

National vs. Global Rating Agencies: Is There Complementarity Under Basel II?¹

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Abstract

Under the Basel II accord banks are required to hold Capital Asset Requirements according to the riskiness of their exposures, thus a fair evaluation of creditworthiness is necessary. Useful tools in credit risk evaluation are ratings issued by Global Rating Agencies (GRAs) but, though their coverage of activity is widespread all over the world, GRAs don't seem to rate small and medium-sized enterprises consistently across countries. Thus, also the activity of National Rating Agencies (NRAs) should be taken into account. Indeed, NRAs might reduce the regulatory costs of Basel II by rating issuers which would not be rated by GRAs. In such a context, after examining the degree of specialization of NRAs versus GRAs we investigate whether ratings issued by NRAs have a valuable information content compared to those issued by GRAs. Our results show that NRAs' coverage concentrates on SMEs, and that their ratings have a larger effect on financial markets vis-à-vis GRAs' ratings. This means that ratings issued by NRAs are valuable at least as those issued by GRAs and may be a useful tool to make CARs more responsive to the riskiness of exposures.

¹ I'm grateful to Giovanni Ferri who suggested me this idea, I also owe gratitude to Pierluigi Morelli for valuable help in the data collection process.

Introduction

Attaining bank stability via capital requirements is a primary goal. Banking crises are, in fact, very costly. At the same time, deposit guarantee schemes give bank managers incentives to undertake high risk which can raise banks' exposures to moral hazard. The costs associated with banking crisis could be even higher if we take in account that such crises very likely associate with currency crises (Kaminsky and Reinhart, 1996). To overcome such problems, since 1988, the BIS introduced the minimum Capital Asset Requirements (CARs).

Thus, the aim of Basel II is to take a further step in this direction by setting capital requirements accordingly to bank exposures, and reducing the implicit costs associated to it for banks whose assets are riskless and the management activity is smarter. Under Basel I, banks were asked to retain a flat percentage of their capital; i.e. 8% of all the risk-adjusted on- and off- balance sheet assets, a risk invariant requirements. Basel II contemplates the evaluation of credit risk of bank exposures by the use of own internal rating system and/or external rating agencies.

In this context obtaining ratings by more than one rating agencies may be problematic especially if, as it usually happens, the ratings assigned by different rating agencies are not the same. The problem of split ratings may be even more severe if the same firm obtains an investment grade rating from one agency and a below investment grade rating from another agency. Having a rating in the investment grade category has severe implication on CARs, in that the implicit costs associated to him rise in a considerable manner.

On the other hand for small, less capitalized firms it might be extremely expensive, if not prohibitive, obtaining a rating, especially from Global Rating Agencies (GRAs), which seem to charge higher fees than those applied by National Rating Agencies (NRAs). Thus, in this respect the contemporaneous presence of both, GRAs and NRAs, can have beneficial effects if it is positively associated to the extent of rated companies. But, on the other side of the coin, lies the evaluation ability: how effectively are GRAs vs. NRAs able to evaluate the issuers' risk? In particular, due to the divergence in the evaluation of the same entity, doubts arise over the fairness of the ratings assigned by the NRAs. Obtaining a higher rating has important implication for CARs: it lowers the cost associated to it, improving bank competitiveness, but at the same time it might increase the instability of the banking system.

In this paper we show how the development of NRA's ratings can have beneficial effects by enlarging the extent of rated entities and making CARs more responsive to the actual credit risk.

In fact, after detecting that NRAs are mainly hired by small/less capitalized entities, we show how valuable the information content of their rating is.

We focus our analysis on Japanese financial markets, because both of its size – it is the second one after the US –, and Japan is also one among the few markets² boasting a significant contemporaneous presence of GRAs and NRAs. In Japan other than Moody's and S&P (the GRAs) operate also R&I and JCR (the NRAs). Nonetheless, Japan is one of the country in which the CARs are applied.

Using the event study methodology, we evaluate the effects of rating changes by both NRAs and GRAs on the stock market.³ We take in account only non-financial firms with listed stocks on Japanese stock market. Our sample encompasses the period between the 1990s (when the NRAs' activity developed) and June 2005.

Conversely to other early empirical results (Li et al. 2006) we find a strong information content of rating changes by NRAs. This might be due either to the failure of the Market Efficiency Hypothesis or to the fact that also NRAs' ratings contain valuable information on issuers' creditworthiness not readily incorporated in stock prices. Especially in the case in which the same firm hires both a NRAs and a GRAs, we detect a higher stock price reaction to rating changes belong to NRAs rather than those belong to GRAs.

These results provide evidence on the fact that though NRA' rating may be inflated, they provide indeed some useful information for financial markets. Thus, the contemporaneous presence of both NRAs and GRAs could be beneficial in providing a widespread evaluation of creditworthiness and a valuable base to set the CARs in a more coherent way with the issuer creditworthiness.

In addition once the reliability of information content of NRAs' ratings is proved it can be argued that the presence of NRAs can serve important market niche characterized by the presence of less capitalized firms to whom hiring a GRAs may have prohibitive costs.

1. Potential benefits for the existence of both GRAs and NRAs

The well-functioning of financial markets is based on the availability of good information about creditworthiness of whoever operates in the markets, because only a fair valuation of risk can lead to an efficient allocation of financial resources.⁴

The availability of information about the creditworthiness is especially valuable in those countries in which opaqueness dominates credit relationships. Clearly collection and processing information

² Other countries which have witnessed in the last 20 years a significant development of rating agencies are India, Malaysia and Korea

³ The significance of abnormal returns are evaluated using the tests proposed by Boehmer et al. 1991.

⁴

is easier where there is an high level of information disclosure, additional resources can be required in particular markets characterized by information opaqueness. In particular it is noticeable that obtaining information is harder in countries where information disclosure is poor and financial markets are particular volatile.

The flat or bad evaluation of the issuers/issues credit risk may be seriously penalizing for small-medium sized firms in that capital requirements should be based on the degree of riskiness, and a poor evaluation of it can charge them of extra capital costs. The setting of CARs, under Basel II, accordingly to the degree of riskiness, may reduce the competitiveness of those firms that cannot hire a rating agency because it is very expensive or even if hiring an agency is affordable for them, creditworthiness evaluation maybe misleading because empirical evidence claim how GRAs apply tougher standards everywhere (Shin and Moore, 2003) regardless the specific characteristic of the rated entity.

Thus, in this particular context the presence of both national rating agencies (NRAs) and global rating agencies (GRAs) could have more beneficial effects, not only because in general competition could enhance information efficiency in gathering information⁵, but also because these two entities can have different scale of specialization. In fact, due to the interrelation of NRAs with local entities which they rate , they can have singular informative advantage. In particular, as will be shown later, small entities, for which hiring a GRAs might be expensive, can obtain a rating from NRAs that usually apply cheaper fees. Thus, if NRAs don't exists, small-medium sized firms would not ask for a rating at all, and their credit risk evaluation will be based on the internal bank rating system.

Clearly such evaluation is less accurate than it should be if creditworthiness analysis would be done by a rating agencies, especially because internal ratings does not encompass private (soft) information. Thus internal ratings probably do not mirror the fair valuation of the issuer solvency and consequently can rise the costs tight to CARs. On the other hand it seems that the information content of rating assigned by NRAs seem to be higher than that of the GRAs, or at least not worse than information provided by the last one (Packer, 2000).

2. Rating agency industry

The rating industry is characterized by two groups of rating agencies: on one hand we have the Global Rating Agencies (GRAs) which operate on a global scale of coverage, and on the other hand we have the National Rating Agencies (NRAs) which operate in a small local basis. Rating agencies qualified as GRAs are Moody's, S&P and Fitch. They began rating activity since the early nineteenth century in the US, but their coverage became to widespread outside the US since 1970s

⁵ Galil K.(2003), The quality Of Corporate Credit Rating: an Empirical Investigation, Wp. Berglas School of Economics, Tel-Aviv University

through merger, subsidiaries and affiliations. More recent is the rating activity of NRAs, they are smaller than GRAs and their activity is mainly on local basis. The only valuable experience about NRAs has been experienced on East Asia financial markets, only there rating agencies in the early 1980s founded favourable condition to began rating activity, i.e. their setting was promoted by financial institutions to overcome some widespread insolvencies which were threatening financial stability. Specifically the most important NRAs are: Japanese Credit Rating agency (JCR), Rating and Investment Information (R&I) and Mikuni in Japan; Korea Investment Service (KIS), Korea Rating (KR), National Information and Credit Evaluation (NICE) and AM Best in Korea; Malaysian Rating Corporation Berhad (MARC), and Rating Agency Malaysia (RAM) in Malaysia; Investment Information and Credit Rating Agency (ICRA), Credit Rating Information Services of India (CRISIL) and Credit Analysis & Research (CARE) in India.

Though, these NRAs originated recently (none of them was established before 1985), in these countries they issue numerous ratings compared to GRAs (Figure 1) and they are very active also in revising previously issued credit rating.

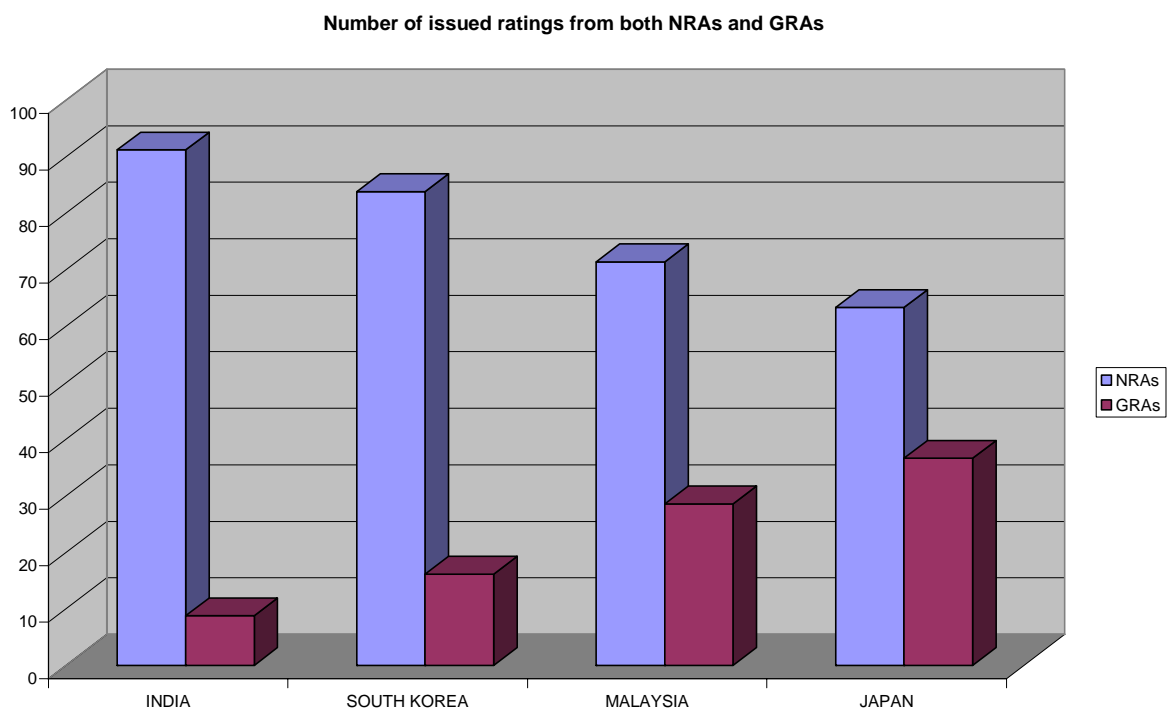


Fig. 1, Source:Our Calculations on Bloomberg data for 2004

Differently from the US tradition, NRAs in Japan originated with a strong support from regulation. Ratings were a necessary tool to obtain regulatory approval to issue bonds. After 1985, many Japan

corporate bonds were required to have a minimum credit rating in order for the issue to be approved. While this requirement was abolished in January 1996, other regulatory obligations remained tied to credit rating (for example the CARs under Basel II).

