

Effects of National Recognition on the Influence of Credit Rating Agencies: The Case of Dominion Bond Rating Service

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Abstract

Much of the influence of rating agencies such as Moody's and S&P may be attributed to their status as Nationally Recognized Statistical Rating Organizations (NRSRO). Only ten rating agencies worldwide including Dominion Bond Rating Service (DBRS), a Canadian agency, have obtained NRSRO accreditation as of 2008. The study is the first attempt to investigate the relationship between NRSRO designation and rating agency influence.

We find that ratings for the pre-NRSRO period are distinctly higher than those from the post-NRSRO period. In addition, DBRS sharply increased the frequency of new ratings to non-Canadian firms and expanded unsolicited credit ratings significantly after recognition. We also find that stock price reactions to the announcements of rating downgrades in the post-NRSRO period are equivalent to those in the pre-NRSRO period. While stock prices react significantly to rating downgrades of Canadian firms in both periods, we find no significant price reactions for those of non-Canadian firms for either period. We conclude that NRSRO designation does not amplify the influence of a rating agency.

JEL Classification: G28

Key words: Credit Ratings, NRSRO Designation, Default Risk

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I. Introduction

In April 1995, Moody's Investors Service downgraded the sovereign credit rating of Canadian government bonds from AAA to Aa1 mainly due to increased budget deficits. As a result, the Canadian government had to pay additional interest expenses of about \$300 million on its debt (*Washington Post*, 2004). The power and influence of the Big Two credit rating agencies, Moody's and S&P, are acknowledged to be substantial.¹ According to the *Wall Street Journal* (2003), these two agencies alone dominate the world credit services market with about 80% of market share.

Rational investors should condition their beliefs as to the influence of rating agencies on their specialized skills at assessing credit worthiness and default risk.² A reliable relationship between ratings and default rates has long been in evidence for established agencies such as Moody's and S&P. In addition, certification such as Nationally Recognized Statistical Rating Organizations (NRSRO) status is valuable to the extent such certification reinforces or confirms the market's confidence in the abilities of rating agencies to discern credit quality.

The designation of NRSRO by the U.S. Securities and Exchange Commission (SEC) enables the ratings of NRSRO agencies to be used as credible investment guidance by investors such as bond and money-market mutual fund managers, as well as a crucial financing benchmark by issuers. This is because most mutual funds, insurance companies, banks, and pension funds in the U.S. are not allowed to invest in bonds with low-quality ratings.³

According to the Basel II agreement of the Basel Committee on Banking Supervision (Bank for International Settlements, 2004), commercial banks can use the credit ratings of External Credit Assessment Institutions (ECAI) in assessing their capital requirements. Bank regulators in each country such as central banks can designate ECAI. For example, the State Bank of Pakistan (2005) lists the objectivity of rating methodology, independence, and international access and transparency as eligibility criteria for the recognition of ECAI. The Bank of Italy awarded ECAI status to Moody's and Fitch Ratings in 2006. In the United States, ECAI status is equivalent to NRSRO designation. The SEC allows commercial banks to use credit ratings assigned by NRSRO in calculating their capital requirements.

¹ According to the *Wall Street Journal* (2003), S&P and Moody's have 80% market share, followed by Fitch (14 percent) and other rating agencies (6 percent).

² S&P Rating Services, a unit of McGraw Hill, began assigning ratings in 1916, and has 1,250 analysts, and Moody's Investors Services, a subsidiary of Moody's Corporation, was founded in 1900, and has 1,000 analysts (*Wall Street Journal*, 2006a).

³ Rule 2a-7 of the Investment Company Act (1940) of the U.S. specifies that money market funds should invest in high-quality short-term securities rated by the NRSROs.

Many domestic and foreign rating agencies such as Egan-Jones Ratings Co. in the U.S., and R&I, the largest rating agency in Japan, have tried unsuccessfully to obtain NRSRO status from the SEC for many years. Only Moody's, S&P, Fitch, Dominion Bond Rating Service (DBRS), and A.M. Best Co.⁴ had NRSRO status until 2006. The Big Two and Fitch received NRSRO status in 1975, DBRS obtained the recognition in February 2003, and A.M. Best in March 2005. On the other hand, after the U.S. Congress passed the Credit Rating Agency Reform Act on September 29, 2006 (*Wall Street Journal* 2006a), five more rating agencies obtained the NRSRO status. The law required the SEC to establish clear decision criteria for the qualification of NRSRO rating agencies.

For example, the SEC awarded NRSRO status to two Japanese rating agencies, R&I (Rating & Investment Information) and Japan Credit Rating Agency (JCR), in 2007. R&I and JCR are the first non-Anglo-American rating agencies to have acquired the designation. Additionally the SEC approved the application of three private U.S. rating agencies such as Egan-Jones Rating Company, Realpoint LLC, and LACE Financial Corp for NRSRO status 2008. Those three agencies generate revenue by selling rating information services to subscribers. In particular, while LACE Financial specializes in financial institutions, Realpoint has expertise in commercial real estate industry. In summary the SEC issued seven NRSRO certifications out of total ten after 2000.

Table 1
Historical Development of Designation of NRSROs
(Nationally Recognized Statistical Rating Organizations)*

<u>Rating Agency</u>	<u>Country</u>	<u>Year of Designation</u>	<u>Main Revenue Source</u>
Moody's	US	1975	Issuer
S&P	US	1975	Issuer
Fitch	France	1975	Issuer
DBRS	Canada	2003	Issuer
A.M. Best	US	2005	Investor
R&I	Japan	2007	Issuer
JCR	Japan	2007	Issuer
Egan-Jones	US	2008	Investor
LACE Financial	US	2008	Investor
Realpoint LLC	US	2008	Investor

*The information is obtained from www.sec.gov. Country is the nation where each rating agency is headquartered. For Main Revenue Source, if a rating agency generates revenues from investors by selling them rating subscription services, the agency is classified as "investor"; if it receives most revenues from bond issuers by soliciting ratings, the agency is called "issuer."

⁴ Dominion Bond Rating Service, founded in 1976, is a privately owned Canadian credit rating agency. A.M. Best is a U.S.-based private rating agency established in 1899 and its specialty is insurance company ratings.

The historical development of the designation of the NRSROs is summarized in Table 1. Even though there were only three NRSROs before 2003, seven raters attained the recognition over the last five years. In addition, the main revenue source of four rating agencies such as A.M. Best, Realpoint, LACE and Eagan-Jones is investors, not issuers who request ratings to rating agencies. In other words, the four raters assign ratings based on public information without the request of issuers and do not receive fees from issuers.

In a letter to DBRS in February 2003, and in a letter to A.M. Best in March 2005, the SEC stated that it granted NRSRO status because the agencies met the designation requirements in terms of organizational structure, rating process, and internal procedures to prevent misuse of information.⁵ In a proposed rule, the SEC (2005) stated that the most important criterion to be recognized as a NRSRO agency is that “a rating agency should be widely accepted in the U.S. as an issuer of credible and reliable ratings by the predominant users of securities ratings.” During the process of review for NRSRO designation, the SEC examines the operational capability and reliability of the rating agency, its organizational structure, financial resources, size and ability of the workforce, rating procedures, internal procedures to prevent misuse of non-public information, and the independence of the agency from issuers.

In this study, we examine whether NRSRO designation affects on both the ratings and the influence of rating agencies. Our research is the first effort to investigate both the rating differences and the differences in stock market reactions before and after NRSRO designation and to explore the relationship between NRSRO designation and rating agency influence. In particular, we compare DBRS ratings before and after NRSRO designation in February 2003, and investigate whether there are differences in ratings and investor responses subsequent to the designation.

Because of data availability, we examine only DBRS ratings and stock market reactions to its rating changes. For instance, we checked the availability of data for A.M. Best around the NRSRO designation (two years before and after the designation) and found a very small number of testable sample size. In addition, we could not obtain the ratings of the Big Two around the designation and there are not enough samples for the ratings of R&I, JCR, and Eagan-Jones because they joined the NRSRO club recently. We also use only stock market reactions due to the unavailability of bond yields data for DBRS.

