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Anna Gibert

Università Bocconi
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Solicited versus Unsolicited Ratings: The Role of Selection

Anna Gibert[†]

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Abstract

This paper analyses the extent to which selection explains the observed discrepancy between solicited and unsolicited ratings. I propose a model of selection with truth telling rating agencies and borrowers with the ability to veto the revelation of the rating. The observed difference between the two categories of ratings in different markets is in line with the prediction of the model. In the financial sector, for example, selection of less creditworthy borrowers into unsolicited status makes unsolicited ratings grades lower on average than those solicited. In the government sector, on the other hand, there is a positive selection of borrowers into unsolicited ratings.

JEL Classification: G24; H63; G20.

Keywords: Unsolicited ratings; Sovereign debt; Rating Agencies, Ancillary services.

[†]German Institute for Economic Research (DIW Berlin). Mohrenstraße 58, 10117 Berlin, Germany. Email: agibert@diw.de. I am grateful to Piero Gottardi, Árpád Ábrahám, Vito Polito, and the participants at the DIW working group, the 48th Money, Macro and Finance Research Group Annual Conference, and the Economic Theory seminar at the University of Malaga for their helpful comments. The author acknowledges financial support from the Baffi Carefin Centre for applied research on international markets, banking, finance, and regulation.

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1 Introduction

Credit rating agencies are financial intermediaries that give opinions on the creditworthiness of borrowers. Most rating agencies operate under the "issuer-pays" business model (White, 2010), whereby they produce a rating upon solicitation from a potential borrower. The rating conveys, in an alphanumerical grade, the probability that the borrower will fulfil its repayment obligations in a timely fashion. Borrowers approach the rating agency in hopes of a positive evaluation, which may allow them to sell their debt on the credit market at a lower price. They are charged a fee regardless of the outcome of the evaluation.[1]

Another option available to the borrowers is to ask for a confidential preliminary rating, a non-binding forecast of the rating they would receive if they were to solicit an official rating. The two largest rating agencies, Standard and Poor's (S&P) and Moody's, offer this service as part of their ancillary services.[2] Preliminary ratings are confidential, and the borrower may decide whether to proceed with the issuance of a final rating.

Credit rating agencies may also give unsolicited ratings without the consent or participation of the borrower. These unsolicited ratings have been under the scrutiny of the American Justice Department, which started an antitrust investigation in 1996 suspecting that Moody's practice of issuing unsolicited ratings could be a strategy to push borrowers into soliciting more favourable official ratings.[3] Empirical evidence has indeed shown that, in the case of the Asian corporate sector and the non-US financial sector, the group of firms with unsolicited ratings has a lower mean grade than the group of firms with solicited ratings. Much of the academic discussion focuses on whether unsolicited ratings are downward biased. Downward biased ratings mean that borrowers with an unsolicited rating receive a lower rating grade than they would receive if they solicited a rating. This outcome is often interpreted as evidence of the rating agencies' strategic behaviour, with the aim of pressuring

[1] According to the 2013 amendment to the EU legislation on credit rating agencies, "fees charged for credit rating services shall not depend on the level of the credit rating issued by the credit rating agency or on any other result or outcome of the work performed" (Annex I Section B 3c through Article 6(2) of the Regulation (EU) No 462/2013 of the European Parliament and of the Council of 21 May 2013 amending Regulation (EC) No 1060/2009 on credit rating agencies).

[2] Moody's Rating Assessment Service was launched in 2000. They charge 75,000 Euros for an unofficial rating (The Economist, 2001). S&P also offers a similar service called the Ratings Evaluation System.

[3] Three years later, the Justice Department abandoned the antitrust investigation taking no action.

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borrowers into paying for the full service. For instance, Poon and Firth (2005) study a sample of international banks rated by Fitch in 2002 and find that lower unsolicited ratings cannot be accounted for with fundamentals. They confirm this result using a sample of non-financial firms rated by (S&P) between 1998 and 2003 (Poon and Chan, 2010). Similarly, Bannier et al. (2010) find lower ex-post default rates for the group of S&P unsolicited non-US banks between 1996 and 2006 and argue that this result suggests unsolicited bank ratings are driven by strategic factors. In a sample of Asian banks rated by Fitch in 2004, Van Roy (2013) finds further evidence that unsolicited bank ratings are lower than solicited ones and concludes that there is no support for selection bias. Finally, Poon et al. (2009) studies self-selection estimating a regime switching model on the basis of observable characteristics of the firm. They conclude that solicitation matters in addition to the financial profile, but they do not discuss the motivation for the effect of the solicitation status.

In this paper, I present new evidence challenging the notion that unsolicited ratings are lower than solicited ratings for all sectors and regions. Using a simple model, I illustrate how the selection of borrowers into different solicitation groups may generate positive or negative average rating grade differences and differences in ex-post default rates without any strategic behaviour from the rating agencies. Finally, I present evidence that, in the sovereign market, selection seems the most likely explanation for the difference in grades across borrowers with solicited and unsolicited ratings, while for banks selection alone may be insufficient to explain observed differences in average grades or in discrepancies between rating and default rate.