Some of the Asian NRAs are owned, at least in part, by consortia of financial institutions (e.g. ICRA is mainly owned by Indian banks; RAM is owned by 49 financial institution) which may receive credit ratings of their own from the controlled NRA and may also have important business relationships with borrowers that receive ratings from the controlled NRA in turn. This ownership structure – probably stemming from the need to rely on private sector assistance in developing credit analysis – poses potential conflicts of interests, which should require greater efforts to ensure the integrity of the rating process.

Based on the scant literature addressing this issue, the growing coverage of NRAs seems a positive signal because the market seems to take into account both NRA and GRA ratings when pricing securities. For instance, Packer (2000) shows that a combination of NRA and GRA ratings predicts spreads on securities secondary market trading more accurately than any of the two classes taken separately. JCIF (2001) survey finds that, in the opinion of Japanese corporations, NRAs do not differ from GRAs in terms of market influence and recognition but NRAs get a strong minus as regards global activity while they are reputed somewhat better than GRAs in terms of: (i) placing more importance on factors relating to Japanese business practice (industrial specialization); (ii) providing more persuasive reasons as to the level of the assigned rating and/or of the subsequent changes (rating fairness)⁶ (Figure 2).

⁶ There is a third aspect where NRAs outperform GRAs according to the JCIF survey: the fact that they are designated rating agencies. Of course, this has to do with institutional decisions and not with economic efficiency.

5 Factors Viewed As Most Important (in %) In Selecting Rating Agency (average; data for 2001)

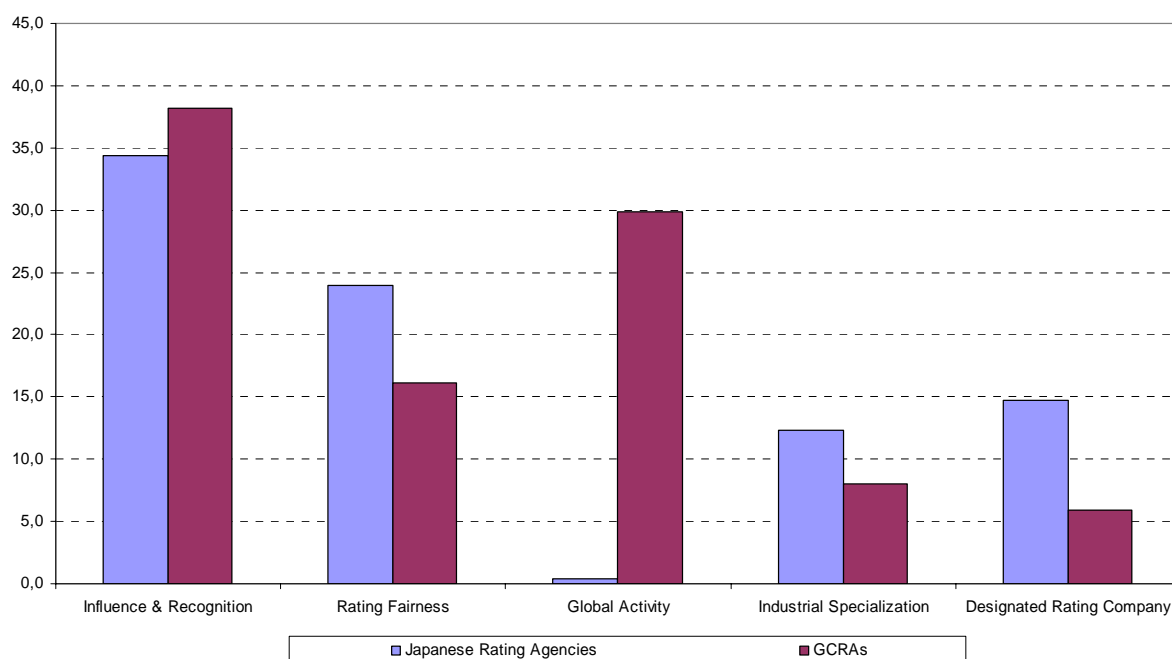


Figure 2 Source: Our calculations on JCIF (2001).

Thus, issuers may benefit obtaining ratings both from GRAs and from NRAs. Possibly, NRAs' judgment on issuer reliability places a larger weight on the local environment and business practice, which depends on idiosyncratic aspects of the specific country. On the contrary, GRAs may be keener to use standardized rating criteria for all issuers in the world, regardless of local business practice, and this could sometimes deliver an under-estimation of issuers' creditworthiness.⁷ Indeed, studying the case of Japan, Packer (2000) documents that the ratings assigned by NRAs are, on average, 3.5 notches higher than GRA ones. However, he also shows that, notwithstanding, NRA ratings are more related to rated companies' financial ratios than GRA ratings.

3. The Business Specificity of National Rating Agencies: Some Evidence From Asia

Financial markets will develop more strongly if, *ceteris paribus*, a country increases the number of rated companies. The availability of more rated companies will, in fact, improve the information available to intermediaries and investors. In turn, market failures depending on information

⁷ A remarkable example that it may take an extra effort for GRAs to capture local business practice is offered by Yamaoka and Fukutomi (2003). These two S&P analysts show that, at some point, S&P started factoring loan waivers in its ratings assigned to Japanese corporations. The study concludes that the loan waiver practice should remain popular in Japan in the near future. One may observe that loan waivers in Japan depend – to a large extent – on the role of the main bank, which, in case of distress of a related company, will choose to suffer haircuts on its own loans and keep the company's debt payments to third parties going as scheduled, rather than losing its face. Thus, it seems that the loan waiver business practice was at work in Japan well before S&P accounted for it in its corporate ratings. This exemplifies two aspects. On the negative, GRAs ratings may be biased as they do not give enough weight to local business practice. On the positive, over time also GRAs can have the incentive/ability to tailor their ratings to the specificities of the country.

asymmetries will be reduced and financial markets will be boosted by expanding both demand and supply. Indeed, nourishing NRAs can be key to increasing the number of rated companies in the country. This is because the presence in the country of the three big players (Moody's, S&P, Fitch, the global rating agencies; GRAs) may be not enough. By and large, the GRAs tend to specialize in the top rank of companies, i.e. the country's companies which are larger/more internationalized. In part, this depends on demand: larger/more internationalized companies are more inclined to get a rating from the GRAs as this rating will be more reputed in the international financial markets, where they may wish to issue debt. For another part, however, GRAs may chose to rate larger/more internationalized companies because these are the typical companies they do business with all over the world. By the same token, NRAs are likely more cost effective – and charge lower fees – at rating smaller/less internationalized companies, whose assessment depends more on getting local – often soft – information and understanding the local business practice. All in all, it appears that GRAs might have a comparative advantage in rating larger/more internationalized companies while NRAs might have a comparative advantage in rating smaller/less internationalized companies. This configures the possibility that GRAs and NRAs, rather than engaging in fierce competition across the board, might largely be complementary and specialize in different clientele. If so, a country lacking NRAs will have fewer rated companies and, consequently, less developed financial markets.

We verify whether, in fact, NRAs are more specialized in domestic-focused corporations. We investigate this hypothesis using rating data⁸ for Japan, South Korea, India and Malaysia for non financial corporations only.⁹ As already mentioned, we focus on Asia because this is the area of the world where the presence of NRAs is largest and this allows identifying any NRAs' company specialization pattern. We consider all issuers obtaining a rating either from GRAs or from NRAs or from both. In addition, we consider issuers' size along with as a proxy of their degree of internationalization. if they have shares are quoted in other market other than their domestic market (this is a proxy for internationalization). We measure issuers' size as the mean total asset in 2002. As a proxy for a company's degree of internationalization we distinguish whether a company is listed in a foreign stock market, beside being listed on its own domestic market. Naturally, one could think of many alternative ways to capture internationalization but our proxy is particularly valuable to convey that form of internationalization which could make GRA ratings more appealing. A firm which is also listed abroad is, in fact, the best potential candidate to issue securities in the international market and, as such, the most interested in obtaining a GRA rating, well recognized by global investors.

⁸ Source: Bloomberg data base.

⁹ In further work we intend analyze the impact of financial ratios on credit ratings and financial ratios of financial firms have a particular structure that needs to be controlled for.

Among the companies obtaining a rating (also) from GRAs the share of companies listed also internationally is significantly larger than among companies receiving a rating only from NRAs. In India and Malaysia this share is 100.0% for the former group and, respectively, 69.1 and 77.4 for the latter group (Figure 3). The two figures for Japan are, respectively, 94.6 and 69.3%. only in the case of Korea we find the opposite: respectively, 48.3 and 65.2%.

The difference between GRAs' clientele and NRAs' one is even more blatant when we look at company size. The average size of the companies obtaining a rating only from NRAs is much smaller than that of those companies receiving a rating (also) from GRAs. The ratio of the average size of the former group to the average size of the latter group is 5.5% in Malaysia, 9.7% in Japan, 12.8% in India and 25.9% in Korea (Figure 4).

