Effects of credit rating announcements on risk perception of financial markets in emerging countries

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Abstract: This study measured the reactions of five different financial instruments used in credit rating agencies' (CRAs) announcements using the event study method with 19 years of daily data from 21 emerging countries. It also analysed the reactions of these financial instruments to upgrading and downgrading investment grades. This has not been frequently discussed in the previous literature. There were three key findings: 1) credit default swaps (CDSs), stock markets, 1-year, and 10-year government bonds reacted significantly to CRA announcements while Eurobonds did not; 2) while 1-year bonds and 5-year CDSs reacted significantly only to degradation to non-investment grade, 10-year bonds and stock indices reacted significantly to both gradation and degradation but Eurobonds did not react significantly to either; 3) there were significant reactions to CRA announcements before degradation to non-investment grade, indicating that degradations are predicted by the market prior to their announcement.

Biographical notes: Umut Burak Geyikci is an Associate Professor of Finance at the Faculty of Business, Manisa Celal Bayar University (MCBU). He has over 15 years experience teaching undergraduate and graduate finance courses, including financial markets and institutions, derivative markets and financial management. He received his Undergraduate degree from the Dokuz Eylul University, his Master's and PhD from the Manisa Celal Bayar University. Before joining MCBU in 2016 as a faculty member, he worked in Turkstat as an expert. He has over 45 publications including journal articles, conference papers, books and book chapters in derivative markets, international finance, financial management and business management. He also works part-time as a management board member and financial advisor in large companies. He currently continues her academic studies in the USA.

1   Introduction

As trade and financial relations between countries increase, national borders are weakened. Increasing international trade and financial transactions have created new markets that require secure relations over long distances. In the last two decades, various financial derivatives have been widely used, especially in developing countries. Widespread financial products and volatility in financial markets have increased the risk perception of investors (Kose et al., 2009). Credit rating agencies (CRAs) have the task of reducing the risk of information asymmetry at both country and company level and determining the risks. In particular, the ratings given by rating agencies in the last 20 years have become an important indicator of countries' riskiness (Creighton et al., 2007). For investors, these ratings are an important indicator in their investment decisions. Therefore, country ratings play an important role in comparing countries at the macro level and determining risk levels. Despite failing to forecast the 2008 Asian crisis and the Greek debt crisis, credit ratings are still an important and valid risk indicator. Credit ratings allow countries to be graded individually according to their risk levels and also broadly classified as underdeveloped, developing, and developed countries. In terms of international portfolio theory, developing countries with higher risk levels and volatile markets may offer more profit opportunities than developed countries with low risk levels and stable markets. In terms of international portfolio theory, developing countries with higher risk levels and volatile markets may offer more profit opportunities than developed countries with low risk levels and stable markets. Although there are some studies on the subject in the recent literature, its scope remains extremely limited. In particular, the effects of rating disclosures on one or a few countries and only on the stock markets were examined. Some of these are those; Ovalı et al. (2020) on T-BRICS countries, Pervaiz et al. (2021) on Asian markets, Avrutskaya and Maricheva (2021) on Russia, Le and Duong (2022) on Vietnam, Dawar et al. (2021) on India. Within the scope of the study, it was tried to reach generalised results by examining as many countries as possible. In this framework, the weight of 21 developing countries in the world is 36% in 2021 on a GDP current USD 2015 basis (World Bank, 2022).

In contrast to previous research, the present study applies effectiveness study and acquisition methods to measure the direct impact of a total of 301 credit ratings produced by S&P on five financial variables (5-year sovereign bonds, 1-year sovereign bonds, 10-year sovereign bonds, share indexes, and Eurobonds) from 21 developing countries between 2000 and 2019, yielding 257,964 data points. Additionally, it specifically investigates ratings that were below the investment grade or reached the investment grade to evaluate if the level accepted as the investment grade in the financial markets was chosen effectively. This topic has rarely been considered in the literature.

This study makes four specific contributions to the international financial markets and credit rating literature. First, it is very comprehensive by covering the most important developing countries while examining the relationships between credit rating grades and multiple financial instruments. Secondly, it is the first study to investigate the effect of 19 years of credit ratings of 21 developing countries on five different financial instruments. Thirdly, it includes not only the impact of credit rating annotations on credit default swaps (CDS), stock markets, and the bond market but also the bond markets in the short and long term in terms of local currency and Eurobonds. Fourthly, it investigates for the first time how financial markets in developing countries are affected if their credit ratings

fall below the investment grade or reach the investable grade. In short, this study offers a wide framework for evaluating the effects of credit rating announcements.

The next section reviews the relevant literature while the Section 3 presents the methodology. The results from the event study model are reported in Section 4, followed by discussion and evaluations in Section 5.

2 Previous research

Sovereign rating is accepted as a country risk (Chen et al., 2013) and is an important indicator for comparing risk between countries, particularly in helping the private sector invest international capital in developing countries (Al-Sakka and Gwilym, 2009). In some countries, budget financing is highly influenced by sovereign ratings. For example, the capital pricing asset model (CAPM) predicts that investors' expected returns are directly affected by the risk-free rate plus the risk premium. Therefore, if the return on any government bond changes, this will affect other government financial instruments (the sovereign ceiling doctrine) (Safari and Ariff, 2015).

A number of previous studies have reported that only negative credit rating events have an significant effect: Hite and Warga (1997) and Dichev and Piotroski (2001) on bond markets; Gande and Parsley (2005) on stock markets; Vassalou and Xing (2004), Chung et al. (2012), Corbet (2014) and Hu (2017) on both; Goh and Ederington (1993) on Eurobonds; Steiner and Heinken (2001) on stock markets and CDS; Hull et al. (2004), Norden and Weber (2004) and Imbierowicz and Wahrenburg (2009) on CDS and bond markets.

In contrast, several studies have concluded that both positive and negative rating announcements have an effect: Abad et al. (2017) on stock markets; Pukthuanthong-Le et al. (2007) on both the stock and bond markets; Micu et al. (2006), Galil and Soffer (2011) and Yang et al. (2017) on CDSs.