2 A simple model of selection into solicitation status

In what follows, I examine the idea that unsolicited ratings are used to increase a rating agency's visibility. According to Byoun and Shin (2012a),"unsolicited ratings are considered a means of raising a rating agency's profile in particular countries: that is, rating agencies provide unsolicited ratings to investors in an attempt to gain a competitive advantage over those who do not assign an unsolicited rating". As an agency becomes known, it is more likely to be approached by clients requesting its services. Even if a rating agency is well-

known, producing more ratings or more recent ratings may be a way to let the market know about their technology and advertise their accuracy. A standard rating is easier for lenders to interpret and is more helpful in attracting funds. For instance, in response to a European Securities and Markets Authority (ESMA) call for evidence on the "Competition, choice and conflicts of interest in the credit rating industry" FCE Bank plc indicated that "in order to protect and provide confidence to our investors, we tend to select the market accepted CRAs." (ESMA, 2015). This visibility is modelled in a reduced form as any action that allows the CRA to gain market power and charge higher fees for its solicited ratings.

In my model, I abstract from strategic considerations. The rating agency reveals the truth about the signal they receive. As a consequence, less creditworthy borrowers are more afraid of receiving an unsolicited rating than are better borrowers.[4] This seems to be a plausible feature, as unsolicited ratings are not equally undesirable to all types of borrowers, particularly for those who suspect that they are likely to receive a bad evaluation. When these borrowers have the option to take action to decrease their chances of being exposed (such as asking for a confidential evaluation and revealing the results only if they are good), they will choose to do so if the return from pooling with the group of non-rated borrowers of unobserved quality is high enough. The withdrawal of low creditworthy borrowers from the potential recipients of unsolicited ratings explains the positive selection of the unsolicited status.

The model may also give rise to a negative selection outcome depending on some key parameters. The trade-offs that determine the sign of selection are the profitability of a market (in terms of visibility or higher fees), which makes it more attractive to issue unsolicited ratings, and the return of remaining unrated as opposed to receiving a bad rating for the less creditworthy borrower.

[4]Fulghieri et al. (2014), in contrast, develops a model of strategic unsolicited ratings where good borrowers are more adversely affected by the possibility of the rating agencies issuing an unfair low rating as a punishment.

2.1 Economic environment

There are three agents in this economy: borrowers, lenders, and a credit rating agency (CRA). Borrowers can be of two types: $i \in \{A, B\}$ with shares θ and $1-\theta$. Each borrower of type i gets indebted for a fixed amount D. The gross return from production is $\tilde{R} = R$ with probability λ_i and $\tilde{R} = r$ with probability $1-\lambda_i$, where $R > D > r > 0$. Since the borrower has limited liability, type i's probability of default is $1-\lambda_i$, where $1 \geq \lambda_A > \lambda_B > 0$.

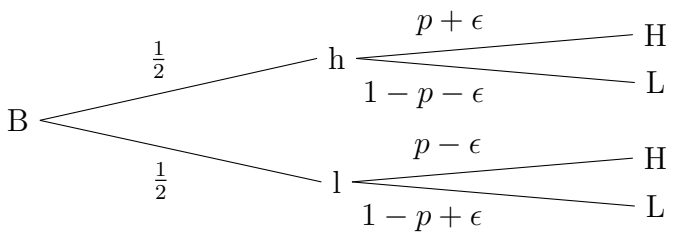
Lenders do not know the borrower's type. They are risk neutral agents with discount factor β. Lenders compete on debt prices à la Bertrand, making zero expected profits. They charge a price q for lending D, taking into account the expected probability of default, as specified later. For a pair (q, D), the borrower's expected payoff equals $qD + \mathbb{E}_i\{\tilde{R}\} - \lambda_i D$, where $\mathbb{E}_i\{\tilde{R}\} := \lambda_i R + (1-\lambda_i)r$.

In the economy, there is a CRA with costly access to private information about the borrower's type. This cost can be interpreted as the analyst's wage to study the data and produce a rating. The CRA incurs this cost every time they have to come up with a rating, regardless of whether they are compensated for it. By paying a cost c, the CRA receives the random signal $\sigma = \{H, L\}$: if the country is of type A, the CRA receives the H signal with probability 1, while if the country is of type B, the H signal is received with probability $p < 1$. The rating grade consists of a truthful report on the signal received and is denoted by $g \in \{H, L\}$.

The CRA provides three distinct products or services: solicited ratings, unsolicited ratings, and ancillary services. A solicited rating is requested by a borrower before issuing debt. The benefit of doing so is that a rating gives information to the market, and this may improve the debt price q that lenders are willing to accept. The rating agency charges a fee ϕ for issuing solicited ratings. Before the borrower solicits a rating, the CRA can issue an unsolicited rating free of charge. The CRA benefits from unsolicited ratings, because they affect the fee that can be charged for a rating. I assume the following functional form for the fees: $\phi(D, \gamma) = \alpha_1 + \alpha_2 \gamma D$. For $\alpha_1, \alpha_2 > 0$ fees are increasing in the amount of debt issued and in the fraction of unsolicited ratings issued.