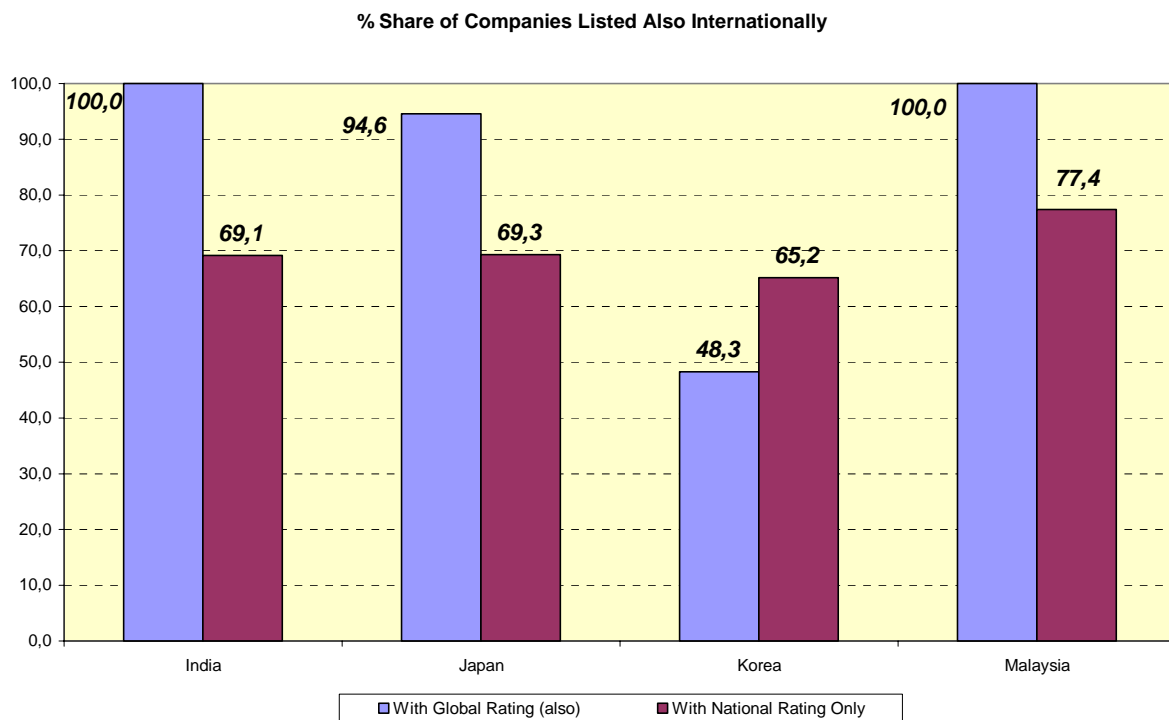


Fig. 3 Source: Our calculations on Bloomberg data between 1990 and may 2005.

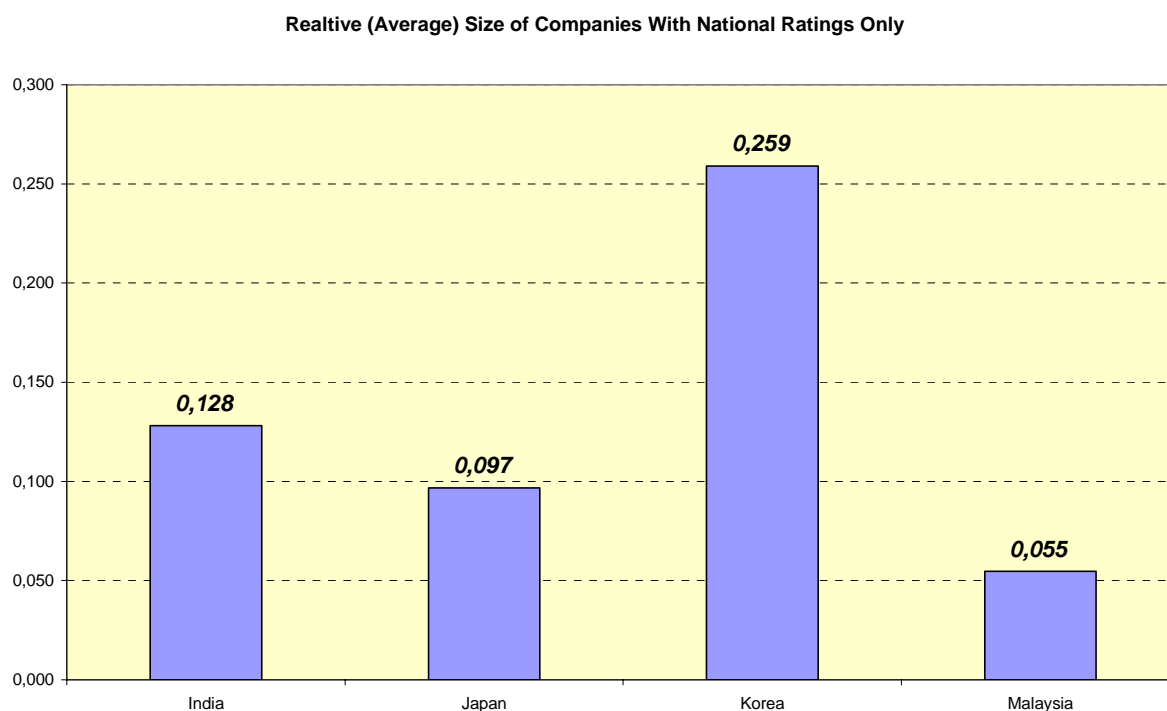


Fig. 4 Source: Our calculations on Bloomberg data between 1990 and may 2005

Our evidence on Asia, thus, supports the view that GRAs and NRAs do specialize in rating different clientele. In other words, there seems to be a division of labour between GRAs – specializing in larger-sized/internationalized companies – and NRAs – concentrating on smaller-sized/domestic-focused companies. Consequently, this evidence supports the view that the presence of NRAs may boost the extent of rated companies in a country and, through this, reduce costs associated to CARs for the banking system.

4. The ratings' information content: GRAs versus NRAs

Several studies have investigated the information content of ratings, but there is not a common agreement about that. For example one strand of literature affirms that rating upgrades have no impact on the bond and stock markets (see Griffin and Sanvicente, 1982; Holthausen and Leftwich, 1986; Impson et al., 1992; Barron et al., 1997; Ederington and Goh, 1998; Goh and Ederington, 1993, 1999; Liu et al., 1999; Matolcsy and Lianto, 1995; Wansley et al., 1992; Zaima and McCarthy, 1988). Contrary evidence on this has been found by Glascock et al. (1987) and Hsueh and Liu (1992). Another strand of literature affirms that rating downgrades are consistently associated with significant negative returns in equity and bond markets (see Impson et al., 1992;

Wansley et al., 1992; Barron et al., 1997; Ederington and Goh, 1998; Glascock et al., 1987; Goh and Ederington, 1993, 1999; Griffin and Sanvicente, 1982; Holthausen and Leftwich, 1986; Hsueh and Liu, 1992; Impson et al., 1992; Liu et al., 1999; Matolcsy and Lianto, 1995; Wansley et al., 1992; Zaima and McCarthy, 1988).

Coherently with the efficiency market hypothesis (EMH), if rating agencies base their rating change on publicly available information, stock prices should not adjust in response to rating changes. If, instead, there is a stock price reaction, this implies either evidence against the semi-strong form of the EMH, or the presence of private information available only to rating agencies that, only with the rating variation, comes into the public domain.

Bheenick (2004), in contrast with previous literature, finds that rating change announcements do not impart additional information to the market; rating changes do not seem to provide the market with additional information over the longer term period. Informative value of the ratings is already known to the market, and hence, it does not impact on stock market returns.

Hull et al. (2004) and Norden and Weber (2004), examine the relationship between rating changes and market prices in the context of the CDS (Credit Default Swap) market. They find that CDS prices predict rating changes in advance. Norden and Weber (2004) find that both the equity and the CDS markets anticipate rating downgrades, as well as reviews for downgrade, by all three global rating agencies (Moody's, Fitch and S&P). Reviews for downgrade by Moody's and S&P's exhibit the largest impact on both markets. The magnitude of abnormal performance is influenced by the level of the previous rating and by previous rating events.

The informational content of the bond ratings was studied early on by Ederington et al. (1987). They found that the market considered Moody's and S&P's ratings more reliable than other services and they viewed both ratings as equally reliable measures of an issue's creditworthiness.

Brooks et al. (2004) investigate the aggregate stock market impact of local currency and foreign currency sovereign rating changes. Consistently with the results obtained by Reinsen and Von Maltzan (1999), they found that rating downgrades have a wealth impact on stock market returns. In addition, the results indicate that multiple downgrades do not appear to impart an additional wealth effect on country markets. Holthausen and Leftwich (1986) find that in the case of downgrades which cross the investment grade (Baa and above for Moody's and BBB and above for Standard

and Poor's) and speculative grade (Ba and below for Moody's and BB and below for Standard and Poor's) bonds are associated with larger reactions than in the case of downgrades in general.

To our knowledge, though many are the empirical contributions on the evaluation of the rating effects on stock markets, there is still little evidence about the comparison of the rating activity between NRAs and GRAs; the widespread diffusion of the local agency activity and, contemporaneously of the GRAs in the same markets have been experienced only in the last 20 years.¹⁰

Mollema (2003), comparing the stock price reactions to rating changes between Moody's and S&P and Japanese raters (R&I and JCR), finds significant price reactions following the announcements of rating downgrades only by S&P and JCR, but not by Moody's and R&I. Some of his results are at odds with ours and with those reached by other studies (see Li et al. (2006), Fairchild and Shin (2004), JCIF (1999), and *Wall Street Journal* (2002, 2003b)).

The more established hypothesis is that financial markets react more consistently to rating announcements by the GRAs rather than by the NRAs (see Li, Shin and Moore, 2006). This because a "rule" is established by which the biggest and oldest rating agencies are perceived as the most accurate and reliable by the public. They retain credibility and reputation capital which takes time to build. While NRAs' activity dates back only to the mid-1980s, the GRAs operate since 1909. In fact, evidence shows that global rating agencies with more prestigious reputational capital have stronger influence on Japanese capital markets than local agencies with less prestigious reputational capital (Carow, 1999).

We try to investigate whether, indeed, the NRAs' rating variations have a different effect on stock markets than those caused by GRAs' rating variations. Our hypothesis is based on the different type of specialization of the NRAs. They seem to concentrate (as showed before) on the smaller-sized and domestically-focused firms which, if the NRAs didn't exist, would probably not ask for a rating. In addition, there is evidence that NRAs focus, more than GRAs do, on soft information rather than hard information, suggesting to think about their customized activity. To evaluate the quality of information content of rating we use the event study methodology.

