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**The Chinese and The Big Three Credit Rating Agencies –
their impact on stock prices**

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Keywords: stock prices, abnormal rates of return, credit rating

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Abstract

The aim of the paper is to analyse the impact of the changes in credit ratings on the stock market, comparing the Chinese and the American Big Three agencies. A literature review has been made and as a result the following three hypotheses have been put. The first one seems as follows: Changes in credit ratings have influence in the case of both upgrades and downgrades of stock prices. The second one is: A stronger reaction of the stock market is observed as an effect of credit rating changes presented by the Chinese and not the American agencies. The third one seems as follows: The impact of credit rating changes is stronger for non-financial institutions and larger companies. Daily observation of the rates of returns on the stock prices and long-term issuer credit ratings proposed by the Chinese and the biggest three rating agencies (S&P's, Moody's and Fitch) have been taken for the analysis. Data has been collected from the Thomson Reuters Database from the period between 1990 and 2016. Event study methods have been used to verify the mentioned hypotheses.

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Introduction

Credit rating agencies (CRAs) play a significant role on the financial market. Their aim is to reduce the asymmetrical information between investors and issuers. In national and international regulation we can observe trends according to which the notes proposed by CRAs are used during estimation of the default risk, especially in the credit risk assessment by banks. The notes given by them are also important in the corresponding banking and investment decisions. During the last years, as a result of the financial crisis, credit rating agencies have lost their importance. It was an effect of their response to the deteriorating financial condition of the issuers coming too late. Because of the existing oligopoly of CRAs, the supervisors and regulators emphasize their intention to reduce it. As a result, we can observe trends in the international and national law aimed at increasing the competition. Some countries are introducing an obligation to use the notes proposed by smaller national CRAs. For example, in the European Union we can find regulations defining smaller agencies (which should have less than a 10 %-share of the market).

The described situation let us analyse the impact of credit rating changes on stock prices according to the type of a credit rating agency. To analyse it, the Big Three (i.e., S&P, Moody, and Fitch) and the Chinese ones have been taken into consideration. The decision to use them has been connected with their share of the market. The mentioned biggest three agencies take from 60 to 90% of the market share. As a result, the following three hypotheses have been put. The first one seems as follows: Credit rating changes have influence in the case of both upgrades and downgrades of stock prices. The second one is: The strongest reaction of the stock market is observed as an effect of credit rating changes presented by the Chinese and not the American agencies. The third one seems as follows: The impact of credit rating changes is stronger for non-financial institutions and larger companies.

Section 2 summarizes the literature review and the Chinese rating industry. The research plan is described in Section 3 and the results are discussed in Section 4. Section 5 presents our conclusions.

Literature review

In China, the regulation on the qualifications for bond issuing firms leads to a lower demand for credit rating in a long-term perspective. Strong competition between credit rating agencies on the mentioned market has also been observed. In 2009 200 CRAs have been registered, only 80 of which were filed in the central bank. As a result, a strong concentration on the mentioned market has been observed. Most of them are small, except Dagong Global Credit Rating Co., Lianhe Credit Rating Co., China Cheng Xin International Credit Rating Co., and Shanghai Brilliance Credit Rating. In the European Union there were 45 credit rating agencies registered or certified in 2016. The biggest three takes 90% of the market. In the United States the mentioned agencies take nearly 50% of the market. The biggest 10 CRAs in China have got 70% of the total revenues of the rating industry. The described situation suggests that in the European Union a weaker competition has been observed. Zhu (2013) suggests that the Chinese agencies are not compatible the rating assessment methods. According to his opinion, it is an effect of the weak regulation system and traditional conventions in China, rather than data verifiability or objectivity.

At the moment there are five big credit rating agencies, i.e., CCXI, Shanghai Far East, Dagong, Lianhe, and Shanghai Brilliance on the Chinese market. They are known as the “Big Five”. The China’s credit rating industry did not experience a change from the investor-pay to the issuer-pay model. Initially, China’s CRAs collected most of their revenue from the borrowers. The only investor-pay rating agency is China Rating, and only the subscribers can read their reports in detail. The same situation can be observed in Europe and the USA. There is a strong price competition between agencies there that leads to malignant competition (Chen, 2010). The “Big Five” have introduced the Guiding Opinions of the People's Bank of China for the Management of Credit Rating (PBOC, 2006) and the People’s Republic of China financial industry standard Specification for credit rating in the credit market and interbank bond market (PBOC, 2007) (Hu & Shi, 2016). The mentioned regulation establishes the minimum charging rate to reduce price dumping². In the mentioned case, in contrast to the CRAs in the USA, the decision has been taken by the government. Because of the higher reputation of the “Big Three” they set higher prices. In China the unsolicited ratings are not presented to the public. Because of the existing differences between notes, and misleading information, China Credit Rating Co., Ltd (CCR) was founded by the National Association of Financial Market Institutional Investors.

In the current researches issues connected with the credit ratings agencies in China have been presented. Xu and Weng (2011) put attention to the limited competition of CRAs. Credit rating agency must have a licence from the China Securities Regulatory Commission (CSRC). At the moment only the “Big Five” has got the mentioned permission. They also observed the ‘rating shopping’ phenomenon when the rated institutions cherry-pick the agencies which will provide them with better ratings. The mentioned situation has also been observed in the USA (Coffee, 2006), but some of the Chinese researchers suggest that it would have happened in the Chinese market even with a limited competition. The mentioned situation caused a rating inflation. Because credit ratings do not want to lose their market share, the rating inflation has been more popular in the last ten years (Xu & Weng, 2011). This situation confuses investors and erodes the credibility and accuracy of credit ratings. It has been argued that the credit ratings offered by Chinese credit rating agencies do not have information content. Poon and Chan (2008) found that with the emergence of newer and internationally connected credit rating agencies, there is information content in credit ratings in China. They verified the mentioned impact by using the pooled time – series cross – sectional issuer rating data of 170 listed companies from 2002 to 2006. The same results were obtained by Lee (2006) and Asiamoney (2006).

The lower information value of the Chinese credit ratings cause these credit ratings to have no significant impact on the decisions of corporate bond buyers in China and the market attaches little credibility to their ratings (Kennedy, 2003).

The researches can be divided into two groups. There exist some studied analysed the impact of credit rating changes on the stock prices of non-financial entities. In the first analysis the impact of credit rating changes has been verified without a division into financial and non-financial institutions (Pinches & Singleton, 1978; Griffin & Sanvicente, 1982; Holthausen & Leftwich, 1986; Glascock et al., 1987; Hand et al., 1992). The first research in which the financial

² The values of the minimum charged according to the type of institution are: non-financial institution’s CP - 100,000 Yuan from issuer and 150,000 Yuan from bond; long-term corporate bond, convertible bond and MTN - 250,000 Yuan; financial institution’s bonds - 350,000 Yuan; ABS - 600,000 Yuan; MBS - 1000,000 Yuan. The fee of monitor rating for long-term bonds is 20% of the initial rating fee.

institutions' credit ratings have been noticed was prepared by Schweizeiger et al. (1992). Different reactions of stock prices as a result of credit rating changes have been observed. The mentioned situation has been connected with the stronger supervision over financial institutions. Almeida et al. (2016) suggest that sovereign downgrades lead to greater decreases in investment and leverage of firms that are at the sovereign rating bound relative to otherwise similar firms below the bound.