We find that ratings for the pre-NRSRO period are higher than those of the post-NRSRO period. Moreover, we find that DBRS sharply increased the frequency of assignment of new ratings to non-Canadian firms, and it expanded unsolicited credit ratings significantly after NRSRO recognition. Examining U.S. stock markets, we also find that stock price reactions for the announcements of rating downgrades in the post-NRSRO period are not different from those in the pre-NRSRO period. While stock prices react significantly to rating downgrades of Canadian firms in both periods, we find no significant differences in stock market reactions for the pre- and post-periods. The results

⁵ The letters to DBRS and A.M. Best are available on www.sec.gov.

suggest that investors pay attention to the opinions of DBRS when the agency changes ratings of Canadian firms because they believe that DBRS possesses specialized skills at assessing credit worthiness and default risks for these firms. However, after we control for the influence of the Big Two by examining the rating changes of Canadian firms by Moody's and S&P, the influence of DBRS vanishes. We conclude that NRSRO designation does not amplify the influence of a rating agency.

We develop two research hypotheses in Section II, and we describe the methods used to test the hypotheses in Section III. Data are described in Section IV, and our empirical findings are reported and discussed in Section V. We also provide robustness checks for the empirical results in Section VI and conclude in Section VII.

II. Literature Review and Hypothesis Development

Previous literature documents the influence of the major agencies on firm value. For example, using Moody's and S&P's ratings in the U.S., Holthausen and Leftwich (1986), Hand, Holthausen and Leftwich (1992), and Dichev and Piotroski (2001) find that bond downgrading announcements result in significant reductions in firm value, while bond upgrading announcements do not. In addition, Li, Shin, and Moore (2006) find that Moody's and S&P are more influential than the two major Japanese raters (R&I and JCR) for rating downgrades even in the Japanese capital markets.

Partnoy (1999, 2001, and 2006) and White (2002), argue that the designation of NRSRO grants rating agencies monopolistic power, and the influence of raters stems from the designation, not from their specialized skills or knowledge at assessing credit risk. They insist that the SEC provides rating agencies with reputational capital by giving them "regulatory licenses," i.e. NRSRO designation, and they contend that the SEC should eliminate NRSRO designation and replace credit ratings with credit spreads.⁶ Partnoy (2001) argues that the profit and size of the Big Two increased significantly after NRSRO designation in 1975.⁷

On the other hand, Beaver, Shakespeare, and Soliman (2006) compare the ratings of a NRSRO agency (Moody's) with those of a non-NRSRO agency (Egan Jones) and find that the former are on average about one notch lower than the latter. Shin and Moore (2003) report that the ratings of NRSRO agencies (Moody's and S&P) are on average two notches lower than those of non-NRSRO agencies (R&I and JCR).

We first hypothesize that rating agencies assign more conservative ratings to maintain their reputational capital ("regulatory licenses") following NRSRO designation. Although Beaver, Shakespeare, and Soliman (2006) and Li, Shin, and Moore (2006) show that

⁶ Rating agencies are frequently criticized for ratings failures. For instance, the Big Two had maintained Enron's credit rating as investment grade until four days before Enron filed for bankruptcy on December 2, 2001. The U.S. Congress held hearings to investigate the rating failure.

⁷ We do not know the profit and size of DBRS before and after its NRSRO designation in 2003 because DBRS is a private company and does not disclose the information. However, according to www.dbrs.com, we find that the number of credit analysts in the company sharply increased from 41 in February 2003 to 107 in August 2008.

rating downgrades of some non-NRSRO agencies such as R&I and Egan Jones cause negative effects on stock prices of rated firms, the influence of raters varies in each study. For example, while investors respond more strongly to downgrades of Egan Jones than those of Moody's in the U.S. market (Beaver, Shakespeare, and Soliman, 2006), stock prices react more strongly to changes in credit ratings of NRSRO agencies (Moody's and S&P) than non-NRSRO raters (R&I, JCR) in the Japanese market (Li, Shin, and Moore, 2006).

Norden and Weber (2004) and Hull, Predescu and White (2004) examine stock price reactions and credit default swap (CDS) spreads around rating changes and rating reviews by U.S. rating agencies. They find that reviews for possible downgrades have a significant effect on stock prices and CDS spreads, but rating downgrades themselves do not, suggesting that the market anticipates the rating downgrades from reviews by rating agencies.⁸

According to the argument of Partnoy (1999, 2001, and 2006) and White (2002) the influence of NRSRO raters results from certification status, and not from their specialized skills or knowledge at assessing credit risk. We test the second hypothesis that investors react more strongly to the announcements of ratings after NRSRO certification than before the certification. Examining rating changes of S&P, Moody's, and Fitch before and after the implementation of Regulation Fair Disclosure (RFD)⁹ by the Securities and Exchange Commission (SEC) on October 23, 2000, Jorion, Liu, and Shi (2005) report that stock market reactions to rating downgrades and upgrades in the post-RFD period are stronger than those in the pre-RFD period.

We summarize the two hypotheses as follows.

Hypothesis 1: rating agencies assign lower ratings during the post-NRSRO period.

Hypothesis 2: equity investors react more strongly to the announcements of rating changes for the post-NRSRO period.

III. Research Methods

We use the Wilcoxon rank sum test due to the ordinal nature of the ratings data¹⁰ and then use an ordered probit model in order to test the hypothesis that agencies assign more conservative ratings following NRSRO designation. The Wilcoxon rank sum test examines whether ratings in the pre-NRSRO period have the same distribution compared

⁸ We analyzed the announcements of DBRS "ratings under reviews with positive or negative implications" during the sample periods, and found that the sample size is very small and most announcements are contaminated with corporate events such as mergers and acquisitions, asset sales, bankruptcy filings, and so forth.

⁹ RFD prevents public companies in the U.S. from revealing private or inside information to some elite professionals such as equity analysts. However, credit analysts working for rating agencies are excluded in the implementation of RFD and keep access to confidential information of a firm. As a result, RFD strengthened the information advantages of rating agencies in the post-RFD period.

¹⁰ We also provide results of t-tests with equal variances after converting letter ratings to numeric ratings.

with those of the post-NRSRO period. We then examine differences between pre-NRSRO ratings and post-NRSRO ratings using an ordered probit model (Kaplan and Urwitz, 1979; and Ederington, (1985); Shin and Moore, 2003).¹¹ We examine new ratings assigned during the two different time periods and test whether DBRS assigned lower new ratings during the post-NRSRO period.

The ordered probit model is specified as:

$$Y^* = \chi_i \beta + \varepsilon_i \quad (1)$$

$$Y_i = \begin{cases} 0 & \text{if } Y_i^* \leq \mu_0 \\ 1 & \text{if } \mu_0 < Y_i^* \leq \mu_1 \\ 2 & \text{if } \mu_1 < Y_i^* \leq \mu_2 \\ 3 & \text{if } \mu_2 < Y_i^* \leq \mu_3 \\ 4 & \text{if } \mu_3 < Y_i^* \leq \mu_4 \\ 5 & \text{if } \mu_4 < Y_i^* \leq \mu_5 \\ 6 & \text{if } Y_i^* > \mu_5 \end{cases}$$

where Y^* is an unobserved continuous random variable representing the rater's risk evaluation of issuer i , Y_i is the observed rating category by a rating agency for issuer i , χ_i is a vector of explanatory variables, β is a vector of coefficients, ε_i is a standard normal random error, and μ_i denotes threshold parameters (cut-off points). A positive (negative) and larger coefficient implies a greater chance of a higher (lower) credit rating.

The independent variables in vector χ include measures of financial risk. DBRS (2005) uses financial ratios such as interest coverage, leverage, and profitability as important determinants of corporate credit ratings. Therefore, we employ total market capitalization, debt ratio, profitability ratio, and coverage ratio as the independent variables in the ordered probit model.¹² These four variables are computed using a 3-year arithmetic average of the annual ratios, thus the estimation period is the 3 years including the fiscal year of the new rating assignment.¹³ We also add a control variable YIELD to capture macro-economic effects on ratings. YIELD is daily 10-year Treasury yields on the date of new rating assignments during the sample period.

¹¹ The dependent variable is the ordered ranking of credit ratings and the letter ratings are converted into numeric ratings. The dependent variable for DBRS ratings is defined as: 0=CCC and below, 1=B, 2=BB, 3=BBB, 4=A, 5=AA, 6=AAA.