We evaluate stock price reaction in the Japanese market to eliminate a possible domicile contamination effect for raters; i.e. if global raters are shown to be more influential even in markets

¹⁰ The GRAs' activity has increased in the Japanese stock market as a consequence of the disintermediation of the banking industry and the strong growth of structured finance ratings. In particular, the *Wall Street Journal* (2003a) reports that S&P and Moody's held 79% of the combined market share in 2001, and their activity is growing on local markets at a compounded rate of 30% per year.¹⁰ In addition, the Japanese bond market has good pre-conditions for the development of the rating activity, because its size is second only to that of US bond market (Hattori, Koyama, and Yonetani, 2001).

outside the U.S. (i.e. local markets), their dominance has been convincingly demonstrated. The Japanese stock market constitutes a valid environment for the purpose of analysis because of its size is huge enough to justify the development of financial services, and among others those offered by rating agencies.

Specifically, we focus our attention on Japanese financial markets and RAs operating in that markets for the following reasons:

- 1) Japan has the most developed and well experienced rating agencies with respect to other countries where local rating agencies are only at an earlier stage of development (e.g. Korea, Malaysia);
- 2) Bond markets in Japan are experiencing an extraordinary growth with respect to other Asian countries and rating agencies are more active there than elsewhere;
- 3) Japan has the second largest capital market in the world;
- 4) Investigation of equity market reactions to rating announcements in homogeneous capital markets should result in more reliable results;
- 5) Other public capital markets (e.g. the Chinese market) are not credible because of poor corporate governance and a lack of information transparency even though the Chinese market is growing very rapidly (Wall Street Journal, 2004a).

Our hypothesis is that NRAs are more specialized in evaluating local (Japanese) firms rather than GRAs because the NRAs potentially have a deep inside knowledge of local entities and, as a consequence, hold a better knowledge of the local environment, market share and business practice which can affect in a reasonable manner the “soft” information about issuer creditworthiness.

5.The event study implementation

Thus, to determine the impact of single rating changes on the Japanese stock market we set an event study to detect the abnormal returns resulting from upgrades or downgrades; after that we test whether abnormal returns are statistically significant. If the event does not have any impact on the stock market, the abnormal returns should not be statistically significant, i.e. all publicly available information is already mirrored in stock prices.

First of all we set-up the event study framework for firms which experienced a rating variation from whichever rating agencies either GRA or NRA, then we consider the rating variations experienced

by firms which obtain a rating from at least one GRA and from at least one NRA. In both cases we distinguish between negative variations (downgradings) and positive variations (upgradings).

For the reasons discussed previously – relating to the different specialization of the NRAs and their larger reliance on soft information – and contrary to what held by Li et al. (2006), our hypothesis is that variations by NRAs might have a greater impact on Japanese stock markets than those by GRAs, such effect is supposed to be stronger in case of rating downgrading, where previous empirical works have detected poor or no effect caused by rating upgrading.

In the first event study we deal with a total of 2,262 rating variations assigned by GRAs and NRAs to 542 firms listed in the Japanese stock market. In the second event study the sample size drops to 1,522 rating variations, while the firms involved reduce to 192. Robustness matters bring us to consider also the latter sample without overlapping observations (i.e. events involving the same firms by different rating agencies in the same date), whereby observations reduce to 1,498, but firms remain 192.

We consider only non financial firms listed in the Japanese stock market and use stock daily data around a period of 180 listing days. For each firm we consider the event date, which is different case by case, the actual returns and a measure of predicted returns to calculate the abnormal returns in the event window. All information is collected from the Bloomberg data base.

The event date happens at $t = 0$, $t = T_1 + 1$ to $t = T_2$ represents the event window, and $t = T_0 + 1$ to $t = T_1$ constitutes the estimation window. $L_1 = T_1 - T_0$ and $L_2 = T_2 - T_1$ are the lengths of the estimation window and of the event window, respectively. Asset returns are jointly multivariate normal and independently and identically distributed through time. Evidence on the event study framework is provided in fig. 5.

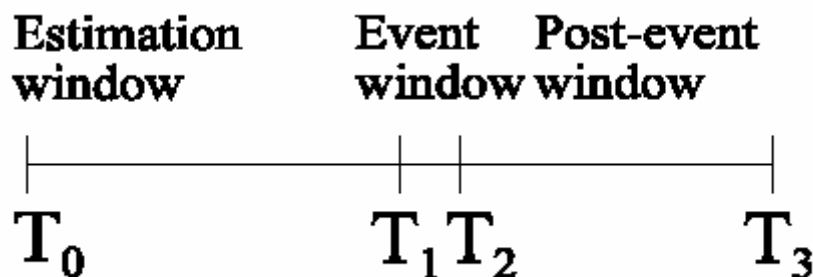


Fig. 5

Daily abnormal returns are derived from the market model which is a slight variation of the factor model (Sharpe, 1970) under the assumption of joint normality of the asset returns.

$$(2) AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})$$

$$E(\varepsilon_{it}) = 0 \quad \text{var}(\varepsilon_{it}) = \sigma_{\varepsilon_i}^2$$

where R_{it} is the return on stock i at day t , R_{mt} is the corresponding return on industry index¹¹ at day t , ε_{it} is the zero mean disturbance term, and α_i , β_i and $\sigma_{\varepsilon_i}^2$ are the market model parameters obtained via ordinary least squares regressions.

Using the sub-market index related to the specific industry in which the firms operates might be able to capture the specific market performance of that firm which can be “hidden” by the overall market performance. We reasonably believe that the stock market price trend is influenced specifically by the trend of the industry to which firms belong.

The abnormal return is a measure of the unexpected change in the stock prices associated with the event. We implicitly assume that the event is exogenous with respect to the change in the market value of the security, and the change in value of the firm is caused by the event.¹² The specific null hypothesis to be tested is whether the mean abnormal return at time t is equal to zero.

The market model parameters are based upon an estimation window of 75 days of stock price observations beginning 90 days through to 16 days before the rating change.

The event window ranges from 15 days before to 15 days after the rating change. Predicted (normal) returns are calculated by OLS estimation. We regress R_{it} on R_{mt} during the estimation period (-90, -16) to get α_i and β_i . Then, during the event period, we predict R_{it} using the market returns during the window. For each i -th firm in the event window the OLS estimator for the market model parameters for an estimation window of observations are:

¹¹ Improving on the literature, we use the sector index rather than the market index to capture the stock market trend of the sector to which firms belong. This should further reduce the variation of abnormal stock returns.

¹² Really some doubt may arise about the reasonability of this assumption in that just the rating variation may be caused by the change of the market value of the security, i.e. the event is endogenous. In such case this interpretation might be incorrect.

$$(3) \hat{\beta}_i = \frac{\sum_{t=T_0+1}^{T_1} (R_{it} - \hat{\mu}_i)(R_{mt} - \hat{\mu}_m)}{\sum_{t=T_0+1}^{T_1} (R_{mt} - \hat{\mu}_m)^2}$$

$$(4) \hat{\alpha}_i = \hat{\mu}_i - \hat{\beta}_i \hat{\mu}_m$$

$$(5) \hat{\sigma}_{\varepsilon_i}^2 = \frac{1}{L_1 - 2} \sum_{t=T_0+1}^{T_1} (R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt})^2$$

where

$$(6) \hat{\mu}_i = \frac{1}{L_1} \sum_{t=T_0+1}^{T_1} R_{it}$$

and

$$(7) \hat{\mu}_m = \frac{1}{L_1} \sum_{t=T_0+1}^{T_1} R_{mt}$$

R_{it} and R_{mt} are the return in the event period for stock i and the industry index.

Then, using the previous estimate we can calculate and analyze the abnormal returns. As stated previously, they are calculated subtracting the observed returns from the predicted (normal) returns.

$$(8) AR_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt}$$

where AR_{it} , $t = T_1 + 1, \dots, T_2$ is the sample of L_2 abnormal returns for firm i in the event window.

Under the null hypothesis, conditional on the event window market returns, the abnormal returns will be jointly normally distributed with a zero conditional mean and conditional variance $\sigma^2(AR_{it})$:

$$(9) \sigma^2(AR_{it}) = \sigma_{\varepsilon_i}^2 + \frac{1}{L} \left[1 + \frac{(R_{mt} - \bar{R}_m)^2}{\sigma_m^2} \right]$$

where L is the estimation period length (i.e. the number of days used for estimation) and \bar{R}_m is the mean of the market portfolio. With L large, $\sigma^2(AR_{it}) \rightarrow \sigma_{\varepsilon_i}^2$, that is the additional variance due to the sampling error in α_i and β_i approaches to zero; from that it derives that abnormal returns are not correlated.

Thus, estimates are based on a number of statistical assumptions, the models assume that the residuals are normally distributed with a mean of zero, are not serially correlated, have a constant variance, and are not correlated with the explanatory variables; further it is assumed that there is no correlation between residuals for the different firms.¹³ Under these assumptions the OLS estimator is efficient.

Before the construction of the test, abnormal returns have been aggregated both across firms and across time. Aggregation across firms is obtained averaging the abnormal returns for all firms in the sample on a given day, where days are counted in event time. We call this average AAR_t , which is the average residual across all firms on day t , where t is measured relative to the event day.¹⁴

$$(10) AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{it}$$

where for L large the variance is:

$$(11) VAR(AAR_t) = \frac{1}{N^2} \sum_{i=1}^N \sigma_{\varepsilon_i}^2$$

The significance of AAR_t may be tested by a Z or t test.

In order to test the persistence of the effect of rating variations during the event window $(t_2 - t_1)$, AAR_t are aggregated through time. Aggregation over time is a simple accumulation of the AAR_t over the event days. The cumulative abnormal return, CAR_{t_1, t_2} is the sum of all the AR_t between t_1 and t_2 .

$$(12) CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it}$$

¹³ Indeed, there is evidence of a slight serial correlation in security returns, they are not normally distributed (especially in the case of daily data). The residuals are correlated with values of R_{mt} ; further, when there is calendar clustering, there is evidence of contemporaneous covariance between residuals of different firms. Fortunately, the event study framework seems to be robust to most of these problems and the distribution of the residuals is close enough to normal (see Berry, Gallinger and Henderson, 1990).

