-statistics are not significant). In emerging markets, rating upgrades that result in a change in rating bands have an average stock-related CAR of 0.70%, compared to -0.38% for rating upgrades that stay within the investment grade band (the t-statistic for upgrades that cross the investment grade band in emerging markets is significant).

9.5 Stock Related CAR for (-1, +1) by State of Local Market

Table 10
Average Stock Related CAR for Long Term Rating Events, Partitioned by whether Event occurs in an "Up' local market, or "Down" local market

Average Stock Related CAR for long term rating events for 3 day period in window (-1, +1) centered around day 0 partitioned by whether the event occurs during an "up" local market or "down" local market

Event Type	Average Stock Related CAR (t-statistics in parantheses)	# of observations
Panel A: Overall Sample		
Downgrades in Down Local Market	-1.54% (-4.92)	1,120
Downgrades in Up Local Market	-1.16% (-5.20)	1,315
Welch t-test for difference in sample means	***t-statistic = 0.9855 df = 2085***	
Upgrades in Down Local Market	0.01% (-0.09)	619
Upgrades in Up Local Market	0.12% (1.17)	985
Welch t-test for difference in sample means	***t-statistic = 0.6816 df = 1067***	
		Total: 4,039
Panel B: Developed Markets		
Downgrades in Down Local Market	-2.00% (-5.26)	841
Downgrades in Up Local Market	-1.08% (-4.38)	1,113
Welch t-test for difference in sample means	***t-statistic = 2.0284 df = 1496***	
Upgrades in Down Local Market	0.04% (0.19)	464
Upgrades in Up Local Market	0.11% (0.99)	741
Welch t-test for difference in sample means	***t-statistic = 0.2865 df = 712***	
		Total: 3,159
Panel C: Emerging Markets		
Downgrades in Down Local Market	-0.15% (-0.30)	279
Downgrades in Up Local Market	-1.60% (-3.14)	202
Welch t-test for difference in sample means	***t-statistic = 2.0115 df = 466***	
Upgrades in Down Local Market	-0.18% (-0.73)	155
Upgrades in Up Local Market	0.16% (0.63)	244
Welch t-test for difference in sample means	***t-statistic = 0.9613 df = 381***	
		Total: 880

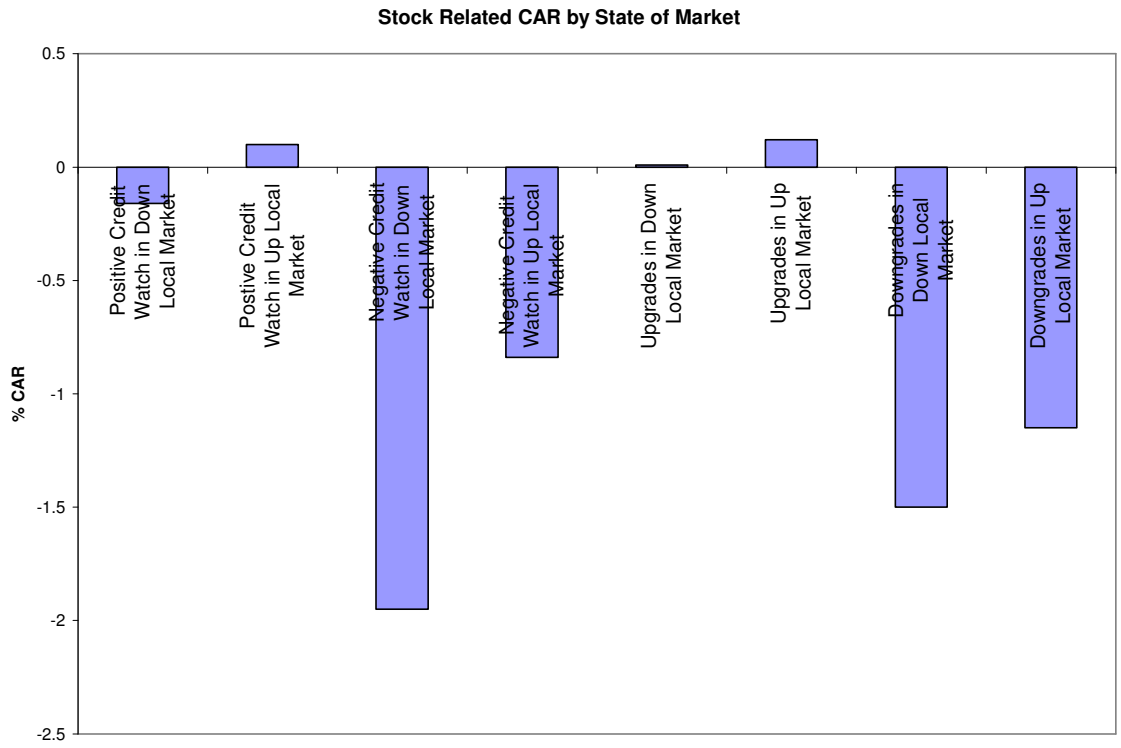
Table 11

Average Stock Related CAR for Credit Watch Events, Partitioned by whether Event occurs in an "Up' local market, or "Down" local market

