How Do Regulations Affect Credit Rating? Evidence from the Upgrades in the Chinese Banking Sector*

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Abstract

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Keywords: Credit rating, rating inflation, rating shopping, regulation arbitrage, interbank negotiable certificate of deposit.

JEL: G21, G24, G28

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Abstract

We observe 180 upgrades but only two downgrades in the Chinese banking sector in 2015-2017. The upgrades were results of rating inflation as rating standards significantly loosened over time. Except for the banks being upgraded to AAA and AA+ to gain significant regulatory advantage, the upgraded banks did not experience due reduction in credit price and financing gap. The upgrades granted by non-incumbent agencies, where ratings were more likely to be shopped, experienced stronger negative market reactions. The mechanical regulatory use of ratings played a pivotal role in causing rating inflation. Investors were able to discover information, but they accepted inflated ratings for regulatory arbitrage. In this regard, conflicts of interest between investors and rating agencies and agencies' reputation concerns would not alleviate rating inflation.

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1. Introduction

Credit ratings serve dual purposes: they provide information to investors, and are used to regulate institutional investors. As issuers prefer higher ratings for their securities to reduce cost of capital, credit rating agencies (CRAs) have an incentive to inflate ratings to share some of the benefits from higher ratings. Regulations outsource credit risk assessment to CRAs, providing them a source of revenue that is independent of rating informativeness. Hence, financial theory suggests that the mechanical use of ratings for regulatory purposes could cause rating inflation and reduce rating informativeness (Opp, Opp and Harris, 2013; Cole and Cooley, 2014). On the empirical side, almost all evidence comes from the U.S. market.[1] There is little international evidence, particularly due to the lack of sufficient observable rating inflation.

In China, regulations extensively rely on credit ratings. They explicitly impose rating thresholds for the eligibility for public issuance, which is different from the practice in the developed markets. The regulations also use ratings to decide capital and reserve requirements and investment restrictions.[2] Given the regulation background, we observe 180 upgrades but only two downgrades in the Chinese banking sector during 2015-2017. Upgrading of such an abnormally high volume relative to downgrading provides an intriguing and unique setting for examining rating inflation and the implication of rating-contingent regulation for rating informativeness. The recently available interbank negotiable certificate of deposit (INCDs) data allows us to observe changes in credit price before and after the upgrades in a timely and accurate manner.[3] We primarily examine the following questions: (1) were the upgrades supported by improvements to bank fundamentals, or due to rating inflation caused by

[1] Among other, Kisgen and Strahan (2010), Bongaerts, Cremers and Goetzmann (2012) study additional ratings provided by DBRS and Fitch, and find that change in credit spread is linked to regulation certification. Bruno, Cornaggia and Cornaggia (2016) show that the regulation certification does not affect the rating informativeness of investor-paid rating agencies, while Beher, Kisgen and Taillard (2018) show that the regulation certification for Moody's, S &P and Fitch in 1975 leads to rating quality deterioration.

[2] See Section 2 and Table 1 for a detailed description of the regulatory uses of ratings in China.

[3] See Section 2.3 for a detailed introduction of interbank negotiable certificates of deposit.

loosening rating standards? (2) How did investors react to the upgrades? Could they discover the true information about the riskiness of the upgraded banks? (3) What role did regulations play in the upgrades?

Morgan (2002) states that banks are more opaque than normal firms, and initial ratings of banks could be conservative or imprecise. If so, meaningful upgrades would be accompanied by improvements to issuers' fundamentals (Merton, 1974; Leland, 1994; Collin-Dufresn, Goldstein, and Martin, 2001). Unfortunately, we find no evidence that the upgrades are supported by change in bank fundamentals before and after. On the contrary, the banks exhibited relatively lower profitability and higher impaired loan ratios after being upgraded. Following the spirit and methodology of Blume, Lim and Mackinlay (1998), Alp (2013) and Baghai, Servaes and Tamayo (2014), we find strong evidence that rating standards loosened over time. The average magnitude of loosening is 1.48 grades, which translates into that a hypothetical bank with average financial performance in the sample would have a probability of 0.52% to be rated as AAA in 2014, while the probability would dramatically increase to 41.94% in 2017. Thus, the upgrades constitute clear evidence of rating inflation.

The INCD market is dominated by institutional investors. If investors trust the upgrades, the INCD credit spreads would decrease after the upgrades. The results show that the credit spreads were not duly reduced. Compared to the banks already in the higher rating categories, the newly upgraded banks issued INCDs with significantly higher credit spreads and greater financing gaps that capture the unpopularity of the issues.[4] Investors reacted more negatively to the upgrades granted by non-incumbent CRAs, where CRAs were more likely to be divided in opinion and ratings were more likely to be shopped.[5] The evidence indicates that investors were able to discover information about the riskiness of the upgraded banks.

Traditional rating inflation and rating shopping theory (see, e.g., Bolton, Freixas

[4] Financing gap is measured as the normalized difference between the target issue amount and subscription amount. Both amounts are publicly disclosed.

[5] China currently practices single-rating disclosure, and does not require to disclose preliminary agency contacts. So, issuers can easily hide the disagreement among CRAs (Skreta and Veldcamp, 2009; Faure-Grimaud, Peyrache and Quesada, 2009; He, Qian, and Strahan, 2016; Sangiorgi and Spatt, 2017).

and Shapiro, 2012; Bar-Isaac and Shapiro, 2013) does not entirely explain the motivation behind the upgrades because investors are not naïve and do not blindly accept the rating results. We examine the implications of rating-contingent regulation, and find that for banks being upgraded to AAA and AA+ to gain significant regulatory advantage, their INCD credit spreads and financing gaps were significantly reduced. In contrast, for the banks that were upgraded into AA or below and gained no significant regulatory benefits, there were no significant changes in credit spread. Their financing gaps increased by 20% on average, suggesting that their INCD issues became less popular after being upgraded. Rating-contingent regulations played a pivotal role in causing rating inflation and reducing rating informativeness, confirming the theoretical implication of Opp, Opp and Harris (2013) and Cole and Cooley (2014). Ratings affect credit prices through the channel of regulation, regardless of the accuracy of the information they provide (Kisgen and Strahan, 2010; Ashcraft, Goldsmith-Pinkham, Hull, and Vickery, 2011). Investors accepted inflated rating results for regulatory advantage, even they were capable of discovering the true information behind. In this regard, conflicts of interest between investors and CRAs and CRA's reputation concerns do not help to alleviate rating inflation (Mathis, McAndrews and Rochet, 2009; Mariano, 2012).

Our findings have implication for the reform of financial regulations. They highlight that market price-based or public information-based regulation could help to resolve many of the problems deep-rooted in the credit rating industry. The availability of massive digital data and fast development of data processing and analysis technology and tools make the reform plausible.

Besides adding unique complementary evidence to how regulation affects rating practice from the perspective of inflated upgrading, this work is among the first efforts to overview and investigate the Chinese rating practice. There are only a few such studies, among them, Jiang and Packer (2017) contrast rating outcomes of the Chinese and international CRAs. Livingston, Poon and Zhou (2018) investigate rating effectiveness using a sample of corporate bonds. Our investigation focuses on the banking sector that is of crucial importance to China's financial system from a dynamic

rating adjustment perspective. We also shed light on the fast growing INCD market that facilitates China's on-going interest rate liberalization and has caused concerns over its riskiness that may lead to financial instability. We show that in practice, AA+, instead of BBB-, is a more suitable investment grade/junk bond threshold in China, given the country's regulatory application of credit ratings.

The remainder of the paper is organized as follows: Section 2 overviews the credit rating industry and rating-contingent regulations in China. Section 3 describes our empirical strategy and Section 4 summarizes the data. Section 5 analyzes the relationship between the upgrades and bank fundamentals and investor reactions to the upgrades. Section 6 examines the implication of rating-contingent regulation for credit rating. Section 7 concludes the paper.

2. Institutional Background

This section introduces China's credit rating industry, rating-contingent regulation and the INCD market to provide a necessary background for this study.

2.1 Credit Rating Industry in China

In China, the earliest regulatory application of credit rating is dated back to the 1990s. Many CRAs have been established since then. The People's Bank of China (PBoC, China's central bank) accredited six CRAs to allow their ratings to be used for regulatory purposes in the interbank bond market.[6] Among these agencies, *Cheng Xin* (in partnership with Moody's), *Brilliance* (in cooperation with the Standard & Poors), *Lian He* (in partnership with Fitch Rating), *Da Gong* and *Dong Fang* practice issuer-paid business model, while *Zhong Zhai Zi Xin*, established by the members of National Association of Financial Market Institutional Investors (NAFMII) in 2010, applies investor-paid business model.

The PBoC issued Regulation No. [2006] 95 to unify the rating symbols. The letter

[6] There are two major bond markets in China: the interbank bond market and the exchange market. The interbank market dominates as it has about 85% of the aggregate issuance amount, 75% of the trading volume, and over 90% of the amount of bond outstanding (China's Bond Market Overview, 2016).

rating symbols are very similar to those of the Standard & Poor's, ranging between AAA and D. Finer grids such as "+" and "-" are available to further differentiate ratings. China applies single rating disclosure rule (with exception to the asset-backed securities, to which double-rating disclosure rule applies). Transition to double-rating disclosure rule for all securities is under discussion (Li, 2018).

2.2 Rating-Related Regulations in China

The Chinese bond markets are regulated by multiple regulators. In general, the Ministry of Finance (MoF) regulates Treasury bonds; the PBoC and China Bank Regulatory Commission (CBRC) regulate financial bonds; National Development and Reform Commission (NDRC) regulates enterprise bonds that are mainly issued by the state-owned sector; China Securities Regulatory Commission (CSRC) regulates corporate bonds; China Insurance Regulatory Commission (CIRC) regulates bonds issued by insurance companies; China Securities Depository Clearing Corporation (CSDC) undertakes the registration, clearing and settlement of all securities in China. Table 1 presents a list of rating-contingent regulations issued by these regulators.