¹⁴ $T=0$ is the event day; $t-1$ is the day before, $t+1$ is the day after.

where $T_a \leq T_1 \leq t \leq T_2 \leq T_a$ is the event window, and T_a and T_b are the lower and upper limits of the event window, respectively. Asymptotically (as L increases) the variance of the cumulative abnormal returns for security i is:

$$(13) \sigma^2(t_1, t_2) = (t_2 - t_1 + 1)\sigma_{\varepsilon_i}^2$$

To test the null hypothesis of zero cumulative abnormal returns, one can formulate a Z test as $CAR_i(t_1, t_2) \square N(0, \sigma_i^2(t_1, t_2))$:

$$(14) Z = \frac{CAR}{\sigma_i^2(t_1, t_2)^{1/2}} \square N(0, 1)$$

Further analysis can be conducted on aggregation across both time and securities. To aggregate across securities and through time, the assumption of no correlation across the abnormal returns of different securities must be satisfied, the average cumulative abnormal return is defined as:

$$(15) CAAR(t_1, t_2) = \frac{1}{N} \sum_{i=1}^N CAR_i(t_1, t_2)$$

where N is the number of events. The variance of the CAAR is:

$$(16) \text{var}(CAAR(t_1, t_2)) = \frac{1}{N^2} \sum_{i=1}^N \sigma_i^2(t_1, t_2)$$

Under the null hypothesis that the abnormal returns are zero:

$$(17) Z = \frac{CAAR(t_1, t_2)}{(\text{var}(CAAR(t_1, t_2)))^{1/2}} \square N(0, 1)$$

This distributional result is asymptotic with respect to the number of events N and the length of the estimation window L .

These tests are quite simple but might be poor at detecting the significance of abnormal returns, thus parametric test statistics are used. In addition, price adjustment delays may enhance the serial cross-sectional dependence in observed returns which contribute to biased OLS beta estimates.

The longer the price adjustment delay, the more the OLS beta tends toward zero [Cohen, Maier, Schwartz and Whitcomb (1986)]. Thus, in addition to “traditional” tests, parametric and non parametric tests have been specified. In our study we use the parametric test statistic developed by Boehmer et al. (1991). Abnormal test statistics are estimated as follows¹⁵. Abnormal returns are first standardised to give the standardised abnormal return (SAR):

$$(18) SAR_{it} = AR_{it} / \sigma_i \sqrt{1 + \frac{1}{T} + \frac{(R_{mt} - \bar{R}_m)^2}{\sum_{t=-90}^{-16} (R_{mt} - \bar{R}_m)^2}}$$

where σ_i is market i 's standard deviation of the risk adjusted abnormal share price return during the estimation period; T is the number of trading days in the estimation period of firm i ; and \bar{R}_m is the average market sector index in the estimation period.

Then, for each day in the event period, we calculate the cross-sectional standard deviation of the SARs:

$$(19) \sigma_{SAR_t} = \sqrt{\frac{\sum_{i=1}^N (SAR_{it} - \sum_{i=1}^N SAR_{it} / N)^2}{N(N-1)}}$$

From that it follows the standardised cross-sectional test statistic:

$$(20) Z = \frac{\sum_{i=1}^N SAR_{it} / N}{\sigma_{SAR_t}}$$

¹⁵ As underlined by Cowan and Sergeant (1996) using daily data may cause cross-sectional dependence in observed returns which contribute to biased OLS beta estimates. Campbell and Wasley (1993) report that the standardized test rejects a true null hypothesis too often. Boehmer, Musumeci and Poulsen (1991) develop a standardized cross-sectional test as a remedy for event induced increases in return variance. Their standardized cross-sectional test adjust for both non-constant variance across stocks and out-of-sample prediction. The standardized cross-sectional test improves on the Patell test by allowing the abnormal return variances to differ between the estimation and event periods. Because trading activity and therefore variance are likely to differ between the estimation and event periods, the Boehmer, Musumeci and Poulsen procedure is potentially useful in thinly traded samples (i.e. daily data). Another solution is to use the rank test (Corrado, 1989), but Cowan (1992) finds that the rank test is misspecified with Nasdaq data and he proposes the generalized sign test. Also this one is non parametric, thus avoid the dependence on normality of return distribution.

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

5.1 Description of data sample

We have collected data on rating changes/assignments and stock price data of Japanese firms listed on Japanese financial markets from 1990 until June 2005. We consider only the long term credit rating assigned by Moody’s, S&P, R&I, JCR and Mikuni to non financial Japanese firms. As in the paper by Li et al. (2006) the sample periods for the agencies are different because of the availability of ratings data: Moody’s (January 1990–May 2005), S&P (September 1990–June 2005), R&I (September 1991–June 2005), JCR (February 1995–June 2005) and Mikuni (April 1998–March 2005). Even though the data series on JCR ratings begins in late 1990s this should not affect the tests significantly because the sample size before that period is very small. Rating agencies’ activity has expanded significantly starting from 1998; evidence on this is provided in tables 1, and 2 where we report the distribution across the years of all ratings issued starting from 1990 through June 2005.

Tab.1: Distribution of issued ratings since 1990 until June 2005.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
JCR						2	2	3	298	129	101	112	126	124	111	55	1063
Mikuni									1511	194	192	170	193	184	177	123	2744
Moody's	19	22	31	79	48	28	29	25	84	59	45	60	68	65	158	29	849
R&I		1			1			1	677	250	109	159	133	91	74	27	1523
S&P	1	1	7	5	2	6	2	50	46	76	174	43	50	246	109	47	865
Total	20	24	38	84	51	36	33	79	2616	708	621	544	570	710	629	281	7044

Tab.2: Distribution of rating variation since 1990 until June 2005

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
JCR	1	1	1	2			5	3	64	77	64	50	75	86	103	42	574
Mikuni	1	4	6	10	6	6	8	7	146	177	157	145	158	212	172	70	1285
Moody's	3	1	5	5	4	2	5	2	99	104	73	68	72	71	88	60	662
R&I	1	5	9	15	3	4	5	5	192	220	149	67	88	100	70	50	983
S&P											68	131	111	124	92	44	570
Total	6	11	21	32	13	12	23	17	501	578	511	461	504	593	525	266	4074

All data have been downloaded from the Bloomberg database. Our sample encompasses only non financial Japanese firms listed on Japanese financial markets and both solicited and unsolicited ratings.

The total sample consists of 1,575 firms. JCR assigns rating to 467 firms, Mikuni rates 1,450 firms, Moody's assigns ratings to 207 firms, R&I to 530 and S&P to 297. Firms which obtain ratings from all three NRAs are 220, 192 firms have ratings both from at least one of the GRAs and from at least one of the NRAs, 82 from at least one of the NRAs and from Moody's. The bulk of our analysis will be on the GRAs and the two most important NRAs, i.e. R&I and JCR.¹⁶

Cleaning the sample to exclude the firms which are not listed on the Japanese financial markets and for which data about stock prices are not available, we obtained a total of 3,203 rating changes for a sample of 1,191 firms. Rating changes by JCR are 475, rating changes by Mikuni are 941, rating changes by Moody's are 501, rating changes by R&I are 776, rating changes by S&P are 510. The overlapping events reduce to 41 rating changes which happen in the same day and in the window of 2 days. Without considering rating variations by Mikuni, our sample drops to 2,262 rating changes involving 542 firms. A summary of the sample size is provided in table 3.

Tab.3: Distribution of the sample used

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
JCR	1	1	1	2			3	3	56	57	53	44	59	76	82	37	475
Mikuni		3	5	6	3	2	7	4	96	136	108	96	117	165	138	55	941
Moody's	2	1	3	4	5	6	3	3	71	70	62	60	68	61	60	22	501
R&I	2	1	4	6	3	1	5	3	113	116	100	85	81	87	106	63	776
S&P		1	1	2		1	2	2	48	80	88	45	68	80	47	45	510
Total	5	7	14	20	11	10	20	15	384	459	411	330	393	469	433	222	3203

The sample is characterized by a larger amount of downgradings than of upgradings. This pattern is not surprising if we take in account that, just when the RAs' activity became more intense the Japanese financial market experienced a prolonged downturn. Downgradings are almost two times as numerous as rating upgradings. R&I was the most active in rating downgradings followed by JCR, Moody's and S&P. Conversely the less active in rating upgradings was R&I, followed by JCR,

¹⁶ Mikuni has not yet obtained the recognized status from institutions, thus may be that markets are not sensible to its rating variations. Its rating cannot be used for regulation purposes. In addition the rating grades used by Mikuni have a larger range than those used by the other local rating agencies which conversely use a finer rating grade.

Moody's and S&P. Thus, at least in terms of the variations, the NRAs seem to be more conservative than the GRAs, but on the other hand ratings assigned by the NRAs were, on average, higher than those attributed by the GRAs. Some descriptive statistics about rating changes are provided in table 4.

5.2 Empirical results

We evaluate separately the effects of rating downgrades and upgrades on abnormal returns in the event window (-15, 15) for both GRAs and NRAs. Cumulative abnormal returns, average abnormal returns and their statistics are reported in table 4 for the GRAs and in table 5 for the NRAs in the cases in which a firm experiences a rating change from one of the GRAs and/or from one of the NRAs. Tables 6 and 7 report the results in the cases in which a firm experiences a rating variation from both at least one of the GRAs and at least one of the NRAs.¹⁷

¹⁷ Results which takes in account overlapping events are omitted because their incidence on the overall analysis is low, thus results are not relevantly different from those reported in table 9 and 10..