Average Stock Related CAR for credit watch events for 3 day period in window (-1, +1) centered around day 0 partitioned by whether the event occurs during an "up" local market or "down" local market

Event Type	Average Stock Related CAR (t-statistics in parantheses)	# of observations
Panel A: Overall Sample		
Negative Credit Watch in Down Local Market	-1.95% (-5.90)	1,144
Negative Credit Watch in Up Local Market	-0.84% (-4.06)	1,279
Welch t-test for difference in sample means	***t-statistic = 2.8456 df = 1948***	
Positive Credit Watch in Down Local Market	-0.16% (0.67)	331
Postive Credit Watch in Up Local Market	0.10% (0.61)	533
Welch t-test for difference in sample means	***t-statistic = 0.1939 df = 640***	
		Total: 3,287
Panel B: Developed Markets		
Negative Credit Watch in Down Local Market (Developed Markets)	-2.19% (-5.75)	959
Negative Credit Watch in Up Local Market (Developed Markets)	-0.81% (-3.66)	1146
Welch t-test for difference in sample means	**t-statistic = 3.1168 df = 1572**	
Positive Credit Watch in Down Local Market (Developed Markets)	0.17% (0.66)	289
Positive Credit Watch in Up Local Market (Developed Markets)	0.06% (0.36)	481
Welch t-test for difference in sample means	***t-statistic = 0.3412 df = 560***	
		Total: 2,875
Panel C: Emerging Markets		
Negative Credit Watch in Down Local Market (Emerging Markets)	-0.74% (-1.37)	185
Negative Credit Watch in Up Local Market (Emerging Markets)	-1.08% (-1.97)	133
Welch t-test for difference in sample means	***t-statistic = 0.4416 df = 306***	
Positive Credit Watch in Down Local Market (Emerging Markets)	0.09% (0.13)	42
Positive Credit Watch in Up Local Market (Emerging Markets)	0.47% (1.02)	52
Welch t-test for difference in sample means	***t-statistic = 0.4709 df = 75***	
		Total: 412

Fig 8: Stock Related CAR by State of the Local Market Index



Additionally, Table 10 & 11 shows that rating downgrades in developed markets that occur during periods where the local MSCI country index is up exhibit less negative returns. Rating downgrades in developed markets that occur when the local MSCI country index is up have an average stock-related CAR of -1.08%, compared to -2.00% when the index is down. The picture is not as clear in emerging markets. Rating downgrades in emerging markets that occur when the local MSCI country index is up have an average stock-related CAR of -1.60%. As the average stock-related CAR of -0.15% when the index is down is not significant (t-statistic of -0.30), there is no basis for making the same

comparison as with developed markets. As seen in table 10, none of the t-statistics for the average stock-related CAR with upgrades are significant.

Negative Credit Watch in developed markets also exhibit a less negative stock related CAR when the local MSCI index is up. Stock related CAR is –1.95% in a down market, compared to –0.84% in an up market. All t-statistics are significant at the 2.5% level of significance. For emerging markets, the stock related CAR to negative credit watch in a down local market is not significant at the 2.5% level of significance, so there is no basis for comparison.

10. PREANNOUNCEMENT TRADING EFFECTS

We note that there is some evidence of insider trading in both developed and emerging markets for long term downgrades, with a greater preannouncement effect in the form of negative abnormal returns in emerging markets. Table 12 shows that in the -50 to -26 day window before a long term ratings downgrade, developed (emerging) markets exhibit an average stock related CAR of -2.35% (-2.79%). Both sets of averages have significant t-statistics of -9.04 (-3.35). However, in the -25 to -1 day window before the downgrade, emerging markets exhibit a much larger -3.42% abnormal CAR, compared to only -1.84% for developed markets. Once again, both sets of t-statistics are significant at -7.08 (-3.69).