¹² The independent variables are defined as follows: (1) LMKT: Natural log of total market capitalization; (2) DEBT: Total debt/Total assets; (3) PROFIT: Operating Income/Total sales; (4) COVER: Earnings before interest and taxes/Interest expenses.

¹³ S&P (2006) considers financial and business risks in assigning credit ratings. With regard to financial risk, S&P incorporates the 3-year average of annual financial ratios mentioned above to avoid the influence of a single-year financial ratio.

In addition, following Poon's (2003) method, we add a dummy variable POST for post-NRSRO ratings (1 for post-NRSRO and 0 otherwise) as an independent variable in the ordered probit model. If the variable is negative and significant, we conclude that post-NRSRO ratings are lower than pre-NRSRO ratings. We also add a dummy variable NF for non-financial firms (1 for non-financial firms and 0 for financial firms) to differentiate non-financials from financials. Since NRSRO licenses are issued by the SEC in the U.S., DBRS may have assigned different ratings to U.S. firms compared with Canadian firms after it obtained the license in 2003. We therefore form a dummy variable US for U.S. firms (1 for U.S. firms and 0 for firms in other countries) to test rating differences between U.S. firms and non-U.S. firms. Furthermore, we include a dummy variable UNS for unsolicited ratings (1 for unsolicited ratings and 0 for solicited ratings) because DBRS assigned many unsolicited ratings for post-NRSRO periods.¹⁴

It is expected that higher market capitalization, a higher profitability ratio, and a higher interest coverage ratio will raise the credit rating of a firm's bond issue, while a high debt ratio and Treasury yield will reduce the rating. We also expect that the rating method for financial firms is different from that for non-financial firms, but we do not hypothesize whether the credit ratings of financial firms are higher or lower than those of non-financial firms.

Poon (2003) and Fairchild, Flaherty, and Shin (2006) find that unsolicited ratings of S&P and Moody's are lower than solicited ratings. Partnoy (2006) and Allen and Dudney (2006) argue that rating agencies issue unsolicited ratings to force bond issuers to buy ratings. Byoun and Shin (2002) find that most firms with unsolicited ratings have speculative grade ratings while those with solicited ratings have investment grade ratings. A negative UNS dummy variable suggests that unsolicited ratings are lower than solicited ratings. We anticipate a negative sign for the coefficient of US, and the coefficient associated with unsolicited new ratings of U.S. firms (inter-action term between UNS and US) is expected to be negative to the extent that DBRS aggressively assigns unsolicited ratings to U.S. firms to increase its market share in U.S. credit services markets after the agency acquires NRSRO certification. The full ordered probit model is:

$$\text{RATINGS} = \text{LMKT} + \text{DEBT} + \text{PROFIT} + \text{COVER} + \text{YIELD} + \text{POST} + \text{NF} + \text{US} + \text{UNS} + \text{UNS*US} + \varepsilon \quad (1)$$

To test the hypothesis that NRSRO designation affects stock market reactions to rating announcements, we estimate announcement period abnormal returns using the method in Brown and Warner (1980).¹⁵ Parameters of the market model are estimated using the Center for Research in Securities Prices (CRSP) value-weighted market index for the estimation period ($t = -200, \dots, -20$) relative to the announcement date ($t = 0$). We

¹⁴ Rating agencies sometimes issue a rating even though an issuer does not request the rating; this type of rating is called an *unsolicited* rating. In general, unsolicited ratings are based on the public information of the issuer. DBRS attaches "p" subscript to rating symbols to show that the ratings are unsolicited ratings based on public information.

¹⁵ We also used the standardized cross-sectional test in Boehmer, Musumeci, and Poulsen (1991), and the results are very similar.

investigate the three-day window ($t = -1, 0, +1$) relative to the announcement date appearing in the *Lexis-Nexis* database. We eliminate firms with significant information releases within three trading days ($t = -1, 0, +1$) around the announcement date. This includes information on earnings, credit rating changes by other agencies, and mergers and acquisitions, etc.

To test the hypothesis we examine mean and median cumulative abnormal returns (CARs) separately for downgrades and upgrades for the three-day and two-day windows, and compare these in the pre-NRSRO and post-NRSRO periods. To assess the robustness of our results, we estimate the following regression model of announcement period abnormal returns for rating downgrades.

$$\text{CAR} = \text{DEBT} + \text{LMKT} + \text{SPEC} + \text{UNS} + \text{NF} + \text{CAN} + \text{POST} + \varepsilon \quad (2)$$

In equation (2), CAR = cumulative abnormal return for the three-day window (-1, 0, +1); SPEC = 1 if rating downgrade from investment grade to speculative-grade or within speculative grade, and 0 otherwise; and CAN = 1 if Canadian firm and 0 otherwise. The remaining variables are the same as those defined in equation (1).

We examine equation (2) separately for rating upgrades as well. The first two independent variables, DEBT and LMKT, are control variables. The expected sign of the coefficients of POST and UNS for rating downgrades is negative to the extent of aggressiveness of the ratings policy of DBRS after its certification in February 2003. The signs of CAN and SPEC are expected to be negative due to the relative influence of DBRS in Canada and the pronounced effect of speculative grade rating downgrades documented in previous studies. We offer no prediction for the sign of NF. For upgrades, we eliminate SPEC. Estimation of equation (2) is based on pooled cross-section time series panel data. To allow both serial correlation and heteroskedasticity across countries, we employ generalized least squares.

IV. Data

The SEC designated DBRS as a new NRSRO on February 27, 2003. We collect DBRS, S&P, and Moody's ratings from *Bloomberg*, and these include long-term credit ratings of public corporations such as issuer ratings, corporate ratings, and ratings of unsecured debentures. Municipal credit ratings, ratings of private corporations, and short-term ratings are excluded from the sample. Similar to the method of Jorion, Liu, and Shi (2005), we designate the three-year post-NRSRO period as March 2003 to February 2006, and the three-year pre-NRSRO period as February 2000 to January 2003. We begin sample collection as of February 2000 because *Bloomberg* does not provide ratings prior to 2000. To examine the first hypothesis that DBRS assigns lower ratings after the NRSRO designation, we compare only new ratings before and after the designation. New ratings are obtained from "current rating" without any "last rating" in the *Bloomberg*. They are senior unsecured debt, subordinated debt or long-term issuer ratings without any previous long-term ratings. Withdrawn ratings or rating changes are excluded from new ratings.

To investigate the second hypothesis that equity investors react differently to the rating changes of DBRS before and after the NRSRO designation, we look at stock prices in U.S. markets.¹⁶ We collect daily stock prices and firm characteristics data for each rated company from *CRSP* and *Worldscope*, respectively. Many Canadian firms are cross-listed in the Canadian and U.S. markets. For example, 88 Canadian issuers including public companies, closed-end funds, and exchange-traded funds are listed on the New York Stock Exchange (NYSE). *CRSP* contains stock prices of Canadian firms listed on the NYSE and prices of American Depositary Receipts (ADRs) issued by other foreign companies. Since bond transaction data are not available for our sample firms, we use the yields of new bond issues to check the robustness of our results. Treasury yields are obtained from Federal Reserve Bank reports, and the spreads between the yield of the benchmark treasury issue and the issue's offering yield are from the Mergent Fixed Income Securities Database (FISD). Regarding rating symbols, categories, and definitions applied to long-term debt, DBRS uses the same ones employed by S&P and Fitch. For example, according to www.dbrs.com, AAA, AA, A, and BBB are investment-grade ratings and BB, B, CCC, CC, C, and D are speculative-grade ratings. However, for notch rating symbols within a particular rating category, DBRS uses the terms such as "high," "middle," and "low" rather than the characters such as "+" and "-" used by S&P.

Table 2 shows the new rating distributions for the two periods, pre- and post-NRSRO. According to Panel A, for the pre-period, DBRS assigned only 73 (17.94%) long-term credit ratings to U.S. firms out of 407 new ratings, while for the post-period, DBRS assigned new ratings for 281 (68.20%) U.S. firms out of 412. Thus DBRS increased new ratings to U.S. firms after it obtained its NRSRO license in 2003. DBRS also increased assignment of new ratings of firms (exclusive of U.S. and Canadian) from 39 (9.58%) to 86 (20.87%). However, new ratings of Canadian firms declined from 295 (72.48%) to 45 (10.92%).