[Insert Table 1 Here]

These regulations mainly affect security issuers and investors through the following channels:

1) *Public Issuance*: for example, bonds rated as AAA can be issued to public investors (CSRC No. [2015] 113). Simplified issuance procedure applies to issuers and issues with credit ratings of AAA (NDRC No. [2013] 957).

2) *Investment Restrictions*: for example, money market funds are prohibited to invest in bonds with issuer ratings below AA+ (CSRC No. [2015] 120). Insurance companies are required to report to the CIRC if holding below AA+ bonds that exceed 10% of the total assets in previous quarter (CIRC No. [2014] 13).

3) *Capital Requirements*: for example, less reserve is required for holding highly rated bonds. For designated institutions, the reserve ratios for holding bonds rated "AAA", "≥AA" and "<AA" are 10%, 15%, and 50%, respectively (CSRC No. [2016] 30).

2.3 The INCDs

The INCDs are book-entry fixed-term deposit certificates issued by depository institutions, and invested and traded by banks and fund management companies in the interbank bond market (China's Bond Market Overview, 2016). After being introduced in December 2013, the INCDs have become the primary source of short-term financing for banks in China. This market-priced instrument facilitates the on-going interest rate liberalization in China,[7] similar to the negotiable certificates of deposit used during the interest rate liberalization in the U.S. and Japan (Patrick, 1972; Summers, 1980; Takeda and Turner, 1992).

The yields and issue amounts of the INCDs are determined through negotiations between issuers and investors. The yields are benchmarked to the Shanghai Interbank Offered Rates (SHIBORs) and adjusted for the credit quality of issuers. We define the financing gap of an INCD issue as the difference between the publicly announced target issue amount and the subscription amount normalized by the latter. The financing gap reflects the popularity of an INCD issue. The lower the financing gap, the more popular an issue is, *vice versa*.

[Insert Figure 1 Here]

As depicted in Figure 1, the number of INCD issuance grew rapidly in 2013-2017. The monthly issuance amount exceeded two trillion RMBs in September 2017, being the largest among all bond products. Issuer's credit rating is mandatorily disclosed in the issuing document. The frequent issuance of INCDs allows us to compare credit spreads before and after the upgrades in a timely and accurate manner.

3 Empirical Methodology

This section presents our empirical methodology and hypotheses.

3.1 Rating Informativeness

Information discovery is a core function of credit rating (Ramakrishnan and

[7] In September 2013, Ms. Xiaolian Hu, the former vice governor of the PBoC, stated that issuance and trading of INCDs constitute one key aspect of interest rate liberalization in China.

Thakor, 1984; Millon and Thakor, 1985). This section first examines whether the upgrades reflect improvements to bank fundamentals, or due to loosening rating standards. We propose and test the following hypotheses:

H1a: Bank fundamentals improved after the upgrades;

H1b: Rating standards were stable during the sample period.

In testing *H1a*, we conduct the t-tests to compare bank financial performance before and after being upgraded.

In testing *H1b*, we follow Blume, Lim and Mackinlay (1998), Alp (2013) and Baghai, Servaes and Tamayo (2014) to apply the ordered probit model as follows:

$$R_{i,t} = \begin{cases} 5 \ if \ \ Z_{i,t} \in [\mu_4, \infty) \\ 4 \ if \ \ Z_{i,t} \in [\mu_3, \mu_4) \\ 3 \ if \ \ Z_{i,t} \in [\mu_2, \mu_3) \\ 2 \ if \ \ Z_{i,t} \in [\mu_1, \mu_2) \\ 1 \ if \ \ Z_{i,t} \in (-\infty, \mu_1) \end{cases}, \quad (1)$$

$$, Z_{i,t} = \alpha_t + \beta' X_{i,t-1} + \varepsilon_{i,t}, \quad (2)$$

$$E\left[\varepsilon_{i,t} \middle| X_{i,t-1}\right] = 0, \quad (3)$$

where $R_{i,t}$ denotes the rating category of bank *i* at the end of year *t*. We use five rating categories, so $R_{i,t}$ ranges from one to five. $Z_{i,t}$ is a latent variable that relates to $R_{i,t}$ by partition point μ_i. $X_{i,t-1}$ are firm characteristics that include *Log(Assets)*, *Assets Growth*, *Total Capital Ratio*, *Leverage Ratio*, *Net Interest Margin*, *ROE*, *Cost to Income Ratio*, *Liquidity Ratio* and *Impaired Loan Ratio*. In this model, credit rating is a function of bank characteristics and year indicators. The year indicators are used to measure whether rating standards had changed relative to the benchmark year.

In the ordered probit model, the magnitudes of coefficients are not economically meaningful, since the year dummy coefficient α_t is not in the same units as $Z_{i,t}$. We follow Alp (2013) to convert the year indicator coefficient α_t to the unit of rating notch. For example, the average distance between the cut points in Equation (1) is $(\mu_4 - \mu_1)/3$. We report the year dummy coefficients as the multiples of the average distance, that is, by how many notches a bank's credit rating would change for one standard deviation change in the explanatory variables.

3.2 Investor Reactions and Regulation Effects

This section presents the methodology to examine whether investors are able to discover information and the impact of rating-contingent regulation on the upgrades.

3.2.1 Can Investors Discover True Information?

Bolton, Freixas and Shapiro (2012) show theoretically that under the issuer-paid business structure, rating inflation and rating shopping are more likely to occur in the presence of naïve investors. In the context of our model, if investors respond positively to the upgrades, the INCD credit spreads and financing gaps would decrease. Thus, we develop and test the following hypotheses:

H2a: The INCD credit spreads decreased after the upgrades;

H2b: The INCD financing gaps decreased after the upgrades.

We compute credit spread using the INCD's issuing yield minus the SHIBOR of matched maturity.

We compute financing gap using

$$Gap_{i,t} = \frac{Target\ \ Issuance\ \ Amount_{i,t} \ - \ \ Actual\ \ Subscription\ \ Amount_{i,t}}{Target\ \ Issuance\ \ Amount_{i,t}}, \qquad (4)$$

where *Gap* is a truncated variable greater than zero. Therefore, we use the Tobit model in the investigation. The baseline regression is

$$Spread_{i,t}/Gap_{i,t} = \alpha_0 + \beta_1 * Upgraded_{i,t} + \sum \alpha_j X_{i,t} + \varepsilon_{i,t}. \qquad (5)$$

The key explanatory variable of interest is *Upgraded,* which equals 1 if the bank's credit rating has been upgraded, and 0 otherwise. We control for the following variables: (1) the INCD maturity; (2) the target amount of INCD issuance; (3) the volatility of last five-day O/N SHIBOR rate, which is used to control for general market environment; (4) bank types, which are dummy variables for different bank categories (see Table 3); (5) the CRAs, which are dummy variables for different rating agencies. We also control for the year and region fixed effects and clustered standard errors by bank.

China applies single-rating disclosure rule, and does not require issuers to disclose initial contacts with the CRAs. The practice encourages rating shopping as issuers can purchase and report the most favorable ratings (Skreta and Veldcamp, 2009; Faure-

Grimaud, Peyrache and Quesada, 2009; Sangiorgi and Spatt, 2017). The upgrades granted by non-incumbent agencies are more likely to be shopped. Given the conflicts of interest between investors and rating agencies, investors would respond more negatively to the upgrades granted by non-incumbent agencies. We develop and test the following hypothesis:

H2c: Investors reacted more negatively to the upgrades granted by non-incumbent CRAs.

We use Equation (6) to test investors' reactions to upgrading granted by incumbent and non-incumbent CRAs. *Upgraded without CRA Switched* is a dummy variable that takes 1 if a higher rating is assigned by incumbent CRAs, and 0 otherwise; *Upgraded with CRA Switched* is a dummy variable that takes 1 if a higher rating is granted by non-incumbent CRAs, and 0 otherwise. The sum of the two variables equals *Upgraded* in Equation (5).

$$Spread_{i,t}/Gap_{i,t} = \alpha_0 + \beta_1 * Upgraded\ \ without\ \ CRA\ \ Switch_{i,t} + \beta_2 * Upgraded\ \ with\ \ CRA\ \ Switch_{i,t} + \sum \alpha_j X_{i,t} + \varepsilon_{i,t}. \quad (6)$$

We use the full sample to check whether the upgraded banks were treated equally as the banks already in the higher rating categories. Thus, we add numerical *Rating* variables (e.g., AAA=10, AA+=9 … BBB-=1) to Equations (7) and (8). *Rating* is used to capture the difference in the credit spreads (financing gaps) of banks with two adjacent rating grades as the benchmark for the upgrading effects.

$$Spread_{i,t}/Gap_{i,t} = \alpha_0 + \beta_1 * Rating_{i,t} + \beta_2 * Upgraded_{i,t} + \sum \alpha_j X_{i,t} + \varepsilon_{i,t}, \quad (7)$$

$$Spread_{i,t}/Gap_{i,t} = \alpha_0 + \beta_1 * Rating_{i,t} + \beta_2 * Upgraded\ \ without\ \ CRA\ \ Switch_{i,t} + \beta_3 * Upgraded\ \ with\ \ CRA\ \ Switch_{i,t} + \sum \alpha_j X_{i,t} + \varepsilon_{i,t}. \quad (8)$$

3.2.2 The Regulation Effects

Opp, Opp and Harris (2013) and Cole and Cooley (2014) argue that ratings are more likely to be inflated when prudential regulation outsources credit risk assessment to rating agencies. Hence, regulation constitutes a primary cause for rating quality deterioration. In China, the regulations explicitly specify rating thresholds for the

eligibility for public issuance. Capital and reserve requirements and investment restrictions are also contingent on ratings. We develop and test the following hypothesis:

H3: The effects of upgrading on credit prices and financial gaps depend on whether the upgrades bring regulatory advantage.

We use Equations (5)-(8) to test *H3*. The sample is divided into three subsamples to capture various levels of regulatory advantage: (1) ⩾AA (upgrading will bring significant regulatory benefits in terms of access to the public market, and less capital and reserve requirements and investment restrictions for investors); (2) <AA+ and ⩾ A+ (upgrading will bring limited regulatory benefits); and (3) <AA- (upgrading will bring almost no benefits).