Brooks et al. (2004) found no significant impact of sovereign rating announcements on emerging country stock markets between 1973 and 2001 whereas Ismailescu and Kazemi (2010) found that both positive and negative sovereign rating announcements have a dramatic effect on sovereign CDS spreads in emerging markets. Afonzo et al. (2012), found a significant relationship between negative rating announcements and EU sovereign bond yields, including a persistence effect for recently downgraded countries. Michaelides et al. (2015) found no information leakage prior to downgrade rating announcements in 65 emerging countries between 1988 and 2012. Leakage is statistically important and causes negative daily abnormal stock index returns, especially in countries with lower corporate quality. Finally, using an event study and GARCH method, Mutize and Gossel (2018) found that sovereign credit rating (SCR) announcements had no significant effect on African equity and bond markets between 1994 and 2014.

3 Data and methodology

3.1 Data

In this study, credit ratings are included from 3 January 2000 to 31 December 2018. The big three CRAs (S&P, Moody's, and Fitch) have approximately 95% market share.

However, S&P ratings were used for this study because it is the most dominant (Brooks et al., 2004), provides a broader dataset, is less predicted by the markets, and is ahead of other rating institutions (Reisen and Von Maltzan, 1999; Gande and Parsley, 2005; Ferreira and Gama, 2007; Hill and Faff, 2010; Ismailescu and Kazemi, 2010; Ballaster and Urtega, 2015). Table 1 lists the SCR announcements and variables examined for the 21 developing countries included in this study. The 301 announcements include increasing, decreasing, and stable ratings. Regarding the frequency of announcements, Turkey had the most (29) while Czechia had the fewest (4) over the research period.

Table 1   Summary of SCR events and variables

Country	Stock index	1-year Gov. Loc. Curr. Bond Index	10-year Gov. Loc. Curr. Bond Index	1-year Gov. USD Eurobond Index
Argentina	Merval (03/01/2005)	N/A	N/A	N/A
Brazil	IBOV (03/01/2005)	GTBRL1Y Govt. (04/06/2010)	GTBRL10Y Govt. (30/03/2007)	GTUSDBR1Y Govt. (03/09/2015)
Bulgaria	BSO (06/01/2011)	GTBGN1Y Govt. (19/3/2008)	GTBGN10Y Govt. (24/03/2008)	N/A
Chile	IPSA (03/01/2005)	GTCLP1Y Govt. (29/09/2005)	GTCLP10Y Govt. (29/09/2005)	GTUSDCL1Y Govt. (09/12/2015)
Colombia	COLCAP (03/01/2005)	GTCOP1Y Govt. (03/01/2005)	GTCOP10Y Govt. (03/01/2005)	N/A
Czechia	PX (03/01/2005)	GTCZK1Y Govt. (02/03/2007)	GTCZK10Y Govt. (2/3/2007)	N/A
China	SSEC (04/01/2000)	N/A	N/A	N/A
Hungary	BUX (03/01/2005)	GTHUF1Y Govt. (15/03/2012)	GTHUF10Y Govt. (2/3/2007)	N/A
India	SENSEX (24/02/2011)	GTINR1Y Govt. (03/01/2005)	GTINR10Y Govt. (03/01/2005)	N/A
Indonesia	JCI (03/01/2005)	GTIDR1Y Govt. (03/01/2005)	GTIDR10Y Govt. (03/01/2005)	GTUSDID1Y Govt. (06/11/2012)
South Korea	KOSPI (03/01/2005)	GTKRW1Y Govt. (03/01/2005)	GTKRW10Y Govt. (03/01/2005)	N/A
Malaysia	FBMKLCI (03/01/2005)	N/A	GTMYR10Y Govt. (03/01/2005)	N/A
Mexico	MEXBOL (03/01/2005)	GTMXN1Y Govt. (22/03/2011)	GTMXN10Y Govt. (23/03/2011)	GTUSDMX1Y Govt. (09/04/2010)
Peru	IGBVL (03/01/2005)	N/A	N/A	N/A
Philippines	PCOMP (03/01/2005)	GTPHP1Y Govt. (03/01/2005)	GTPHP10Y Govt. (03/01/2005)	GTUSDPH1Y Govt

Source: 5-year CDS Indices were received from Bloomberg, 5-year CDS Indices were received from MSCI, 1-year Government Local Currency Bond Indices, 10-year Local Currency Bond Indices, 1-year Government USD Eurobond Indices data were received Bloomberg

Table 1 Summary of SCR events and variables (continued)

Country	Stock index	1-year Gov. Loc. Curr. Bond Index	10-year Gov. Loc. Curr. Bond Index	1-year Gov. USD Eurobond Index
Poland	WIG (03/01/2005)	GTPLN1Y Govt. (03/01/2005)	GTPLN10Y Govt. (03/01/2005)	N/A
Romania	BET (03/01/2005)	GTRON1Y Govt. (20/05/2011)	GTRON10Y Govt. (09/06/2011)	N/A
Russia	INDEXCF (03/01/2005)	GTRUB1Y Govt. (8/4/2010)	GTRUB10Y Govt. (09/04/2010)	GTUSDRU1Y Govt. (27/10/2015)
South Africa	TOP-40 (03/01/2005)	GTZAR1Y Govt. (13/2/2007)	GTZAR9Y Govt. (03/01/2005)	N/A
Thailand	SET (03/01/2005)	N/A	N/A	N/A
Turkey	XU-100 (03/01/2005)	GTTRY1Y Govt. (20/06/2006)	GTTRY10YR Corp. (27/01/2010)	GTUSDTR1Y Govt. (04/09/2010)

Country	CDS USD SR 5 years	Upgrade	Downgrade	Stable
Argentina	N/A	7	11	8
Brazil	(12/10/2001)	6	6	10
Bulgaria	(13/07/2012)	8	3	6
Chile	(24/01/2003)	3	1	4
Colombia	(08/10/2004)	3	2	6
Czechia	N/A	2	0	2
China	N/A	4	1	3
Hungary	N/A	4	5	10
India	N/A	2	0	10
Indonesia	(08/10/2004)	8	3	8
South Korea	(28/02/2002)	6	0	1
Malaysia	(22/10/2001)	2	0	5
Mexico	(12/10/2001)	5	1	5
Peru	(20/10/2003)	5	1	9
Philippines	(04/04/2002)	4	2	8
Poland	N/A	2	1	11
Romania	N/A	7	1	8
Russia	(12/10/2000)	9	4	10
South Africa	(09/10/2000)	3	4	5
Thailand	(04/04/2002)	2	0	5
Turkey	(12/10/2000)	5	4	20

Source: 5-year CDS Indices were received from Bloomberg, 5-year CDS Indices were received from MSCI, 1-year Government Local Currency Bond Indices, 10-year Local Currency Bond Indices, 1-year Government USD Eurobond Indices data were received Bloomberg

The data sources for the event study analysis were as follows: 74,755 daily data from the national stock indices for 21 countries; 47,940 daily data from the Bloomberg 1-year Government Local Currency Bond Index for 16 countries; 53,326 daily data from the Bloomberg 10-year Local Currency Bond Index for 17 countries; 11,047 daily data from the Bloomberg 1-year Government USD Eurobond Index for 7 countries; 57,644 daily data from the Bloomberg CDR 5-year USD Index for 14 countries.