According to Panel C, DBRS sharply expanded unsolicited ratings from only 8 (1.97%) to 182 (44.18%). In particular, 118 (64.84%) out of 182 unsolicited ratings are concentrated on U.S. firms. It is conjectured that the agency issued more unsolicited ratings to U.S. firms to increase its market share in the U.S. after it had obtained NRSRO designation. In addition, in Panel B the percentage of speculative grade ratings (below BBB) also increased from 24 (5.90%) to 58 (14.08%) from the pre-period to the post-period.¹⁷ The percentage of industrial firms versus financial firms remained stable over the two time periods.

¹⁶ Because the yields of bonds rated by DBRS are not available, we depend on stock prices.

¹⁷ Out of 58 speculative-grade ratings for the post-period, 25 are speculative-grade unsolicited ratings of US firms. For the post-period, although only 16 (9.76%) of 164 solicited ratings of US firms are speculative grades, 25 (21.19%) of 118 unsolicited ratings of US firms are speculative grades. The numbers are not reported in Table 2.

Table 2. New Rating Distribution

Panel A: Distribution by Country			
Pre-Period		Post-Period	
Canada	295	Canada	45
USA	73	USA	281
Other	39	Other	86
Australia	1	Australia	7
Belgium	2	Belgium	4
France	1	France	7
Germany	4	Germany	6
Japan	11	Japan	7
Netherlands	2	Netherlands	10
Swiss	3	Swiss	0
UK	15	UK	28
		Brazil	2
		Finland	2
		Chile	1
		Ireland	1
		Italy	4
		Norway	1
		South Africa	2
		Spain	3
		Sweden	1
Total	407	Total	412
Panel B: Distribution by Rating Scales			
Pre-Period		Post-Period	
AAA	10	AAA	1
AA	77	AA	65
A	187	A	158
BBB	109	BBB	130
BB	18	BB	30
B	4	B	28
<CCC	0	<CCC	0
Total	407	Total	412
Panel C: Solicited vs. Unsolicited Ratings			
Pre-Period		Post-Period	
Solicited	399	Solicited	230
USA	73	USA	164
Canada	287	Canada	38
Other	39	Other	28
Unsolicited	8	Unsolicited	182
Canada	8	Canada	118
		USA	7
		Other	57
Total	407	Total	412
Industrial	255	Industrial	284
Financial	152	Financial	128
Total	407	Total	412

New ratings are obtained from “current rating” without any “last rating” in the Bloomberg. They are senior unsecured debt, subordinated debt or long-term issuer ratings without any previous long-term ratings. Withdrawn ratings or rating changes are excluded from new ratings. We designate the post-NRSRO period as March 2003 to February 2006, and the pre-NRSRO period as February 2000 to January 2003.

Table 3. Descriptive Statistics and T-test Results of Financial Ratios for Firms with New Ratings						
Panel A. Pre-Period						
Ratios	Min	Max	Mean	SD	Median	N
DEBT	0.02	2.13	0.38	0.25	0.35	138
PROFIT	-0.58	0.54	0.13	0.12	0.12	137
COVER	-14.37	25.00	4.91	5.54	3.52	131
MKT	102.56	142697.58	14196.21	23919.29	4061.24	140
YIELD	3.61	6.67	5.15	0.71	5.13	750
Panel B. Post-Period						
Ratios	Min	Max	Mean	SD	Median	N
DEBT	0.21	1.43	0.71	0.20	0.70	233
PROFIT	-0.28	0.54	0.16	0.12	0.15	232
COVER	-4.46	5.36	1.20	1.29	1.08	232
MKT	47.70	247427.75	22596.80	34127.29	10798.18	218
YIELD	3.13	4.89	4.22	0.31	4.23	749
Panel C. Pre-Post Difference						
Ratios	Mean Differences (Pre-Post)		Median Differences (Pre-Post)			
DEBT	-0.33 (t=-13.83)***		-0.35 (z=-12.18)***			
PROFIT	-0.03 (t=-1.97)**		-0.03 (z=-1.64)*			
COVER	3.71 (t=9.76)***		2.45 (z=10.67)***			
MKT	-8400.59 (t=-2.54)**		-6736.94 (z=-4.18)***			
YIELD	0.93 (t=32.94)***		0.90 (z=24.57)***			

The financial ratios are from data available from Worldscope, and YIELD from Federal Reserve Bank Reports. The financial ratios are defined as follows: MKT = Total market capitalization; DEBT = Total debt/Total assets; PROFIT = Operating Income/Total sales; COVER = Earnings before interest and taxes/Interest expenses; YIELD = Daily 10-year Treasury yields. We designate the post-NRSRO period as March 2003 to February 2006, and the pre-NRSRO period as February 2000 to January 2003. Units are in millions of US dollars for MKT. Asterisks denote significance at the 0.01 (***), 0.05 (**), and 0.10 (*) and t-statistics are in parentheses. N is the number of observations and SD is standard deviation. We use two sample t-tests assuming equal variances for mean differences and Wilcoxon Rank Sum tests for median differences.

Table 3 reports descriptive statistics and t-test results of financial ratios for firms with new ratings. We also compare Treasury yields before and after the designation. The financial ratios are defined as follows: MKT = Total market capitalization; DEBT = Total debt/Total assets; PROFIT = Operating Income/Total sales; COVER = Earnings before interest and taxes/Interest expenses; YIELD = Daily 10-year Treasury yields. We test the null hypothesis that means and medians of the ratios between the two periods are equal. Mean and median differences in MKT, DEBT, PROFIT, COVER and YIELD are significant at the 1%, 5% and 10% levels, respectively. While the mean (median) DEBT ratio of pre-period is 38% (35%), that of post-period is 71% (70%). In other words, the average pre-period DEBT ratio is better than post-period. However, even though the mean (median) PROFIT ratio of pre-period is 13% (12%), that of post-period is 16% (15%). Regarding the PROFIT ratio, pre-period is weaker than post-period. In addition, while pre-period mean (median) COVER is greater than post-period, pre-period mean (median), MKT value is lower than post-period. As a result, we cannot argue that firm quality over the pre-period is unambiguously better than that over the post-period due to the mixed evidence for the DEBT, PROFIT, COVER, and MKT variables. On the

other hand, YIELD over the pre-period (5.15%) is higher than that over the post-period (4.22%), reflecting lower interest rates for the post-period.

Table 4. Distribution of Rating Changes					
Pre-Period			Post-Period		
Panel A. Number of Rating Changes					
I. Upgrade			I. Upgrade		
Canada	22	81.48%	Canada	41	51.25%
Non-Canada	5	18.52%	Non-Canada	39	48.75%
Total	27	100%	Total	80	100%
II. Downgrade			II. Downgrade		
Canada	126	77.78%	Canada	93	56.36%
Non-Canada	36	22.22%	Non-Canada	72	43.64%
Total	162	100%	Total	165	100%
Panel B. Distribution of Rating Changes by Rating Scales					
I. Upgrade			I. Upgrade		
Within Investment Grade	22	81.48%	Within Investment Grade	62	77.50%
Speculative to Investment Grade	1	3.70%	Speculative to Investment Grade	3	3.75%
Within Speculative Grade	4	14.82%	Within Speculative Grade	15	18.75%
Total	27	100%	Total	80	100%
II. Downgrade			II. Downgrade		
Within Investment Grade	108	66.67%	Within Investment Grade	102	61.82%
Speculative to Investment Grade	21	12.96%	Speculative to Investment Grade	20	12.12%
Within Speculative Grade	33	20.37%	Within Speculative Grade	43	26.06%
Total	162	100%	Total	165	100%
Panel C. Upgrade/Downgrade Ratio					
Canada	22/126	17.46%	Canada	41/93	44.09%
Non-Canada	5/36	13.89%	Non-Canada	39/72	54.17%
Total	27/162	16.67%	Total	80/165	48.48%
Panel D. Rating Volatility					
I. Upgrade			I. Upgrade		
1 Notch Upgrade	25	92.59%	1 Notch Upgrade	69	86.25%
2 Notch Upgrade	0	0.00%	2 Notch Upgrade	6	7.50%
3 Notch and More Upgrade	2	7.41%	3 Notch and More Upgrade	5	6.25%
Total	27	100%	Total	80	100%
II. Downgrade			II. Downgrade		
1 Notch Downgrade	124	76.54%	1 Notch Downgrade	143	86.67%
2 Notch Downgrade	22	13.58%	2 Notch Downgrade	15	9.09%
3 Notch and More Downgrade	16	9.88%	3 Notch and More Downgrade	7	4.24%
Total	162	100%	Total	165	100%

DBRS rating changes are from Bloomberg. We collect only long-term credit rating changes of public corporations. We designate the post-NRSRO period as March 2003 to February 2006, and the pre-NRSRO period as February 2000 to January 2003. One notch is minimum unit for rating change. For example, the rating difference between BBB (low) and BBB is one notch. Credit ratings BBB (low) and above are defined as investment grade, and those below BBB (low) speculative grade.