4 The Data

This section introduces our data of upgrading, INCD, and bank financials.

4.1 The Upgrades

The data of upgrades comes from China National Interbank Financial Center. Panel A of Table 2 shows that vast majority of the upgrades were associated with city commercial banks and rural commercial banks, which are of medium or small size. There are 159 banks being upgraded once and by one grade. Among them, 37 banks were upgraded by non-incumbent CRAs.

[Insert Table 2 Here]

Panel B describes rating migration in 2015-2017. The 12-month probabilities of upgrading were much higher than those of the developed markets. For example, there is a 25.49% probability for an AA+ bank to be upgraded into AAA. Panel C shows that *Cheng Xin* and *Lian He* have the largest market shares and have upgraded more banks than their peers. Upgrading (by both incumbent and non-incumbent CRAs) occurred in every year throughout our sample period.

4.2 The INCD Data

We manually collected the INCD data from the website of China National

Interbank Financial Center. There are two files for each INCD issue: (1) the pre-issuance document describes the basic information of the INCD, including the target issue amount and issuer's credit rating; (2) the post-issuance document contains issuing yield and subscription amount. The two files share a unique identification number assigned to the INCD. Our sample contains 49,474 INCD issues, consisting of 98.35% of the total issues of 50,306 in 2013-2017, according to Shanghai Clearing House.

We apply the following filtration to process the data. Five INCD issues without post-issuance information were removed. To focus on the domestic CRAs, we excluded 250 INCD issues rated by the Standard & Poor's and Moody's. We removed 12 free-trade-zone special INCDs (potentially not market priced) and one issue without credit rating. We excluded seven issues rated by two CRAs. We also exclude 13 INCDs issued by two rural cooperative banks that were transformed into rural commercial banks and upgraded at the same time. A vast majority of the INCDs have zero-coupon, so we excluded 396 issues that have fixed rate or floating rate coupons. Our final sample contains 48,790 INCDs, which is 98.62% of the original data. These INCDs were issued by 657 banks, among which 180 banks were upgraded.

[Insert Table 3 Here]

Panel A of Table 3 reports the summary statistics of the INCDs for the full sample and two subsamples. Subsample 1 consists of the INCDs issued by the banks that were upgraded once by one grade. Subsample 2 merges the INCDs in Subsample 1 with the INCDs issued by the banks that have never experienced any rating adjustments during the sample period. We mainly use these subsamples in our empirical tests.

The average credit spread for the full sample is 46.20 bps with a standard deviation of 42.82 bps, suggesting that there is a substantial variation in the spreads. Some of the spreads are negative. The reason is that the SHIBORs (the proxy of risk-free rate) are calculated based on the quotes from 18 qualified financial institutions. The quotes reflect the banks' individual liquidity situations, so the SHIBORs can be higher than some banks' INCD rates. The average credit spread of the upgraded banks in Subsample 1 is 51.86 bps, slightly higher than the full sample average.

The average (median) maturity of the INCDs for the full sample is 160 (92) days.

Most the INCDs have maturities around three months. The average target issue amount is 0.89 billion yuan, higher than the average subscription amount of 0.79 billion yuan. The average financing gap is 0.10 billion yuan, equivalent to 12.44% of the average target issue amount. The financing gaps range between 0.00% and 99.67% with a standard deviation of 26.18%, indicating that the financing gaps vary significantly. The average financing gap for Subsample 1 is 15.59%, slightly higher than that for the full sample. The upgraded banks are more likely to miss their issue targets.

About 33% of the INCDs were issued by the banks after being upgraded. Among them, 27% were issued by the banks upgraded by incumbent CRAs and 6% were issued by the banks upgraded by non-incumbent CRAs. For the upgraded banks, 57% of their INCDs were issued after the upgrades; 8% were issued after the banks being upgraded by non-incumbent CRAs.

Panel B of Table 3 reports the INCD statistics by bank type and credit rating, respectively. Almost all types of depository institutions participate in the INCD market, The medium- or small-sized banks dominate the market.[8] By both issue number and subscription amount, the national joint-stock banks, city commercial banks and rural commercial banks account for 90% of the market. Among them, the national joint-stock banks and city commercial banks raised 17.72 and 15.13 trillion yuan from the INCD market, respectively. The five national banks (typically called “big five”) issued only 0.75% of INCDs by issue number.

Over half of the INCDs were issued by banks rated at AAA and AA+, consistent to the observation that most of bonds have ratings concentrating on AAA and AA+ in China (Jiang and Packer, 2017; Livingston, Poon and Zhou, 2018). The credit spreads increase as issuers’ credit quality deteriorates. The financing gaps increase as ratings fall from AAA to AA, and then revert to decrease as ratings continue to fall. Banks with below AA ratings typically set conservative target issue amounts in the first place.

4.3 Bank Data

The bank financial data is obtained from *Bankscope*, covering the period of time

[8] According to NIFC, there are 1712 banks in China as of August 2017. More than 1/3 of the banks participate in the INCDs markets. The rest 2/3 are small regional banks mainly operating in rural areas.

between 2012 and 2017. It allows us to obtain lagged financial data as the INCDs market started in 2013. *Bankscope* contains the financial data of 224 banks, among which 181 banks have issued the INCDs. After merging the bank and INCD data and removing banks with missing key financial variables, we have 381 bank-year observations from 143 individual banks, among which 90 (one) banks were upgraded (downgraded); 14 banks were upgraded by non-incumbent CRAs.

[Insert Table 4 Here]

Table 4 reports the key financial variables. Panel A presents their definitions and construction. We use *Logarithm of Total Assets* and *Assets Growth* to describe bank size and growth rate, respectively. *Total Capital Ratio* captures the capital adequacy of the banks. *Net Interest Margin* and *ROE* represent the profitability of the banks. *Cost to Income Ratio* captures the cost management ability of the banks. *Liquidity Ratio* captures bank short-term solvency. Lastly, *Impaired Loan Ratio* reflects the loan quality of the banks. Except for *Assets Growth*, all the variables are directly or indirectly employed by the CRAs in their rating. The CRAs also use *Shareholders' Equity*, *Non-performing Provision Coverage*, *Common Equity Tier 1 Capital Ratio*, *Net Operating Income*, *Pre-provision Earnings* and *Net Income* as key indicators in their rating. We do not include these variables because of their high correlations with the listed variables.

Panel B reports the summary statistics. The bank ratings range between AAA and A+ in the sample. We translate the letter ratings into numerical ratings as "AAA=5, AA+=4, AA=3, AA-=2, A+=1". The average numerical rating is 3.82, suggesting that the banks have an average rating above AA. Panel C reports the univariate correlations between the variables. *Leverage Ratio* is highly correlated to *Total Capital Ratio*, so we exclude *Total Capital Ratio* in the regressions to avoid potential multi-collinearity problem.

5 The Empirical Results

This section analyzes the empirical results. We start with the relationship between

upgrading and bank fundamentals, the time-series pattern of change in rating standards, and then investigate investors' reactions to the upgrades.

5.1 Bank Fundamentals and Rating Standards

We collect bank financial information two years before and after the upgrades occurred in 2015 and 2016. Among the 58 banks, 29 were upgraded into AA+ or AAA; the rest were upgraded into grades below AA+; 50 banks were upgraded by the incumbent CRAs and the rest were upgraded by non-incumbent CRAs.

[Insert Table 5 Here]

Table 5 reports the changes in the banks' key financial variables before and after the upgrades. Panel A shows that the banks exhibit significantly higher *Leverage Ratios* and *Impaired Loan Ratios*, and lower *Net Interest Margins*, *ROEs* and *Liquidity Ratios*. Credit quality in general deteriorated rather than improved after the upgrades, suggesting that the upgrades are not supported by bank fundamentals.

To rule out the potential non-comparable problems for different rating groups and different CRAs, we conduct analysis with subsamples. Panels B and C report the results for the banks upgraded into AA+ or AAA and entitled to regulatory advantage, and for those upgraded into grades below AA+ and had less or no regulatory advantage. Panels D and E report the results of the upgrades granted by incumbent CRAs (ratings are less likely to be shopped) and non-incumbent CRAs (ratings are more likely to be shopped), respectively. The results are consistent to those in Panel A. The upgraded banks exhibit significantly weaker performance in terms of *Leverage Ratios*, *Net Interest Margins*, *ROEs*, *Liquidity Ratios* and *Impaired Loan Ratios*.[9] Thus, *H1a* is rejected. The evidence does not support the initial rating conservativeness story, according to which the banks should exhibit improved fundamentals after being upgraded.

We use the ordered probit model in Equations (1)-(3) to study the time-series change in rating standards. For the full sample, Column (1) in Panel A of Table 6 shows that the coefficients of *Log (Assets)*, *Assets Growth*, *Leverage Ratio*, *Cost to Income*

[9] For robustness, we include the banks that were upgraded in 2017 into analysis, and use one-year financial information before and after upgrading. The results are consistent. In particular, *Assets Growth Rates*, *Net Interest Margins* and *Liquidity Ratios* were significantly lower after the banks being upgraded.

Ratio and *Impaired Loans Ratio* are statistically significant. The signs of *Log (Assets)* (+), *Leverage Ratio* (-) and *Impaired Loans Ratio* (-) are consistent to our intuition. Banks of larger size and lower leverage ratio tend to have higher ratings. These results are consistent to the findings of Jiang and Packer (2017) and Livingston, Poon and Zhou (2018). However, the coefficient of *Assets Growth* and *Cost to Income Ratio* are unexpected as banks with higher growth rates and lower cost to income rates should have higher credit ratings. This may be due to that the small- and medium-sized banks in China experienced faster growth and higher profits from the shadow banking activities in China (Acharya, Qian and Yang, 2017; Wang, Wang, Wang and Zhou, 2018). Column (2) reports similar results after controlling for the fixed effects of bank location (in province) and CRA. Overall, credit ratings to some degree capture the riskiness of the issuers. The result, however, does not rule out the possibility that the ratings are systematically inflated.