The presented researches have also suggested differences in the moment of reaction. Some researchers suggest that there is no impact of credit rating changes on the rates of return on the stock prices (Pinches & Singleton, 1978). In other cases only a negative relationship between these two variables has been noticed (Holthausen & Leftwich, 1986; Glascock, Davidson, & Henderson, 1987; Linciano, 2004; Leonard, 2013). The impact of both upgrades and downgrades has been noticed by Goh and Ederington (1993) and Norden and Weber (2004). In the current researches a stronger reaction of stock prices has been observed as a result of a decrease than an increase of notes (Followill & Martell, 1997; Chodnicka-Jaworska, 2016, Poornima et al., 2015). Also changes from speculative to investment grades have a significant impact (Reisen & von Maltzan, 1999).

The previous literature suggests that the reaction of banks' notes is weaker to credit rating changes than stock prices of productive companies. For example, Gropp and Richards (2001) found that the upgrade of credit ratings causes an increase of abnormal returns of 1.2% on the announcement day and 1.5% in the 3-day event window. Just as in the previous sample a differentiated impact of credit ratings change on banks' stock prices has been observed. Bremer and Pettway (2001) suggest that during the event window and the post-event window no significant abnormal returns are observed. They are for a longer period of time only because by taking the mean from 2 years, when negative and statistically significant impact of downgrade of ratings. On the other hand, Hiu et al. (2004) suggest that the market reacts significantly to positive and negative announcements, to downgrade and negative outlook announcements. They found that only long-term returns show a significant negative response. In a small but liquid stock market credit rating agencies only provide a limited informational value to the investors. Significant cumulative abnormal returns for downgrades in a two-day window and during the event window have been noticed by Calderoni et al. (2009).

Differences between the impact of long-term and short-term credit ratings have also been verified. Barron et al. (1997) suggest that only publication of information about the changes of long-term issuer credit ratings has got a significant influence on stock prices. Li et al. (2004) suggest that for both a downgrade and negative outlook announcements, the short-term returns show no significant reaction but long-term returns show a significant negative response. They also put attention to the size of the financial market. In a small but liquid stock market credit rating agencies provide only a limited informational value to the investors.

The next analysed phenomenon has been the contagion effect. Kaminsky and Schmukler (2002) and Pacheco (2010) signalized the existing impact of credit rating changes between countries. Rating announcements do in fact affect both domestic and foreign markets. Rating announcement effects are strongest on both the country and the asset being rated (Flores 2011). Arezki et al. (2011) have examined the spillover effects of sovereign rating news on CDS spreads and stock market. Downgrades lead to significant spillovers across countries. The mentioned phenomenon has been found stronger at the regional level Mateev (2012). Almeida et al. (2016) put attention

to a contraction in the capital supply, bond yield spreads of firms at the bound increase relative to firms below the bound. Public debt management generates negative externalities for the private sector and real economic activity.

The differences between the results received by particular researches can be connected with the sample. The mentioned relationship has been verified for the “Big Three”. Chodnicka-Jaworska (2016a, 2016b, 2016c) analysed the type of credit rating agency. The notes given by all credit rating agencies (both small and bigger one) for European banks have been taken into consideration. In the mentioned researches the level of the economy development and political divisions have been taken into consideration. Doherty et al. (2012) verified the impact of the S&P and A.M. Best credit ratings changes. They found that S&P required higher standards to assign a rating similar to the one assigned by A.M. Best, and that higher-than-average quality insurers in each rating category of A.M. Best chose to receive a second rating from S&P.

Vassalou and Xing (2003) also suggest that the strength of the reaction of the stock returns in rating event studies should be adjusted by size, book-to-market and default risk. A particular credit rating agency can have a different impact on the abnormal stock prices. Brook et al. (2004) have found that only S&P and Fitch rating downgrades result in significant market falls. There is no evidence that emerging markets are particularly sensitive to rating changes or that markets react more severely to multiple rating changes. The reaction of stock prices is most significant when a downgrade is unanticipated, rated sector is unregulated Choy et. al. (2006). The significant impact on the abnormal rates of return can influence the period of crisis. Fatnassi et al. (2014) found that market reactions to foreign downgrades are stronger. Michaelides (2012) suggest that the relation between credit rating changes and the abnormal rates of return on the stock prices is more pronounced in non-developed markets, in countries with civil (relative to common) law systems, lower measures of law and order institutional quality, and higher measures of corruption.

The impact of credit rating changes on the abnormal rates of return on stock prices by taking into account the division into national and international banks, has been presented by Jones and Mulet-Marquis (2013). They found that US domestic banks experience significantly larger negative abnormal returns to downgrades than international banks listed in the USA, which they attributed to the greater impact of a rating change of a US bank on the rest of the local economy. They report abnormal returns and significance for pre- and post-financial crisis samples, simultaneous and long-term only rating announcements, ratings within and across investment classes, and ratings which cross the investment grade line.

The size of the rated company can have another important impact. Creighton (2007) suggests that the announcement effects are larger for small firms, for re-ratings from investment to speculative grade, and for cases where agencies have not indicated that the rating is under review. Ferreira, Gama (2007) put attention to the fact that downgrade spillover effects at the industry level are more pronounced in traded goods and small industries. Rating agencies incorporate negative information in ratings, which should comfort those who are concerned that the issuer-pay model leads to inflated ratings (Ahn et al., 2014). Wang and Chen (2015) suggested that stock yields are negatively related to credit risk, and listed companies with low credit risk will get higher stock returns in the future than those with high credit risk. Miyamoto (2016) put attention to the moment of reaction. According to the Fama theory, stock prices react before the information of rating changes is announced.

A credit watch placement provides an early signal of the subsequent rating downgrade and gives investors more time to better understand the information content of the downgrade (the early-disclosure effect) (Liu & Sun, 2015). A credit watch placement induces a better recovery from credit deterioration for the downgraded firm in the long run (the recovery effect). Firms receiving watch-preceded downgrades show better improvements in operating profitability, financial leverage, and overall default risk, and are less likely to be further downgraded in the future periods, compared with firms that are directly downgraded. The recovery effect is important in explaining downgraded firms' performance in the long run and provide a new evidence in support of the premise in the recent literature that credit watches can induce on-watch firms' efforts to restore the deteriorated credit quality.