The following market data was used to compare to the calculation of the abnormal returns of each series in the event study: 1,675 daily data from the Bloomberg Emerging Markets 5-year CDS Index; 4,962 daily data from the MSCI Emerging Markets Stock Index; 2,757 daily data from the Bloomberg Barclays Emerging Markets Local Currency Government Bond Index; 4,168 daily data from the Bloomberg Barclays Emerging Markets Sovereign Bond Index (USD). To keep the scope of the study wide, each country's data series was analysed as far back as possible. However, complete series were not available for all countries, as shown in Table 1, which presents the starting dates for each country's data and the type of data used. In total, 257,694 daily data points were studied, resulting in one of the most comprehensive studies in the emerging markets literature.

The movements related to stock exchange returns show how credit ratings affect the stock market. Therefore, the stock index of each country was used to estimate firm returns during the review period. The MSCI Emerging Markets Stock Index was the market index used to measure the effect of credit ratings on national indices. The Bloomberg Emerging Markets 5-year CDS Index was used to measure the effect of credit ratings on the sovereign 5-year CDS index. The Bloomberg Barclays Emerging Markets Local Currency Government Bond Index was used to measure 1-year and 10-year sovereign bond indices. The Bloomberg Barclays Emerging Markets Sovereign Bond Index (USD) was used to measure the effect of credit ratings on Eurobonds.

Some data were either missing or had different starting dates for some countries. Countries with missing data were excluded or included using the available data. The data used in the analysis were taken from the Bloomberg database.

3.2   Methodology

This study measured the impact of credit rating events on 1-year and 10-year bonds, stocks, Eurobonds, and CDS spreads using event study methodology in accordance with Campbell et al. (1996), Brooks et al. (2004), Kothari and Warner (2007), Dutta (2014) and Safari and Arif (2015).

The event study methodology used here is based on the efficient market hypothesis (Fama et al., 1969). That is, if there is new information from an unpredictable event, market agents are assumed to have heard about it such that the prices of financial products are affected by the changed situation (Kollias et al., 2011). The power of this methodology comes from its ability to monitor these 'abnormal' changes (Schwert, 1981). Brooks et al. (2004), Safari and Ariff (2015) and Mutize and Gossel (2018) have all used event study analysis to investigate the impact of rating announcements.

It is essential to calculate abnormal returns to measure the effects of events. The main reason for applying this technique is to measure the effects of the determined events on the examined series. There are three different calculation methods in the literature: fixed average return models, market models, and factor models. Since it is the most commonly

used method in the literature, the market method was preferred in this study, using the following formula:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{1}$$

where R_{it} = return on equity, R_{mt} = market return, α_i = constant, β_i = systematic risk trends of stocks, and ε_{it} = non-systematic return.

When calculating the market model in case studies, the model coefficients (α and β_i) are calculated using the ordinary least squares (OLS) method [Babacan and Özel, (2013), p.95]. Since the event study was conducted under N grade and appearance announcements, the average abnormal returns (AAR) was used to collect all the information that facilitates decision-making on the impact CRA announcements on two different economies. It also minimises the effect of possible outliers:

$$AAR_t = \frac{1}{N} \sum_{i=1}^{N} AR_{it} \tag{2}$$

The cumulative average abnormal return (CAAR) is a useful tool for better understanding of abnormal returns. It is calculated by collecting the calculated AAR at the time that the activity affected the data:

$$CAAR_t = \sum_{i=1}^{T} AAR_t \tag{3}$$

Pre-event data for 120 days was used to calculate expected returns. To make the analysis as detailed and inclusive as possible, the event window in this study was 50 days long, i.e., running from –25 to +25 days either side of the rating description.

To test whether the rating events had statistically significant effects on the financial variables, t-statistics were used (Strong, 1992), as in previous studies (Brooks et al., 2004; Mateev, 2012; Afik et al., 2014; Geyikçi and Tepeci, 2017; Mutize and Gossel, 2018). The greater the t-statistic, the greater is the reliability of the result from the analysis.

4 Empirical results

Table 2, panel A reports daily AAR for event windows [–10, 10] and their statistical significance. Results are reported separately for upgrades ($n = 11$), downgrades ($n = 16$), and both ($n = 27$). Panel A presents the rating announcements and daily AARs while Panel B presents CAARs. Table 2 presents the event study results of how SCR changes impact the daily 5-year CDS index.

Four key findings emerge from the table. First, there are more significant reactions associated with upgrades than downgrades. Second, the economic impact of upgrades is more effective and meaningful than downgrades, especially in the period preceding each rating announcement. Thirdly, the market reaction is concentrated in the expected direction and prior to the announcements of upgrades, downgrades, or both, with 80% of the statistically significant abnormal returns occurring prior to the announcements. Fourth, contrary to the previous research, markets show more strongly significant reactions to upgrade than downgrade announcements. These findings are discussed in more detail in subsequent sections.