The CRA also provides ancillary services for a fee χ. Ancillary services give the borrower

Figure 1: Ancillary services assessment.



the opportunity to learn about the CRA's private signal and to veto the revelation of that information.[5] The rating assessment $m = \{h, l\}$ is an imperfect forecast of the rating signal g, and it is summarized in figure 1. An assessment $m = h$ is received with probability $\frac{1}{2}$ and $m = l$ with probability $\frac{1}{2}$. Conditional on receiving a positive assessment, type B receives a rating grade H with probability $p + \epsilon$, and L with the complementary probability $1 - p - \epsilon$, whereas conditional on a negative assessment a rating grade H is given with probability $p - \epsilon$ and L with probability $1 - p + \epsilon$. There is no uncertainty about a type A rating; it receives H with probability 1. Assume $\epsilon > 0$ and $\epsilon < 1 - p$. These probabilities can be seen as posteriors and the technology of information acquisition is the same in both cases. Additionally, in the ancillary services contract, the agency commits that it will not issue an unsolicited rating if the borrower does not solicit one.

Assume that a fraction ξ of borrowers does not enter the game; they access the market issuing unrated debt. This assumption guarantees that the $g = L$ rating, which is fully revealing of a B type, is perceived to be worse than no rating $g = 0$. Having a low rating or being downgraded is known to have an effect in the price of debt. It is reasonable for borrowers to expect that the market will judge them more harshly if they have been given a bad rating than if they have no rating at all. In the absence of bad news, borrowers can expect lenders to have some uncertainty about their credit standing. As unrated countries are a pool of different borrowers that do not access rating services, being unrated could be

[5] Ancillary services can play several roles. For instance, they can reduce uncertainty about the outcome of the rating process for the borrowers or improve the transmission of information between the borrower and the rating agency. In addition, CRAs have started to guarantee confidentiality as an essential element in some of these services.

perceived as better than having a low rating.[6]

The timing of the model is as follows:

1. In stage $t = 0$, the borrower decides whether to buy ancillary services at cost χ. I denote this decision by $a \in \{0, 1\}$.

2. If the borrower is a client of ancillary services, in stage $t = 1$, the borrower receives a non-binding assessment of the rating grade, which can be $m = h$ or $m = l$. In stage $t = 2$, borrowers choose whether to solicit and pay the fee $\phi(D, \gamma)$ for a rating: $s = \{0, 1\}$.The notation for an unrated borrower is $g = 0$.

3. If the borrower is not a client of ancillary services, in stage $t = 1$, the rating agency may issue an unsolicited rating. $\gamma \in [0, 1]$ represents the fraction of unsolicited ratings issued. After deciding to issue an unsolicited rating, the signal $\sigma = \{H, L\}$ is received. In stage $t = 2$, borrowers that did not receive an unsolicited rating have the option to solicit one, $s = \{0, 1\}$. Note that a borrower cannot have both a solicited and an unsolicited rating.

Lenders observe the choices of the borrower and those of the rating agency, except for ancillary services, which are kept confidential between the borrower and the CRA. Thus, the borrower can have one of the two rating grades, $g = H$ or $g = L$, or none, $g = 0$.

2.2 CRA problem

The CRA takes two actions: in $t = 1$ it decides the fraction γ of unsolicited ratings to non-clients of ancillary services,[7] and in $t = 2$ it issues a solicited rating if it has been asked for one. The truth-telling assumption implies that the grade report will be either the signal the CRA received or none. I denote the rating grade report $g(a, u, s, \sigma)$, where the first element corresponds to the choice of ancillary services, the second represents the existence of an unsolicited rating, the third represents a solicited rating, and the last element is the

[6] As a matter of fact, a small but growing number of borrowers has decided to issue debt in the international debt market without a rating. They have accounted for about 10 per cent of the European corporate bond market in recent years and are usually classified as investment, or near-investment grade (Bolger and Wigglesworth, 2014).

[7] Recall that clients of ancillary services do not receive unsolicited ratings.

signal of the creditworthiness of the borrower available to the CRA. Depending on those elements, the rule for assigning a rating grade is as follows:

$$g^*(1,0,1,\sigma) = \sigma,\ g^*(1,0,0,\sigma) = 0, \tag{2.1}$$

$$g^*(0,0,1,\sigma) = \sigma,\ g^*(0,1,0,\sigma) = \sigma \tag{2.2}$$

$$\text{and } g^*(0,0,0,\sigma) = 0. \tag{2.3}$$

When the borrower is a client of ancillary services, $a = 1$, it may or may not request a rating, in which case it will not receive an unsolicited rating. If the borrower is not a client, $a = 0$, it may request a rating and, if not, it may receive an unsolicited rating or it may also be unrated.

In $t = 1$ the CRA problem is as follows:

$$\max_{\gamma} -\gamma c + \left[(1-\gamma) f^*(\gamma)\left(\phi(D,\gamma) - c\right)\right], \tag{2.4}$$

where $f^*(\gamma)$ is the fraction of borrowers that solicit a rating in equilibrium. The CRA chooses the proportion of unsolicited ratings taking into account that each rating has a cost c today and it also has an effect in the next stage. On one hand, it crowds out solicited ratings, as a borrower cannot have both a solicited and unsolicited rating, hence only $1-\gamma$ borrowers are susceptible to solicit a rating afterwards; on the other hand, it increases the fees that can be charged for those solicited ratings. γ^* also represents the probability that a non-client of ancillary services will get an unsolicited rating.