[Insert Table 6 Here]

Our main interest is the time-series variation in rating standards proxied by the year indicator variables benchmarked to year 2014. All the coefficients of the year indicators are greater than zero, statistically significant at the 1% level, suggesting that rating standards gradually and significantly loosened from 2015 to 2017. We follow Alp (2013) to assess the economic significance of the results by calculating the product of the coefficients and standard deviations of the relevant independent variables. This product measures the change in the conditional expectation of rating standards for one standard deviation increase in the explanatory variables. We then compare this product to the size of rating partition to comprehend its economic importance.[10] Panel A shows that the size measure, *Log (Assets)*, is the most important variable in affecting ratings. In Column (2), a one standard deviation increase in *Log (Assets)* tends to change credit rating upward by 1.63 notches. We also estimate the economic effects of the year indicators. As reported in Panel A, the year indicators display a strikingly monotonic

[10] For example, In Column (2) of Panel A, the rating notch length is (3.98-(-9.19))/3)=4.39. The coefficient of Log (Assets) is 4.71 and standard deviation of Log (Assets) is 1.53 as reported in Table 4. One standard deviation increase in Log (Assets) will increase the credit rating by 4.71×1.53/4.39=1.63 notches.

trend---holding firm characteristics constant, rating standards loosened by 1.48 notches since 2014.[11]

We follow Baghai, Servaes and Tamayo (2014) to estimate the marginal effects of bank fundamentals over time. In particular, we use a hypothetical bank with the average bank features in the sample, and report in Panel B the probabilities that this bank would obtain various ratings in 2014 and 2017, respectively. The change is striking---the probability of this bank receiving AAA rating is 0.52% in 2014, while the probability went up to 41.94% in 2017. With 60% probability the bank would receive a rating above AA in 2014, while the chance of being rated above AA went up to over 90% in 2017.

The evidence suggests that the rating agencies relaxed rating standards over time. The upgrade are due to rating inflation rather than improvements to bank fundamentals. Thus, *H1b* is rejected.

5.2 Investor Reactions

Bolton, Freixas and Shapiro (2012) argue that naïve investors would facilitate rating shopping and rating inflation. This section investigates whether investors were able to discover the true information and rationally react to the upgrades.

We first look at the upgraded banks only. In Panel A of Table 7, Columns (1) and (2) report that the coefficients of *Upgraded* are statistically insignificant in both the credit spread and financial gap regressions. In general, the credit spreads and financing gaps of INCDs did not reduce significantly after the upgrades. Investors appear to be able to recognize the riskiness of the securities, consistent to the findings in He, Qian and Strahan (2016).

[Insert Table 7 Here]

Column (3) shows that the banks upgraded by incumbent CRAs would experience an average decrease of 3.12 bps in credit spread, significant at the 10% level. In contrast, the banks upgraded by non-incumbent CRAs experienced no reductions in credit spread. Column (4) shows that the upgrades did not significantly affect the financing gaps. The

[11] For robustness, we conduct similar analysis with (1) banks with initial ratings equal or above AA in 2014, so upgrading would make them gain substantial regulatory benefits, and (2) banks with ratings equal or below AA in 2017, so upgrading would not bring significant regulatory advantages. The results are consistent.

differences between the coefficients for the incumbent and non-incumbent groups are 6.72 and 5.53 in the credit spread and financing gap regressions, respectively. Both are significant at the 1% level. Investors reacted more negatively to the upgrading events accompanied by CRA switches, where the CRAs were more likely to have divided rating opinions and the upgrades were more likely to be shopped, as issuers could purchase and report the most favorable ratings after receiving the preliminary opinions from multiple rating agencies.

How did the upgraded banks perform compared to those experienced no rating adjustments in the INCD market? We analyze the full sample and report the results in Panel B of Table 7. Columns (1) and (2) show that the coefficients of *Rating* are -5.96 and -3.38, respectively, significant at the 1% level. When a bank's rating is higher by one grade, on average, its INCD credit spread is lower by 5.96 bps and its financing gap is lower by 3.38%. In cross-section, the ratings reflect the credit quality of issuers, consistent to the findings of Livingston, Poon and Zhou (2018).

The coefficients of *Upgraded* are 3.51 and 10.82, respectively, and statistically significant. On average, upgrading itself causes an increase of 3.51 bps in credit spread and an increase of 10.82% in financing gap. Investors in general react negatively to these upgrading events. Combine the effects of *Rating* and *Upgraded*, an upgraded bank on average would experience a net reduction of 2.45 bps (5.96 bps - 3.51 bps) in credit spread, and a net increase of 7.44% (10.82%-3.38%) in financing gap.

Column (3) shows that the coefficients of *Upgraded without CRA Switched* and *Upgraded with CRA Switched* are 2.58 and 8.31, respectively, suggesting that the upgrades granted by incumbent CRAs experienced more adverse changes in credit spread. Column (4) reports that the coefficients of *Upgraded without CRA Switched* and *Upgraded with CRA Switched* are 10.42% and 12.67%. The INCDs issued by the banks upgraded by non-incumbent CRAs lost more popularity.

In the face of rating inflation, investors did not respond positively to the upgrades, and they reacted more negatively to the upgrades granted by non-incumbent CRAs, where ratings are more likely to be shopped. The traditional rating shopping and rating inflation theory does not entirely explain the motivation of the upgrading, as investors

did exhibit the capability of discovering true information and did not accept the rating results blindly.[12]

6 The Impact of Regulations

In China, prudential regulations extensively rely on credit ratings. What are the implications of regulatory use of ratings for the rating inflation? This section addresses this question.

6.1 Regulation Benefits: Sample of Upgraded banks

According to the Chinese regulations, issuers rated AA+ and above have significant advantage over those rated below AA+, while issuers rated AA- and below hardly have any regulatory benefits. We divide the whole sample into three groups: the first group includes the banks that are initially rated with AA or AA+ ("≥AA"). These banks would gain significant regulatory advantage when being upgraded into AA+ or AAA. The second group includes the banks initially rated A+ or AA- ("<AA+&≥A+"), where less regulatory advantage exists if being upgraded into AA or AA-. The third group includes the banks initially rated below AA- as of 2017, where no regulatory advantage exists when being upgraded.

Columns (1)-(3) of Table 8 show that only for the first group, the coefficient of *Upgraded* is statistically significant. The coefficient is -4.66, suggesting that the credit spreads on average decreased by 4.66 bps after the banks were upgraded into AA+ or AAA. Column (4) shows that the coefficient for *Upgraded without CRA switch* is -5.09 and significant at the 5% level, while the coefficient for *Upgraded with CRA switch* is 0.09 and statistically insignificant. Hence, the reduction in credit spread mainly comes from the upgrades granted by incumbent CRAs. For those banks that were upgraded into ratings below AA+, there is still no significant change in their INCD credit spreads.

[Insert Table 8 Here]

[12] For robustness, we follow Hand, Holthausen and Leftwich (1992) to examine how the stock markets react to these upgrading events. There are 12 listed banks (three in China and nine in Hong Kong) experienced upgrades. We find that the upgrading events hardly generate any significant cumulative abnormal returns.

For financing gap, Column (7) shows no significant interaction between *Upgraded* and change in financing gaps for the first group. Column (8) and (9) show that for the second and third groups, the coefficients of *Upgraded* are positive and significant. The results echo the early findings in that investors tend to penalize the upgrades in the absence of fundamental support. Columns (11) and (12) show that investors penalize the upgrades granted by non-incumbent CRAs more heavily.

The reduction in credit spread is driven by the banks that were upgraded into the regulation-favorable categories, as their INCDs could be issued to a significantly larger pool of investors who face substantially less investment restrictions and lower capital and reserve requirements. The decrease in the INCD spreads are unlikely due to reduced credit risk per se, given unimproved bank fundamentals. Investors accepted the inflated ratings for regulatory advantage, regardless of their information content.

6.2 Regulation Benefits: Comparing to the Banks Already with Higher Grades

We pool the upgraded banks with the banks already in the higher rating categories to gain further insights into how regulation affects credit rating practice.

[Insert Table 9 Here]

Columns (1)-(3) of Table 9 show that only for the "≥AA" group, the credit spreads are significantly correlated to *Rating* and *Upgraded* at the 1% level. The coefficient of *Rating* is -11.02, implying that the INCD credit spread is lower by 11.02 bps on average if the issuing bank has a higher rating by one grade. The coefficient of *Upgraded* is 5.45, implying that the credit spread would on average increase by 5.45 bps if a bank is upgraded by one grade. Investors do not entirely and unconditionally recognize the upgrades. The net effect of upgrading on credit spread for the "≥AA" group is still good, as the credit spreads fell by 5.57 bps on average.

Column (4) reports that the coefficients of *Upgraded without CRA switch* and *Upgraded with CRA switch* are 5.13 and 8.07, respectively, statistically significant at the 1% level. The market tends to penalize more heavily the upgrade granted by non-incumbent CRA. Even so, the upgraded banks still benefit from the overall decrease in credit spread. Regulatory reliance on credit rating could provide a sufficiently strong incentive for rating shopping. Consistently, Columns (5) and (6) show that for the banks

that were upgraded into ratings below AA+, where no regulation arbitrage exists, there were no significant changes in their INCD credit spreads.

Column (7) shows that for the "≥AA" group, the financing gaps are significantly correlated to *Rating* at the 1% level, suggesting that the financing gaps are 5.31% lower on average if a bank's rating is higher by one grade. Conversely, Columns (8) and (9) show that for the lower rating groups, upgrading has a significantly negative impact on the financing gaps. The coefficients of *Upgraded* are positive and statistically significant, implying that the financing gaps increased after the banks were upgraded. The results in Columns (10)-(12) suggest that for the banks in the two lower rating groups, especially in the "<AA-" group, investors invested less in the INCDs issued by the banks upgraded by non-incumbent CRAs. These findings confirm that investors are able to discover credit risk information behind the upgrades.

To sum up, rigid rating-contingent regulations played a pivotal role in creating a common incentive of issuers, CRAs and investors for rating inflation. Investors could appear to accept inflated ratings results as they appreciate the regulatory advantage brought by inflated ratings. In this regard, conflicts of interest between investors and rating agencies and agencies' reputation concerns would not alleviate rating inflation. Our results also imply that in practice, AA+ could be a more effective and meaningful investment grade/junk bond threshold in China, given the country's regulatory application of credit rating.