Table 2   Effect of sovereign ratings on 5-year CDSs

Panel A: average abnormal returns (AARs)

Relative day	Upgrades		Downgrades		All grades	
	AAR (percent)	t-statistics	AAR (percent)	t-statistics	AAR (percent)	t-statistics
−10	0.0133	1.3497	0.0096*	2.8941	0.0110**	2.3505
−9	−0.0173***	−1.8723	−0.0022	−0.2477	−0.0095	−1.5326
−8	0.0007	0.0888	−0.0049***	−1.9166	−0.0017	−0.4451
−7	0.0071	0.9896	0.0002	0.0171	0.0016	0.2333
−6	−0.0011	−0.1288	0.0027	0.4900	−0.0001	−0.0207
−5	−0.0166	−1.7680	0.0080	0.7033	−0.0066	−0.8395
−4	−0.0019	−0.3143	0.0151	0.9084	0.0045	0.4901
−3	0.0177*	2.6847	0.0050	1.2102	0.0094**	2.1681
−2	−0.0018	−0.2405	0.0109	0.9706	0.0035	0.5260
−1	−0.0106**	−1.9625	0.0122	1.4471	−0.0008	−0.1367
0	−0.0195*	−2.8098	0.0080	0.6746	−0.0058	−0.7896
1	−0.0053	−0.7329	−0.0008	−0.1213	−0.0030	−0.6248
2	0.0046	1.0934	−0.0002	−0.0339	0.0022	0.6157
3	−0.0253	−1.4487	−0.0020	−0.2834	−0.0137	−1.4365
4	0.0047	0.6522	−0.0054***	−1.9195	−0.0004	−0.1018
5	0.0168	3.7589	0.0087	1.0982	0.0128*	2.8283
6	−0.0028	−0.4891	0.0009	0.1999	−0.0009	−0.2517
7	0.0084	1.2657	0.0008	0.1439	0.0046	1.0684
8	0.0012	0.1645	−0.0003	−0.0282	0.0005	0.0794
9	−0.0026	−0.6819	0.0006	0.0619	−0.0010	−0.1963

Notes: *, **, and *** indicate significance at 1%, 5%, and 10% level respectively.
    Source: Table created by author

Table 2   Effect of sovereign ratings on 5-year CDSs (continued)

Panel B: cumulative average abnormal returns (CAARs)

Emerging markets	Prior effects			Post effects			Prior and post		
	All ratings	*Positive ratings*	*Negative ratings*	*All ratings*	*Positive ratings*	*Negative ratings*	*All ratings*	*Positive ratings*	*Negative ratings*
$x = 1$		–0.0333*			–0.0248*				
$x = 2$		–0.0372*			–0.0202***				
$x = 3$					–0.0456**				
$x = 7$		–0.0508***	0.0622***						
$x = 15$		–0.0615**	0.0738**						
$x = 25$									
$x = -1, 1$								–0.0386*	
$x = -2, 2$								–0.0379**	
$x = -3, 3$									
$x = -7, 7$									0.0641**

Notes: *, **, and *** indicate significance at 1%, 5%, and 10% level respectively.

Source: Table created by author

Table 3   Effect of sovereign ratings on stock indices

Panel A: average abnormal returns (AARs)

Relative day	Upgrades		Downgrades		All grades	
	AAR (percent)	t-statistics	AAR (percent)	t-statistics	AAR (percent)	t-statistics
−10	−0.0006	−0.3568	0.0091**	2.4331	0.0015	1.4083
−9	0.0008	0.5387	0.0006	0.1628	0.0005	0.4652
−8	0.0018	1.1937	−0.0048	−1.3177	−0.0009	−0.8384
−7	−0.0001	−0.0737	−0.0006	−0.1932	−0.0004	−0.4006
−6	−0.0017	−1.5378	−0.0044	−0.5983	−0.0024	−1.5003
−5	−0.0011	−0.7609	−0.006**	−2.3292	−0.0012	−1.1860
−4	−0.0006	−0.3924	−0.0012	−0.4604	−0.0021**	−1.9542
−3	−0.0014	−1.0285	0.0029	1.0827	−0.0002	−0.1547
−2	0.0033**	2.2376	−0.0018	−0.5756	0.0007	0.6019
−1	−0.0022	−1.3098	−0.009***	−2.3008	−0.0026	−1.7198
0	0.0023	1.2350	−0.0005	−0.1670	0.0019	1.2566
1	0.0033**	2.0380	−0.0008	−0.3032	0.0014	1.4892
2	−0.0001	−0.0634	−0.0022	−0.7452	−0.0003	−0.3161
3	−0.0009	−0.5594	0.0033	1.1673	−0.0003	−0.3035
4	0.0002	0.1171	0.0071**	1.9684	0.0015	1.3923
5	0.0000	−0.0051	0.0016	0.6436	−0.0004	−0.3928
6	−0.0013	−0.8856	0.0018	0.7849	0.0012	1.1345
7	−0.0045*	−3.3414	−0.0021	−0.7259	−0.0003	−0.2828
8	0.0005	0.3462	0.0020	0.5405	0.0005	0.4720
9	0.0002	0.1309	0.0061**	2.4352	0.0022**	2.0689
10	−0.0002	−0.1572	0.0006	0.2143	0.0008	0.6555

Notes: *, **, and *** indicate significance at 1%, 5%, and 10% level respectively.

Source: Table created by author

Table 3 Effect of sovereign ratings on stock indices (continued)

Panel B: cumulative average abnormal returns (CAARs)

Emerging markets	Prior effects			Post effects			Prior and post		
	All ratings	Positive ratings	Negative ratings	All ratings	Positive ratings	Negative ratings	All ratings	Positive ratings	Negative ratings
$x = 1$			−0.0095**	0.0033***	0.0056*				
$x = 2$			−0.0113***		0.0055**				
$x = 3$									
$x = 7$	−0.0062***		−0.0207***						
$x = 15$	−0.0079***			0.0086**		0.0177**			
$x = 25$	−0.0099**			0.0101**		0.0273*			
$x = -1, 1$									−0.0103***
$x = -2, 2$								0.0065***	−0.0143***
$x = -3, 3$									
$x = -7, 7$									

Notes: *, **, and *** indicate significance at 1%, 5%, and 10% level respectively.

Source: Table created by author

Table 4   Effect of sovereign ratings on 10-year local currency bonds

Panel A: average abnormal returns (AARs)