2.3 Lenders' problem

Lenders lend the amount qD to the borrower and receive D if there is no default. In case of default, there is no partial repayment. The lender profit function is:

$$\Pi = -qD + \beta\left[\mu\lambda_A D + (1-\mu)\lambda_B D\right], \tag{2.5}$$

where $\mu = \mu(s, g)$ are the lenders' beliefs that the borrower is of type A, given s, g. Beliefs depend on what the lender observes about the borrower's creditworthiness: the solicitation status and the rating grade. As a result of imposing the zero-profit condition, the price function satisfies:

$$q(\mu) = \beta[\mu\lambda_A + (1 - \mu)\lambda_B]. \tag{2.6}$$

The value $\mu(0, 0)$ represents the lenders' beliefs when they see no rating for a borrower. The values $\mu(0, H)$ and $\mu(0, L)$ represent what lenders believe about an unsolicited rating of H or L, respectively.

2.4 Borrower's problem

The borrower faces two problems: whether to buy ancillary services at $t = 0$ and whether to solicit a rating at $t = 2$. The borrower's payoff, depending on its rating, is as follows:

- If the borrower buys ancillary services and solicits a rating: $q(\mu)D + \lambda_i(R - D) + (1 - \lambda_i)r - \phi(D, \gamma) - \chi$, where the first term is the amount of borrowing at price $q(\mu) = q(1, g)$, the second and third terms are the net revenues weighted by the repayment probabilities, and the last two terms are the fees for solicitation and ancillary services, respectively.

- If the borrower solicits a rating but does not buy ancillary services, it saves on the amount of ancillary fees: $q(1, g)D + \lambda_i(R - D) + (1 - \lambda_i)r - \phi(D, \gamma)$.

- A borrower that does not buy ancillary services may receive an unsolicited rating with an associated payoff of $q(0, g)D + \lambda_i(R - D) + (1 - \lambda_i)r$, where the price of debt is $q(0, g)$ and the borrower does not incur any fees.

- Finally, if the borrower is unrated the payoff equals $q(0, 0)D + \lambda_i(R - D) + (1 - \lambda_i)r$ if it did not buy ancillary services or $q(0, 0)D + \lambda_i(R - D) + (1 - \lambda_i)r - \chi$ if it did.

2.5 Equilibrium

I use the Perfect Bayesian Equilibrium concept to solve for the equilibrium outcome of the credit market with a CRA that issues solicited and unsolicited ratings and provides confidential ancillary services. First, I define the Perfect Bayesian Equilibrium in the context of this model. In section 2.6, I apply it to solve the model without ancillary services. In section 2.7 I solve for the full model.

Definition 2.1. *Given the CRA rule of $g^*(a, u, s, \sigma)$, symmetric equilibrium is a fraction γ^*, a strategy for the borrower:*

$$\{a^*, s^*\} : \{A, B\} \to \{0, 1\} \times \{0, 1\}, \tag{2.7}$$

where $a^*(i)$ is the choice of ancillary services and $s^*(i, a(i))$ is the rating solicitation, a strategy for the lender on the debt price $q^*(s, g) : \{0, 1\} \times \{H, L, 0\} \to \mathbb{R}_+$ and a system of beliefs $\mu^*(s, g) : \{0, 1\} \times \{H, L, 0\} \to [0, 1]$ about the borrower being type A, such that:

- *γ^* maximises the CRA profit function (2.4) and the fraction of borrowers that solicit a rating $f^*(\gamma)$ is consistent with the borrower's strategy.*
- *The strategy profile is sequentially rational given the beliefs and γ^*.*
- *The beliefs are consistent with Bayes' rule whenever possible.*

2.6 Solving without ancillary services

Let us first solve the model without ancillary services. The game starts at $t = 1$. All the other modelling assumptions remain the same.

Let $\phi(D, \theta, \xi, \lambda_A, \lambda_B, \alpha_1, \alpha_2, c)$ be within $(\underline{\underline{\theta}}, \overline{\overline{\theta}})$, where the threshold levels as a function of parameters are defined in Appendix A.

Proposition 2.1. *A rule of $g^*(u, s, \sigma)$: $g^*(0, 1, \sigma) = \sigma$, $g^*(1, 0, \sigma) = \sigma$ and $g^*(0, 0, \sigma) = 0$, the strategies $s^*(A) = 1, s^*(B) = 0$, $q^*(\mu) = \mu\lambda_A + (1 - \mu)\lambda_B$ and $\gamma^* = \frac{(1-\theta)c+\theta\alpha_1}{-2\theta\alpha_2 D} + \frac{1}{2}$ constitute an equilibrium of the model without ancillary services given the beliefs $\mu(s, g)$:*

$\mu(s, L) = 0 \,\forall\, s, \mu(1, H) = 1,$

$$\mu(0, H) = \begin{cases} 1 & w.\ prob.\ \frac{\theta}{\theta+(1-\theta)p} \\ 0 & w.\ prob.\ \frac{(1-\theta)p}{\theta+(1-\theta)p} \end{cases}$$

and

$$\mu(0, 0) = \begin{cases} 1 & w.\ prob.\ \frac{\theta\xi}{\theta\xi+(1-\theta)(1+\gamma(\xi-1))} \\ 0 & w.\ prob.\ \frac{(1-\theta)(1+\gamma(\xi-1))}{\theta\xi+(1-\theta)(1+\gamma(\xi-1))}. \end{cases}$$