The larger preannouncement reaction for emerging markets is also verified by the Welch t-test, which has a t-statistic of 1.64 for the difference between preannouncement reactions in the 2 class of markets in the -25 to -1 window. We also note that all the t-statistics for the preannouncement announcements in (-50, -26) and (-25, -1) for both markets are significant. For negative credit watch, we note that there is no basis for comparison of magnitude

of insider trading because the t-statistics for preannouncement effects in emerging markets are all not significant.

Table 12

Average Preannouncement Stock Related CAR for (-50, -26) and (-25, -1) for Entire Sample of Positive / Negative Creditwatch and Long Term Rating Upgrades / Downgrades

Average Preannouncement Stock Related Culmulative Abnormal Return (CAR) for 2 periods, (-50, -26) & (-25, -1) is calculated as the difference between the daily raw stock return and the concurrent local market index (as defined in DataStream). We note that not all the observations in the previous samples have preannouncement stock prices available.

	Avg Stock Related CAR in (-50, -26) (*t-statistic in parantheses)*	Avg Stock Related CAR in (-25, -1) *(t-statistic in parantheses)*	# of observations
Negative Credit Watch (Developed Markets)	-1.51% (-6.91)	-1.95% (-8.27)	2,087
Negative Credit Watch (Emerging Markets)	-0.11% (-0.16)	0.24% (0.17)	302
Welch t-test for difference in sample means	***t-statistic = 1.9372 df = 363***	***t-statistic = 2.1822 df = 336***	
Positive Credit Watch (Developed Markets)	-0.03% (-0.12)	0.24% (0.84)	743
Positive Credit Watch (Emerging Markets)	-1.92 (-1.86)	-0.11 (-0.11)	88
Welch t-test for difference in sample means	***t-statistic = 1.7639 df = 100***	***t-statistic = 1.6396 df = 516***	
		Total:	3,220*
	**not all obs in sample have preannouncement stock prices available*		
Long Term Rating Downgrade (Developed Markets)	-2.35% (-9.04)	-1.84% (-7.08)	1,933
Long Term Rating Downgrade (Emerging Markets)	-2.79% (-3.35)	-3.42% (-3.69)	446
Welch t-test for difference in sample means	***t-statistic = 0.5046 df = 534***	***t-statistic = 1.6396 df = 516***	
Long Term Rating Upgrade (Developed Markets)	0.41% (1.96)	0.26% (1.25)	1,183
Long Term Rating Upgrade (Emerging Markets)	-0.35% (-0.66)	0.11% (0.22)	367
Welch t-test for difference in sample means	***t-statistic = 1.3236 df = 481***	***t-statistic = 0.3435 df = 102***	
		Total:	3,929*
	**not all obs in sample have preannouncement stock prices available*		

11. CROSS SECTIONAL ANALYSIS OF EXCESS STOCK RETURNS

11.1 Explanatory Variables

We estimate multivariate regressions to try to explain cross-sectional variation in the stock-related CAR due to credit watch and bond rating changes. Using the same methodology as Jorion (2004), Hand, Holthausen and Leftwich (1992), etc, separate regressions are estimated for upgrades and downgrades. The following variables are included in the regression:

1. Rating change magnitude, represented by a cardinal variable that indicates the number of grades changed (with AAA having a score of 1, and D having a score of 26), and the variable being new score – old score.
2. For rating changes, a dummy variable set to 1 if the rating change is not a resolution of a prior credit watch. The criteria for resolution is that the rating change is in the same direction as the credit watch, occurs within 1 year of the credit watch, and is the earliest rating change for that specific

bond after the credit watch. For credit watch, this is set to 1 if the credit watch was informative.

3. For rating changes, a dummy variable set to 1 if the rating change moves the bond into or out of investment grade.
4. A dummy variable set to 1 if the credit watch / rating change occurs to a company domiciled in an developed market country, as defined in the Morgan Stanley Capital Index classification.
5. The monthly return of the MSCI country index for the country of domicile of the company during the month of the rating change.
6. Time lapse since the last rating change
7. Market capitalization of company during the credit watch / rating change.
8. A dummy variable set to 1 if the country enforces prohibitions against insider trading – i.e., the country has previously persecuted insider trading.
9. An index score of Anti Director Provisions, as a proxy for shareholder rights. This proxy of country level corporate governance provisions is used as defined in “Law and Finance”, La Porta, Harvard University, ’98. The index is the sum of the following dummy variables (as defined and reproduced from La Porta ’98):

a. One share - one vote: Equals one if the Company Law or Commercial Code of the country requires that ordinary shares carry one vote per share, and zero otherwise. Equivalently, this variable equals one when the law prohibits the existence of both multiple-voting and non-voting ordinary shares and does not allow firms to set a maximum number of votes per shareholder irrespective of the number of shares she owns, and zero otherwise.