The different results received by particular researches can be connected with the sample. The analyses of the impact of credit rating changes on stock prices have been prepared for different groups of countries, i.e., emerging markets (Flores, 2010), Europe (Arezki et al., 2011) or particular one, i.e., United Kingdom (Barron et al., 1997), United States (Eichengreen & Mody, 1998; Calvo & Mendoza, 2000a; Jorion & Zhang, 2007; Leonard, 2013; Tidwell et al., 2013), Sweden (Li et al., 2004), Italy (Linciano, 2004), Australia (Choy et al., 2006; Creighton, 2007), Spain (Abad-Romero & Robles Fernandez, 2006), Poland (Chodnicka -Jaworska, 2016), Portugal (Pacheco, 2011), India (Poornima, et al., 2015). It is a lack of data on analysis of the Chinese financial market. Oneresearch has been presented by Wang and Chen (2015). In most cases the event study methodology has been used, as well as – more rarely –panel data models (Kaminsky & Schmukler, 2002; Avramov et al., 2009; Flores, 2010; Fatnassi et al., 2014; Ahn et al., 2014; Almeida et al., 2016) or GARCH (Li et al., 2004). A wider literature review about the impact of credit rating changes on the financial instruments has been presented in Appendix 1 and Appendix 2.

Methodology

The aim of the article is to analyse the impact of credit rating changes on the rates of return on shares taking the type of credit rating agencies into consideration. The analysis has been prepared based on the Thomson Reuters Database. Daily logarithmized rates of return of shares are taken into consideration as a dependent variable. The threat of long-term issuer credit rating changes proposed by the American (i.e., Fitch, S&P'S, Moody's) and the Chinese credit rating agencies³ are independent variables. The analysis has been prepared for the data from the years between 1990 and 2016 using event study methods.

The sample has been divided into subsamples divided as follows: the type of credit rating agency, the change of credit ratings, the financial and non-financial institutions and the size of entities measured by the value of the capitalization. The analysis has been prepared for the companies that received notes from at least two credit rating agencies.

³ China Chengxin International Long-term Issuer Credit Rating, China Chengxin Securities Long-term Issuer Credit Rating, China Lianhe Long-term Issuer Credit Rating Golden Credit Long-term Issuer Credit Rating, China Credit Long-term Issuer Credit Rating Pengyuan Long-term Issuer Credit Rating, Shanghai Brilliance Long-term Issuer Credit Rating, Dagong Long-term Issuer Credit Rating.

The analysis has been prepared by using event study methods. The basic goal of the mentioned method is to verify the response of the rates of return of banks' shares on credit rating changes in a short period. The research has been performed for the three periods of time, using the cumulative rates of returns. The first period relies on the verification of the abnormal rates during the pre-event window. This window consists of the abnormal rates of return changes from 21 to 2 days before the event. The event period provides five days starting from one day before the event date and ending on the third day after it. It allows us to catch the better absorption of news, which may be appropriate because some credit rating changes were unprecedented. The post-event window represents twenty days after it. The methodology of an event study requires aggregation of the abnormal differences in a variable within each event window to construct cumulative abnormal differences (CAD), with an assumption that no other factors occurred in that time.

For each subsample upgrades and downgrades of credit rating assessments are tested separately. The significance of the impact of the mentioned credit rating changes is verified by using Student's t-tests. A small number of observations may weaken the power of statistical tests, suggesting the need to consider both the economic and statistical significance of the results.

Because of the qualitative type of credit ratings, a linear decomposition of the credit rating agencies has been made according to the methods proposed by Ferri, Liu and Stiglitz (1999). The numerical version of notes has been presented in the tables 1 and 2.

Table 1. Linear decomposition of American credit ratings.

Moody's Long-term Issuer Rating (Foreign)		S&P's Long-term Issuer Rating (Foreign)		Fitch Long-term Issuer Rating	
Rating	Code	Rating	Code	Rating	Code
Aaa	100	AAA	100	AAA	100
Aa1	95	AA+	95	AA+	94,74
Aa2	90	AA	90	AA	89,47
Aa3	85	AA-	85	AA-	84,21
A1	80	A+	80	A+	78,95
A2	75	A	75	A	73,68
A3	70	A-	70	A-	68,42
Baa1	65	BBB+	65	BBB+	63,16
Baa2	60	BBB	60	BBB	57,89
Baa3	55	BBB-	55	BBB-	52,63
Ba1	50	BB+	50	BB+	47,37
Ba2	45	BB	45	BB	42,11
Ba3	40	BB-	40	BB-	36,84
B1	35	B+	35	B+	31,58
B2	30	B	30	B	26,32
B3	25	B-	25	B-	21,05
Caa1	20	CCC+	20	CCC	15,79

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Caa2	15	CCC	15	CC	10,53
Caa3	10	CCC-	10	C	5,26
Caa	5	CC	5	RD	-5
C	0	NR	0	D	-5
WR	-5	SD	-5	WD	-5
NULL	0	NULL	0	NR	0
Ca	0	D	-5		
		C	2,5		
		R			

Source: own elaboration.

Table 2. Linear decomposition of Chinese credit ratings.