Table 4 describes the distribution of rating changes. In Panel A, even though there were only 27 (14.29%) rating upgrades out of 189 rating changes for the pre-period, they

increased to 80 (32.65%) out of 245 rating changes for the post-period. While the total number of rating downgrades was roughly constant during the two time periods (from 162 to 165), the number of downgrades for U.S. firms and foreign firms doubled from 36 to 72. However, the number of upgrades for non-Canadian firms has increased from 5 to 39. Panel C describes upgrade/downgrade ratios between pre- and post-period. Regardless of Canadian or non-Canadian firms, post-period upgrade/downgrade ratio (48.48%) is much higher than pre-period (16.67%). In addition, we look at rating volatility or magnitude of rating changes for each period in Panel D. For the pre-period, 2 notch and more upgrades consist of 2 (7.41%) out of 27, and for the post-period, they are made up of 11 (13.75%) out of 80. On the other hand, while the 2 notch and more downgrades of the pre-period are 38 (23.46%), those of the post-period are only 22 (13.33%). The evidence implies that DBRS is more volatile in the post-period in terms of upgrades and is less volatile in the post-period for downgrades. We expected rating downgrades could be more volatile after DBRS acquired NRSRO designation. However, the findings in Panel A, C, and D suggest that rating downgrade volatility is less over the post-period, contrary to our expectation.

We also examine the distributions of rating changes by rating scales in Panel B. Out of 162 rating downgrades during the pre-period and 165 downgrades during the post-period, 54 (33.33%) and 63 (38.18%) observations in each period are downgrades from investment grade to speculative grade or within speculative grade. Credit ratings BBB (low) and above are defined as investment grade and those below BBB (low) speculative grade. The proportion of downgrades within investment grade is about constant; 108 (66.67%) in the pre-period and 102 (61.82%) in the post-period. In addition, rating upgrades from speculative grade to investment grade, within investment or speculative grade, do not change notably between the two time periods. The majority of downgrades or upgrades in each period are rating changes within investment or speculative grade.

V. Findings

Our first hypothesis is that ratings in the pre-NRSRO period are higher than those in the post-NRSRO period. Wilcoxon rank sum test and t-test results are reported in Panel A, B, and C of Table 5. In Panel A, the mean and medians of the whole sample are significantly different for the pre- and post-periods at the 1% level. The mean is 3.83 for the pre-period and it decreases to 3.50 for the post-period. While the median difference between the pre- and post-period is 0, the z-statistic (4.20) of Wilcoxon rank sum test is significant at the 1% level. The results suggest that ratings in the pre-NRSRO period are higher than those in the post-NRSRO period. Since Byoun and Shin (2002) report that unsolicited ratings are lower than solicited ratings, we compare only solicited ratings between the two periods (Panel B) and compare US firms with solicited ratings with those with unsolicited ratings for the post-period (Panel C).¹⁸ When we examine mean and median differences of solicited ratings for the two periods, the differences found in the whole sample almost disappear. Even though the mean difference is significant at the 10% level ($t = 1.88$), the median is not significant ($z = 1.26$). Moreover, the comparison

¹⁸ We do not compare unsolicited ratings between the two periods due to the small sample size of unsolicited ratings for the pre-period.

of US firms between solicited ratings and unsolicited ones in Panel C reveals that solicited ratings are one letter rating higher in terms of median, and the mean ($t = 5.66$) and median differences ($z = 5.34$) are significant at the 1% level. The findings in Table 5 reveal that the rating differences for the two periods in the whole sample result from differences between the solicited and unsolicited ratings of the US firms during the post-period.¹⁹

Ordered-probit estimation results are provided in Panel D of Table 5.²⁰ We estimate the full version of equation (1) along with two subsets. Model 1 is the full version, model 2 omits all dummy variables except POST, and model 3 retains only dummy variables. In every model, we confirm the results found in Panel A. POST is negative and significant at the 1% or 5% level ($t = -2.22$ in model 1, $t = -3.78$ in model 2, and $t = -3.19$ in model 3), and the findings confirm that DBRS assigned lower ratings in the post-period, consistent with the hypothesis. In models 1 and 2, the control variables except YIELD are generally significant, and the signs of the coefficients are consistent with our expectations. For instance, firms with high market capitalization, coverage ratios, and profitability ratios receive higher ratings, but those with high debt ratios obtain lower ratings. In models 1 and 3, NF is negative and significant, which implies that the ratings of non-financial firms including industrial firms are lower than those of financial firms. Interestingly, the interaction term US*UNS in model 3 is negative and significant at the 5% level ($t = -2.18$). This supports our findings in Panel B and C, and we may infer that DBRS assigns lower unsolicited ratings to U.S. firms aggressively to increase its market share in the U.S. after its NRSRO accreditation.

We examine abnormal returns separately for downgrades and upgrades over the 3-day window (-1, 0, 1) and 2-day window (0, 1). Mean cumulative abnormal returns (CARs) for the pre- and post-periods are summarized in Table 6. Panel A includes only non-contaminated observations, while Panel B reports all observations. From 189 and 245 rating changes for the respective pre- and post-periods in Table 4, we eliminate firms without available stock prices, as well as subsidiaries with the same ratings as their parent companies.²¹ Finally we retain 72 and 70 rating changes including contaminated observations for the pre- and post-periods, respectively.²²

¹⁹ In footnote 17, we report that the proportion of speculative grade ratings of US firms with unsolicited ratings is greater than those with solicited ratings.

²⁰ In Panel D of Table 5, we retain only firms with financial variables available in *Worldscope*. As a result, our sample size of new ratings decreased to 139 for the pre-period and 233 for the post-period.

²¹ 17 ratings changes of subsidiaries for the pre-period and 53 rating changes of subsidiaries for the post-period are eliminated because they have the same ratings as their parent companies. Except for subsidiaries, we do not find any systematic differences between firms with stock prices and those without stock prices.

²² We keep 54 non-contaminated rating changes out of 72 changes for the pre-period and 56 non-contaminated ones out of 70 changes for the post-period because we eliminate rating changes contaminated with earnings surprises, simultaneous rating changes by Moody's and S&P, and mergers and acquisitions.

Table 5. The Results of Mean and Median Tests and Ordered-Probit Model Test			
RATINGS = LMKT + DEBT + PROFIT + COVER + YIELD + POST + NF + US + UNS + UNS*US + ε (1)			
Panel A. Whole Sample			
I. Pre-Period			
Median=4.00	Mean=3.83	N=407	
II. Post-Period			
Median=4.00	Mean=3.50	N=412	
Mean Difference=0.33 (t=4.73)***			
Median Difference=0 (z=4.20)***			
Panel B. Firms with Solicited Ratings Only			
I. Pre-Period			
Median=4.00	Mean=3.87	N=399	
II. Post-Period			
Median=4.00	Mean=3.72	N=230	
Mean Difference=0.15 (t=1.87)*			
Median Difference=0 (z=1.26)			
Panel C. Post-Period US Firms only			
I. US Firms with Solicited Ratings			
Median=4.00	Mean=3.75	N=164	
II. US Firms with Unsolicited Ratings			
Median=3.00	Mean=3.08	N=118	
Mean Difference=0.67 (t=5.66)***			
Median Difference=1 (z=5.34)***			
Panel D. Ordered-Probit Model Estimation Results			
Variable	(1)	(2)	(3)
LMKT	1.29 (11.35)***	1.25 (11.43)***	
DEBT	-0.99 (-3.30)***	-0.26 (-0.96)	
PROFIT	2.26 (4.17)***	2.79 (5.37)***	
COVER	0.01 (2.19)**	0.01 (2.03)**	
YIELD	-9.38 (-0.70)***	-7.71 (-0.60)	
POST	-0.62 (-2.22)***	-1.00 (-3.78)***	-0.46 (-3.19)***
NF	-0.81 (-4.74)***		-0.78 (-5.57)***
US	-0.18 (-1.12)		0.24 (1.70)*
UNS	-0.32 (-1.33)		0.27 (1.25)
US*UNS	-0.04 (-0.15)		-0.56 (-2.18)**
Chi-Squared	229.07***	190.20***	54.58***
Log-Likelihood	-358.77	-378.21	-483.19
Pseudo R-Squared	0.24	0.20	0.05
N	343	343	372