b. Proxy by mail: Equals one if the Company Law or Commercial Code allows shareholders to mail their proxy vote to the firm, and zero otherwise.

c. Shares not blocked before meeting: Equals one if the Company Law or Commercial Code does not allow firms to require that shareholders deposit their shares prior to a General Shareholders Meeting thus preventing them from selling those shares for a number of days, and zero otherwise.

d. Cumulative voting or proportional representation: Equals one if the Company Law or Commercial Code allows shareholders to cast all of their votes for one candidate standing for election to the board of directors (cumulative voting) or if the Company Law or Commercial

Code allows a mechanism of proportional representation in the board by which minority interests may name a proportional number of directors to the board, and zero otherwise.

e. Oppressed minorities mechanism: Equals one if the Company Law or Commercial Code grants minority shareholders either a judicial venue to challenge the decisions of management or of the assembly or the right to step out of the company by requiring the company to purchase their shares when they object to certain fundamental changes, such as mergers, assets dispositions and changes in the articles of incorporation. The variable equals zero otherwise. Minority shareholders are defined as those shareholders who own 10 percent of share capital or less.

f. Preemptive rights: Equals one when the Company Law or Commercial Code grants shareholders the first opportunity to buy new issues of stock and this right can only be waved by a shareholders' vote, and zero otherwise.

11.2 Expected Signs

The stock-related CAR should be more positive depending on the number of grades changed by the rating, and should also be smaller in absolute magnitude for resolutions of a credit watch. Additionally, the absolute magnitude of the rating change should also be larger for rating changes that moves the bond across investment grades, if the bond is related to a company that is domiciled in a developed country and if it has been longer since the last credit watch / rating change (since the incremental amount of new information is greater).

Market capitalization is also included in the model – we hypothesize that information availability on larger firms (by market capitalization) would be greater, therefore reducing the informational value of assessments by credit rating agencies. Additionally, the stock related CAR for observations in countries where insider trading laws are enforced should be greater because there will be less information leakage, therefore resulting in the credit event having greater informational value.

Lastly, we hypothesize that the more rights shareholders have over the firm's management (as proxied by the anti director rights variable), the more positive the reaction to all rating events should be. While rating events represent (to some degree), the release of private information to investors, investors have an increased capacity to take action and prevent management from acting contrary to their interests.

Table 13

Regression Tests on Excess Stock Returns for Companies with Credit Watch and Long Term Rating Changes by Moody's or Standard and Poor's from 1982 - 2007

CAR(credit watch)j = B0 + B1(INFORMATIVE DUMMYj) + B2(DEVELOPED MARKETS DUMMYj) + B3(CONTEMPORANEOUS MSCI RETURNSj) + B4(MARKET CAPITALIZATIONj) + B5(INTERVAL SINCE LAST RATING CHANGEj) + B6(INSIDER TRADING LAWS ENFORCEMENT) + B7(ANTIDIRECTOR RIGHTS)

CAR(rating change)j = B0 + B1(SURPRISE DUMMYj) + B2(DEVELOPED MARKETS DUMMYj) + B3(CONTEMPORANEOUS MSCI RETURNSj) + B4(MARKET CAPITALIZATIONj) + B5(INTERVAL SINCE LAST RATING CHANGEj) + B6(RATING CHANGE MAGNITUDEj) + B7(INVESTMENT GRADE TRANSITIONj) + B8(INSIDER TRADING LAWS ENFORCEMENT) + B9 (ANTI DIRECTOR RIGHTS)

CAR is the culmulative abnormal stock related return over the 3 day period (-1, +1). Informative Dummy, Developed Markets Dummy, Investment Grade Transition Dummy and Surprise Dummy are dummy variable that are 1 if the credit watch is informative, if the observation is for a company domiciled in an developed markets country, if the rating change results in an investment grade transition, and if the rating change is not foreshadowed by credit watch respectively. Contemporaneous MSCI Returns is the return on the MSCI country index for the country of domicile for the month of the rating change. Interval Since Last Rating Change is the number of days since the last rating change event, and Rating Change Magnitude is the new rating score - the old rating score, with AAA having a score of 1 and D having a score of 26. Anti Director rights is the index score on country level corporate governance provisions as defined in "Law and Finance", La Porta, with a higher score indicating better corporate governance