China Chengxin International Long-term Issuer Credit Rating		China Chengxin Securities Long-term Issuer Credit Rating		China Lianhe Long-term Issuer Credit Rating		Golden Credit Long-term Issuer Credit Rating		China Credit Long-term Issuer Credit Rating		Pengyuan Long-term Issuer Credit Rating		Shanghai Brilliance Long-term Issuer Credit Rating		Dagong Long-term Issuer Credit Rating	
Rating	Code	Rating	Code	Rating	Code	Rating	Code	Rating	Code	Rating	Code	Rating	Code	Rating	Code
AAA	100	AAA	100	AAA	100	AAA	100	AAA+	100	AAA	100	AAA+	100	AAA	100
AA+	94,73684	AA+	94,73684	AA+	95,2381	AA+	95,2381	AAA	95,2381	AA+	94,73684	AAA	95,65217	AA+	95,2381
AA	89,47368	AA	89,47368	AA	90,47619	AA	90,47619	AAA-	90,47619	AA	89,47368	AAA-	91,30435	AA	90,47619
AA-	84,21053	AA-	84,21053	AA-	85,71429	AA-	85,71429	AA+	85,71429	AA-	84,21053	AA+	86,95652	AA-	85,71429
A+	78,94737	A+	78,94737	A+	80,95238	A+	80,95238	AA	80,95238	A+	78,94737	AA	82,6087	A+	80,95238
A	73,68421	A	73,68421	A	76,19048	A	76,19048	AA-	76,19048	A	73,68421	AA-	78,26087	A	76,19048
A-	68,42105	A-	68,42105	A-	71,42857	A-	71,42857	A+	71,42857	A-	68,42105	A+	73,91304	A-	71,42857
BBB+	63,15789	BBB+	63,15789	BBB+	66,66667	BBB+	66,66667	A	66,66667	BBB+	63,15789	A	69,56522	BBB+	66,66667
BBB	57,89474	BBB	57,89474	BBB	61,90476	BBB	61,90476	A-	61,90476	BBB	57,89474	A-	65,21739	BBB	61,90476
BBB-	52,63158	BBB-	52,63158	BBB-	57,14286	BBB-	57,14286	BBB+	57,14286	BBB-	52,63158	BBB+	60,86957	BBB-	57,14286
BB+	47,36842	BB+	47,36842	BB+	52,38095	BB+	52,38095	BBB	52,38095	BB+	47,36842	BBB	56,52174	BB+	52,38095
BB	42,10526	BB	42,10526	BB	47,61905	BB	47,61905	BBB-	47,61905	BB	42,10526	BBB-	52,17391	BB	47,61905
BB-	36,84211	BB-	36,84211	BB-	42,85714	BB-	42,85714	BB+	42,85714	BB-	36,84211	BB+	47,82609	BB-	42,85714
B+	31,57895	B+	31,57895	B+	38,09524	B+	38,09524	BB	38,09524	B+	31,57895	BB	43,47826	B+	38,09524
B	26,31579	B	26,31579	B	33,33333	B	33,33333	BB-	33,33333	B	26,31579	BB-	39,13043	B	33,33333
B-	21,05263	B-	21,05263	B-	28,57143	B-	28,57143	B+	28,57143	B-	21,05263	B+	34,78261	B-	28,57143
CCC	15,78947	CCC	15,78947	CCC+	23,80952	CCC+	23,80952	B	23,80952	CCC	15,78947	B	30,43478	CCC+	23,80952
CC	10,52632	CC	10,52632	CCC	19,04762	CCC	19,04762	B-	19,04762	CC	10,52632	B-	26,08696	CCC	19,04762
C	5,263158	C	5,263158	CCC-	14,28571	CCC-	14,28571	CCC	14,28571	C	5,263158	CCC+	21,73913	CCC-	14,28571
D	0	D	0	CC	9,52381	CC	9,52381	CC	9,52381	D	0	CCC	17,3913	CC	9,52381
				C	4,761905	C	4,761905	C	4,761905			CCC-	13,04348	C	4,761905
				D	0	D	0	D	0			CC	8,695652	D	0
												C	4,347826		
												D	0		

Source: own elaboration.

Findings

The analysis of the impact of credit ratings changes the stock prices has been prepared in subsamples. First the influence on the downgrades and upgrades of the mentioned notes has been verified. The results of the estimation have been presented in Table 3. Both upgrades and downgrades of notes have a statistically significant influence on stock prices. A stronger reaction of the financial market has been observed for a decrease of credit ratings than for increase of them. The mentioned situation is similar to the results received by previous researches. On the other hand, the Chinese stock market reaction is weaker to credit rating changes than to European stock prices. There is also a difference in the moment of reaction to downgrades and upgrades. Upgrades of notes have a statistically significant influence before, during, and after the moment of publication of the information about credit rating changes, but downgrades have a statistically significant influence after the moment of publication. However, in both cases the strongest reaction has been noticed during the post-event window.

Table 3. Impact of credit rating changes on stock prices of Chinese companies, taking into account an upgrade and a downgrade of notes.

Variable	upgrade	downgrade
pre event window		
_cons	0.0142*	-0,00255
	(-2.04)	(-0.25)
<i>N</i>	471	213
event window		
_cons	0.00734*	-0,00717
	(-2.18)	(-1.49)
<i>N</i>	471	213
post event window		
_cons	0.0260***	-0.0309*
	(-3.66)	(-2.49)
<i>N</i>	471	213

Source: own elaboration.

The next step was to prepare an analysis separately for the American and the Chinese credit rating changes. The results of the estimation have been presented in Table 4. The mentioned division is significant for issuers and investors in terms of choosing which credit rating agencies they should rely on when taking investment decisions. The presented findings suggest that stronger credit rating changes of stock prices have been observed for the Chinese agencies than for the American ones. In the case of Chinese notes statistically most significant impact has been observed for downgrades than for upgrades, but upgrades of notes have an influence during and after the moment of publication about credit rating changes. For the sample of American notes a statistically significant impact has been observed only for upgrades, and it was insignificant for a decrease of notes. The mentioned situation can relate to the types of investors. As a result, if issuers want to issue the debt securities on the Chinese market, they should rely on the Chinese credit ratings agencies.

Table 4. Impact of the American and the Chinese agencies' credit ratings changes on the stock prices of the Chinese companies, taking into account an upgrade and a downgrade of notes.

Agency	Chinese		American	
	upgrade	downgrade	upgrade	downgrade
pre event window				
_cons	0,0154	-0,0124	0,00785	0,02
	(-1.91)	(-1.04)	(-0.88)	-1,07
<i>N</i>	397	148	74	65
event window				
_cons	0.00840*	-0,00817	0,00162	-0,0049
	(-2.18)	(-1.40)	(-0.29)	(-0.57)
<i>N</i>	397	148	74	65
post event window				
_cons	0.0277***	-0.0344*	0.0171*	-0,0229
	(-3.33)	(-2.09)	(-2.17)	(-1.45)
<i>N</i>	397	148	74	65

Source: own elaboration.

The third part of the analysis relies on a verification which of the credit ratings agencies have got the stronger impact on the stock prices. The results of the estimation have been presented in Tables 5 and 6. The first part of the analysis relies on the verification of the impact of the changes in the credit ratings of particular Chinese agencies. As previously mentioned, the Chinese Big Five comprises CCXI, Shanghai Far East, Dagong, Lianhe, and Shanghai Brilliance. From the mentioned agencies the notes of Dagong, Chengxin and Lianhe have got a statistically significant impact. But the strength and moment of the reaction has been differentiated. In the case of Dagong long-term issuer credit ratings, a statistically significant impact has been observed for downgrades during and after the moment of publication of information about changes. For the notes published by Lianhe both upgrades and downgrades have a statistically significant influence on the changed notes. In the case of upgrades the reaction has been noticed during the post-event window, but for the upgrades during the event window. Stock prices react to the Chengxin upgrades during the whole period of time. In the case of a decrease of notes a statistically significant impact has been noticed during the moment of publication of information. For Pengyuan long-term issuer credit ratings for the abnormal rates of return have been found before the moment of publication of information about downgrades. From all the mentioned credit rating agencies in the case of upgrades the strongest reaction has been noticed for an increase of credit rating changes proposed by Lianhe and Chengxin. For downgrades the strongest reaction has been observed for Pengyuan credit ratings. The presented situation confirms the findings of the previous researches, namely that the financial market reaction is stronger to credit rating changes presented by the bigger than the smaller CRAs (Chodnicka-Jaworska, 2016).

The second part of the analysis was to analyse the impact of credit rating changes presented by the American CRAs. The prepared analysis suggests that the reaction of stock prices is statistically more significant for upgrades proposed by Moody and S&P downgrades. In both cases the abnormal rates of return have been received after the moment of publication of credit rating changes.