The CRA assigns a proportion γ^* of unsolicited ratings to both type A and type B borrowers in order to maximise its profit function (2.4) in $t = 1$:

$$\max_{\gamma} -\gamma c + (1-\gamma)\theta\left[\phi(D, \gamma) - c\right].$$

Substituting the functional form of $\phi(D, \gamma)$ and solving the maximization problem, we obtain the first order condition:

$$-c - \theta(\alpha_1 + \alpha_2\gamma D) + \theta(1-\gamma)\alpha_2 D + \theta c = 0.$$

Rearranging, we find an expression for the optimal fraction of unsolicited ratings that the CRA issues:

$$\gamma^* = \frac{(1-\theta)c + \theta\alpha_1}{-2\theta\alpha_2 D} + \frac{1}{2}. \tag{2.8}$$

Since α_1, α_2, c and θ are non negative, γ^* is increasing in the amount of debt.

Type A prefers to solicit a rating rather than remain unrated if they are not given an unsolicited rating, while type B does not. In equilibrium, ϕ has to remain within upper and lower bounds, which depend on $D, \gamma^*, \theta, \lambda_A$, and λ_B. A fee that is too high would discourage even the best borrowers from asking for a rating, and a fee that is too low would encourage the worst borrowers to try to obtain a high rating with probability p.

Type A can have either a solicited or unsolicited H rating, and a fraction ξ is unrated by assumption. If type A were allowed to solicit a rating after an unsolicited rating, they

may choose to do so, because the price of debt is better for solicited ratings for the same H grade. We simplify away from this possibility, but this behaviour is something we might observe. Type B can have an H unsolicited rating, L unsolicited rating, or no rating. There are no grade L solicited ratings. Thus, unsolicited ratings have lower grades on average.

Type A knows that it is more likely to receive an H rating, so it has an incentive to pay the fee for a solicited rating. Type B, on the contrary, has a lower probability p of receiving an H rating and a high probability of receiving an L rating, which bears a higher risk premium than no rating. The fact that higher quality borrowers are more inclined to get rated is a well-known result in the literature (Lizzeri, 1999; Mathis et al., 2009; Fulghieri et al., 2014). The novelty here is that type B borrowers stand to lose more on average from getting an unsolicited rating than type A borrowers.[8] As long as there are no ancillary services, this heterogeneous effect plays no role, because there is nothing a type B borrower can do about it. This changes in the following section.

2.7 Introducing ancillary services

Let $\phi(D, \theta, \xi, \lambda_A, \lambda_B, \alpha_1, \alpha_2, c)$ be within $(\underline{\theta}, \overline{\theta})$, where the threshold levels as a function of parameters are defined in Appendix B.

Proposition 2.2. ***(Positive selection)*** *Assume the following condition on parameters:*

$$\xi < \frac{2\alpha_2 D(1-\theta)\beta G(\theta,\xi,\lambda_A,\lambda_B) - 4\left[(1-\theta)+\theta\alpha_1\right]\beta G(\theta,\xi,\lambda_A,\lambda_B)}{4\theta\alpha_2 D} - \\ - \frac{2(1-\theta)c\alpha_2 D + (\theta+1)(\alpha_2 D)^2}{4\theta\alpha_2 D} \tag{2.9}$$

where $G(\theta,\xi,\lambda_A,\lambda_B) = \frac{2\theta\xi\lambda_A+(1-\theta)(\xi+1)\lambda_B}{2\theta\xi+(1-\theta)(\xi+1)}$. *For* $g^*(a,u,s,\sigma)$ *given by equations* (2.1)-(2.3), *the strategies* $a^*(A)=0, a^*(B)=1, s^*(A,0)=1, s^*(B,0)=0, s^*(A,1)=1$, $s^*(B,1)=1$ *if* $m=h$ *and* 0 *if* $m=l$, $q^*(\mu)=\mu\lambda_A+(1-\mu)\lambda_B$ *and* γ^* *that solves problem* (2.4) *constitute*

[8] Actually, type A borrowers benefit from truthful unsolicited ratings, because they save on solicitation fees.

an equilibrium of the model given the following beliefs: $\mu(0,H)=1, \mu(s,L)=0 \,\forall s=\{0,1\}$,

$$\mu(1,H)=\begin{cases}1 & w.\ prob.\ \frac{2\theta(1-\gamma)}{2\theta(1-\gamma)+(1-\theta)(p+\epsilon)} \\ 0 & w.\ prob.\ \frac{(1-\theta)(p+\epsilon)}{2\theta(1-\gamma)+(1-\theta)(p+\epsilon)}\end{cases}$$

and

$$\mu(0,0)=\begin{cases}1 & w.\ prob.\ \frac{2\theta\xi}{2\theta\xi+(1-\theta)(\xi+1)} \\ 0 & w.\ prob.\ \frac{(1-\theta)(\xi+1)}{2\theta\xi+(1-\theta)(\xi+1)}.\end{cases}$$