Relative day	Upgrades		Downgrades		All grades	
	AAR (percent)	t-statistics	AAR (percent)	t-statistics	AAR (percent)	t-statistics
−10	0.0034	1.2184	−0.0015	−0.6961	0.0014	1.0906
−9	−0.0047*	−3.6394	0.0018	0.5601	−0.0020	−1.4695
−8	0.0011	0.4564	−0.0036	−1.4686	−0.0017	−1.5518
−7	−0.0016	−0.7237	−0.0013	−0.4896	0.0005	0.3935
−6	−0.0016	−0.7833	0.0018	0.6579	−0.0006	−0.4938
−5	0.0012	0.6993	0.0025	0.6161	0.0018	0.6649
−4	0.0012	0.5082	−0.0020	−0.6065	−0.0021	−0.7384
−3	0.0026	0.9694	0.0063	1.4443	0.0038**	2.4662
−2	−0.0162	−1.2731	−0.0005	−0.1339	−0.0012	−0.3060
−1	−0.0012	−0.3980	−0.0003	−0.0986	−0.0014	−0.8695
0	−0.0015	−0.5095	0.0017	0.5867	0.0014	1.0047
1	−0.0039	−1.2315	0.0072	1.6061	0.0017	0.9596
2	−0.0012	−0.4606	−0.0051**	−2.4383	−0.0022***	−1.8647
3	−0.0008	−0.3117	−0.0018	−0.5660	−0.0021***	−1.7734
4	−0.0006	−0.2057	−0.0018	−0.8093	−0.0022	−1.3981
5	−0.0024	−1.1434	−0.0016	−0.8340	−0.0005	−0.4033
6	0.0001	0.0561	0.0056*	2.9175	0.0022**	2.4790
7	0.0013	0.4827	0.0044	1.6275	0.0015	1.1938
8	−0.0016	−0.8014	0.0003	0.1182	−0.0007	−0.5892
9	0.0024**	2.0297	−0.0033	−1.2067	−0.0009	−0.6664
10	0.0024	0.8405	0.0014	0.4583	0.0013	0.9450

Notes: *, **, and *** indicate significance at 1%, 5%, and 10% level respectively.

Source: Table created by author

Table 4 Effect of sovereign ratings on 10-year local currency bonds (continued)

Panel B: cumulative average abnormal returns (CAARs)

Emerging markets	Prior effects			Post effects			Prior and post		
	All ratings	Positive ratings	Negative ratings	All ratings	Positive ratings	Negative ratings	All ratings	Positive ratings	Negative ratings
x = 1									
x = 2									
x = 3									
x = 7									
x = 15									
x = 25									
x = −1, 1									
x = −2, 2								−0.0244***	
x = −3, 3								−0.0224***	
x = −7, 7								−0.0248***	

Notes: *, **, and *** indicate significance at 1%, 5%, and 10% level respectively.
    Source: Table created by author

Panel B shows the CAARs. In line with global trends, pre-announcement periods had significant effects on both upgrades [0, 1] > 2, 32, [0, 2] > 2, 32, [0, 7] > 1, 96, [0, 15] > 1, 96 and downgrades [–7, 0] > 1, 64, [–15, 0] > 1, 96. However, post-announcement periods only significantly affected upgrades [–1, 0] > 2, 32, [–2, 0] > 1, 64, [–3, 0] > 1, 96. Taken together, prior and post-announcement periods significantly affected upgrades [–1, 1] > 2, 32, [–2, 2] > 1, 96. There was no significant CAAR, except for –15 and +15 days.

Table 3 presents the event study results of how SCR changes impact daily stock indices. Results are reported separately for upgrades ($n = 99$), downgrades ($n = 82$), and all ratings ($n = 249$). Panel A shows the rating announcements and daily AARs. Panel B shows CAAR.

Table 3, panel A shows that stock markets reacted on more days to downgrades than upgrades. Similar to the previous literature, the market response to upgrades was as expected on days [0, 1] but not for downgrades. Market reaction was stronger to downgrades than upgrades in accordance with the previous literature.

Table 3, panel B shows CAAR in separate event windows. Downgrades were associated with significant negative market reactions in the pre-announcement period [–1, 0] > 1, 96, [–2, 0] > 1, 64, [–7, 0] > 1, 64 whereas upgrades were associated with significant positive market reactions in the post-announcement period [1, 0] = 2, 32, [2, 0] > 1, 96. Downgrades and upgrades together were associated with significant market reaction in both pre-announcement [–7, 0] > 1, 64, [–15, 0] > 1, 64, [–25, 0] > 1, 96 and post-announcement periods [0, 15] > 1, 96, [25, 0] > 1, 96.

Table 4 presents the event study results for how SCR changes impact the daily 10-year bond indices. The results are reported separately for upgrades ($n = 33$), downgrades ($n = 25$), and all ratings ($n = 107$). Panel A shows the rating announcements and daily AARs. Panel B shows the daily CAAR.

As Table 4, panel B shows, the effects of CRAs on 10-years bonds were not concentrated around the event day. Instead, there were significant reactions 2 and 6 days after downgrade announcements and 2, 3, and 6 days after all grade announcements.

Panel B shows CAAR in different event windows. The 10-years sovereign bonds reacted significantly to upgrades announcements when the prior and post-announcement period was evaluated together but showed no reaction to downgrade announcements. There were significant market reactions to days [–2, 2] > 1, 64, [–3, 3] > 1, 64, [–7, 7] > 1, 64. As can be seen from the strength and intensity of the reactions, CRAs had only a limited effect on 10-years bonds.

Table 5 presents the event study results of how SCR changes impact the daily 1-year bond indices. Results are reported separately for upgrades ($n = 22$), downgrades ($n = 28$), and all ratings ($n = 108$). Panel A shows the rating announcements and daily AARs while panel B shows daily CAAR. For 1-year bond indices, there were more significant reactions to downgrades than upgrades. In addition, the economic impact of downgrades was more forceful and significant than upgrades in the post-announcement periods. Moreover, evaluating downgrades, upgrades, and both downgrades and upgrades together, market reactions were concentrated in the post-announcement periods. That is, 70% of the statistically significant abnormal returns occurred here. These results, which are in line with the previous literature, demonstrate that markets react more strongly to downgrades than upgrades. These findings are discussed in more detail in subsequent sections.