Table 5. Impact of the credit rating changes of Chinese agencies on stock prices taking into account the upgrades and downgrades of notes.

agency Change	Dagong		Lianhe		Chengxin International		Chengxin Securities		Pengyuan		Shanghai Brilliance		China	
	upgrade	downgrade	upgrade	downgrade	upgrade	downgrade	upgrade	downgrade	upgrade	downgrade	upgrade	downgrade	upgrade	downgrade
pre-event window														
_cons	-0,00379	-0,0496	-0,0266	-0,00815	0,0239*	0,0034	-0,0304	0,00574	0,0104	-0,0455*	-0,0014	-0,00039	0,00878	0,0206
	(-0.20)	(-0.80)	(-1.53)	(-0.36)	(-1.67)	-0,15	(-0.57)	-0,15	-0,14	(-1.98)	(-0.07)	(-0.01)	-0,57	-0,33
<i>N</i>	44	8	95	41	140	30	13	9	9	34	59	12	37	14
event window														
_cons	-0,0112	-0,0291*	-0,00511	-0,0212*	0,0145**	-0,00751	0,00842	-0,0275*	-0,0166	-0,0125	0,000623	0,00259	-0,00867	0,0188
	(-0.90)	(-1.77)	(-0.58)	(-1.88)	(-2.25)	(-0.71)	-0,27	-1,67	(-0.67)	(-0.84)	-0,07	-0,15	(-1.24)	-0,9
<i>N</i>	44	8	95	41	140	30	13	9	9	34	59	12	37	14
post event window														
_cons	-0,0302	-0,13*	0,0335*	-0,0637	0,0325**	0,039	0,0744	-0,0119	0,0216	-0,0336	-0,0357	-0,0332	-0,0265	-0,0686
	(-1.17)	(-1.99)	(-1.94)	(-1.50)	(-2.52)	-1,43	-1,5	(-0.25)	-0,6	(-1.24)	(-1.44)	(-0.65)	(-1.00)	(-1.40)
<i>N</i>	44	8	95	41	140	30	13	9	9	34	59	12	37	14

Source: own elaboration.

Table 6. Impact of the credit rating changes of American agencies on stock prices taking into account the upgrades and downgrades of notes.

agency Change	Fitch		Moody		S&P	
	upgrade	downgrade	upgrade	downgrade	upgrade	downgrade
pre-event window						
_cons	0,0369 -0,47	-0,00016 (-0.00)	-0,0168 (-1.39)	-0,00129 (-0.04)	-0,00724 (-0.67)	0,0321 -1,24
N	2	13	14	11	58	41
event window						
_cons	0,0129 -4,02	-0,00936 (-0.68)	0,00364 -0,47	-0,0107 (-0.54)	-0,00339 (-0.49)	-0,00193 (-0.16)
N	2	13	14	11	58	41
post event window						
_cons	-0,0518 (-0.69)	-0,00113 (-0.03)	0.0374* (-2.68)	0,00438 -0,15	-0,0111 (-1.20)	-0.0371* (-1.77)
N	2	13	14	11	58	41

Source: own elaboration.

The aim of the fourth part of the research has been to compare the reaction of the stock market on credit rating changes for Chinese, Taiwanese and Singaporean companies. The received results have been presented in Table 7. A statistically significant impact of credit rating changes has been received for the notes given for Chinese companies, both in the case of upgrades and downgrades. The strongest moment of the reaction has been observed after the publication of information about credit rating changes. The reaction of the stock market is weaker to an increase than to a decrease of notes. Different results have been noticed for companies from Taiwan and Singapore. In both cases we have not observed a statistically significant impact on credit rating changes, neither for upgrades, nor for downgrades. The mentioned situation can suggest that credit ratings have no impact on the decisions taken by further investors.

Table 7. Impact of credit rating changes on stock prices of Chinese, Taiwanese and Singaporean companies.

mainland u	China		Taiwan & Singapore	
	upgrade	downgrade	upgrade	downgrade
pre-event window				
_cons	0,0146* (-1.92)	-0,00789 (-0.67)	-0,0102 (-1.05)	0,0229 -1,48
N	426	176	45	37
event window				
_cons	0.00842* (-2.28)	-0,00858 (-1.60)	0,00292 -0,65	-0,000472 (-0.04)
N	426	176	45	37
post event window				
_cons	0.0282*** (-3.61)	-0.0337* (-2.31)	-0,00542 (-0.64)	-0,0175 (-1.09)
N	426	176	45	37

Source: own elaboration.

Finally the analysis relies on the verification of credit rating changes on stock prices in the sample of banks, other financial institutions and non-financial entities. The received results have been presented in Table 8. In the case of banks, a statistically significant impact has been observed only during the publication of information on downgrades of notes. Upgrades are insignificant. The mentioned situation confirms the results of the previous research about the

weaker impact of the credit ratings of banks. In the case of non-financial institutions a reaction has been observed for both upgrades and downgrades. The stock prices of nonfinancial entities respond to the upgrades during the whole period of the analysed time and to downgrades after the moment of publication of information about the changes. The presented relationship is stronger during the post-event window. The presented situation can be connected with the stronger supervision on banks than on non-financial companies. Surprising results have been noticed for the sample of other non-financial institutions. In the presented sample we can distinguish insurance and reinsurance companies and funds. In the mentioned case a statistically significant impact has been observed for a decrease of credit ratings. The strength of the impact of credit rating changes on the stock prices of these institutions is stronger than for the sample of banks and non-financial institutions. The financial market reacts during the moment of publication of information about changes, but after that a correction of stock prices has been observed. The presented situation can be connected with the weaker supervision than on banks. On the other hand, it can suggest that lower requirements are maintained for non-banking entities.

Table 8. Impact of credit rating changes on stock prices according to the type of sector.

sector change	banks		other financial institutions		non - financial institutions	
	upgrade	downgrade	upgrade	downgrade	upgrade	downgrade
pre-event window						
_cons	-0,00762 (-0.62)	0,00628 -0,28	-0,00619 (-0.39)	0,0327 -1,27	0,0154* (-1.93)	-0,00513 (-0.45)
N	49	25	21	7	401	181
event window						
_cons	0,0118 -1,52	-0.0295* (-2.17)	0,000807 -0,09	-0,0619* -2,09	0.0101** (-2.66)	-0,00676 (-1.32)
N	49	25	21	7	401	181
post - event window						
_cons	-0,0177 (-1.57)	-0,0073 (-0.33)	0,00245 -0,14	0,0541* -1,98	0.0285*** (-3.48)	-0.0374** (-2.64)
N	49	25	21	7	401	181

Source: own elaboration.