Table 5 Continued

We designate the post-NRSRO period as March 2003 to February 2006, and the pre-NRSRO period as February 2000 to January 2003. For mean and median differences, t-tests with equal variances and Wilcoxon Rank Sum tests are used, respectively. The letter ratings of DBRS are converted into numeric ratings, i.e. 0=CCC and below, 1=B, 2=BB, 3=BBB, 4=A, 5=AA, and 6=AAA. The independent variables in Equation (1) are defined as follows: (1) LMKT = Total market capitalization as log (Total market capitalization); (2) DEBT = Total debt/Total assets; (3) PROFIT = Operating Income/Total sales; (4) COVER = Earnings before interest and taxes/Interest expenses; (5) YIELD = 10-year maturity daily Treasury yields; (6) POST = 1 for post-NRSRO ratings and 0 otherwise; (7) NF = 1 for non-financial firms and 0 for financial firms; (8) US = 1 for U.S. firms and 0 for firms in other countries; and (9) UNS = 1 for unsolicited ratings and 0 for solicited ratings. The dependent variable is the ordered rankings of credit ratings and the letter ratings are converted into numeric ratings. The dependent variable for DBRS ratings is defined as follows: 0=CCC and below, 1=B, 2=BB, 3=BBB, 4=A, 5=AA, 6=AAA.

*DBRS new ratings are from Bloomberg. The financial variables are from data available on Worldscope. Asterisks denote significance at the 0.01 (***) , 0.05 (**), and 0.10 (*) and t-statistics are in parentheses. N is the number of observations.*

In Panel A, uncontaminated observations, we have 47 downgrades in the pre-period and 39 in the post-period. Out of 47 downgrades during the pre-period, 32 belong to Canadian firms and 15 are non-Canadian downgrades. For 39 downgrades in the post-period, 17 are Canadian firms and 22 are non-Canadian. We separate the downgrades of Canadian firms from those of non-Canadian firms because it is expected that DBRS is more influential to Canadian investors. The mean CARs (-1.25% in the pre-period and -0.79% in the post-period) of all downgrades for the pre- and post-periods are negative and significant at the 5% level for event window (0, 1). However, when we examine Canadian firms and non-Canadian firms separately, we find that the mean CAR for Canadian firms changes to -1.98% in the pre-period and -2.06% in the post-period, significant at the 5% and 1% levels, respectively. The mean CAR of non-Canadian firms is not significant in any period. We obtain similar results for the event period (-1, 0, 1).

We test for differences in means for Canadian firms between the pre- and post-periods, and find that the differences are not significant at conventional levels. Based on the evidence from downgrades, we conclude that DBRS is more influential for Canadian firms, and non-Canadian firms are indifferent to the NRSRO certification of DBRS. For rating upgrades in Panel A and B, mean CARs are insignificant throughout all periods.

We repeat the analysis in Panel B for all observations including contaminated ones and reach the same conclusion. Even though all rating downgrades are negative and significant both over the pre-period and post-period at the 5% level in each event window, the downgrades of Canadian firms are significant at the 1% level for both periods (mean CAR = -4.59% in the pre-period -3.23% in the post-period for the 3-day event window) when we separate Canadian firms from non-Canadian firms. The significance of all downgrades is attributed to the downgrades of Canadian firms only. Again we confirm that the influence of NRSRO raters does not result from the certification of the status.

Table 6. Mean Cumulative Abnormal Returns (MCAR) and t-statistics for Rating Changes for Event Windows (-1, 0, 1) and (0, 1)							
Pre-Period				Post-Period			
Event Window	MCAR (-1, 0, 1)	MCAR (0, 1)	N	Event Window	MCAR (-1, 0, 1)	MCAR (0, 1)	N
Panel A. Uncontaminated Observations							
I. Downgrades							
All Downgrades	-2.74%	-1.25%	47	All Downgrades	-0.52%	-0.79%	39
	(-3.13)***	(-1.75)**			(-0.91)	(-1.69)**	
Canadian Firms	-4.19%	-1.98%	32	Canadian Firms	-1.91%	-2.06%	17
	(-3.66)***	(-2.12)**			(-2.09)**	(-2.77)***	
Mean Difference for Canadian Firms (Pre-Post)					-2.13%	0.28%	49
					(-0.66)	(0.09)	
Non-Canadian Firms	0.35%	0.30%	15	Non-Canadian Firms	0.55%	0.19%	22
	(0.31)	(0.32)			(0.72)	(0.31)	
II. Upgrades							
All Upgrades	2.02%	1.15%	7	All Upgrades	-0.73%	-0.51%	17
	(1.08)	(0.75)			(-1.13)	(-0.97)	

Table 6 Continued							
Panel B. All Observations							
I. Downgrades							
All Downgrades	-3.96%	-1.73%	65	All Downgrades	-0.91%	-1.08%	47
	(-5.04)***	(-2.69)***			(-1.65)**	(-2.40)***	
Canadian Firms	-4.59%	-2.64%	43	Canadian Firms	-3.23%	-3.37%	19
	(-4.20)***	(-2.96)***			(-3.57)***	(-4.56)***	
Mean Difference for Canadian Firms (Pre-Post)					-1.38%	0.84%	62
					(-0.39)	(0.25)	
Non-Canadian Firms	-2.71%	0.06%	22	Non-Canadian Firms	0.66%	0.47%	28
	(-2.83)***	(0.07)			(0.94)	(0.82)	
II. Upgrades							
All Upgrades	2.02%	1.15%	7	All Upgrades	-0.52%	-0.04%	23
	(1.08)	(0.75)			(-0.96)	(-0.08)	

We designate the post-NRSRO period as March 2003 to February 2006, and the pre-NRSRO period as February 2000 to January 2003. The symbols ***, **, and * show the significance and direction of Brown and Warner (1980) at the 0.01, 0.05 and 0.10 levels, respectively. We calculate market-adjusted returns with CRSP equally weighted market index.

T-statistics are provided in all parentheses. Mean differences are examined with t-tests. N is the number of observations, and all observations contain both non-contaminated and contaminated observations.

Table 7. Estimates of Linear Regression Models of 2-day (0, 1) Cumulative Abnormal Returns for Rating Changes					
CAR = DEBT + LMKT + SPEC + UNS + NF + CAN + POST + ε (2)					
Variable	(1)	(2)	Variable	(3)	(4)
Panel A. Uncontaminated Observations					
I. Downgrades			II. Upgrades		
DEBT	0.0039 (0.08)	-0.0058 (-0.14)	DEBT	0.0015 (0.10)	0.0028 (0.20)
LMKT	-0.0208 (-1.31)	-0.0237 (-1.66)	LMKT	-0.0118 (-0.91)	-0.0062 (-0.66)
SPEC	-0.0097 (-0.44)		SPEC		
UNS	0.0117 (0.36)		UNS	0.0103 (1.00)	
NF	0.0259 (0.80)		NF	-0.0127 (-0.90)	
CAN	-0.0428 (-2.04)**	-0.0435 (-2.18)**	CAN	0.0097 (0.81)	0.0057 (0.52)
POST	-0.0226 (-1.15)	-0.0198 (-1.18)	POST	-0.0079 (-0.55)	-0.0154 (-1.36)
Adjusted R-Squared	-0.0068	0.0236	Adjusted R-Squared	0.0968	0.1361
N	72	72	N	23	23
Panel B. All Observations					
I. Downgrades			II. Upgrades		
DEBT	0.0145 (0.36)	0.0099 (0.26)	DEBT	0.0016 (0.11)	0.0022 (0.16)
LMKT	-0.0230 (-1.62)	-0.0244 (-1.90)*	LMKT	-0.0141 (-1.40)	-0.0102 (-1.31)
SPEC	-0.0050 (-0.27)		SPEC		
UNS	0.0119 (0.46)		UNS	0.0115 (1.20)	
NF	0.0139 (0.46)		NF	-0.0143 (-1.13)	
CAN	-0.0394 (-2.12)**	-0.0410 (-2.34)**	CAN	0.0058 (0.54)	-0.0007 (-0.08)
POST	-0.0133 (-0.78)	-0.0101 (-0.67)	POST	-0.0089 (-0.67)	-0.0168 (-1.54)
Adjusted R-Squared	-0.0044	0.0263	Adjusted R-Squared	0.1366	0.1421
N	86	86	N	25	25