Table 5 Effect of sovereign ratings on 1-year local currency bonds

Panel A: average abnormal returns (AARs)

Relative day	Upgrades		Downgrades		All grades	
	AAR (percent)	t-statistics	AAR (percent)	t-statistics	AAR (percent)	t-statistics
−10	−0.0004	−0.1458	−0.0025	−1.1579	−0.0002	−0.0448
−9	0.0015	0.3074	0.0052	0.8604	0.0109	1.2412
−8	−0.0006	−0.1913	−0.0418	−1.2628	−0.0112	−1.4696
−7	0.0021	0.6164	−0.0014	−0.3545	0.0012	0.6503
−6	−0.0149**	−2.3482	−0.0119	−1.0587	−0.0073**	−2.2094
−5	0.0058	1.2301	−0.0037	−1.1308	0.0041	0.7031
−4	−0.0057	−1.0622	−0.0070	−0.4073	−0.0021	−0.3881
−3	0.0047	1.0631	0.0052	1.2768	0.0045	1.4171
−2	−0.0018	−0.2813	−0.0003	−0.0642	0.0004	0.0956
−1	−0.0006	−0.1116	−0.0084	−0.9328	−0.0041	−1.0956
0	−0.0021	−0.3742	0.0219**	2.0899	0.0030	0.8684
1	0.0035	1.4923	0.0047**	2.1280	0.0055**	2.3030
2	−0.0041	−0.6987	0.0024	0.2388	−0.0009	−0.2654
3	0.0042	0.7698	−0.0011	−0.1793	0.0029	0.8234
4	0.0055	1.5556	−0.0104	−1.1287	−0.0003	−0.0938
5	−0.0132	−1.6144	0.0036	0.5383	0.0035	0.8279
6	−0.0017	−0.4326	0.0078	1.3337	−0.0009	−0.3724
7	0.0020	0.5274	0.0115	1.5489	−0.0009	−0.2669
8	−0.0080	−1.2996	0.0050	0.8237	−0.0007	−0.2905
9	−0.0010	−0.3299	−0.0066	−1.5031	−0.0070	−1.1874
10	0.0138***	1.7078	−0.0027	−0.4954	−0.0035	−0.7546

Notes: *, **, and *** indicate significance at 1%, 5%, and 10% level respectively.

Source: Table created by author

Table 5   Effect of sovereign ratings on 1-year local currency bonds (continued)

Panel B: cumulative average abnormal returns (CAARs)

Emerging markets	Prior effects			Post effects			Prior and post		
	All ratings	*Positive ratings*	*Negative ratings*	*All ratings*	*Positive ratings*	*Negative ratings*	*All ratings*	*Positive ratings*	*Negative ratings*
$x = 1$			0.0135***	0.0084**		0.0266*			
$x = 2$				0.0075***		0.029*			
$x = 3$			0.0185***	0.0105**		0.0279***			
$x = 7$						0.0404*			
$x = 15$									
$x = 25$									
$x = -1, 1$									0.0182**
$x = -2, 2$									
$x = -3, 3$							0.0113***		
$x = -7, 7$									

Notes: * , ** , and *** indicate significance at 1%, 5%, and 10% level respectively.

Source: Table created by author

Table 6   Fluctuations between investment and non-investment grade

AAR	5 years CDS's		Stock indices		10 years bonds		EUROBONDS		1 year bonds	
Relative day	Falling to the non-investment grade	Rising to the investment grade	Falling to the non-investment grade	Rising to the investment grade	Falling to the non-investment grade	Rising to the investment grade	Falling to the non-investment grade	Rising to the investment grade	Falling to the non-investment grade	Rising to the investment grade
−15			0.0156***						−0.0083*	
−14								0.0204*		
−13		0.0074**		−0.0046**						
−12								0.022*		
−11		−0.017***	−0.0239**							
−10		0.0366*								
−9		−0.0356***						−0.0036*		
−8								−0.0212*		
−7		0.0208*		−0.0067**				0.0198*		
−6								−0.0083*		
−5										
−4										
−3	0.0153*				0.017*	−0.006***		0.04*		
−2		−0.0262***							−0.0055**	
−1				−0.0094**				−0.0308*	−0.005***	

Notes: *, **, and *** indicate significance at 1%, 5%, and 10% level respectively.

Source: Table created by author

Table 6   Fluctuations between investment and non-investment grade (continued)

AAR	5 years CDS's		Stock indices		10 years bonds		EUROBONDS		1 year bonds	
Relative day	Falling to the non-investment grade	Rising to the investment grade	Falling to the non-investment grade	Rising to the investment grade	Falling to the non-investment grade	Rising to the investment grade	Falling to the non-investment grade	Rising to the investment grade	Falling to the non-investment grade	Rising to the investment grade
0		−0.0442***	−0.0181**							
1					0.0224*	−0.0144***				
2										
3				−0.0052***						
4		−0.01*								
5		0.0133*								
6		0.0016*								
7								−0.0175*		
8										
9								0.0188*		
10	0.0094***									
11		−0.0082*			−0.0224**				−0.0252***	
12					−0.0215*					
13						0.0038***		−0.0183**		
14			0.007***						−0.0101*	
15				−0.0036***					−0.0253**	

Notes: *, **, and *** indicate significance at 1%, 5%, and 10% level respectively.
     Source: Table created by author

As Table 5, panel A shows, there were significant 1-year bond reactions around downgrade announcement dates. In agreement with the previous literature, markets reacted significantly to downgrades on both the date of the announcement and the next day. In contrast, there was no significant response to upgrades.

Table 5, panel B shows CAAR in separate event windows. Both downgrades and upgrades were associated with positive and negative market reactions in the pre-announcement and post-announcement periods. There were significant market responses to downgrades [–1, 0] > 1, 64, [–3, 0] > 1, 64 in the pre-announcement period, which are [0, 1] > 2, 32, [0, 2] > 2, 32, [0, 3] > 1, 64, [0, 7] > 2, 32 in the post-announcement period, which are [–1, 1] > 1, 96, [–3, 3] > 1, 64 in both. The results are similar to the previous literature in that markets react significantly to downgrade announcements.

For Eurobonds, there were no significant reactions to either upgrades or downgrades in both the AAR and CAAR analyses before or after the grade explanations. That is, credit rating announcements had no effects on Eurobonds.

Previous studies have generally measured how financial variables react in specific countries to upgrades and downgrades in their credit ratings. In contrast, the next part of the present study specifically measured market reactions to upgrading to and downgrading from the investment grade – which is of critical importance for the developing countries. Countries that lacked ratings for the investment grade were excluded from this analysis.

For all the countries examined, the market indices reacted more often to upgradings rather than downgradings in terms of the AAR. Furthermore, rating announcements of upgrading to investment grades most strongly affected 5-year CDSs and Eurobonds while more significant returns were observed in the stock indexes of (–13), (–7), (–1) days. In contrast, no meaningful returns were found for 1-year bonds for any day in the (–15, +15) period.

No meaningful differences were observed for Eurobonds on any day during the (–15, +15) period in terms of AAR. However, there was a positive meaningful difference in CDSs on days (–3) and (10), a positive one on Stock Indicest days (–15) and (14), a negative one on days (–11) and (0), a positive one for 10-year bonds on days (–3) and (1), and a negative one on days (11) and (12), and a positive one for 1 year bonds on days (–15), (–2), (–1), (11), (14) and (15).