6.3 Persistence of the Upgrading Effects

This section examines how persistent the upgrading effects are. The banks are supposed to have stronger incentives for upgrading if the negative effects are short-lived. In doing so, we add an interaction term of *Upgraded* and *Time* to the regressions, where *Time* measures the time difference (in month) between the upgrading date and the following issuance date of new INCDs. The coefficient of this interaction term would provide an indication on the speed of change in the upgrading effects.

[Insert Table 10 Here]

Columns (1) and (2) of Table 10 report that for the banks in the "≥AA" category, the coefficient of *Upgraded without CRA Switched* is insignificant, while the coefficient

of its interaction term with *Time* is -0.23 and significant at the 10% level, suggesting that the upgrades had a long-lasting effect. However, it is not the case for the upgrades granted by switched CRAs---the coefficients of *Upgraded* and its interaction term with *Time* are not statistically significant.

Column (3) shows that for banks in the "<AA+&≥A+" category, the coefficients of *Upgraded* and its interaction term with *Time* are insignificant in the credit spread regression. Column (4) shows that in the financing gap regression, the coefficients of *Upgraded without CRA Switched* and *Upgraded with CRA Switched* are 24.81% and 28.79%, respectively, significant at the 1% level. For the upgrades that did not give rise to significant regulatory advantage, the adverse effects of upgrading tend to be immediate and persistent.

Column (5) reports that for the banks in the "<AA-" category, the coefficients of *Upgrades with CRA switched* and its interaction term with *Time* are 13.74 and -1.44, respectively. The credit spreads of newly issued INCDs quickly increased by 13.74 bps on average, then reduced very slowly over time. Column (6) report that the coefficients of *Upgrades without CRA switched* and its interaction term with *Time* are 22.54% and 1.23%, respectively, significant at the 1% level. Investors were more reluctant to invest in the INCDs issued by these banks. Such preferences are not only persisting, but also grow stronger over time. The coefficients of *Upgrades with CRA switched* and its interaction term with *Time* are 38.32 and -0.73, respectively, significant at the 1% level. Investors reacted more negatively to the upgrades granted by non-incumbent CRAs, where ratings are more likely to be shopped. The pattern is even more apparent for the "<AA-" category. In contrast, there are no significant increases in credit spread and financing gap for the "≥AA" category, consistent to the previous findings.

Overall, we find that the negative market reactions to the upgrades were persistent, and might go even stronger for those granted by non-incumbent CRAs over time.

7. Conclusion

We observe 180 upgrades in sharp contrast to two downgrades in the Chinese banking sector during 2015-2017. Interesting questions naturally emerge from the

observation: (1) Why were there abnormally more upgrades than downgrades? (2) Were those upgrades supported by fundamentals or as a result of rating inflation? (3) Were rating shopping involved? (4) How did investors react to the upgrades? Could they discovery true information? (5) Did regulations drive the upgrades? This paper addressed these questions. Along the way, it overviewed credit rating regulations and practice in China, and examined rating informativeness in China, which has long been intensively debated among regulators, practitioners and academics, and mixed evidence is found.

The upgrades are results of rating inflation, as they are not supported by bank fundamentals, while rating standards strikingly loosened over time. Except for the banks being upgraded to AA+ or AAA to gain significant regulatory advantage, the credit spreads and financing gaps of the INCDs issued by the upgraded banks were not sufficiently reduced. More negative reactions followed the upgrades granted by non-incumbent rating agencies, where ratings were more likely to be shopped and less accurate. Investors were able to discover information, but they accepted the biased upgrades when banks are upgraded to AAA and AA+ for regulatory arbitrage. Ratings affect credit prices through regulation arbitrage, independent of the accuracy of rating information. Our findings highlight that market price-based or diverse public information-based regulation could be the ultimate solution to many of the problems deep-rooted in the credit rating industry.

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Table 1

Rating-Contingent Regulations in China

This table lists the regulations related to AAA, AA+, AA and AA- by different regulators in China. CSRC stands for China Securities Regulatory Commission; NDRC stands for National Development and Reform Commission; CIRC stands for China Insurance Regulatory Commission; CBRC stands for China Banking Regulatory Commission; CSDC stands for China Securities Depository Clearing Corporation; PBoC stands for People's Bank of China; MoF stands for Ministry of Finance.

Ratings	Regulators	Regulations and Contents
AAA	CSRC	➢ No. [2006]93: Money market fund can only invest in asset-backed securities with ratings of AAA. ➢ No. [2015]113: Corporate bonds with ratings of AAA can be issued to public investors. Otherwise they can only be issued to qualified investors. ➢ No. [2016]30: Capital reserve for the specific client asset management subsidiaries of fund management companies holding fixed income securities with AAA rating is 10%. ➢ No. [2017]12: Financial Instruments, including the INCDs, with issuer's rating lower than AAA cannot exceed 10% of the total net asset value of a Money Market Fund's portfolio.
	CSDC	➢ No. [2017]47: In the exchange market, corporate bonds rated AAA and issuer rated above AA (included) can be used as collateral in repo transitions.
	NDRC	➢ No. [2013]957: Issuance procedure will be simplified if the issue or issuer has a rating of AAA.
AA+	CSRC	➢ No. [2015]120: Money market funds can only invest in bonds with issuer rating equal or above AA+. ➢ No. [2017]12: If a money market fund invests in the deposits or INCDs issued by banks with rating lower than AA+, the fund is subject to more stringent procedure for prudential regulation.
	CIRC	➢ No. [2014]13: Insurance company must report the following situations and will be monitored: Holding bonds with ratings equal or less than AA exceeding 10% of total assets in the last quarter.
	NDRC	➢ No. [2013]957: Issuance procedure will be simplified if: (1) bonds are guaranteed by guarantee companies with credit ratings equal or above AA+; (2) bonds have collaterals rated equal or above AA+; (3) bond issuers are rated equal or above AA+.
AA	PBoC MoF NDRC CSRC	➢ No. [2010]10: Foreign institutions that are about to issue RMB-denominated bonds should be rated by at least two CRAs. At least one of the CRAs needs to be registered in China and qualified to rate RMB-denominated bonds. The RMB-denominated bonds need to have a rating equal or above AA.
	CSDC	➢ No. [2013]109: In the exchange market, corporate bonds with both bond rating and issuer ratings above AA (included) can be used as collateral in repo transitions.
	CSRC	➢ No. [2016]30: Capital reserve for the specific client asset management subsidiaries of fund management companies for holding fixed income securities with rating below AAA but above AA (included) is 15%; for fixed income securities with ratings below AA is 50%.
AA-	CBRC	➢ No. [2005]3: Risk weighted value is 20% (40%) for banks invested in asset-backed securities with long-term ratings from AAA to AA- (from A+ to A-) ➢ No. [2009]116: Risk exposure for asset securitization is 20% (40%) for banks with long term ratings from AAA to AA- (from A+ to A-). ➢ No. [2014]2: For liquidity coverage ratio (LCR), bonds with ratings equal or above AA- (equal or below A+) need to be discounted by 85% (50%) to be regarded as liquid assets.

Table 2

Rating Actions in the Banking Sector

Panel A classifies the banks that experienced rating actions during the sample period. Panel B presents the rating migration matrix. Panel C summarizes the statistics of INCD issuing banks rated by different CRAs.

Panel A: The Characteristics of Upgraded and Downgraded Banks in 2015-2017

Bank Types*			CCB	RCB	RCC	RCB	PB	NJSB	FB	VB	Total
Number of Banks			82	82	8	5	2	1	1	1	**182**
Cases	Notches	Times									
Up	1	1	73	72	6	4	2	1	1		**159**
	2	1		3						1	**4**
	1	2	8	6	2	1					**17**
Down	1	1	1	1							**2**
CRA Switched & Upgraded			20	15	1	1					**37**
CRA Switched & Downgraded			1								**1**

* Bank Types: (See Table 3 Panel B for all types of the participating banks)

1. CCB: City Commercial Bank，城市商业银行;
2. RCB: Rural Commercial Bank，农村商业银行;
3. RCC: Rural Credit Cooperative，农村信用社;
4. RCB: Rural Cooperative Ban, 农村合作银行;
5. PB: Private Bank, 民营银行;
6. NJSB: National Joint-Stock Bank, 全国股份制商业银行;
7. FB: Foreign Bank，外资银行;
8. VB: Village Bank, 村镇银行.