	Independent Variables							
	3 Day Stock Related CAR for Positive CW	t-statistic	**3 Day Stock Related CAR for Negative CW**	t-statistic	**3 Day Stock Related CAR for Long Term Upgrade**	t-statistic	**3 Day Stock Related CAR for Long Term Downgrade**	t-statistic
Dependent Variables								
Intercept	0.010935686	1.199305909	-0.005486805	-0.538286329	-0.003191999	-0.724052857	-0.004611493	-0.4634405
Marketcap of Company in US $Billions	3.25005E-12	0.56088607	6.19396E-12	0.978345961	-2.47176E-12	-0.931894101	1.10295E-11	1.8079253
Company is Domiciled in Developed Market	-0.007038363	-1.022153037	-0.006256863	-0.805412774	0.001172058	0.430543861	-0.011118227	-1.7404421
Rating Change crosses Investment Grade Boundary	-	-	-	-	0.002698083	0.965929841	-0.01678223	-2.6114668
Surprised Rating Change	-	-	-	-	-3.29546E-05	-0.016112677	-0.00447095	-1.0708853
Return of Local MSCI Country Index	-0.000574349	-0.015981328	0.081633803	3.146301821	0.038899573	2.421862194	0.013415839	0.6201031
Rating Change Magnitude	-	-	-	-	0.000345362	0.56394421	1.44873E-05	0.0093546
Interval Since Last Rating Change	6.24675E-07	0.163419916	7.54837E-06	1.687050207	-9.81837E-07	-0.517271074	1.20871E-05	2.9363613
Informative Credit Watch	-0.000854063	-0.22437229	-0.000828463	-0.175801846	-	-	-	-
Anti Director Rights	-0.000400604	-0.33859153	-0.000678976	-0.509233845	0.000662591	0.9530569	-0.000563936	-0.3693984
Insider Trading Laws Enforcement	-0.002972361	-0.508222361	-0.004162292	-0.521063814	0.001265603	0.407668033	-0.003184623	-0.425067
Number of Observations	591		1,703		1,097		1,602	
Adjusted R Square	-0.008684848		0.00560917		0.000469852		0.01088287	
R Square	0.003222055		0.009684542		0.008677673		0.016443179	
Standard Error	0.041143432		0.079133616		0.030349699		0.079843862	

11.3 Regression Results

The results in Table 13 shows that, for negative credit watch, there is a more negative reaction in developed markets. In the regression used, the t-statistic on the developed markets dummy variable is weakly significant at -0.81, and the coefficient of -0.0063 implies that, holding all else constant, the marginal effect of being domiciled in an emerging market decreases the stock-related CAR from the negative credit watch by 0.63 percentage points (i.e., it is more negative).

Additionally, the coefficient of 0.0816 on the local MSCI country index returns implies that a 1% increase in the local contemporaneous (same month) MSCI country index returns increases returns during a negative credit watch by 8.16% (i.e. the stock-related CAR is less negative). Lastly, although the t-statistics on market capitalization and interval since previous rating change are weakly significant, and the coefficients are in the correct direction, the coefficient values are extremely small, and do not constitute a large impact on stock-related CAR. The coefficient on market capitalization indicates that an additional US$100 million in market capitalization only increases the stock related CAR by 0.062 % pts (but the average market capitalization for the entire sample is only US$128.35 million), while the coefficient on interval since

previous rating change indicates that an additional 100 days interval since previous rating change increases stock related CAR by only 0.075% pts. None of the explanatory variables for positive credit watch are significant. The regression for positive credit watch as a whole also has no explanatory power with a low adjusted R square.

We note that investors may factor the state of the local MSCI country index more heavily for negative credit watch because they condition the probability that a downgrade will materialize on the state of the broader country's economy. However, for positive credit watch, it is possible that since companies more actively disseminate good news, investors are already well informed as to the possibility of a subsequent long term rating upgrade, and hence do not condition as heavily on the state of the broader country's economy.

Additionally, for long term rating downgrades, there is also a more negative reaction in developed markets. In the regression used, the t-statistic on the developed markets dummy variable is -1.74, and the coefficient of -0.01111 implies that, holding all else constant, the marginal effect of being domiciled in an emerging market decreases the stock related CAR by 1.11

percentage points (i.e. more negative). As expected, downgrades that cross the investment grade band have a more negative reaction than downgrades that do not. The t-statistic on the investment grade transition dummy is -2.61, and the coefficient value of -0.0168 implies that, all else being equal, rating downgrades that cross the investment grade band to non investment grade have a stock related CAR that is more negative (-1.68 % pts). We note that although the t-statistics on market capitalization and interval since closest rating change are weakly significant, the coefficient values are too small to have a notable impact on stock related CAR.