Table 4: GRAs' rating change effects on Japanese stock market¹⁸

Event date	Market Model							
	Upgrading				Downgrading			
	AAR	t-stat	CAR	t-stat	AAR	t-stat	CAR	t-stat
-15	0.0007	0.87	0.0007	0.87	0.0008	1.43	0.0008	1.43
-14	-0.0001	0.01	0.0006	0.86	0.0004	0.31	0.0013	1.09
-13	0.0000	-0.01	0.0006	1.49	0.0004	2.40	0.0016	1.40
-12	-0.0005	0.58	0.0002	0.87	0.0009	1.27	0.0025	1.73
-11	-0.0006	-0.15	-0.0005	0.68	0.0015	0.48	0.0041	2.79***
-10	-0.0006	-1.06	-0.0011	0.34	-0.0003	-0.76	0.0038	2.77***
-9	0.0000	-0.18	-0.0011	1.04	-0.0018	-2.53**	0.0020	1.28
-8	-0.0005	0.28	-0.0016	-0.13	0.0017	1.55	0.0037	3.40***
-7	0.0002	0.88	-0.0014	-0.40	0.0006	0.56	0.0043	4.43***
-6	0.0002	-1.08	-0.0012	-0.51	0.0003	2.74***	0.0046	3.75***
-5	-0.0005	-2.95***	-0.0017	-1.15***	-0.0015	-1.11	0.0031	1.89
-4	0.0020	2.15**	0.0003	0.87**	-0.0024	-3.11***	0.0007	0.36
-3	0.0019	5.79***	0.0022	3.00***	0.0014	0.52	0.0021	0.64
-2	-0.0021	-1.41	0.0001	2.19**	0.0005	1.59	0.0026	1.28
-1	0.0022	3.53***	0.0024	3.39***	-0.0015	-0.97	0.0010	0.78
0	0.0008	3.39***	0.0032	3.58***	-0.0037	-2.34**	-0.0027	-2.67***
1	-0.0004	-2.37**	0.0028	3.37**	-0.0009	-3.90***	-0.0036	-4.52***
2	-0.0013	-0.53	0.0015	2.81	0.0013	1.56	-0.0023	-3.67***
3	-0.0016	-0.65	-0.0001	1.25	0.0007	0.51	-0.0015	-3.25***
4	0.0006	0.88	0.0005	2.17**	0.0001	0.70	-0.0014	-3.33***
5	-0.0014	-2.01**	-0.0010	0.29	0.0005	2.18**	-0.0009	-2.26**
6	-0.0007	0.54	-0.0016	0.14	0.0006	1.68	-0.0003	-1.39
7	-0.0015	-1.38	-0.0032	-0.66	0.0001	0.28	-0.0002	-1.01
8	0.0004	1.49	-0.0028	-1.18	0.0003	1.71	0.0001	1.94
9	0.0005	1.73	-0.0023	-0.94	0.0014	0.67	0.0016	0.12
10	-0.0016	-1.52	-0.0040	-2.84	-0.0003	-1.56	0.0013	0.26
11	-0.0002	-0.33	-0.0041	-3.05	0.0011	1.36	0.0024	0.97
12	0.0012	2.09**	-0.0029	-1.13**	-0.0009	-0.21	0.0016	0.40
13	-0.0006	-0.63	-0.0036	-1.37	0.0010	0.52	0.0025	2.17**
14	-0.0002	0.96	-0.0038	-0.38	0.0037	4.03***	0.0063	5.58***
15	0.0004	2.46	-0.0034	0.21**	-0.0001	-2.42**	0.0062	6.12***

¹⁸ * stands for 10% significance level, ** stands for 5% significance level, *** stands for 1% significance level,

In the case of rating changes by the GRAs, it seems that both downgradings and upgradings are predicted by the stock market (fig. 5). This holds true especially for the upgradings. In the upgrading case, the CARs are positive between event dates -4 and event date 2, and are significant from the event date -5 to the event date 1. In case of downgradings, the stock market is less successful in predicting: CARs are persistently negative and significant since the event date 0 until event date 5. The effects of rating downgradings are not strongly persistent: CARs begin to rise already since $t=2$ and become positive since $t=8$, but the effect of rating downgradings is strong on the event date. Downgradings are persistently negative from $t=0$ until $t=5$ and significant at the 1% level until $t=4$.

In turn, the effects of rating upgradings are highly significant (1%) in the event date (both mean CARs and ARs are significant), CARs are still significant at $t=1$, but ARs turn negative, though significant. Thus though, at a weak pace, upgradings have some impact on stock markets, this result is in contrast with the main evidence which affirms that upgradings generally do not impact stock prices.

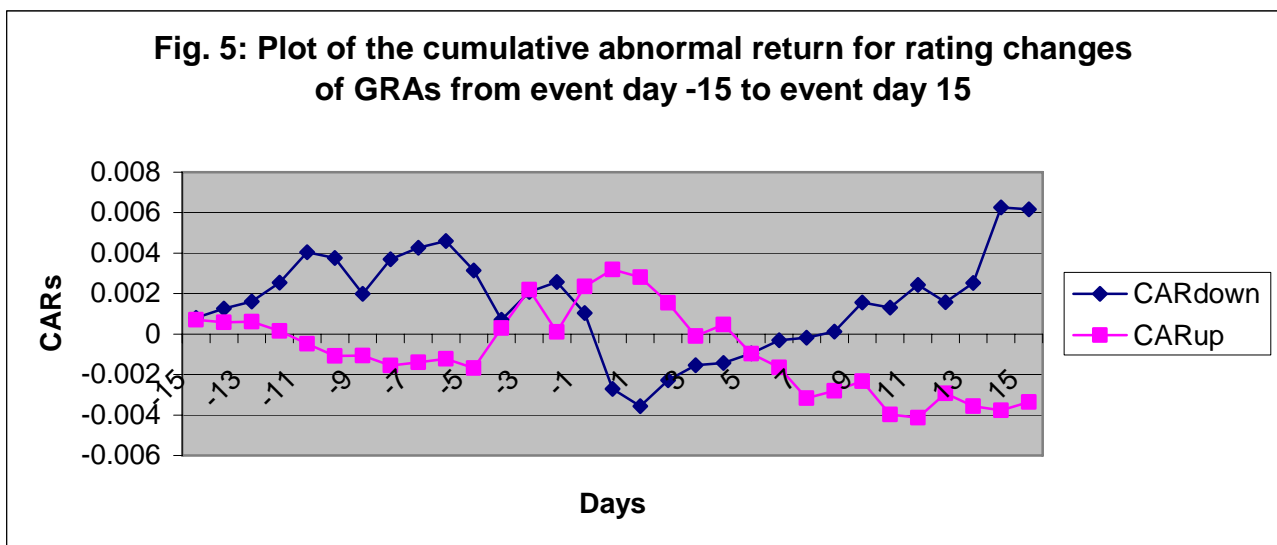
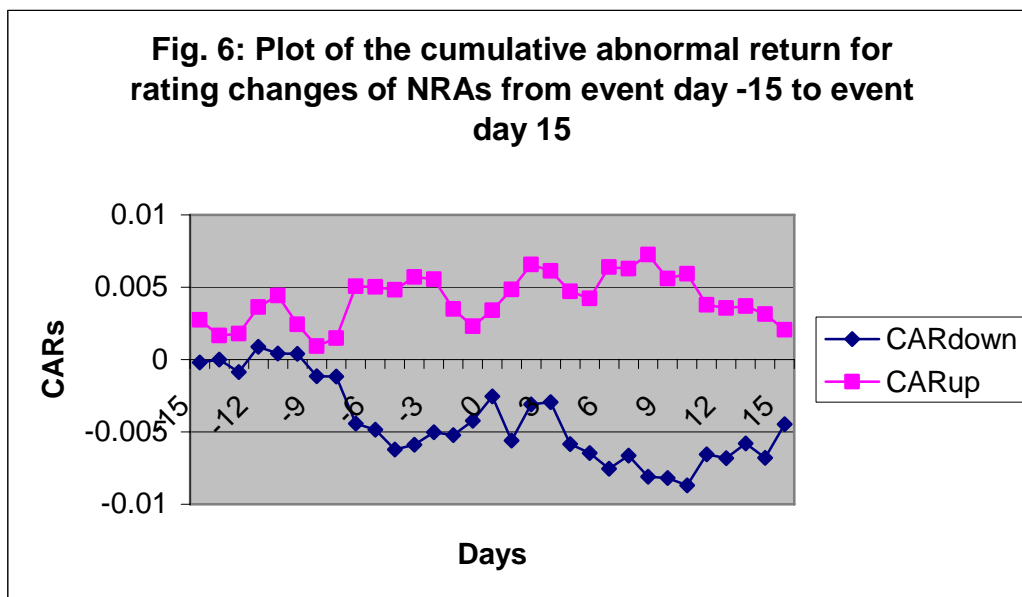


Table 5: NRAs' rating change effects on Japanese stock market¹⁹

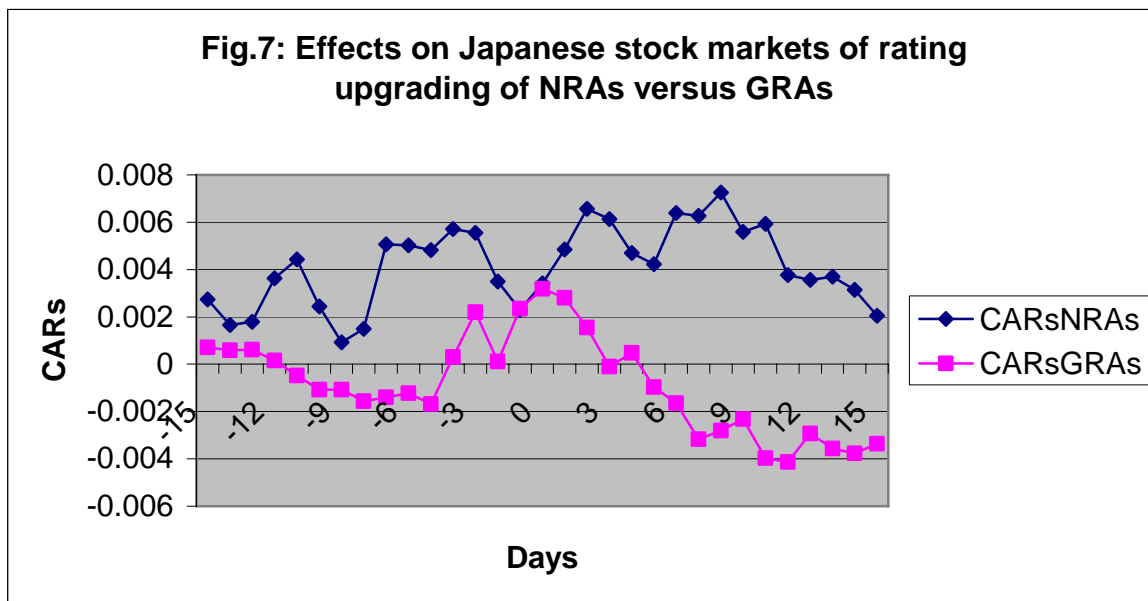
Event date	Market Model							
	Upgrading				Downgrading			
	AAR	t-stat	CAR	t-stat	AAR	t-stat	CAR	t-stat
-15	0.0027	2.01**	0.0027	2.01**	-0.0002	-0.10	-0.0002	-0.10
-14	-0.0011	-0.93	0.0017	1.03	0.0002	0.36	0.0000	0.14
-13	0.0001	0.56	0.0018	0.64	-0.0009	-1.67	-0.0009	-0.67
-12	0.0018	0.21	0.0036	2.56**	0.0018	0.61	0.0009	0.69
-11	0.0008	1.79	0.0044	3.49***	-0.0005	-1.83	0.0004	0.10
-10	-0.0020	-2.25**	0.0024	2.22**	0.0000	0.39	0.0004	0.67
-9	-0.0015	-2.02**	0.0009	1.02	-0.0016	-3.79***	-0.0011	-1.42
-8	0.0006	1.35	0.0015	1.67*	0.0000	3.25***	-0.0012	-0.93
-7	0.0036	5.25***	0.0051	4.74***	-0.0033	-2.74***	-0.0044	-4.14***
-6	0.0000	0.69	0.0050	4.34***	-0.0004	-2.46**	-0.0049	-5.52***
-5	-0.0002	-0.32	0.0048	3.99***	-0.0014	-1.30	-0.0062	-7.24***
-4	0.0009	2.93***	0.0057	4.86***	0.0003	1.78	-0.0059	-6.40***
-3	-0.0002	-0.22	0.0055	4.85***	0.0009	-0.14	-0.0050	-6.27***
-2	-0.0021	-3.11***	0.0035	3.04***	-0.0002	-3.13***	-0.0052	-7.01***
-1	-0.0012	-1.84	0.0023	1.72	0.0010	1.05	-0.0042	-5.24***
0	0.0011	0.27	0.0034	1.76*	0.0017	1.46	-0.0025	-3.69***
1	0.0014	4.92***	0.0049	3.34**	-0.0031	-1.86	-0.0056	-5.89***
2	0.0017	0.62	0.0066	5.09***	0.0025	2.18**	-0.0031	-2.94***
3	-0.0004	-0.53	0.0061	4.24***	0.0001	1.20	-0.0030	-3.08***
4	-0.0014	-1.50	0.0047	2.83***	-0.0029	-2.63***	-0.0058	-5.77***
5	-0.0005	-1.78	0.0042	3.08***	-0.0006	-2.18**	-0.0065	-6.09***
6	0.0022	5.73***	0.0064	4.32***	-0.0011	-2.44**	-0.0075	-7.93***
7	-0.0001	-0.80	0.0063	4.54***	0.0009	1.88	-0.0066	-6.58***
8	0.0010	0.23	0.0073	5.29***	-0.0015	-2.22**	-0.0081	-8.06***
9	-0.0017	-0.36	0.0056	3.79***	-0.0001	-0.20	-0.0082	-7.34***
10	0.0003	0.77	0.0059	4.39***	-0.0005	-0.78	-0.0087	-7.96***
11	-0.0022	-1.24	0.0038	2.77***	0.0021	3.11***	-0.0066	-5.48***
12	-0.0002	-0.66	0.0036	2.21**	-0.0003	-1.12	-0.0068	-5.93***
13	0.0001	0.88	0.0037	1.85*	0.0010	5.04***	-0.0058	-3.99***
14	-0.0006	-0.13	0.0031	1.37	-0.0010	-4.35***	-0.0068	-4.77***
15	-0.0011	-0.74	0.0020	1.22	0.0023	1.44	-0.0045	-2.99***