Panel B: Average One-Year Rating Migration Rates in 2015-2017

Rating	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-
AAA	**100.00%**	-	-	-	-	-	-	-	-	-
AA+	25.49%	**74.51%**	-	-	-	-	-	-	-	-
AA	-	25.12%	**74.41%**	*0.47%*	-	-	-	-	-	-
AA-	-	-	20.15%	**79.85%**	-	-	-	-	-	-
A+	-	-	0.32%	10.76%	**88.61%**	*0.32%*	-	-	-	-
A	-	-	-	1.01%	10.61%	**88.38%**	-	-	-	-
A-	-	-	-	-	2.27%	4.55%	**93.18%**	-	-	-
BBB+	-	-	-	-	-	20.00%	-	**80.00%**	-	-
BBB	-	-	-	-	-	-	-	-	**100.00%**	-
BBB-	-	-	-	-	-	-	-	-	-	**100.00%**

Note: We use the migration rate of AA+ banks to illustrate how we construct the matrix. First, we calculate the number of INCD issuing banks that are initially rated AA+ in each year between 2015 to 2017 (25, 31 and 47 banks in 2015, 2016 and 2017, respectively). We then calculate the number of banks that are upgraded into AAA at the end of each year (8, 0, and 18 in 2015, 2016 and 2017, respectively). Lastly, we use the number of banks that are initially rated AA+ in each year as the weights to calculate the average one-year rating migration rate. The calculation is given as follow:

$$25.49\% = \frac{8}{25} * \frac{25}{25+31+46} + \frac{0}{31} * \frac{31}{25+31+46} + \frac{18}{46} * \frac{46}{25+31+46}.$$

Panel C: Rating Actions by CRA in 2015-2017

	Credit Rating Agencies		*Da Gong*		*Dong Fang*		*Cheng Xin*		*Lian He*		*Brilliance*		Total	
2015	Initially Rated By		22	100.00%	28	100.00%	86	100.00%	64	100.00%	35	100.00%	235	100.00%
	Upgraded	By Incumbent CRA	2	9.09%	3	10.71%	16	18.60%	9	14.06%	4	11.43%	34	14.47%
		Switched Out from	1	4.55%			1	1.16%					2	0.85%
		Switched in & Upgraded									2	5.71%		
2016	Initially Rated By		53	100.00%	69	100.00%	171	100.00%	135	100.00%	52	100.00%	480	100.00%
	Upgraded	By Incumbent CRA	2	3.77%	6	8.70%	16	9.36%	12	8.89%	3	5.77%	39	8.13%
		Switched Out from	5	9.43%	1	1.45%	3	1.75%	1	0.74%	2	3.85%	12	2.50%
		Switched in & Upgraded	1	1.89%	1	1.45%	4	2.34%	5	3.70%	1	1.92%		
2017	Initially Rated By		48	100.00%	83	100.00%	208	100.00%	149	100.00%	48	100.00%	536	100.00%
	Upgraded	By Incumbent CRA	8	16.67%	9	10.84%	30	14.42%	32	21.48%	6	12.50%	85	15.86%
		Switched Out from	6	12.50%	1	1.20%	6	2.88%	9	6.04%	2	4.17%	24	4.48%
		Switched in & Upgraded	3	6.25%	5	6.02%	6	2.88%	5	3.36%	5	10.42%		
	Downgraded	By Incumbent CRA					1	0.48%					1	0.19%
		Switched Out from									1	2.08%	1	0.19%
		Switched in & Downgraded					1	0.48%						

Note: In Panel A we observe 180 banks with 197 upgrades (17 banks were upgraded twice). One bank was upgraded twice in 2015 by the same CRA, thus in Panel C we observe only 196 rating actions. In addition, Panel A reports that 37 banks experienced upgrades granted by non-incumbent CRAs; one bank was upgraded twice and switched CRA twice in 2016 and 2017, thus in Panel C we observe 38 upgrades granted by non-incumbent CRAs.

Table 3

Summary Statistics for the INCD-Level Data

This table reports the descriptive statistics for key variables. Panel A is for INCD-level sample. Subsample (1) consists of INCDs issued by the banks that were upgraded only once by one notch. Subsample (2) consists of INCDs in Subsample (1) and INCDs issued by banks that never experienced any rating adjustments. Panel B reports the INCD characteristics by bank type and credit rating, respectively.

Panel A: The INCD Data

		Full Sample						Subsample (1)			Subsample (2)		
Variables	Abbreviation	Obs	Mean	Std.Dev.	Min	Median	Max	Obs	Mean	Std.Dev.	Obs	Mean	Std.Dev.
Issuance Yield (%) [1]	Yield	48790	4.08	0.84	2.10	4.35	8.24	21397	4.16	0.83	44348	4.08	0.84
Issuance Yield Minus SHIBOR with Matched Term (BP)	Spread	48790	46.20	42.82	-98.79	37.75	544.96	21397	51.86	41.96	44348	45.78	42.98
Term of Each INCD (Days)	Term	48790	159.86	116.84	28.00	92.00	366.00	21397	163.81	120.20	44348	159.70	116.81
Target Issuance Amount of Each INCD (Billion RMB)	Amount-Target	48790	0.89	1.32	0.05	0.50	48.39	21397	0.68	0.72	44348	0.93	1.38
Actual Subscription Amount of Each INCD (Billion RMB)	Amount-Actual	48790	0.79	1.29	0.01	0.48	48.39	21397	0.57	0.70	44348	0.82	1.34
Financing Gap (Billion RMB) [2]	Financing-Gap	48790	0.10	0.30	0.00	0.00	9.00	21397	0.11	0.26	44348	0.11	0.31
Normalized Financing Gap for Each INCD (%) [3]	Gap	48790	12.44	26.18	0.00	0.00	99.67	21397	15.59	28.63	44348	12.76	26.46
Issuer Rating (Numerical value by AAA=10… BBB-=1)	Rating	48790	8.74	1.32	1.00	9.00	10.00	21397	8.47	1.14	44348	8.77	1.34
Volatility of O/N SHIBOR Last 5 Trading Days	5 Days Vol.SHI.ON	48790	0.03	0.03	0.00	0.02	0.45	21397	0.03	0.03	44348	0.03	0.03
Upgraded [4]	Upgraded	48790	0.33	0.47	0.00	0.00	1.00	21397	0.57	0.50	44348	0.27	0.45
Upgraded without CRA Switched		48790	0.27	0.45	0.00	0.00	1.00	21397	0.49	0.50	44348	0.24	0.42
Upgraded with CRA Switched		48790	0.06	0.23	0.00	0.00	1.00	21397	0.08	0.27	44348	0.04	0.19

Note:

[1] The *Issuance Yield* is constructed as *Issuance Yield= (A/T) × (Par Value-Issuance Price)/Issuance Price*, as in the "Procedures for the Issuance and Trading of INCDs in the Interbank Markets: Annex 6".

[2] *Financing Gap* is constructed as *Target Issuance Amount - Actual Subscription Amount*.

[3] *Normalized Financing Gap* is calculated as *Financing Gap/ Target Issuance Amount*.

[4] *Upgraded, Upgraded without CRA Switched and Upgraded with CRA Switch* are dummy variables that equal one after the issuer being upgraded (with/without CRA switched).

Panel B: Sample Breakdown

By Bank Type As of 2017

	Issues		Amount-Actual		Spread		Gap	
	Number	% of Total	Billion RMB	% of Total	Mean	Std. Dev.	Mean	Std. Dev
Big-Five	367	0.75%	446.8	1.16%	24.00	29.63	2.49	12.47
NJSB	11297	23.15%	17715.0	46.16%	25.24	34.59	11.34	25.10
CCB	23664	48.50%	15130.7	39.42%	49.08	39.74	14.67	28.19
RCB	11958	24.51%	4479.9	11.67%	59.79	46.93	9.69	23.01
FB	365	0.75%	161.7	0.42%	31.09	32.00	19.22	32.38
JCB	383	0.78%	214.9	0.56%	44.81	33.84	3.21	12.89
PB	147	0.30%	101.2	0.26%	70.49	43.16	11.32	24.45
RCB	155	0.32%	44.9	0.12%	55.79	54.11	4.52	14.58
RCC	431	0.88%	81.1	0.21%	78.08	64.34	9.52	23.98
VB	20	0.04%	1.2	0.00%	142.77	110.06	0.00	0.00
POSB	3	0.01%	2.3	0.00%	16.41	10.57	16.33	28.29

By Credit Rating

	Issues		Amount-Actual		Spread		Gap	
	Number	% of Total	Billion RMB	% of Total	Mean	Std. Dev.	Mean	Std. Dev
AAA	18723	38.37%	25731.2	67.04%	29.32	34.76	11.01	25.06
AA+	11690	23.96%	6663.5	17.36%	49.73	39.68	13.69	27.12
AA	9697	19.87%	3934.5	10.25%	57.73	44.00	15.82	28.71
AA-	5484	11.24%	1523.5	3.97%	61.11	43.97	11.83	25.67
A+	2075	4.25%	362.7	0.95%	71.30	52.82	7.48	19.98
A	1029	2.11%	149.7	0.39%	70.10	50.71	6.41	19.10
A-	79	0.16%	13.9	0.04%	88.60	57.82	1.96	11.21
<A-	13	0.03%	0.8	0.00%	143.97	135.02	0.00	0.00

Note:

The type of INCD issuing banks as of 2017 and their abbreviations:

1. Big-Five: The “Big-Five” National Banks，五大国有商业银行;
2. NJSB: National Joint-Stock Banks，全国股份制商业银行;
3. CCB: City Commercial Banks，城市商业银行行;
4. RCB: Rural Commercial Banks，农村商业银行行;
5. FB: Foreign Banks，外资银行;
6. JCB: Joint Cooperative Banks，合资银行;
7. PB: Private Banks，民营银行;
8. RCB: Rural Cooperative Bank，农村合作银行;
9. RCC: Rural Credit Cooperatives，农村信用社;
10. VB: Village Banks，村镇银行;
11. POSB: Post Office Saving Bank，中国邮政储蓄银行.

Table 4

Variable Definition, Summary Statistics and Correlation for the Bank-Level Data

This table describes the key variables. Panel A lists bank financial variables. Panel B summarizes their statistics. Panel C reports the univariate correlations between key variables. All the variables are winsorized at the 1st percentile and the 99th percentile.

Panel A: Bank Variables

Variable Names	Explanation & Construction Methodology	Usage by the Domestic CRAs
Log (Assets)	It captures the bank size and is computed as the natural logarithm of the bank's total asset measured in billion RMB. ***Total Assets*** are directly available from Bankscope.	The domestic CRAs use ***Total Assets*** in their reports.
Assets Growth	It captures bank growth rate and is computed as the difference of the Log (Assets) between two consecutive years.	N/A
Total Capital Ratio	It captures the capital adequacy ratio and is computed as net capital divided by risk-weighted assets. The variable is directly available from Bankscope.	The domestic CRAs use ***Capital Adequacy Ratio*** in their reports.
Leverage Ratio	It captures the leverage of the banks and is computed as one minus ***the Ratio of Equity to Total Assets***, which is directly available from Bankscope.	The domestic CRAs use ***the Ratio of Equity to Total Assets*** in their reports.
Net Interest Margin	It captures profitability of banks and is computed as the net interest income divided by interest-generating assets. The higher this figure the cheaper the funding or the higher the margin the bank is commanding. The variable is directly available from Bankscope.	The domestic CRAs use this indicator in their reports.
ROE	It captures profitability of banks and is computed as ***the Return on Average Shareholders' Equity***, which is directly available from Bankscope.	The domestic CRAs use both ***ROA*** and ***ROE*** in their reports.
Cost to Income Ratio	It captures a bank's costs in relation to its income and is computed as the operating cost divided by the operating income. The variable is directly available from Bankscope.	The domestic CRAs use this indicator in their reports.
Liquidity Ratio	It captures the liquidity of banks and is computed as the value of ***Liquid Assets divided by Short-term Funding Plus Total Deposits***, which is directly available from Bankscope. Liquid assets include cash and due from banks, trading securities and at fair value through income, loans and advances to banks, reverse repos and cash collaterals.	The domestic CRAs use this indicator in their reports.
Impaired Loan Ratio	It captures a bank's loan quality and is computed as the impaired loan divided by the gross loan. The variable is directly available from Bankscope.	The domestic CRAs use ***Non-Performing Loan Ratio*** in their reports.