Lastly, the regression on rating upgrades demonstrate that the contemporaneous return on the local MSCI country index significantly impacts stock-related CAR. The t-statistic of 2.42 is significant, and the coefficient of 0.0389 implies that, holding all else constant, the marginal effect of a 1% point increase in the MSCI country index return results in a 3.89% pt increase in stock-related CAR.

We note that MSCI country index returns is positively related to the stock related CAR following negative credit watch, but does not significantly affect the stock related CAR to positive credit watch. Conversely, MSCI country index

returns is positively related to the stock related CAR following long term rating upgrades, but does not significantly affect the stock related CAR to long term rating downgrades. The former is likely due to the fact that investors use the state of economy to determine whether a subsequent downgrade is likely, whilst the latter may be a result of the fact that long term ratings are forward looking with a greater time horizon than credit watches; investors may condition their reaction to good news on whether the broader economy is also performing well, since this could affect the company's future good prospects in the long term. However, the fact that investors do not do this for bad news (i.e. downgrades) could indicate that all the bad news is already 'factored' in. This could also explain why being domiciled in an emerging market versus developed market does not affect stock related CAR to long-term upgrades. In short, investors primarily weigh broader market conditions most heavily in assessing potential positive future prospects implicit in an upgrade.

11.4 Discussion of Insider Trading Prohibitions

With regards to insider trading, we note that the coefficients on the "insider trading laws enforced" dummy and "anti director rights" index variable indicates that the enforcement of insider trading laws increases the stock related CAR to negative CW by -0.42% (more negative) for insider trading laws, and by -0.07% for each point on the anti director rights index. However, both coefficients have low t-statistics which are not significant at the 2.5% level of significance. For long term downgrades, we note an increase of stock related CAR to downgrades by -0.32% (more negative) and -0.06% for each point on the anti director rights index. Once again, both coefficients are not significant at the 2.5% level of significance.

We note that one possible explanation for the significant preannouncement abnormal returns in emerging markets compared to developed markets (for long term downgrades), but the absence of a significant t-statistic for the insider trading law dummy in the regression could be the relative lack of effective enforcement of insider trading regulations in emerging markets compared to developed markets. That is to say, it is possible that insider trading laws may not be entirely effective in preventing insider trading,

especially in emerging markets. There is some evidence for this in the literature.

In “Do Insider Trading Laws Work?”, European Financial Management Journal ’05, Bris shows that profits made by informed corporate insiders before tender offer announcements *increase* after new insider trading laws are first enforced. The paper finds that laws that proscribe insider trading fail to eliminate profits made by insiders. The prohibition then shifts the supply curve for insider trading, and therefore raises its price; insider trading therefore becomes more profitable after laws are introduced that prohibit it. Additionally, law enforcement also raises the possibility of monopoly profits for anyone that can find a way to circumvent the law.

These results are supported by existing literature that compare stock related returns to events in developed and emerging markets. Bekaert & Harvey ’02 note in a paper “Research in emerging markets finance: Looking to the Future” that emerging market equity returns have higher serial correlation than developed market returns. This serial correlation is symptomatic of infrequent trading and slow adjustment to current information (Harvey ’95, Kawakatsu & Morey ’99), and therefore, emerging market returns are less likely

to be impacted by company-specific news announcements than developed market returns. The paper suggests that insider trading occurs well before the release of information to the public.

Additionally, in a paper entitled “When an Event is not an Event: The Curious Case of an Emerging Market”, Jan 2000 Journal of Financial Economics, Bhattacharya et al showed that shares trading in the Bolsa Mexicana de Valores (Mexican stock exchange) do not seem to react to company news. Using a sample of Mexican corporate news announcements from the period July 1994 through June 1997, this paper finds that there is nothing unusual about returns, volatility of returns, volume of trade or bid–ask spreads in the event window. The authors then provide evidence that suggests that unrestricted insider trading causes prices to fully incorporate the information before its public release.

Bekaert & Harvey ’02 also point out that there is literature on stock selection in emerging markets that suggests that simple combinations of fundamental characteristics can be used to develop portfolios with excess returns to the benchmark (as demonstrated in Achour et al, ’99, Fama & French, ’98, Rouwenhorst, ’99, etc). Bekaert & Harvey ’02 conclude that the

preponderance of evidence therefore suggests that emerging markets are relatively less informationally efficient than developed markets.