¹⁹ * stands for 10% significance level, ** stands for 5% significance level, *** stands for 1% significance level.

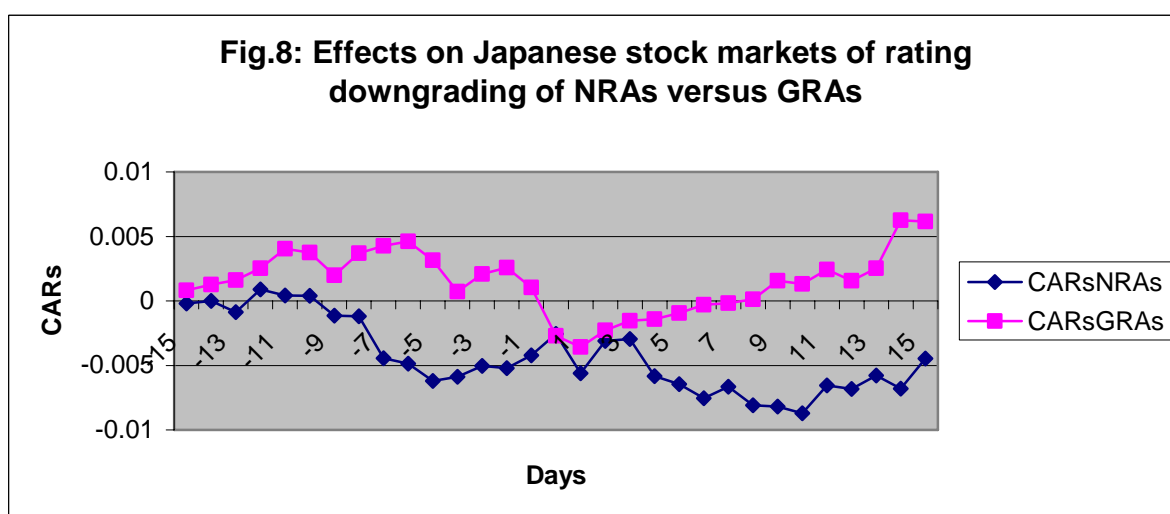
In the case of NRAs' rating changes, as also shown in fig. 6, the effects of rating upgrading seem to be persistently positive and the CARs are persistently significant, besides the effects of rating downgradings seem to be persistently negative (as shown by the value of mean CARs, which range from -0.0011 to -0.0045), and whenever CARs are significant, they are mostly significant at the 1% level. Similarly to GRA's upgradings, the market seems to predict upgradings, but in this case the upgrading effects are highly persistent over time and significant almost all all the times at the 1% level. Rating downgradings are predicted by stock markets and negatively persistent in time as well. CARs are significant at the 1% level from $t=-7$ through $t=15$.



Comparing the upgrading effects on stock markets which follow GRAs' and NRAs' rating changes it comes up that not only the CARs following NRA's upgradings are larger than those caused by GRAs' upgrading (for example at $t=1$ $0.0028 < 0.0049$, i.e. CARs of GRAs are just about half of those of NRAs) but they have always the right (positive) sign and they are persistently significant. CARs following GRAs' upgradings become negative since $t=3$ and behave so (except $t=4$) until $t=15$. Some evidence about the different effects on stock markets of rating upgradings relating to the GRAs and the NRAs is provided in fig. 7.



Besides comparing the downgrading effects, CARs following to NRAs' downgradings are persistently negative since $t=-9$ through $t=15$ and significant all the times at the 1% level. Less clear seems to be the pattern of GRAs' downgradings, though CARs are significant at $t=-11$, $t=-10$, $t=-8$, $t=-7$ and $t=-6$ they are not decreasing. They turn out again significant from $t=0$ through $t=5$ but with the right (negative) sign. Comparing CARs between the GRAs and NRAs it is noteworthy that the effects of NRAs' downgradings tend to be larger than those caused by GRAs' downgradings (e.g. at $t=1$ $-0.0036 > -0.0056$). Furthermore, this 'behaviour' holds true in the event window (fig. 8). In addition, it seems that after $t=5$ the market does not take in account anymore rating downgradings by the GRAs, conversely to what happens for NRAs' downgradings.



Next we consider the effects of rating variations experienced by firms which are rated by at least one of the NRAs and at least one of the GRAs (specif.2)

Table 6: GRAs' rating change effects on Japanese stock market²⁰(specif.2)

Event date	Market Model							
	Upgrading				Downgrading			
	AAR	t-stat	CAR	t-stat	AAR	t-stat	CAR	t-stat
-15	-0.0004	-0.28	-0.0004	-0.28	0.0025	2.55**	0.0025	2.55**
-14	-0.0010	-0.40	-0.0014	-0.12	0.0005	0.59	0.0031	1.63***
-13	-0.0002	-0.50	-0.0016	-0.12	0.0022	2.61***	0.0053	1.95***
-12	-0.0011	-0.23	-0.0027	-0.30	0.0006	0.81	0.0058	1.96***
-11	-0.0009	-0.71	-0.0036	-0.05	0.0015	1.46	0.0073	2.25***
-10	-0.0005	-0.61	-0.0041	-0.27	-0.0004	-0.78	0.0069	2.19***
-9	-0.0015	-3.42***	-0.0056	-0.67	-0.0012	0.81	0.0057	1.82***
-8	0.0002	0.86	-0.0054	-1.45	0.0023	1.24	0.0081	2.39***
-7	-0.0003	-0.27	-0.0057	-1.74*	0.0007	-0.24	0.0087	2.46***
-6	-0.0008	-1.34	-0.0064	-2.13**	-0.0006	-1.07	0.0081	2.14***
-5	0.0002	-1.78	-0.0062	-2.21**	-0.0015	0.83	0.0066	1.71***
-4	0.0016	1.64	-0.0046	-1.12	-0.0029	-1.28	0.0037	1.18***
-3	0.0042	7.03***	-0.0004	2.31**	0.0012	-0.35	0.0049	1.25***
-2	-0.0026	-1.70	-0.0030	1.01	0.0006	2.20**	0.0055	1.56***
-1	0.0030	7.11***	0.0000	2.28**	-0.0029	0.17	0.0026	1.20***
0	0.0022	3.15***	0.0022	2.55**	-0.0012	2.34**	0.0014	0.70***
1	-0.0015	-2.94***	0.0007	1.64	-0.0013	-4.30***	0.0001	0.49**
2	-0.0002	-0.20	0.0005	2.25**	-0.0012	-0.38	-0.0011	1.47
3	-0.0033	-0.32	-0.0028	0.08	0.0007	1.36	-0.0004	1.70
4	0.0012	1.03	-0.0016	1.45	-0.0005	0.27	-0.0009	1.49
5	-0.0016	-1.66	-0.0032	-0.33	0.0021	1.89	0.0012	0.52***
6	0.0001	0.72	-0.0031	-0.27	-0.0012	-3.11***	0.0000	0.35
7	-0.0033	-2.44**	-0.0065	-2.69***	-0.0002	-2.11**	-0.0002	0.34
8	0.0000	0.01	-0.0064	-2.84***	-0.0002	1.16	-0.0005	0.21
9	0.0005	1.67	-0.0059	-2.94***	0.0028	1.77	0.0024	0.45
10	-0.0014	-0.72	-0.0073	-3.43***	-0.0008	-1.79	0.0016	0.41
11	0.0003	0.36	-0.0070	-3.12***	0.0000	2.18**	0.0016	0.50
12	0.0007	0.84	-0.0063	-1.87*	-0.0017	0.03	-0.0001	0.36
13	-0.0024	-2.59***	-0.0087	-3.28***	0.0057	4.51***	0.0056	0.89
14	0.0008	1.60	-0.0079	-0.94	0.0051	4.89***	0.0107	1.33
15	0.0014	3.46***	-0.0065	0.23	0.0006	1.61	0.0113	1.36

²⁰ * stands for 10% significance level, ** stands for 5% significance level, *** stands for 1% significance level.