The last part of the analysis relies on the verification of the impact the credit rating changes on stock prices, taking into consideration the size of the listed companies. According to the level of capitalization entities have been divided into four groups: small (capitalization lower than USD 1.5 bln), medium (capitalization between USD 1.5 and 2.5 bln), big (capitalization between USD 2.5 and 15 bln) and huge (capitalization above USD 15 bln). The first group that has been taken into analysis were smaller companies. The stock prices of these entities react to the upgrades before the moment of publication of the information about credit rating changes. The next group of entities are medium companies. A statistically significant impact has been noticed for upgrades and downgrades, but a stronger reaction has been observed for upgrades than for downgrades. The mentioned relationship has been described in the previous research. Individual investors and funds from Europe invest in medium entities. They usually try to find a prospective source of capital allocation that can bring a higher future income. The next group of the researched companies are big entities. In this sample the impact of credit rating changes on stock prices has

not been found. The last group of companies are huge corporate institutions. A surprising relationship has been observed here because no statistically significant impact of credit rating changes on the rates of return of shares has been noticed here. Only the upgrade of notes gives abnormal rates of return. The mentioned relationship is characterised for two types of markets. The first one is a developed market with potential high rates of return, which investors can receive in the future. The second one is a developing market. In this case we think that it can be connected with the potential additional rates of return investors can receive.

Table 9. Impact of credit rating changes on stock prices according to the size of an institution.

big change	small		medium		big		huge	
	upgrade	downgrade	upgrade	downgrade	upgrade	downgrade	upgrade	downgrade
pre-event window								
_cons	0,0317* (-1.87)	-0,00919 (-0.66)	-0,0158 (-1.12)	0,00257 (-0.09)	-0,00774 (-0.78)	-0,00736 (-0.39)	0,00243 (-0.2)	0,0376 (-1.41)
N	125	80	76	32	215	82	55	19
event window								
_cons	-0,00262 (-0.38)	-0,0122 (-1.55)	0.0216** (-2.68)	-0,0196 (-1.78)	-0,00342 (-0.67)	-0,00224 (-0.27)	0,0137* (-1.66)	0,0137 (-1.13)
N	125	80	76	32	215	82	55	19
post-event window								
_cons	-0,00262 (-0.38)	-0,0122 (-1.55)	0.0216** (-2.68)	-0,0196* (-1.78)	-0,00342 (-0.67)	-0,00224 (-0.27)	0,0137* (-1.66)	0,0137 (-1.13)
N	125	80	76	32	215	82	55	19

Source: own elaboration.

Conclusions

The aim of the paper has been to analyse the impact of credit rating changes on the stock market comparing the Chinese and the American Big Three agencies. The mentioned goal has been fulfilled because stock prices of the entities that received credit ratings from the Chinese and the American credit rating agencies during the last years have been taken for the analysis. The analysis of the source data suggests that in most cases Chinese agencies give notes to the entities from the national market. An assessment of foreign companies is quite rare here. As a result, the following three hypotheses have been put. The first hypothesis seems as follows: Credit rating changes have an influence on stock prices both in the case of upgrades and downgrades. In each of the prepared sample a statistically significant impact of both of upgrades and downgrades has been observed. The mentioned situation can suggest that the Chinese market may be interesting for potential investors. In almost all cases the impact of the decrease of notes is stronger than of an increase, which is compatible with the previous studies. The next hypothesis is: A stronger reaction of the stock market is observed as an effect of credit rating changes presented by the Chinese than the American agencies. The prepared analysis confirms this hypothesis. As a result, if foreign investors want to invest on the Chinese market, they should rely more often on the Chinese credit ratings than on the American ones. The same situation concerns issuers who are going to issue debt securities. They should buy credit ratings from Chinese agencies. The presented analysis also suggests that the reaction of stock prices is statistically significant for the

notes presented by the “Big Five”. The mentioned situation confirms the research from the European market (Chodnicka-Jaworska, 2016).

The last hypothesis relies on the verification of the influence of credit rating changes on stock prices according to the type of sector and the size of the assessed company. The presented results suggest that the reaction of banks’ stock prices is weaker for credit rating changes than the notes of other non-financial institutions. This conclusion is the same as those received for the European market by other researchers, but the strength of this impact is also interesting. The abnormal rates of return of shares of non-financial institutions are weaker than those received for the European market. It can be connected with a weaker interest of investors in credit rating changes. The described situation is not an effect of the quality of Chinese credit ratings, because if it takes place, credit ratings presented by American agencies will have a stronger impact on stock prices, but we have not observed the mentioned relationship. The impact of credit rating changes has been observed especially for medium and huge entities. The mentioned situation can relate to the type of an investor. Especially individual investors and venture capital funds that want to realise additional abnormal rates of return invest in medium companies. On the other hand, especially pension and investment funds invest in huge corporate companies. The described situation can suggest that the Chinese market can be treated as potentially profitable and with a high potential.

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Appendix 1. Researches about the impact of credit ratings changes on the financial instruments.

Authors	Financial security	Period and country	Method	Findings
Pinches & Singleton (1978)	Stock prices	1959-1972, Moody's, 207 firms,	Event study (-30, +12), monthly abnormal stock returns	Anticipation is observed before rating changes, no abnormal reaction afterwards
Griffin & Sanvicente (1982)	Stock prices	1960 – 1975, Moody's, S&P, 180 rating changes,	Event study (-11;+1), monthly abnormal stock returns,	There are observed no anticipation but negative reaction after downgrades
Holthausen & Leftwich (1986)	Stock prices	1977 – 1982, Moody's, S&P, 1014 rating changes, 256 Credit Watch, S&P	Event study (-300, +60) daily abnormal stock returns	It is noticed significantly negative reaction after downgrades, but no significant abnormal performance for upgrades.
Glascok, Davidson and Henderson (1987)	Stock prices	1977 –1981, Moody's, 162 rating changes,	Event study (-90, +90), daily abnormal stock returns	It is observed significantly negative abnormal stock returns before and around downgrades, reversal after day zero (publication date)
Hand, Holthausen and Leftwich (1992)	Stock prices, bonds	1977 - 1982/1981- 83, Moody's, S&P, 1100 rating changes, 250 Credit Watch S&P,	Event study	It is observed significantly negative abnormal stock and bond returns for downgrades and unexpected additions to S&P Credit Watch, no significant abnormal returns for upgrades
Goh & Ederington (1993)	Stock prices	1984 – 1986, Moody's	Event study (-30;30),	There are noticed significantly negative returns for downgrades due to earnings deterioration, positive abnormal returns for downgrades due to increased leverage
Followill & Martell (1997)	Stock prices	1985 – 1986, Moody's	Event study (-5, +5)	There are observed significantly negative returns at reviews for downgrades, negligible abnormal performance around actual downgrades
Barron et al. (1997)	Stock prices	1984 – 1992, S&P, credit	Event study	New ratings have no significant impact on returns. A stock's cost of capital is reduced after a long-term credit rating is awarded for the first time.