Thus, overall, there were stronger significant differences when ratings reached the investment grade than when they fell to the non-investment grade. This finding demonstrates that markets are more sensitive to positive rating announcements in terms of AAR.

Table 7 presents the results regarding falling to the non-investment grade or rising to the investment grade.

In Brazil, markets reacted more strongly to rating announcements falling to non-investment grade. Specifically, 5-year CDSs had positive CAR values on days (–30, +30), (–15, +15), (–15, –7), (–7, –3), and (+7, +15) while 10-year bonds had positive CAR values on days (–30, +30), (–15, –7), (–7, –3), and (+3, +7). These findings demonstrate that falling to non-investment grade in terms of CAR had a significant impact on two financial instruments. However, no significant CAR impact was seen for Stock Indices, Eurobonds, or 1-year index.

Table 7   CAR values of emerging countries

Panel A: CAR values of 5-year CDS

5 years CDS	Brazil		Bulgaria		Russia	
	When falls to the non-investment level	When rises to the investment grade	When falls to the non-investment level	When rises to the investment grade	When falls to the non-investment level	When rises to the investment grade
−30 +30	0.3495**				−0.4328***	
−15 +15	0.3386*		0.2558*			
−15 −7	0.1465**					
−7 −3	0.0928***					
−3 0						
0 +3		0.0745**	0.3436*			
+3 +7		−0.0358***	−0.0847**			
+7 +15	0.1552*				−0.2341**	

Panel B: car values of stock indices

Stock indices	Brazil		Russia		Peru		Colombia		Romania		Indonesia	
	When falls to the non-investment level	When rises to the investment grade	When falls to the non-investment level	When rises to the investment grade	When falls to the non-investment level	When rises to the investment grade	When falls to the non-investment level	When rises to the investment grade	When falls to the non-investment level	When rises to the investment grade	When falls to the non-investment level	When rises to the investment grade
−30 +30												
−15 +15			0.1913*			−0.1777**						
−15 −7			0.1161**									
−7 −3				−0.0697***				−0.0694***				
−3 0				−0.0487***				−0.045**	−0.0654***	−0.0342**		0.0219**
0 +3				−0.055***				0.0477**	−0.0954**			
+3 +7				0.07**								
+7 +15			0.0681***			−0.0824**						

Notes: *, **, and *** indicate significance at 1%, 5%, and 10% level respectively.

Source: Table created by author

Table 7   CAR values of emerging countries (continued)

Panel C: CAR values of 10-year bonds

10 years bond	Brazil		Bulgaria		Romania		Philippines	
	When falls to the non-investment level	When rises to the investment grade	When falls to the non-investment level	When rises to the investment grade	When falls to the non-investment level	When rises to the investment grade	When falls to the non-investment level	When rises to the investment grade
−30 +30	0.1522**		−0.2308*			−0.1415**		
−15 +15			−0.1226**			−0.0917***		−0.174**
−15 −7	0.0668***		−0.1786*			−0.0642**		−0.2265*
−7 −3	0.0603**		−0.0819*					−0.2454*
−3 0								−0.2509*
0 +3		−0.0588**	0.0466**	−0.0576***				
+3 +7	0.0438**							
+7 +15						−0.0341***		

Panel D: CAR values of 1 year bonds

1 year bonds	Brazil		Bulgaria	
	Falling to the non-investment grade	Rising to the investment grade	Falling to the non-investment grade	Rising to the investment grade
−30 +30				
−15 +15	0.0776**		−0.6937**	
−15 −7	0.0467**		−0.888*	
−7 −3	0.0466*		−0.2726***	
−3 0				
0 +3			0.2268**	
+3 +7				
+7 +15				

Notes: *, **, and *** indicate significance at 1%, 5%, and 10% level respectively.

Source: Table created by author

For rating announcements falling to non-investment grade, Bulgaria had positive CAR values for 5-year CDSs on days (–15, +15) and (0, +3) and negative values on days (+3, +7). For 10-year bonds, there were negative CAR values on days (–30, +30), (–15, +15), (–15, –7), and (–7, –3) and positive values for days (0 +3). There were no significant CAR values for rating announcements surpassing the investment grade. Thus, for 10-year and 1-year bonds, Bulgaria had significant negative returns before but positive returns after negative rating announcements.

Romania had positive CAR values 10-year bonds for announcements rising to investment grade on days (–30, +30), (–15, +15), (–15, –7), and (+7, +15) and negative ones for stock indices on days (–3, 0) and (0, +3). No other CAR values were significant.

Russia had negative CAR values for rating announcements rising to investment grade for stock indices days (–7, –3), (–3, 0), (0, +3) and positive ones on days (+3, +7). For announcements falling to non-investment grades CAR values were negative for 5-year CDSs on days (–30, +30) and (+7, +15) positive for stock indices on days (–15, +15), (–15, –7), and (+7, +15).

In Colombia, Indonesia, and Peru, only stock indices were affected by rating announcements of rising to investment grades. Colombia had negative CAR values on days (–15, –7) and positive ones on days (0, +3); Indonesia has positive values on days (–3, 0); Peru has positive ones on days (–15, +15) and (+3, +7).

In the Philippines, only rating announcements for 10-year bonds had negative CAR values on days (–15, +15), (–15, –7), (–7, –3), and (–3, 0) whereas stock indices had negative CAR values on days (–30, +30).

In sum, for all six countries except for the Philippines and Bulgaria, stock indices – but not 5-year CDSs – were affected by rating announcements of rising to investment grade. For Eurobonds, there were no significant CAR values in any of the countries examined.

5   Conclusions

This study firstly investigated the effects of sovereign rating statements provided by S&P on stock indices, 10-year bonds, 1-year bonds, Eurobonds, and CDS indices for 21 emerging markets between 2000 and 2019. The event study results show that stock indices, 1-year bonds, and CDSs are sensitive to rating announcements from emerging markets whereas 10-year bonds are only weakly sensitive, and Eurobonds are not sensitive.