Asterisks denote significance at the 0.01 (***), 0.05 (**), and 0.10 (*) and t-statistics are in parentheses. We designate the post-NRSRO period as March 2003 to February 2006, and the pre-NRSRO period as February 2000 to January 2003. In equation (2), CAR = cumulative abnormal return for the two-day window (0, +1) of rating downgrade or upgrade announcements; LMKT is the log of total market capitalization; SPEC = 1 if rating downgrade from investment grade to speculative-grade rating or from speculative grade to speculative grade and 0 otherwise; and CAN = 1 if firm is Canadian and 0 otherwise. The remaining variables are defined in Table 5.

Table 7 contains results of estimation of regression models of CARs for event window (0, 1) that control for various factors. We test the full version of equation (2) along with one subset for downgrades and upgrades. Model 1 includes all independent variables in equation (2), but model 2 removes SPEC, UNS, and NF. With regard to DEBT and LMKT variables in equation (2), we use annual total debt, total assets, and total market capitalization at the fiscal year of rating change announcement date. Panel A reports the results of uncontaminated observations. For rating downgrades, we confirm the results found in our preliminary analysis in Table 6. CAN is negative and significant in model 1 and model 2 at the 5% level ($t = -2.04$ in model 1 and $t = -2.18$ in model 2), respectively. Other variables are, in general, not significant. For rating upgrades, we remove SPEC. In model 3 and 4, all variables are insignificant and we confirm the results in Table 6.

Panel B reports the results of all observations including contaminated rating changes. As we confirmed in Panel A, CAN is negative and significant in models 1 and 2 at the 5% level for rating downgrades. Of most interest is LMKT in model 2. It is negative and significant at the 10% level ($t = -1.90$), which means that market capitalization influences stock price reactions.

VI. Robustness Checks

We find that DBRS assigns lower ratings after attaining NRSRO status than before. However, after we exclude unsolicited ratings, rating differences for the two-periods almost disappear. It seems that DBRS is more aggressive in assigning unsolicited ratings for the post-period. Unfortunately, there is a possibility that the firms that DBRS rates happen to have deteriorated more in the post-period rather than the pre-period. Hence, we need to check this possibility. Even though we add the YIELD variable in equation (1) to capture changes in macro-economic condition between the two periods, there is a possibility that the model is incomplete. As a result, we compare treasury yields spread for the two periods. First, we obtain treasury spreads between the yield of the benchmark treasury issue and the issue's offering yield expressed in basis points from the Mergent Fixed Income Securities Database (FISD) and conduct two-sample t-test (assuming equal variances) between the pre-period and post-period. Second, to check the robustness of our results, we estimate the following regression model with treasury spreads as dependent variable, using the method in Gabbi and Sironi (2005).

$$\text{SPREAD} = \text{RATING} + \text{CAN} + \text{MAT} + \text{POST} + \varepsilon \quad (3)$$

The variables in equation (3) are defined as follows. SPREAD= the difference between the yield of the benchmark treasury issue and the issue's offering yield expressed in basis points; RATING= DBRS letter ratings are converted into numeric ratings such as AAA=6, AA=5, A=4, BBB=3, BB=2, B=1, and CCC and below=0; CAN =1 for Canadian firms and 0 otherwise; MAT= maturity of an issue in years; POST = 1 for post-NRSRO ratings and 0 otherwise. All bonds examined in equation (3) are new bond

issues rated by DBRS, Moody's, and S&P simultaneously.²³ Because FISD provides bond yields rated by only Moody's and S&P, we first select firms with new long-term issuer credit ratings from 819 new DBRS ratings in Table 2 and then remove the issuers not included in the FISD database. Consequently, the bond yields of new issues in Panel A and C come from firms simultaneously rated by Moody's, S&P, and DBRS, and there could be selection bias in the sample.

Table 8. Two-Sample t-tests with Equal Variances and Linear Regression Models for the Treasury Spreads of New Bond Issues Rated by DBRS, Moody's, and S&P between Pre- and Post-Period					
SPREAD = RATING + CAN + MAT + POST + ε (3)					
	Mean / SD	N	Variable	(1)	(2)
Panel A. T-test Results of SPREAD			Panel C. OLS Estimation Results		
Pre-Period	1.79% / 0.95%	191	RATING	-0.084	-0.835
Post-Period	1.56% / 1.34%	133		(-15.10)***	(-16.96)***
Mean Difference	0.24%		CAN	0.197	
(Pre-Post)	(1.87)*			(1.47)	
			MAT	-0.0003	
Panel B. T-test Results of Benchmark Spreads				(-0.05)	
Pre-Period	2.86% / 0.46%	749	POST	-0.422	-0.47
Post-Period	2.14% / 0.39%	749		(-4.25)***	(-5.01)***
Mean Difference	0.72%		Adjusted R-Squared	0.475	0.475
(Pre-Post)	(33.94)***		N	324	324

The variables in equation (3) are defined as follows. SPREAD= the difference between the yield of the benchmark treasury issue and the issue's offering yield expressed in basis points; RATING= letter ratings are converted into numeric ratings such as AAA=6, AA=5, A=4, BBB=3, BB=2, B=1, and CCC and below=0; CAN =1 for Canadian firms and 0 otherwise; MAT= maturity of an issue in years; POST = 1 for post-NRSRO ratings and 0 otherwise. Benchmark spreads in Panel B are spreads between the yields of Baa rated corporate bonds and 10-year maturity Treasury yields. For samples in Panel A and C, because FISD provides bond yields rated by only Moody's and S&P, we first select firms with new long-term issuer credit ratings from 819 new DBRS ratings in Table 2 and then remove the issuers not included in the FISD database. Consequently, the bond yields of new issues in Panel A and C come from firms simultaneously rated by Moody's, S&P, and DBRS.

We designate the post-NRSRO period as March 2003 to February 2006, and the pre-NRSRO period as February 2000 to January 2003. The symbols ***, **, and * show the significance at the 0.01, 0.05 and 0.10 levels, respectively. T-statistics are provided in all parentheses. N is the number of observations. SPREAD and MAT data are obtained from the Mergent Fixed Income Securities Database (FISD). RATING is DBRS ratings and comes from Bloomberg.

Table 8 shows the results of two-sample t-tests with equal variances, and OLS model estimation for the treasury spreads of new bond issues over the two-periods. Panel A reports the t-statistic for the mean differences of SPREAD in the sample between the pre- and post-period is significant at the 10% level (t = 1.87). In particular, the mean spread over the pre-period (1.79%) is higher (24 basis points) than the mean spread over the post-period (1.56%). In Panel B, we also examine benchmark credit spreads between Baa-rated corporate bond yields and 10-year maturity Treasury yields obtained from the Federal Reserve Bank reports. Similarly, the benchmark mean spread over the pre-period (2.86%) is much higher (72 basis points) than the mean spread over the post-period (2.14%), and the mean difference for the benchmark spread is significant at the 1% level (t=33.94). The results are contrary to the findings in Table 5, where the mean

²³ All issues in the sample are unsecured plain vanilla bonds denominated in US dollars. Additionally, we cannot examine changes in bond yields after rating changes because bond transaction data are not available for the sample firms in our study.

rating over the pre-period (3.83) is higher than that over the post-period (3.50). Since higher ratings over the pre-period should have smaller spreads, a larger mean spread for the pre-period is not consistent with our intuition. Panel C in Table 8 confirms our results in Panel A in Table 8. The POST variable in model 1 and 2 is negative and significant ($t = -4.25$ in model 1 and $t = -5.01$ in model 2) at the 1% level after we control credit ratings. As a result, we argue that the credit risk of the firms that DBRS rates has not deteriorated in the post-period. The lower DBRS ratings with their lower yield spreads over the post-period imply that DBRS may have changed its rating policy in the second period.