Note: The domestic CRAs also use ***Shareholders' Equity***, ***Non-performing Provision Coverage***, ***Common Equity Tier 1 Capital Ratio***, ***Net Operating Income***, ***Pre-provision Earnings*** and ***Net Income*** in their rating reports. We do not include these variables due to their high correlations with the listed variables.

Panel B: Summary Statistics

Variables	Unit	Obs	Mean	Min	25%	Median	75%	Max	Std.Dev
$Rating_{t}$	\	381	3.82	1.00	3.00	4.00	5.00	5.00	1.03
$Year_{t}$	\	381	2016.07	2014.00	2015.00	2016.00	2017.00	2017.00	0.88
$Log(Assets)_{t-1}$	\	381	5.48	2.64	4.41	5.11	6.18	9.82	1.53
$Assets\ Growth_{t-1}$	%	381	17.89	-37.81	11.26	16.14	23.16	131.22	13.38
$Total\ Capital\ Ratio_{t-1}$	%	363	13.12	9.88	11.79	12.65	14.00	36.50	2.24
$Leverage\ Ratio_{t-1}$	%	381	92.63	74.78	91.81	93.04	94.00	95.80	2.05
$Net\ Interest\ Margin_{t-1}$	%	381	2.60	0.36	2.01	2.58	3.08	5.58	0.90
ROE_{t-1}	%	381	13.63	0.86	10.25	13.79	17.03	26.17	4.99
$Cost\ to\ Income\ Ratio_{t-1}$	%	381	39.57	21.26	33.94	37.98	43.08	75.11	8.88
$Liquidity\ Ratio_{t-1}$	%	381	19.60	4.38	11.68	16.82	25.88	62.97	10.67
$Impaired\ Loan\ Ratio_{t-1}$	%	381	1.51	0.06	1.09	1.48	1.84	3.89	0.60

Panel C: Correlation Matrix

Variables		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$Log(Assets)_{t-1}$	(1)	1.00								
$Assets\ Growth_{t-1}$	(2)	-0.07	1.00							
$Total\ Capital\ Ratio_{t-1}$	(3)	-0.26	-0.15	1.00						
$Leverage\ Ratio_{t-1}$	(4)	0.42	0.27	**-0.78**	1.00					
$Net\ Interest\ Margin_{t-1}$	(5)	0.37	0.21	-0.25	0.44	1.00				
ROE_{t-1}	(6)	-0.30	-0.19	0.28	-0.39	-0.53	1.00			
$Cost\ to\ Income\ Ratio_{t-1}$	(7)	-0.19	-0.17	0.31	-0.26	-0.13	0.36	1.00		
$Liquidity\ Ratio_{t-1}$	(8)	-0.15	-0.01	0.03	-0.23	0.32	-0.09	-0.03	1.00	
$Impaired\ Loan\ Ratio_{t-1}$	(9)	-0.24	-0.10	-0.18	0.06	-0.36	0.07	-0.17	0.00	1.00

Table 5

Univariate Comparison for the Upgraded Banks

This table uses t-test to compare the mean values of the financial fundamentals of banks upgraded in 2015 and 2016. For example, if a bank is upgraded in 2016, we then compare its two-year average financial variables of 2014 and 2015 with its two-year average financial variables of 2016 and 2017 (after upgrades). ***, **, * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Full Sample of 58 Banks

Variables	Unit	Before Upgrades		After Upgrades		After-Before	
		Obs	Mean	Obs	Mean	Diff	p-values
Log(Assets)	\	103	4.72	104	5.16	0.44***	0.00
Assets Growth	%	81	18.94	100	18.72	-0.22	0.90
Total Capital Ratio	%	86	13.21	94	13.05	-0.16	0.44
Leverage Ratio	%	103	92.39	104	92.99	0.62***	0.01
Net Interest Margin	%	103	3.09	104	2.36	-0.73***	0.00
ROE	%	103	15.54	104	13.26	-2.28***	0.00
Cost to Income Ratio	%	103	39.36	104	37.24	-2.12**	0.02
Liquidity Ratio	%	103	24.70	104	16.53	-8.17***	0.00
Impaired Loan Ratio	%	78	1.26	97	1.58	0.32***	0.00

Panel B: Subsample of 29 Banks Upgraded into AA+ or AAA

Variables	Unit	Before Upgrades		After Upgrades		After-Before	
		Obs	Mean	Obs	Mean	Diff	p-values
Log(Assets)	\	51	5.30	55	5.70	0.41***	0.00
Assets Growth	%	39	20.37	52	19.62	-0.75	0.75
Total Capital Ratio	%	43	12.97	50	13.06	0.09	0.72
Leverage Ratio	%	51	93.31	55	93.49	0.18	0.41
Net Interest Margin	%	51	3.15	55	2.52	-0.63***	0.00
ROE	%	51	18.11	55	15.42	-2.68***	0.00
Cost to Income Ratio	%	51	39.79	55	35.87	-3.92***	0.00
Liquidity Ratio	%	51	22.30	55	14.01	-8.30***	0.00
Impaired Loan Ratio	%	43	1.11	52	1.38	0.27***	0.01

Panel C: Subsample of 29 Banks Upgraded into AA or AA-

Variables	Unit	Before Upgrades		After Upgrades		After-Before	
		Obs	Mean	Obs	Mean	Diff	p-values
Log(Assets)	\	52	4.16	49	4.55	0.39***	0.00
Assets Growth	%	42	17.62	48	17.74	0.13	0.96
Total Capital Ratio	%	43	13.45	44	13.04	-0.41	0.22
Leverage Ratio	%	52	91.45	49	92.43	0.98***	0.01
Net Interest Margin	%	52	3.03	49	2.18	-0.85***	0.00
ROE	%	52	13.03	49	10.84	-2.19***	0.01
Cost to Income Ratio	%	52	38.95	49	38.78	-0.17	0.90
Liquidity Ratio	%	52	27.05	49	19.36	-7.69***	0.00
Impaired Loan Ratio	%	35	1.45	45	1.82	0.37***	0.00

Panel D: Subsample of 50 Banks Upgraded by Incumbent CRAs

Variables	Unit	Before Upgrades		After Upgrades		After-Before	
		Obs	Mean	Obs	Mean	Diff	p-values
Log(Assets)	\	87	4.74	90	5.17	0.43***	0.00
Assets Growth	%	67	18.90	86	18.49	-0.41	0.84
Total Capital Ratio	%	74	13.29	82	13.13	-0.16	0.47
Leverage Ratio	%	87	92.44	90	93.02	0.58**	0.02
Net Interest Margin	%	87	3.13	90	2.42	-0.71***	0.00
ROE	%	87	15.69	90	13.50	-2.19***	0.00
Cost to Income Ratio	%	87	39.73	90	37.68	-2.05**	0.03
Liquidity Ratio	%	87	25.01	90	16.91	-8.10***	0.00
Impaired Loan Ratio	%	70	1.26	84	1.56	0.30***	0.00

Panel E: Subsample of Eight Banks Upgraded by Non-Incumbent CRAs

Variables	Unit	Before Upgrades		After Upgrades		After-Before	
		Obs	Mean	Obs	Mean	Diff	p-values
Log(Assets)	\	16	4.63	14	5.09	0.47**	0.02
Assets Growth	%	14	19.14	14	20.12	0.98	0.81
Total Capital Ratio	%	12	12.74	12	12.51	-0.23	0.72
Leverage Ratio	%	16	92.02	14	92.82	0.80	0.29
Net Interest Margin	%	16	2.87	14	1.97	-0.90***	0.01
ROE	%	16	14.74	14	11.75	-2.98	0.17
Cost to Income Ratio	%	16	37.36	14	34.49	-2.97	0.31
Liquidity Ratio	%	16	23.00	14	14.10	-8.90***	0.01
Impaired Loan Ratio	%	8	1.28	13	1.77	0.49*	0.07

Table 6

Credit Rating Standards

This table reports the estimation results of the ordered probit model. Rating notch length is calculated by averaging the difference between cut points. For example, in Column (2) of Panel A, the rating notch length is (3.98-(-9.19))/3)=4.39. The coefficient of Log (Assets)$_{t-1}$ is 4.71 and standard deviation of Log (Assets)$_{t-1}$ is 1.53 as reported in Table 4. One standard deviation increase in Log (Assets)$_{t-1}$ will increase the credit rating by 4.71×1.53/4.39=1.63 notches. Panel B reports the marginal effects for the ordered probit Model in specification (1) of Panel A. Standard errors are reported in the parentheses. We control for clustered standard errors at the bank level. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels respectively.