11.5 Country Breakdowns

As a robustness check, we compute the average stock related CAR for each country for long term rating upgrades / downgrades and positive / negative credit watch (Table 14). We find that for long term rating downgrades in developed countries, 90.9% of the developed countries in the sample have negative stock related CAR upon long term rating downgrade, and 61.1% of the emerging countries in the sample have negative stock related CAR upon long term rating downgrade. Less than 50% of developed and emerging countries in the sample have positive stock related CAR upon long term rating upgrades.

Table 14 shows that 78.3% of developed countries in the sample exhibit an average stock related CAR that is negative after negative credit watch. Additionally, 61.1% of emerging countries in the sample exhibit an average stock related CAR that is negative after negative credit watch. 54.6% of developed countries in the sample exhibit an average stock related CAR that is positive after positive credit watch, and 53.9% of emerging countries in the sample exhibit an average stock related CAR that is positive after positive credit watch.

Table 14

Listing of average stock related CAR to Long Term Rating Changes from Moody's Investor's Service and S&P Rating Agency

The combined sample of long term rating changes is broken down by rating type (upgrades or downgrades) and country, with the average stock related CAR of long term rating events in each country for that rating type listed. Overall country results are considered to be in the correct direction if the rating type is a downgrade and the average stock related CAR for all rating types for that country is negative, or if the rating type is an upgrade and the average stock related CAR for all rating types for that country is positive. Emerging Dummy is 1 if the country is classified as emerging in the Morgan Stanley Capital Index

Table 14 Panel A: Developed Markets

Country	Positive Credit Watch Stock Related CAR	Negative Credit Watch Stock Related CAR	Long Term Upgrade Stock Related CAR	Long Term Downgrade Stock Related CAR
AUSTRALIA	-0.43%	-1.19%	-0.03%	-1.46%
AUSTRIA	-0.32%	0.04%	0.42%	-0.52%
BELGIUM	-0.32%	0.98%	-0.32%	-2.07%
BRAZIL	0.00%	-1.48%	0.17%	-1.00%
CANADA	0.08%	-0.69%	1.23%	-1.56%
DENMARK	1.82%	5.65%	0.00%	-0.40%
FINLAND	5.84%	-2.13%	-0.66%	0.19%
FRANCE	-0.54%	-1.74%	-0.20%	-1.28%
GERMANY	-0.06%	-0.35%	-0.14%	-1.03%
GREECE	3.00%	1.00%	0.02%	1.21%
HONG KONG	0.00%	-1.13%	0.32%	-0.59%
IRELAND	0.69%	-0.63%	-0.06%	-3.23%
ITALY	0.14%	-1.07%	0.17%	-1.00%
JAPAN	-0.08%	-1.76%	0.15%	-0.69%
NETHERLANDS	-0.07%	-5.15%	-0.09%	-3.44%
NEW ZEALAND	0.28%	-1.46%	-0.50%	-0.01%
NORWAY	-1.15%	-2.55%	-0.18%	-6.67%
PORTUGAL	4.52%	0.46%	0.21%	-0.09%
SINGAPORE	N/A	-4.00%	-0.15%	N/A
SPAIN	0.14%	-0.17%	-0.28%	-0.57%
SWEDEN	0.01%	-1.85%	-0.50%	-0.43%
SWITZERLAND	1.69%	-9.25%	0.07%	-5.06%
UNITED KINGDOM	0.36%	-1.72%	-0.08%	-1.75%
# of countries	22	23	23	22
# of countries with average returns in the correct direction (i.e. > 0 for positive watch and upgrades, and < 0 for negative watch and downgrades)	12	18	10	20
% of countries with average returns in correct direction	54.55%	78.26%	43.48%	90.91%