The results for 5-year CDSs are compatible with some previous studies. Unlike Hull et al. (2004), Norden and Weber (2004) and Imbierowicz and Wahrenburg (2009) but similar to Ismailescu and Kazemi (2010), I found significant reactions to upgrades in the 21 countries both in the pre-announcement and post-announcement periods. Additionally, there was a little impact to downgrades but not around the event day. SCR announcements for emerging countries mostly react to upgrade announcements on CDSs, which are considered country risk indicators whereas there were no significant reactions around the event date to downgrade announcements. The credit ratings of developing countries, which tend to fluctuate around the investible grade, are affected by changes in risk perceptions due to political, economic, and geographical factors. Therefore, given that the negative situation is more normal, the response to positive situations is inevitably stronger for the risk indicator. The results obtained from the analysis confirm that the

response to upgrades is more significant than the response to downgrades for developing countries.

This study secondly examined whether sovereign rating announcements influence stock indices in 21 emerging markets. The results completely contradict Brooks et al. (2004) and Mutize and Gossel (2018), who found no significant impact. The results also differ from Vassalou and Xing (2004), Chung et al. (2012), Hu (2017), Hand et al. (1992), Goh and Ederington (1993), Hull et al. (2004), Norden and Weber (2004) and Imbierowicz and Wahrenburg (2009), who found that only negative rating announcements have an impact. Likewise, Abad et al. (2017), Micu et al. (2006), Galil and Soffer (2011) and Yang et al. (2017) found that both upgrades and downgrades significant affect stock indices. The results of this study support Michaelides et al. (2015), suggesting that there is information leakage prior to the announcements. That is, emerging countries generally do not have efficient markets in terms of Fama's efficient market hypothesis. Stock market investors behave quite timidly in developing countries, mainly because their stock markets lack sufficient depth and capital accumulation while speculative movements have quite large effects on the markets. Both domestic and foreign investors therefore respond immediately to any news. I found that both positive and negative changes in the credit ratings of the 21 developing countries also significantly affect stock indices. Although there are different results in the literature, the results of this study prove that it is usual to react strongly to CRAs, not only to the downgrades or upgrades, but also to both situations in emerging countries.

Thirdly, I found only a limited impact of CRAs on 10-year bonds in the 21 developing countries. There is no consensus in the literature on this. Hand et al. (1992), Goh and Ederington (1993), Hite and Warga (1997), Dichev and Potroski (2001), Gande and Parsley (2005) and Afonzo et al. (2012) all reported that only downgrade announcements had affected 10-year bonds. In contrast, according to Pukthuanthong-Le et al. (2007), both upgrades and downgrades announcements affected them while Mutize and Gossel (2018) reported no impact.

Fourthly, I investigated the effect of CRAs on 1-year bonds whereas previous studies have overlooked this by mainly focusing on 10-year bonds. The results showed that 1-year bonds are only affected by downgrade announcements, especially in the (0–1) day period, in contrast to 10-year bonds. That is, risk perceptions are lower for 1-year than 10-year bonds, presumably because investors think that they are more reliable.

This analysis of the above local currency bonds raises the question of whether USD-based Eurobonds react differently to CRAs. The results showed no significant reaction by Eurobonds to CRA announcements, similar to Steiner and Heinken (2001). Eurobonds were unaffected by the currency risks in developing countries because they are USD/Euro denominated debt instruments, which are exported abroad to provide long-term finance. Therefore, USD-based Eurobonds did not react in the same way as local currency bonds or stock markets to upgrade or downgrade announcements. This situation, which is also in line with the previous literature, accurately explains the lack of response of Eurobonds to CRA announcements.

In the last part of the study, unlike similar studies in the literature, I examined the effects on financial markets of credit rating announcements of falling to non-investment grade or rising to investment grade. Only 8 of the 21 countries experienced a fall to non-investment grade, a rise to the investment grade, or both. The findings showed that markets in these countries react more to rating rises than rating falls in terms of the AAR.

While rating announcements of rising to investment grade had most effect on 5-year CDSs and Eurobonds, announcements of falling to non-investment grade had no effective at all.

Regarding the response of CAR to rising to investment grade or falling to non-investment grade, only Brazil, Bulgaria, and Russia reacted significantly. Regarding stock indices, on the other hand, Brazil, Russia, Peru, Colombia, Romania, and Indonesia reacted significantly to rising to investment grade while Romania and Russia reacted significantly to falling to non-investment grade. Regarding 10-year bonds, Brazil and Bulgaria reacted significantly when CAR values fell to non-investment grade while Romania and the Philippines reacted significantly to rising to investment grade. Finally, regarding 1-year bonds, Brazil and Bulgaria both reacted significantly to falling to non-investment grade.

Overall, considering both falling non-investment grade and rising to investment grade, each of the eight countries reacted differently. However, there were more reactions to falling from investment grade, indicating that negative rating announcements are predicted by the market prior to the announcement.

In conclusion, I analysed the effects of credit rating announcements on different financial instruments using data from 2000 to 2019 from 21 of 27 countries (78%) in the MSCI emerging markets index. Despite their risks, emerging markets offer many potential investment return opportunities, with perhaps the most important being portfolio diversification. One of the most important of the study is that local currency bonds and stocks react to credit upgrades and downgrades whereas Eurobonds do not. This implies that investors perceive that currency risks are the most important risk factor. They therefore hedge their local currency risks by means of USD/Euro investment instruments like Eurobonds to protect themselves from potential losses. This study has also demonstrated that emerging markets are important diversification areas as they lack financial trends hat can be fully generalised for all financial variables. Of the five different financial indicators analysed in this study, CDSs, stock markets, and 1-year government bonds reacted significantly to CRAs in emerging markets whereas 10-year government bonds reacted less significantly, and Eurobonds did not react at all.

Developing countries have the most variable credit ratings in contrast to developed countries with generally stable high credit scores and undeveloped countries with generally stable low credit scores. Developing countries experience significant credit grade changes, particularly around the investment grade. The study makes an important contribution to the literature in this respect. In contrast to previous studies, which examined the relationship between credit rating grades for just a few countries or variables, the present study included all developing countries and used uninterrupted data. Only six countries (Greece, Egypt, Taiwan, Qatar, Saudi Arabia and Pakistan) were excluded due to excessive volatility or missing data. The findings show that credit rating disclosures in developing countries only affect certain variables in increasing the grade of investment, and that there are no valid rules for all countries to predict market responses to investment grade increases or decreases. Thus, while credit rating statements have different effects in each country, emerging countries are good alternatives for portfolio diversification. Future research should develop this analysis by focusing on exchange rate risk. Evaluating countries comparatively, particularly those with similar rating grades and geographical proximity, could provide important new contributions to the literature.

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