		watch outlook, UK		
Eichengreen & Mody (1998), Calvo & Mendoza (2000a)	short term interest rates	US	Event study	There are registered the potential impact of changes in the US short-term interest rate on financial markets in emerging market economies
Reisen & von Maltzan (1999)	Bonds, stock prices	1989 – 1997, 29 countries, S&P, Moody	Event study (-40, +40)	Changes in country ratings on sovereign risk as measured by the yield spreads of domestic financial instruments relative to mature market benchmarks, significant only the possible downgrade, especially for ratings below investment – grade
Dichev & Piotroski (2001)	Stock prices	1970 – 1997, Moody,	Event study	Negative abnormal returns from 10 to 14 % during the first year following downgrades, especially for low – rated companies.
Kaminsky & Schmukler (2002)	Bonds, stock prices	January 1990- June 2000; 15 countries	Panel data models, event study (-10: +10)	Changes in sovereign ratings have an impact on country risk and stock returns. It exists transmission across countries, with neighbor-country effects being more significant. Rating upgrades (downgrades) tend to occur following market rallies (downturns). Countries with more vulnerable economies, as measured by low ratings, are more sensitive to changes in U.S. interest rates.
Vassalou & Xing (2003)	Stock prices	1971 – 99, Moody’s	Event study (-36;36),	Stock returns in rating event studies should be adjusted by size, book – to market and default risk, increase of default loss indicator before and decrease after downgrades.
Li et al. (2004)	Stock prices – outlook	1992 – 2003, Moody, S&P, Sweden	Event study, GARCH	For the rating assignments, positive outlooks and affirmations announcements, there is no significant share price reaction following credit rating announcements in both the long-term and short-term. It is significantly positive (negative) market reaction to the upgrade (downgrade) announcements. For the downgrade and negative outlook announcements, the short-term returns show no significant reaction but long-term returns show significant negative response. In the small but liquid stock market, credit rating agencies only provide limited informational value to the investors.
Linciano (2004)	Stock prices	1991 – 2003, Fitch, S&P, Moody, Italy	Event study (-1; +1)	Significant average excess returns are recorded only for negative watches and for actual downgrades. Abnormal returns however seem to be driven mainly by the release of relevant information around the announcement of the rating action. The study, by providing evidence for a specific European country, is a useful sensitivity check to the earlier empirical research, mainly focused on the U.S. case.
Norden & Weber (2004)	CDS, stock prices	2000 – 2002, Moody, S&P, Fitch	Event study (-90, +90)	Both markets not only anticipate rating downgrades but also reviews for downgrade by all three agencies, reviews for downgrade by S&P and Moody’s exhibit the largest impact on the both markets, the magnitude of abnormal performance in the both markets is influenced by the level of the old rating, previous rating events and, only in the CDS market by the pre-event average rating level by all agencies.
Brooks et al.	Stock	1973-2001, S	Event window	It is noticed that only rating downgrades have a wealth impact on market returns. Decreases in

(2004)	prices	& P, Moody's, Fitch,	(-10, +10)	local currency ratings appear to impart no information to the market whereas foreign currency rating downgrades are associated with significant wealth effects. Only S& P and Fitch rating downgrades result in significant market falls. It is no evidence that emerging markets are particularly sensitive to rating changes or that markets react more severely to multiple rating changes.
Choy et. al. (2006)	Stock prices	S&P, Moody, Australia	Event study	The reaction of the stock prices is most significant when the downgrade: (i) is unanticipated; (ii) is for an unregulated firm; and (iii) reduces the firm's rating by more than one category.
Abad-Romero & Robles Fernandez (2006)	Bond, stock prices	Spain, S&P, Fitch, Moody,	Event study, (-1;+1), (-5;+5), (-15;+15)	Changes in both directions cause a rebalancing effect in the total risk of the firm, with significant reductions on their systematic component
Creighton (2007)	Bonds, stock prices	1990 – 2003, Moody, S&P, Australia,	Event study (-100; +20)	The impact of credit rating changes is very small. There are observed a large movements in prices in the six months prior to the rating announcement, that suggest largely validating information. The announcement effects are larger for small firms, for re-ratings from investment to speculative grade, and for cases where agencies have not indicated that the rating is under review.
Jorion & Zhang (2007)	Bond, stock prices	January 1996 – May 2002, S&P, Fitch, Moody, U.S.	Event study, three day window	Stronger information effect, measured by stock prices effects, for rating changes for low – rated relative to high – rated. On stock prices influence the downgrades of notes, upgrades are insignificant.
Ferreira & Gama (2007)	Stock prices	1989 – 2003, S&P, Fitch, Moody	Event study	It is noticed negative reaction of 51 basis points to a credit ratings downgrade of one notch in a common information spillover around the world. Upgrades have no significant impact on return spreads of countries abroad. Closeness and emerging market status amplify the effect of a spillover. Downgrade spillover effects at the industry level are more pronounced in traded goods and small industries.
Avramov et al. (2009)	Stock prices	1985 – 2003, S&P	Panel data models	The negative relation between credit risk and returns is statistically and economically significant only during periods of credit rating downgrades. Low quality firms experience substantial deterioration in their operating and financial performance, and are sold by institutional investors leading to considerable price drops. The deteriorating fundamental performance is unanticipated by the market as evidenced by the large negative earnings surprises and analyst forecast revisions. In contrast, average returns do not differ across credit risk groups in periods of stable or improving credit conditions, which account for about 90% of the sample observations.
Flores (2010)	Stock prices	1997 – 2010, S&P, Fitch, Moody, 18 emerging markets	Panel regression, event study	The rating announcements do in fact affect both domestic and foreign markets. Rating announcement effects are strongest on both the country and asset being rated.
Pacheco (2011)	Stock prices	2006 – 2011, Moody, Portugal	Event study	They found a significant response of share prices to changes in ratings, with that response anticipating the announcement, that could be explained by previous sovereign rating changes or to the contagion effects of a bearish market. When analyzing the period after January 2010, they