Whenever the stock market experiences GRAs' upgradings ARs are significant at the 1% level around the event date, CARs are significant with the right (positive) sign only at $t=-3$, $t=-1$, $t=0$, $t=2$. GRAs' downgradings are largely predicted by the stock market; CARs are significant from $t=-15$ through $t=1$.

Table 7: NRAs' rating change effects on stock market²¹ (specif.2)

Event date	Market Model							
	Upgrading				Downgrading			
	AAR	t-stat	CAR	t-stat	AAR	t-stat	CAR	t-stat
-15	0.0033	1.81	0.0033	1.81*	0.0004	0.57	0.0004	0.57
-14	-0.0007	-0.77	0.0026	0.98	0.0013	0.62	0.0017	1.12
-13	-0.0002	0.07	0.0024	0.71	-0.0017	1.26	0.0000	-0.26
-12	0.0042	0.21	0.0067	3.50***	0.0009	0.47	0.0009	0.03
-11	0.0015	0.89	0.0082	4.44***	0.0012	-0.44	0.0021	1.18
-10	-0.0011	-1.54	0.0071	3.69***	0.0006	2.83***	0.0027	1.97**
-9	-0.0034	-4.34***	0.0037	1.61	0.0000	-1.12	0.0027	2.08**
-8	-0.0007	-1.20	0.0030	1.42	-0.0004	2.02**	0.0023	2.38**
-7	0.0027	5.71***	0.0058	3.73***	-0.0018	-2.16**	0.0005	0.98
-6	-0.0006	-0.45	0.0052	3.15***	-0.0010	-3.70***	-0.0005	-0.90
-5	0.0002	0.72	0.0054	2.38**	-0.0010	-1.12	-0.0015	-2.17**
-4	0.0015	1.04	0.0069	3.05***	-0.0010	1.43	-0.0024	-2.14**
-3	0.0010	1.07	0.0079	3.84***	0.0008	1.13	-0.0016	-2.03**
-2	-0.0017	-2.73***	0.0062	2.24**	0.0001	-1.97**	-0.0015	-2.53**
-1	-0.0023	-2.12**	0.0039	0.63	0.0005	-1.10	-0.0010	-2.13**
0	-0.0022	-1.39	0.0017	-1.26	0.0009	2.43**	-0.0001	-0.83
1	-0.0002	4.13***	0.0016	-0.54	-0.0041	-1.40	-0.0042	-3.07***
2	0.0034	0.75	0.0050	1.45	0.0035	2.57**	-0.0007	-0.57
3	0.0002	0.82	0.0052	1.46	0.0009	0.81	0.0002	-0.12
4	-0.0020	-2.17**	0.0032	0.07	-0.0009	-1.71	-0.0007	-0.72
5	0.0007	-1.10	0.0039	1.65*	-0.0006	-2.33**	-0.0013	-0.88
6	0.0028	3.73***	0.0067	2.92***	-0.0001	-1.76	-0.0014	-1.77
7	0.0011	0.49	0.0078	3.42***	-0.0013	0.70	-0.0027	-1.42
8	0.0023	0.62	0.0100	4.99***	-0.0009	-0.94	-0.0036	-2.13
9	-0.0031	-0.65	0.0069	2.67***	0.0002	0.56	-0.0034	-1.65
10	0.0005	-0.35	0.0074	3.42***	0.0005	0.96	-0.0029	-1.31
11	-0.0020	-1.17	0.0054	1.77*	0.0020	1.68	-0.0009	0.38
12	0.0021	2.91***	0.0075	2.80***	0.0006	0.52	-0.0003	0.08
13	0.0007	0.11	0.0082	2.38**	0.0011	5.30***	0.0008	1.54
14	-0.0007	-0.42	0.0075	2.39**	0.0000	-1.40	0.0008	1.62
15	-0.0011	-2.54**	0.0064	2.18**	0.0033	2.30**	0.0041	3.80

²¹ * stands for 10% significance level, ** stands for 5% significance level, *** stands for 1% significance level,

Instead, NRAs' upgradings, as in the previous case, are predicted by the stock market, CARs are significant at $t=-12$, $t=-11$, $t=-10$ and from $t=-7$ through $t=-2$, then CARs are significant from $t=5$ until $t=15$. CARs are persistently positive and significant. In the downgrading case CARs (still positive, but decreasing) are significant at the 5% level at $t=-10$, $t=-9$ and $t=-8$; at $t=-7$ and $t=-6$. ARs are negative and significant respectively at 5% and 1% level of significance. CARs become negative from $t=-6$ and behave persistently so until $t=12$ except at $t=3$ but they are significant at the 5% level only from $t=-5$ to $t=-1$ and at $t=1$.

Comparing the downgrading effects of the two different groups of rating agencies it comes up that the effects of NRAs' downgradings are larger than those of GRAs' downgradings (at $t=1 - 0.0042 < 0.0001$), though their effects are no longer persistently significant after $t=1$ (as it happens also for GRAs' downgradings). The effects of GRAs' upgradings remain almost the same (CARs are less significant), instead the effects of NRAs' upgradings become by far weaker, but, anyway once again, the upgrading effects on the stock market is larger for NRAs' upgradings. This different impact on the stock market of rating changes with respect to the previous ones, may due to the fact that whenever we restrict our sample to firms which obtain ratings from at least one GRA and at least one NRA we drop many observations for the NRAs' rating changes.

All in all, it seems that, also this last evidence confirms a larger impact on the stock market of rating variations by the NRAs. In addition it is confirmed that rating upgradings have a poor effect with respect to rating downgradings. Furthermore, it is interesting to underline that in the second event study implementation the most observations lost belong to the NRAs and the overlapping events reduce noticeably. Evidence on this is reported in table 8:

Table 8: summary of observation used in the event study

	TOT. (1)	G&L (2)	G&Lw_overlapping (3)
downgrading GRAs	330	293	286
upgrading GRAs	269	230	228
downgrading NRAs	579	344	329
upgradingNRAs	178	96	96

It seems quite evident that firms obtaining a rating from a GRAs obtain also a rating from NRAs, but there are also many firms obtaining a rating from only national rating agencies. When we cross from (1) to (2) we loose 37 and 39 observation regarding downgradings and upgradings, respectively which belong to GRAs, instead when we consider NRAs' variation we loose 235 and 82 observation for downgradings and upgradings, respectively. This may involve that the significant

response of stock markets to rating downgrading in the first event study implementation may be due to the further information released by NRAs rather than those issued by GRAs and the reason for what previous evidence don't find significant evidence regarding rating upgrading might be because they disregard activity made by NRAs.

6. Conclusions

Our empirical results suggest that the contemporaneous operativity of GRAs and NRAs could be beneficial in financial markets in that they specialize in different clientele. While the GRAs are prone to rate the internationalized/big firms, the NRAs focus on small-medium sized firms that, probably, are unable to hire a rating from GRAs because is too expensive for them. Further it seems that NRAs' rating have a major effect on financial markets, this confirms that they are at least worthy as those attributed by GRAs. Financial markets react to rating variation but they react much more to NRAs' rating variation. This means that, despite their small scale of coverage, their ratings matter. NRAs' ratings are evaluated by markets as reliable, thus their further development may help banks in setting CARs more responsive to the fair creditworthiness of the issue/issuer saving costs due to useless extra capital held using internal ratings based only on public information.

We find contrary evidence with respect to what has been found by Li, Shin and Moore (2006). Our investigation shows that local agencies (R&I and JCR) are more influential than the two global ones (Moody's and S&P) and this holds true both for downgradings and upgradings, but it is especially true for downgradings. This last results holds especially true when we take in account firms which obtain rating both from whichever NRAs and GRAs, in particular the theory about no or poor effects of rating upgradings is confirmed.

Such different results could be due to various issues. First, to the fact that we don't consider financial firms, while Li et al. (2006) do. Second, our sample is 2 years longer. Third, in our market model we consider, instead of the market return, the industry market return to capture the trends of the specific industrial sector to which each firm belongs. Fourth, the event window is very short, it is not large enough to assure that abnormal return are independent through the time, i.e. is not reasonable to assume that the second term of equation (9) approaches to zero.²² In addition, , considering also financial firms can introduce some distortion in the sample in that the financial firms can have relationships with rating agencies they hire.

²² MacKinlay (1997), p. 21.

The fact that the activity of the NRAs appears more influential with respect to that of the GRAs is plausible in the sense that they have a sort of “domicile” advantage. If, on one hand, they may be tied to the industry they rate, they can have confidential information that GRAs cannot have, because their activity is decentralized and they apply standardized criteria in assigning ratings regardless the specific environment in which rated firms operate.

The concern about the first move player is somewhat surprising, in the sense that though GRAs are the first ones in issuing a rating change, the subsequent rating change by NRAs still conveys information to financial markets. Thus, it appears that the NRAs do not just provide a useless duplication of information, rather it seems that NRAs convey to the market something that GRAs are not able to capture. In this view, we may conclude that the contemporaneous activity by the global and local rating agencies is useful to reach market efficiency rather than creating rating fear or rating shopping. This is especially true if we keep in mind that previous studies have found that both global ratings and local ratings are equally predictable using financial indicators, thus the idea of inflated ratings should be kept away (Packer, 2000). The additional information provided by the NRAs can explain why markets take into account a combination of both Japanese and global ratings. Indeed, we showed that, conversely to NRAs, GRAs rather than bringing new, confidential, information to the stock market, simply convey information already known. In a sense, it appears that GRAs are mirroring all public information.

A very interesting point to be explored in the future would pertain to investigating the timing of the rating processes in which both the GRAs and the NRAs are involved. In particular, given event uncertainty, it could be that the distinction about who is the first mover is not really exact. In addition, it may be the case that the rating change effects differ across small and big firms.²³ But the sample size makes this investigation hardly affordable.

Furthermore, it may be interesting to investigate the behaviour of the Japanese NRAs in other markets, other than the Japan, where also the GRAs operate; the possible detection of major effects of NRAs rating activity might provide a further support to our findings. Nonetheless, to better understand the reason of the different stock market reaction, one should be able to identify in which respects the qualitative information encompassed in NRA and GRA ratings really differ. Perhaps, the ‘double’ information effect might make investors more confident and CARs more responsive to the actual riskiness of exposures.

²³ Firms dimension may be measured by different variable, i.e. total assets, number of employees, sales, etc.

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