(Negative selection) *Assume condition* (2.9) *is not satisfied. For* $g^*(a,u,s,\sigma)$ *given by equations* (2.1)-(2.3)*, the strategies* $a^*(A)=0, a^*(B)=0, s^*(A,0)=1, s^*(B,0)=0, s^*(A,1)=1$*,* $s^*(B,1)=1$ *if* $m=h$ *and* 0 *if* $m=l$*,* $q^*(\mu)=\mu\lambda_A+(1-\mu)\lambda_B$ *and* γ^* *that solves problem* (2.4) *constitute an equilibrium of the model given the following beliefs:* $\mu(s,g)$*:* $\mu(s,L)=0 \,\forall\, s=\{0,1\}, \mu(1,H)=1$*,*

$$\mu(0,H)=\begin{cases}1 & w.\ prob.\ \frac{\theta}{\theta+(1-\theta)p} \\ 0 & w.\ prob.\ \frac{(1-\theta)p}{\theta+(1-\theta)p}\end{cases}$$

and

$$\mu(0,0)=\begin{cases}1 & w.\ prob.\ \frac{\theta\xi}{\theta\xi+(1-\theta)(1+\gamma(\xi-1))} \\ 0 & w.\ prob.\ \frac{(1-\theta)(1+\gamma(\xi-1))}{\theta\xi+(1-\theta)(1+\gamma(\xi-1))}.\end{cases}$$

In the equilibrium with positive selection described above, the CRA assigns a proportion γ^* of unsolicited ratings, which are grade H and go to type A borrowers. Type B borrowers enter a contract for ancillary services and avoid receiving unsolicited ratings. They can either have a solicited rating (which can be H or L), after having observed the assessment $m=h$, or no rating, after having observed the assessment $m=l$. A fraction ξ of borrowers is unrated by assumption. Type A borrowers that are not exogenously unrated or that have not received an unsolicited rating solicit and receive an H rating. There are no grade L

unsolicited ratings, as the type B borrowers that would be subject to receiving such a rating prefer to pay for ancillary services and veto that possibility. In equilibrium, type A borrowers prefer to solicit a rating, whether they are clients of ancillary services or not. Their incentives to solicit are high, because the probability of getting a high rating is good as long as the price of ratings is sufficiently low. Type B borrowers, on the contrary, prefer not to solicit a rating unless they are given a strong signal that the rating will be high in the form of a positive assessment. Otherwise, the fees are too high with respect to the probability p of being given an H rating.

Taking into account the solicitation choices of the borrowers, the CRA problem (2.4) from the previous period can be rewritten as follows:

$$\max_{\gamma} -\gamma c + (1-\gamma)\theta\left[\phi(D,\gamma) - c\right] + \frac{1}{2}(1-\theta)\left[\phi(D,\gamma) - c\right]. \tag{2.10}$$

Plugging in the functional form of $\phi(D,\gamma)$ and solving for γ:

$$\gamma^* = \frac{(1-\theta)c + \theta\alpha_1}{-2\theta\alpha_2 D} + \frac{1}{2}\left(\frac{1}{2} + \frac{1}{2\theta}\right), \tag{2.11}$$

where the first two terms coincide with the expression for the optimal fraction of unsolicited ratings in the model without ancillary services and the term in parenthesis, which is > 1 for $0 > \theta > 1$, represents the additional incentive to issue unsolicited ratings due to the gains coming from the clients of ancillary services.

The condition (2.9) can be reformulated as:

$$\gamma > \bar{\gamma} := \frac{\beta G(\theta,\xi,\lambda_A,\lambda_B) + \frac{\alpha_1}{2} + \chi}{2\beta G(\theta,\xi,\lambda_A,\lambda_B) - \alpha_2 D}, \tag{2.12}$$

where $G(\theta,\xi,\lambda_A,\lambda_B) = \frac{2\theta\xi\lambda_A + (1-\theta)(\xi+1)\lambda_B}{2\theta\xi + (1-\theta)(\xi+1)}$. This guarantees that $a^*(B) = 1$. For a high enough γ^*, type B prefers to buy ancillary services for a fee χ and obtain a rating H with probability p and no rating $g = 0$ with probability $1-p$ than getting an unsolicited H rating with probability γp and risking an L rating with probability $\gamma(1-p)$. The fact that $a^*(A) = 0$ is always true,[9] because type A always receives an H rating and ancillary services

[9]For $a^*(A) = 0$: $\gamma q(0,H)D + (1-\gamma)\left[q(1,H)D - \phi(\gamma,D)\right] > \frac{1}{2}q(1,H)D + \frac{1}{2}q(1,H)D - \phi(\gamma,D) - \chi$. Since

only represent a cost.

In this equilibrium, all unsolicited ratings are grade H, whereas of the total $\theta(1-\gamma)+(1-\theta)\frac{1}{2}$ solicited ratings, $\theta(1-\gamma)+(1-\theta)\frac{1}{2}(p+\epsilon)$ are grade H and the rest are grade L. If we translate grades into a numerical scale and assign 1 to grade H and 0 to grade L, we obtain that the average unsolicited rating is higher than the average solicited rating:

$$1 > \frac{\theta(1-\gamma)+(1-\theta)\frac{1}{2}(p+\epsilon)}{\theta(1-\gamma)+(1-\theta)\frac{1}{2}}.$$

Henceforth, there is a positive selection of creditworthy borrowers in unsolicited ratings.