				observed a stronger reaction to announcements, which is understandable given the greater influence and market sensitivity to rating agencies.
Arezki et al. (2011)	CDS, stock prices	2007 – 2010, European countries	Event study	It is examined the spillover effects of sovereign rating news on CDS spreads and stock market. Downgrades lead to significant spillovers across countries.
Michaelides (2012)	Stock prices	Fitch, S&P, Moody	Event study (-21, +21)	The stock market moves before the public announcement of a sovereign rating downgrade, resulting in a significant market reaction prior to the event, weak reaction at the event and a mild correction after the event. The results are weaker for upgrades. This relation is more pronounced in non-developed markets, in countries with civil (relative to common) law systems, lower measures of law and order institutional quality, and higher measures of corruption.
Mateev (2012)	Stock prices, bonds	1998-2007, S&P, 9 countries	Event study (-20; +20)	Rating changes of sovereign bonds in one country trigger significant changes in yield spreads and stock market returns in other (neighboring) countries. In line with previous research the spillover effects of rating changes are found to be stronger at the regional level.
Leonard (2013)	Stock prices	January 2001, September 2011, S&P, U.S.	Event study (-1;+1), (-2;+2)	There are no statistically significant abnormal returns exist on the day of a ratings downgrade, and on the days surrounding it. The information content of a downgrade to equity investors is low as the information resulting in the downgrade has already been reflected in the company's stock price.
Freitas et al. (2013)	Stock prices	2000 – 2009, Credit ratings, watch lists	Event study (-14: +30)	The impact of credit ratings and credit watches is significant for downgrades but less relevant for rating upgrades. The most significant variable is the absolute change in the number of notches for downgrades.
Tidwell et. al (2013)	Stock prices	2000 – 2011, S&P, Fitch, Moody, Dominion, U.S.	Event study (-1, +2)	An examination of trading volume revealed a significant increase in trading in reaction to downgrade credit rating changes, with a more subdued response to upgrades. The findings support the notion that REITs are more publicly forthcoming about the expectation of positive news in comparison to negative new.
Fatnassi et al. (2014)	Stock prices	2008 – 2012, S&P, Fitch, Moody	Panel data models	They found that (i) upgrades and downgrades affect both own country returns and other countries' returns, (ii) market reactions to foreign downgrades are stronger during the sovereign debt crisis period, and (iii) negative news from rating agencies are more informative than positive news.
Ahn et al. (2014)	Stock prices	1985 – 2012, S&P	Panel regression	The negative deviations have significantly stronger associations (relative to positive deviations) with bid-ask spreads and investor reaction to ratings changes. The negative rating deviations predict abnormal stock returns around subsequent earnings announcements, while positive deviations do not. Rating agencies incorporate negative information in ratings, which should comfort those who are concerned that the issuer-pay model leads to inflated ratings.
Poornima, et al. (2015)	Stock prices	2010 – 2014; India	Event study (-20:+20)	It is a significant impact of rating upgrades and downgrades on the stock returns of the investors. The impacts of such announcements are more pronounced near the announcement date and far off dates as well. Thus, the study observes that the rating announcements have an immediate and long-term significant impact on firms' share prices. The impacts of downgrade announcements on companies' share prices are observed to be more prominent than the upgrade announcements.

Liu & Sun (2015)	Stock prices	1992 – 2008, Moody	Event study (0, +180)	A credit watch placement provides an early signal of the subsequent rating downgrade and gives investors more time to better understand the information content of the downgrade (the early-disclosure effect). A credit watch placement induces better recovery from credit deterioration for the downgraded firm in the long run (the recovery effect). Firms receiving watch-preceded downgrades show better improvements in operating profitability, financial leverage, and overall default risk, and are less likely to be further downgraded in future periods, compared with firms that are directly downgraded. The recovery effect is important in explaining downgraded firms' performance in the long run and provide new evidence in support of the premise in the recent literature that credit watches can induce on-watch firms' efforts to restore deteriorated credit quality.
Wang & Chen (2015)	Stock prices	2013, China	ATP	Stock yields are negatively related to credit risk, and listed companies with low credit risk will get higher stock returns in the future than those with high credit risk.
Almeida et. al. (2016)	Stock prices	1990 – 2012, S&P, Fitch, Moody, 80 countries	OLS, IV GMM	Sovereign downgrades lead to greater decreases in investment and leverage of firms that are at the sovereign rating bound relative to otherwise similar firms below the bound. Consistent with a contraction in capital supply, bond yield spreads of firms at the bound increase relative to firms below the bound. public debt management generates negative externalities for the private sector and real economic activity.
Miyamoto (2016)	Stock prices	2000 – 2007, R&I	Event study (-139, +10)	Stock prices react before the information of rating changes is announced. Market participants act on rumors of rating changes.

Source: own elaboration

Appendix 2. Literature review about the impact of credit ratings changes on the banks' stock prices.

Authors	Findings
Richards & Deddouche (1999)	Stock prices, 1989 – 1998, S&P, Moody, Fitch, 15 countries, event study, weakly data (-35, +15). Downgrades on average have followed periods of negative cumulative abnormal returns for banks, although upgrades have not followed periods of positive returns. Stock prices either do not respond to rating changes or respond in the opposite direction to what would be expected if announcements conveyed value-relevant information. There are limits to the extent that supervisors in emerging markets can rely on market participants to monitor the safety and soundness of banks. The rates of return as a result of the downgrade of credit ratings are lower of 1.5 % and this compared with pre-announcement excess returns in the order of 10-20%. The upgrade results higher rates of return by 1%. The bank regulators do hold back negative information, and that bond rating agencies have a role in generating adverse information about banks to the capital market.
Gropp & Richards (2001)	1989 – 2000, S&P, Fitch, Moody's European banks' rating change, 186 events, the upgrade of credit ratings causes the increase the abnormal returns of 1.2% on the announcement day and 1.5% in the 3-day event window.
Bremer & Pettway (2001)	Japanese banks credit rating changes, during the event window and the post-event window the significant abnormal returns are not observed. Only for the long period of time, because by taking the mean from 2 years, were negative and statistically significant of the impact of downgrade of credit ratings at 20.6%.
Hui, et al.	Significantly positive (negative) market reaction to the upgrade (downgrade) announcements, for the downgrade and negative outlook

(2004)	announcements, the short-term returns show no significant reaction but long-term returns show a significant negative response. In a small but liquid stock market credit rating agencies only provide limited informational value to the investors.
Calderoni et al. (2009)	2002 – 2007, Moody’s banks’ credit rating changes, the significant cumulative abnormal returns for downgrades in a two day window and during the event window, the upgrades insignificant
Doherty et al. (2012)	S&P, A.M. Best. S&P required higher standards to assign a rating similar to the one assigned by A.M. Best and that higher-than-average quality insurers in each rating category of A.M. Best chose to receive a second rating from S&P.
Jones & Mulet-Marquis (2013)	Stock prices, 2000 – 2012, US banks, event study. They found short-term negative abnormal returns exhibited to downgrades and positive post-announcement abnormal returns exhibited to both upgrades and downgrades. Cumulative abnormal returns exhibit a positive trajectory following an upgrade announcement whilst cumulative average abnormal returns to downgrades return almost to zero over our event window. Concurrent announcements impact significantly on reported abnormal returns. US domestic banks experience significantly larger negative abnormal returns to downgrades than international banks listed in the US, which we attribute to the greater impact of a rating change of a US bank on the rest of the local economy. They report abnormal returns and significance for pre- and post- financial crisis samples, simultaneous and long-term only rating announcements, ratings within and across investment classes, and ratings which cross the investment grade line.
Almeida et al. (2014)	Big Three sovereign credit rating downgrades on firm investment and financial policy on companies from 80 countries for the 1990-2012 period. The sovereign downgrades lead to greater decreases in investment and leverage of companies that are at the sovereign rating bound relative to otherwise similar companies below the bound

Source: own elaboration