Table 14 Panel B: Emerging Markets

Country	Positive Credit Watch Stock Related CAR	Negative Credit Watch Stock Related CAR	Long Term Upgrade Stock Related CAR	Long Term Downgrade Stock Related CAR
ARGENTINA	-0.30%	-1.28%	0.05%	-2.87%
BRAZIL	0.01%	0.77%	-1.28%	-0.16%
CHILE	N/A	-0.15%	-0.53%	-1.00%
CHINA	3.40%	-3.44%	1.71%	0.40%
HUNGARY	0.01%	0.13%	-0.33%	-0.23%
INDIA	0.83%	-0.70%	-0.08%	5.43%
INDONESIA	-0.59%	0.61%	-1.88%	0.90%
ISRAEL	N/A	-2.33%	2.00%	3.34%
KOREA	-0.47%	0.53%	1.33%	2.36%
MALAYSIA	-0.55%	0.52%	-0.07%	-1.09%
MEXICO	-0.43%	-2.30%	0.05%	-1.48%
PHILIPPINES	2.75%	0.28%	-1.06%	-0.17%
POLAND	N/A	-12.23%	-0.68%	7.29%
RUSSIA	1.39%	0.83%	-1.03%	-2.33%
SOUTH AFRICA	N/A	-0.83%	N/A	3.00%
TAIWAN	N/A	-3.35%	0.20%	-0.79%
THAILAND	3.77%	-1.62%	1.26%	-1.51%
TURKEY	-7.00%	-21.00%	1.45%	-1.00%
# of countries	13	18	17	18
# of countries with average returns in the correct direction (i.e. > 0 for positive watch and upgrades, and < 0 for negative watch and downgrades)	7	11	8	11
# of countries with significant results (at 2.5% level of significance)	2	4	1	4
% of countries with average returns in correct direction	53.85%	61.11%	47.06%	61.11%

12. CONCLUSION AND FUTURE DIRECTIONS

We examine the informational content of being placed on Moody's and S&P's watch lists using a comprehensive database of credit watch placements, and also bond rating changes for non US domiciled companies. We analyze the informational content in 3 ways – first, we examine stock related CAR from separate samples of credit watch placements and also bond rating changes over a 3 days (-1, +1) window centered on the actual credit watch / rating change on day 0.

Secondly, we examine the linked samples of credit watches that are resolved by expected rating changes, and also the unlinked samples, where the rating changes are unexpected. Thirdly, we analyze the samples by various partitions, include emerging / developed markets, investment grade transition / non-investment grade transition and state of local MSCI country index.

Being placed on a credit watch list is, by itself an informative event. Additionally, negative credit watches appear to carry a greater informational content compared to positive credit watches – this could be due to the

explanation offered in Goh & Ederington (1993) that companies are more proactive in disseminating positive news compared to negative news. Long term rating downgrades on the whole also result in a significant negative stock related CAR. Positive credit watch and upgrades on the whole generally do not result in significant reactions.

Reactions to negative credit watch and long term rating downgrades are generally less pronounced (i.e. more positive) for companies domiciled in emerging markets compared to developed markets. This could be because of greater information leakage (e.g. through insider trading, etc) in emerging markets that result in bad news being disseminated more rapidly than in developed markets. Additionally, surprised long term downgrades and informative negative credit watches all result in stock related CAR that are more pronounced (i.e. more negative) than expected long term downgrades and uninformative negative credit watches – the same is true for both developed and emerging markets. Reactions to credit watches and long term rating changes also appear positively related to the contemporaneous return on the MSCI local country index. Lastly, long term rating downgrades that result in a transition from investment grade to non-investment grade generally exhibit a more negative stock-related CAR.

Going forward, it may be interesting to analyze average stock-related CAR at the country level and also partitioned by national regulatory characteristics at the aggregate level. This could help to identify which specific national regulations that mandate corporate disclosure, regulate insider trading, and enforce corporate transparency impact the additional informational content that bond rating changes and credit watch provide to investors.

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APPENDIX A: THE BEHRENS – FISHER PROBLEM

The Behrens – Fisher problem involves interval estimation and hypothesis testing on the difference of means of two normally distributed populations, when the variances of the 2 populations may not be equal. We note that it is assumed that the 2 populations are independent.

Behrens and Fisher proposed to find the probability distribution of

$$t = \frac{\overline{X1} - \overline{X2}}{\sqrt{\left(S_1^2 / N1 + s_s^s / N2 \right)}}$$

Fisher proposed initially that the distribution of this statistic can be approximated by ignoring random variation in the relative sides of the standard deviations, as in:

$$\frac{\left(s_1 / \sqrt{n_1} \right)}{\sqrt{s_1^2 / n_1 + s_2^2 / n_2}}$$

Welch (1938) approximated the distribution by the Type III Pearson distribution, applying this to the following number of degrees of freedom:

$$v = \frac{\left(\gamma_1 + \gamma_2\right)^2}{\gamma_1^2 / \left(n_1 - 1\right) + \gamma_2^2 / \left(n_2 - 1\right)} \text{ where } \gamma_i = \sigma_i^2 / n_i$$

The null hypothesis would then involve the expectation of equality, $\mu_1 = \mu_2$, so the distribution of the Behrens Fisher statistic, T, which will also depend on the variance ratio (of both distributions) can now be approximated by the Student's t distribution with v degrees of freedom.