Panel A: Estimation Results

	(1) Rating $_t$		$\frac{Coefficient \times Variable\ \ Std.Dev}{Rating\ \ Notch\ \ Length}$	(2) Rating $_t$		$\frac{Coefficient \times Variable\ \ Std.Dev}{Rating\ \ Notch\ \ Length}$
Log (Assets) $_{t-1}$	2.74***	(0.22)	1.64	4.71***	(0.46)	1.63
Assets Growth $_{t-1}$	-0.01**	(0.01)	-0.05	-0.00	(0.01)	0.00
Leverage Ratio $_{t-1}$	-0.27***	(0.06)	-0.22	-0.33***	(0.08)	-0.15
ROE $_{t-1}$	-0.01	(0.02)	-0.02	0.01	(0.03)	0.01
Cost to Income Ratio $_{t-1}$	0.05***	(0.01)	0.17	0.03*	(0.02)	0.06
Liquid Ratio $_{t-1}$	0.00	(0.01)	0.00	-0.01	(0.01)	-0.02
Net Interest Margin $_{t-1}$	-0.11	(0.11)	-0.04	0.24	(0.16)	0.05
Impaired Loans Ratio $_{t-1}$	-0.61***	(0.16)	-0.14	-0.61***	(0.23)	-0.08
Year Indicators			$\frac{Coefficient}{Rating\ \ Notch\ \ Length}$			$\frac{Coefficient}{Rating\ \ Notch\ \ Length}$
2015	1.37***	(0.30)	0.54	5.81***	(0.96)	1.32
2016	1.71***	(0.32)	0.67	6.28***	(0.99)	1.43
2017	2.36***	(0.35)	0.92	7.46***	(1.10)	1.70
Region	×			√		
CRA	×			√		
N	381			381		
Pseudo. R^2	0.607			0.778		

Panel B: Marginal Effects of the Ordered Probit Model

Rating	Probability in 2014	Probability in 2017
AAA	0.52%	41.94%
AA+	39.13%	56.27%
AA	59.85%	1.80%
AA-	0.50%	0.00%
A+	0.00%	0.00%

Table 7

Changes in Credit Spread and Financing Gap

This table reports OLS (Tobit) regression results of credit spread (financing gap) on *Upgraded*. We control for the INCD issue characteristics, such as the term (Log (Term)), the issue amount (Log (Amount)) and the volatility of O/N SHIBOR in previous five days (5Days Vol.SHI.ON). We also include bank type and CRAs as control variables. Standard errors are reported in the parentheses. We control for clustered standard errors at the bank level. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels respectively.

Panel A: Self-Comparison of Upgraded Banks

	(1) Spread	(2) Gap	(3) Spread	(4) Gap
Upgraded	-2.15	3.64		
	(1.83)	(4.11)		
(1) Upgraded			-3.12*	2.80
without CRA Switched			(1.82)	(4.23)
(2) Upgraded			3.60	8.23
with CRA Switched			(2.78)	(8.17)
Other Controls	√	√	√	√
Bank	Clustered	Clustered	Clustered	Clustered
Region	√	√	√	√
Year	√	√	√	√
N	21397	21397	21397	21397
Adj (Pseudo). R^2	0.292	(0.033)	0.293	(0.033)
F-test for (2)-(1)			6.72***	5.53

Panel B: Comparing Upgraded Banks to Banks Already in the Higher Rating Category

	(1) Spread	(2) Gap	(3) Spread	(4) Gap
Rating	-5.96***	-3.38***	-5.81***	-3.31***
	(0.70)	(0.22)	(0.71)	(0.22)
Upgraded	3.51***	10.82***		
	(1.35)	(1.38)		
(1) Upgraded			2.58*	10.42***
without CRA Switched			(1.44)	(1.36)
(2) Upgraded			8.31***	12.67***
with CRA Switched			(2.05)	(1.48)
Other Controls	√	√	√	√
Bank	Clustered	Clustered	Clustered	Clustered
Region	√	√	√	√
Year	√	√	√	√
N	44348	44348	44348	44348
Adj (Pseudo). R^2	0.346	(0.034)	0.347	(0.034)
F-test for (2)-(1)			5.73***	2.25***

Table 8

Upgrading Effects by Rating Group: Self-Comparison of Upgraded Banks

This table reports OLS (Tobit) regression results of credit spread (financing gap) on Upgraded. Banks are grouped into "≥AA", "<AA+&≥A+" and "<AA-" according to the degree of regulatory benefit gained after being upgraded. We control for the INCD issue characteristics, such as the term (Log (Term)), the issue amount (Log (Amount)) and the volatility of O/N SHIBOR in previous five days (5Days Vol.SHI.ON). We also include bank type and CRAs as control variables. Standard errors are reported in the parentheses. We control for clustered standard errors at the bank level. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Spread	Spread	Spread	Spread	Spread	Spread	Gap	Gap	Gap	Gap	Gap	Gap
Cases	≥AA	<AA+&≥A+	<AA-	≥AA	<AA+&≥A+	<AA-	≥AA	<AA+&≥A+	<AA-	≥AA	<AA+&≥A+	<AA-
Upgraded	-4.66**	1.07	5.25				-1.47	26.11***	28.35***			
	(2.20)	(3.21)	(4.98)				(4.16)	(6.43)	(2.44)			
Upgraded				-5.09**	0.59	5.28				-1.34	24.59***	27.25***
without CRA Switched				(2.28)	(3.45)	(5.54)				(4.55)	(6.77)	(2.42)
Upgraded				0.09	2.10	5.13				-2.67	28.91***	32.64***
with CRA Switched				(3.80)	(3.66)	(7.46)				(18.73)	(9.34)	(2.17)
Other Controls	√	√	√	√	√	√	√	√	√	√	√	√
Bank	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered
Region	√	√	√	√	√	√	√	√	√	√	√	√
Year	√	√	√	√	√	√	√	√	√	√	√	√
N	14082	6612	703	14082	6612	703	14082	6612	703	14082	6612	703
Adj (Pseudo). R^2	0.296	0.234	0.341	0.296	0.234	0.340	(0.040)	(0.048)	(0.059)	(0.040)	(0.048)	(0.060)

Table 9

Upgrading Effects by Rating Group: Comparing Upgraded Banks to Banks Already in the Higher Rating Category

This table reports OLS (Tobit) regression results of credit spread (financing gap) on Ratings and Upgraded. Banks are grouped into "≥AA", "<AA+&≥A+" and "<AA-" according to the degree of regulatory benefit gained after being upgraded. We control for the INCD issue characteristics, such as the term (Log (Term)), the issue amount (Log (Amount)) and the volatility of O/N SHIBOR in previous five days (5Days Vol.SHI.ON). We also include bank type and CRAs as control variables. Standard errors are reported in the parentheses. We control for clustered standard errors at the bank level. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Spread	Spread	Spread	Spread	Spread	Spread	Gap	Gap	Gap	Gap	Gap	Gap
Cases	≥AA	<AA+&≥A+	<AA-	≥AA	<AA+&≥A+	<AA-	≥AA	<AA+&≥A+	<AA-	≥AA	<AA+&≥A+	<AA-
Rating	-11.02***	-2.22	1.00	-10.93***	-2.24	0.92	-5.31***	-6.85	18.22***	-5.32***	-6.85	18.35***
	(1.16)	(1.74)	(3.00)	(1.19)	(1.71)	(3.02)	(0.24)	(6.08)	(0.47)	(0.24)	(6.08)	(0.46)
Upgraded	5.45***	2.02	1.85				1.39	19.70***	8.11***			
	(1.64)	(2.36)	(4.62)				(1.59)	(7.59)	(2.28)			
Upgraded				5.13***	0.85	3.72				1.42	19.88**	6.90***
without CRA Switched				(1.75)	(2.66)	(5.17)				(1.56)	(8.47)	(2.35)
Upgraded				8.07***	4.92*	-4.60				1.18	19.34**	12.63***
with CRA Switched				(2.42)	(2.73)	(8.91)				(2.27)	(9.13)	(2.28)
Other Controls	√	√	√	√	√	√	√	√	√	√	√	√
Bank	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered
Region	√	√	√	√	√	√	√	√	√	√	√	√
Year	√	√	√	√	√	√	√	√	√	√	√	√
N	32903	12238	2602	32903	12238	2602	32903	12238	2602	32903	12238	2602
Adj (Pseudo). R^2	0.348	0.205	0.238	0.349	0.206	0.239	(0.040)	(0.053)	(0.077)	(0.040)	(0.053)	(0.077)

Table 10

Persistency of the Upgrading Effects

This table reports the results of persistency of the upgrading effects on credit spreads and financing gaps. We control for the INCD issue characteristics, such as the term (Log (Term)), the issue amount (Log (Amount)) and the volatility of O/N SHIBOR in previous five days (5Days Vol.SHI.ON). We also include bank type and CRAs as control variables. Standard errors are reported in the parentheses. We control for clustered standard errors at the bank level. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels respectively.

	(1) Spread	(2) Gap	(3) Spread	(4) Gap	(5) Spread	(6) Gap
Cases	≥AA		<AA+&≥A+		<AA-	
Upgraded	-3.63	-0.42	-1.89	**24.81*** **	4.05	**22.54*** **
without CRA Switched	(2.35)	(4.58)	(4.32)	**(6.64)**	(5.71)	**(2.88)**
Upgraded without	**-0.23***	-0.16	0.35	-0.03	0.12	**1.23*** **
CRA Switched* Time	**(0.13)**	(0.41)	(0.26)	(0.63)	(1.14)	**(0.32)**
Upgraded	-0.49	6.19	3.70	**28.79*** **	**13.74*** **	**38.32*** **
with CRA Switched	(3.92)	(16.48)	(3.99)	**(10.03)**	**(5.61)**	**(2.49)**
Upgraded with	0.09	-2.72	-0.16	0.01	**-1.44** **	**-0.73*** **
CRA Switched* Time	(0.80)	(1.89)	(0.29)	(0.87)	**(0.64)**	**(0.25)**
Other Controls	√	√	√	√	√	√
Bank	Clustered	Clustered	Clustered	Clustered	Clustered	Clustered
Region	√	√	√	√	√	√
Year	√	√	√	√	√	√
N	14082	14082	6612	6612	703	703
Adj (Pseudo). R^2	0.297	(0.040)	0.235	(0.048)	0.340	(0.060)

Figure 1

Growth of the INCDs and Other Bonds in China

This figure depicts the issue amount of the INCD and other bonds in China during December 2013 to August 2017. The right axis represents issue number in each month. The left axis represents issuance amount (in billion yuan) in each month. The data is sourced from Central Depository & Clearing Company (CCDC) and Shanghai Clearing House (SHCH).