Since unsolicited H ratings are assigned only to A types, they are fully revealing of the high-quality type. But because solicited H ratings can be assigned to A and B types, we expect to see a market discount in the price of debt of high unsolicited ratings.

On the contrary, when condition (2.9) is not satisfied, $\gamma^* < \bar{\gamma}$ and type B does not choose ancillary services, the equilibrium outcome is similar to that which is described in the solution to the model without ancillary services. A formal description of the equilibrium can be found in the second part of proposition 2.2. In this case, ancillary services do not exist in equilibrium. All grade H solicited ratings are assigned to type A borrowers, whereas grade H unsolicited ratings can be given to type A or B with different probabilities. Grade L unsolicited ratings are assigned to type B borrowers. Finally, unrated borrowers can be either type A or B.

In this equilibrium, unsolicited ratings can be grade H, $\theta\gamma+(1-\theta)\gamma p$ out of $\theta\gamma+(1-\theta)\gamma$, and the rest are grade L. If we translate grades into a numerical scale and assign 1 to grade H and 0 to grade L, we obtain that the average unsolicited rating is lower than the average solicited rating:

$$\frac{\theta\gamma+(1-\theta)\gamma p}{\theta\gamma+(1-\theta)\gamma} < 1,$$

due to a negative selection of creditworthy borrowers in unsolicited ratings.

$q(0,H) > q(1,H)$, the statement is always true.

3 Empirical analysis

3.1 Dataset and definition of the variables

The dataset contains end-of-year long-term foreign currency ratings for all entities with issuer ratings by S&P from 1996 to 2016.[10] Long-term issuer ratings are defined as "a forward-looking opinion about an obligor's overall creditworthiness." (Standard&Poor's, 2017). I obtained the data from Bloomberg by collecting all rating actions (including rating assignments, upgrades, downgrades, confirmations, rating outlook, and rating watch changes) from 1950 to the present. I then transformed the ratings into a numerical scale from 0 (D/SD) to 21 (AAA). Rating modifiers (indicated by a plus or minus sign appended to the alphanumerical grade) are represented by a 1 point change in the scale. Credit rating watch is classified separately and it is used as a control in some specifications. Table 1 shows the number, mean grade, and standard deviation of the ratings in the sample. Ratings are defined as unsolicited if S&P reports them as 'pi' or 'u'; otherwise they are classified as solicited. Solicitation is captured in a dummy variable that takes the value of 1 if the rating is unsolicited and 0 if it is solicited.

I merge ratings data with firm characteristics from Datastream. This includes earnings before interest and taxes plus depreciation (ebitd), number of employees, interest expense, net debt, net revenues, stock prices, total assets, total debt, debt over common equity, and debt over capital, with country economic fundamentals from the World Economic Outlook April 2017 and long-term sovereign bond yields from the IMF's International Financial Statistics. The main summary statistics of firm level variables can be found in Table 1.

[Table 1 about here.]

3.2 Preliminary analysis

As seen in Table 2, the sectors with the highest concentrations of unsolicited ratings are the financial sector (7.6%) and the government (3%), followed by the healthcare sector (2.1%). The rest are well below the cross-sectoral average (4.2%). The financial sector comprises

[10] Before 1996 S&P did not report the solicitation status of their issuer's ratings.

banks, insurance companies, investment management, real estate finance, and other financial services. Within the financial sector, banks have a low fraction of unsolicited ratings (1.32%), whereas insurance companies have the highest (16%). Government refers to sovereign states, local and regional governments, central and development banks, and government agencies. The healthcare sector refers to hospitals, managed care facilities, pharmaceutical companies, and healthcare related manufacturing and services.

[Table 2 about here.]

In a more detailed analysis over time, the share of unsolicited ratings in this sample decreases. This is particularly so for the financial sector, while in the other sectors the share of unsolicited ratings over total ratings has remained stable over the last five years or has increased slightly in the case of sovereigns, as seen in Table 3.

[Table 3 about here.]

Pooling all sectors and looking at the difference across regions, Table 4 shows that Africa (12.3%), North-America (5.4%), and Asia (4.7%) are the regions where most unsolicited ratings are assigned. In particular, from all unsolicited ratings, 63% are in the US, 3.97% in Japan, and, within Europe, 4.81% are in the UK, 2.36% are in Germany, 1.73% are in France, and 1.05% are in Italy.

[Table 4 about here.]