When we examine hypothesis 2, we may have neglected an important issue: The market will react only if it believes that DBRS has revealed something new about the firm's default risk. But suppose that Moody's and S&P have already downgraded a firm before DBRS gets around to doing it? In that case, the market probably already knows a lot about the changed circumstances of the firm, and DBRS's downgrade hasn't added much. The second possibility is that Moody's and S&P are behind DBRS in their rating changes. We also check the possibility that the Canadian market may react more to DBRS changes because Moody's and S&P aren't rating as many firms in Canada.

Since DBRS is influential only in Canada for rating downgrades, we examine rating downgrades of Canadian firms by Moody's and S&P. Though S&P and Moody's rate fewer firms than DBRS in Canada,²⁴ the total number of observations for each rating agency is very similar. For example, for an uncontaminated observation over the pre-period, while Moody's has 30 observations and S&P has 33 in Panel A in Table 9, DBRS has 32 observations in Table 6. In Panel A of Table 9, we also find that Moody's and S&P are generally more influential than DBRS in Canada because t-statistics for rating downgrades are more significant than those of DBRS in Table 6.

Additionally, we investigate the influence of rating agencies in terms of stock market reactions for two different cases. First, we check stock returns of firms downgraded by DBRS when DBRS or the Big Two (Moody's or S&P) initiate rating downgrades. Second, we examine stock returns of firms downgraded by the Big Two when DBRS or the Big Two initiates rating downgrades. In Panel B in Table 9, DBRS returns are stock returns of Canadian firms downgraded by DBRS, and MSP returns are stock returns of Canadian firms downgraded by Moody's or S&P. The variable DBRS / MSP is defined as DBRS initiates rating downgrades, followed by downgrades of Moody's or S&P within 6 months after the downgrades of DBRS; MSP / DBRS is defined as Moody's or S&P initiates rating downgrades, followed by the downgrades of DBRS within 6 months after the downgrades of Moody's or S&P.

Regardless of whether the observations are contaminated, stock price reactions are more substantial when the Big Two initiate rating downgrades rather than when DBRS initiates them. For instance, for uncontaminated observations over the 2-day event window (0, 1), mean CAR of firms downgraded by DBRS in the case of the Big Two downgrade initiation is -5.92%, which is significant at the 1% level ($t = -3.96$), compared with no

²⁴ Descriptive statistics of Canadian firms rated by DBRS, Moody's, and S&P are available upon request.

significance in the case of DBRS downgrade initiation ($t = -0.61$). On the contrary, regardless of who initiates rating downgrades, the mean CAR of firms downgraded by the Big Two is always negative and significant at the 1% level in Panel B. The findings show that the Big Two are more influential than DBRS in Canada, and we should accept the results in Table 6 and 7 cautiously. In other words, the influence of DBRS in Canada is generally attributed to Moody's or S&P. We also confirm that the designation of NRSRO status does not affect the influence of the rating agency.

Table 9. Mean Cumulative Abnormal Returns (MCAR) and t-statistics for Rating Downgrades of Canadian Firms Rated by DBRS, Moody's and S&P							
Event Window	(-1, 0, 1)	(0, 1)	N	Event Window	(-1, 0, 1)	(0, 1)	N
I. All Observations				II. Uncontaminated Observations			
Panel A. MCAR of Rating Downgrades by Moody's and S&P							
Pre-Period				Pre-Period			
Moody's	-7.79%	-7.31%	34	Moody's	-6.92%	-7.08%	30
	(-4.62)***	(-5.31)***			(-3.94)***	(-4.94)***	
S&P	-3.05%	-4.78%	36	S&P	-2.78%	-4.90%	33
	(-1.68)**	(-3.23)***			(-1.44)*	(-3.11)***	
Post-Period				Post-Period			
Moody's	-1.15%	1.09%	18	Moody's	-1.34%	0.86%	17
	(-1.32)*	(1.53)*			(-1.47)*	(1.16)	
S&P	-3.05%	-3.23%	26	S&P	-2.66%	-2.55%	21
	(-4.24)***	(-5.50)***			(-3.68)***	(-4.31)***	
Panel B. MCAR of Rating Downgrades by DBRS, Moody's, and S&P							
(1) DBRS Returns				(1) DBRS Returns			
DBRS / MSP	-2.22%	-0.81%	34	DBRS / MSP	-2.36%	-0.80%	31
	(-1.51)*	(-0.68)			(-1.47)*	(-0.61)	
MSP / DBRS	-7.58%	-5.92%	14	MSP / DBRS	-7.58%	-5.92%	14
	(-4.14)***	(-3.96)***			(-4.14)***	(-3.96)***	
(2) MSP Returns				(2) MSP Returns			
DBRS / MSP	-3.95%	-3.18%	31	DBRS / MSP	-4.33%	-3.77%	28
	(-3.24)***	(-3.19)***			(-3.35)***	(-3.56)***	
MSP / DBRS	-6.16%	-4.82%	16	MSP / DBRS	-6.16%	-4.82%	16
	(-4.02)***	(-3.85)***			(-4.02)***	(-3.85)***	

We designate the post-NRSRO period as March 2003 to February 2006, and the pre-NRSRO period as February 2000 to January 2003. The symbols ***, **, and * show the significance and direction of Brown and Warner (1980) at the 0.01, 0.05 and 0.10 levels, respectively. We calculate market adjusted returns with CRSP equally weighted market index. In Panel B, DBRS returns are stock returns of Canadian firms rated by DBRS whose downgrades are initiated either by DBRS or by the Big Two, and MSP returns are stock returns of Canadian firms rated by Moody's or S&P whose downgrades are initiated by either DBRS or the Big Two. DBRS / MSP= DBRS initiates rating downgrades, followed by the downgrades of Moody's or S&P within 6 months after the downgrades of DBRS; MSP / DBRS= Moody's or S&P initiates rating downgrades, followed by the downgrades of DBRS within 6 months after the downgrades of Moody's or S&P.

T-statistics are provided in all parentheses. N is the number of observations, and all observations contain both non-contaminated and contaminated observations.

VII. Conclusions

We find that DBRS assigns lower credit ratings after it obtains NRSRO accreditation even though the overall quality of rated firms is not different between the two periods. In addition, DBRS sharply increased new ratings for non-Canadian firms such as U.S. firms and expanded unsolicited credit ratings significantly after the recognition. Consequently, after excluding unsolicited ratings, the significant rating differences between the pre- and post-periods disappear. The evidence suggests that the rating agency regards NRSRO recognition as an opportunity to enter new credit services markets.

On the other hand, we also find that NRSRO recognition has not influenced investors. Examining U.S. stock markets, we find that stock price reactions to the announcements of rating downgrades in the post-NRSRO period are not different from those in the pre-NRSRO period. We temper our conclusions for upgrades due to the small sample size. While stock prices react significantly to rating downgrades of Canadian firms in both periods, there are insignificant stock price reactions to those of non-Canadian firms for either period. The evidence is consistent with the view that investors focus attention on the opinions of DBRS when the agency changes ratings of Canadian firms because they may believe that DBRS possesses specialized skills at assessing credit worthiness and default risks for Canadian firms.

Finally there is a caveat in our findings. The influence of DBRS in Canada is generally attributed to Moody's or S&P. In other words, the influence of DBRS for Canadian firms vanishes when we control for the influence of Moody's and S&P in Canadian debt markets. Therefore, we confirm that the designation of NRSRO status does not affect the influence of the rating agency, and it is recommended that the SEC issue the NRSRO membership for a qualified rating agency. However, because of availability of data, we examined only one NRSRO agency. Investigation about the effect of NRSRO designation for other new NRSRO agencies should be done in the future.

Moreover, the Credit Rating Agency Reform Act of 2006 clearly defines NRSRO accreditation standards, and any rating agency that has provided ratings for at least three years can apply for the certification. The *Wall Street Journal* (2006b) reports that the new law provides non-NRSRO agencies with a clear roadmap to join the NRSRO club, and predicts a gradual increase in NRSRO membership. We confirm that the SEC has provided five rating agencies with NRSRO certification since the birth of the law. The impact of the Credit Rating Agency Reform Act is also encourages future research in this area.

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