In the empirical literature, several authors have used datasets that are comparable to the one presented here. I summarize the findings of those that use S&P issuer ratings as well: Poon et al. (2009); Poon and Chan (2010) and Bannier et al. (2010). Poon et al. (2009) examined S&P long-term local-currency ratings for 460 commercial banks from 72 countries (excluding the US) between 1998 and 2003. Looking at long-term local-currency ratings, they find that 39.40% of unsolicited ratings that are, on average, 1.25 grades lower. They use a rating scale that does not incorporate the rating modifiers, thus the rating grade goes from 1 (from C/CC) to 8 (AAA). I rescaled my rating level variable to obtain comparable

descriptive statistics. Restricting the sample for the same period and sector but using long-term foreign-currency ratings, I find a comparable fraction of unsolicited ratings over total ratings (26.65%) and a similar average rating gap (1.35 in favour of solicited ratings) in a sample of 693 banks from 103 countries. In a later work, Poon and Chan (2010) focus on non-financial firms in Japan for the same type of ratings and time: as much as 76% of total ratings are unsolicited and the gap is larger (1.67). When I look at a similar subsample in my data (Japanese non-financial firms from 1998 to 2003), using foreign-currency ratings, I find a much lower percentage of unsolicited ratings (47%) and a rating grade difference of only 1.44 between the solicited and unsolicited groups. Lastly, Bannier et al. (2010) works with a larger sample of issuer ratings for international firms, including banks, insurance companies, other financials, industrials, and utilities between 1996 and 2006. If I select those same sectors and years in my data, I again find a lower fraction of unsolicited over total ratings (19.84% versus 26%) and a close rating grade difference between solicitation groups for financial firms (3.74 versus 3.41), whereas for non-financials the difference is much larger (they report a 0.94 grade difference and I find a 2.2 grade difference in my data). Overall, the main descriptive statistics are broadly comparable to these previous papers, even if I generally find a lower percentage of unsolicited ratings over total ratings employing long-term foreign-currency issuer ratings.

Sovereign markets are known to intermediate a large amount of debt. According to BIS data, government is usually the sector that has the largest amount of outstanding debt, followed by financial corporations and non-financial corporations (BIS Quarterly Review: September 2015, Table 18: Total debt securities - all issuers. All maturities amounts outstanding by sector and residence of issuer). Moreover, sovereign bonds are part of many sovereign funds and financial institution portfolios. Newsworthy markets also receive a lot of attention when a rating change occurs. Hence, a rating downgrade of a sovereign is likely to attract more visibility than a downgrade of an industrial company in that country. It is plausible that the CRA will most likely profit from giving unsolicited ratings in this visible market. In my model, the greater the debt in a given market the greater the willingness to issue unsolicited ratings. It is thus consistent that the categories for which more unsolicited ratings are issued are the financial and the government sectors.

Another reason for a CRA to have a particular interest in one market is the potential for growth from entering early and establishing a reputation. In recent years, the corporate bond sector for large African firms is starting to develop, and companies are opening up to issue foreign currency debt. A CRA may also find it worthwhile to issue unsolicited ratings in this market to gain visibility among firms in the hopes of making their demands for solicited ratings more inelastic. A similar phenomenon happened in the Asian market, which resulted in considerable research to investigate why CRAs gave unsolicited ratings disproportionately to Asian firms. In our sample, unsolicited Asian ratings also saw an expansion in the late 1990s and early 2000s, diminishing to near irrelevance in 2016.

Ancillary services represented a small proportion of CRA revenues before the 2000s, arguably because they were just being introduced. In the logic of the model, confidentiality guarantees were harder to obtain from CRAs. This would be consistent with the difference gap in selection status that we see across geographical markets.

3.3 Measurement of selection in unsolicited ratings

In this section, I investigate the presence of selection in unsolicited ratings across markets. My first objective is to understand whether the pattern in the difference between rating grades among solicitation groups can be attributed to selection. Secondly, I analyse the effects of selection on the market valuation of the borrower.

For most of the discussion I focus on two sectors: the financial sector and the government sector. This is motivated by the fact that these sectors represent most of the unsolicited ratings in my sample. In addition, most of the empirical research on unsolicited ratings has been conducted in the financial sector (Gan, 2004; Poon and Firth, 2005; Poon et al., 2009; Bannier et al., 2010; Van Roy, 2013), particularly in the Asian market (Poon, 2003; Poon and Chan, 2010; Byoun and Shin, 2012b). For the sovereign analysis, I restrict the time dimension to 2011 onwards, as 2011 is the first year for which S&P disclosed the solicitation status of a number of sovereign ratings in Europe and Asia (Standard&Poor's, 2011a,b,c).

The main result derived from the model is that, unlike the strategic behaviour that intends to punish the borrower, selection can work both ways. Depending on the parameters of the model, the characteristics of the prevailing equilibrium are such that we may find

positive or negative differences in average ratings between borrowers with a solicited and unsolicited rating.

Table 5 reports the difference in mean grades between solicited and unsolicited ratings and the result of the t-test of mean equality across the two groups.[11] The column 'Mean diff.' is the difference in the average rating grade of unsolicited ratings in a sector with respect to the group of solicited ratings in that sector. Sectors with lower unsolicited grades are energy, finance, and healthcare. On the contrary, in the communications, consumer discretionary, government, industrials, materials, technology, and utilities sectors, unsolicited grades are higher on average than solicited grades. For consumer staples, there are no significant differences between the two groups. In the government sector the difference amounts to less than one notch; the average rating grade for solicited ratings is A and for unsolicited ratings it is AA-, whereas in the financial sector the difference is similar in size but with the opposite sign. In this case, the change goes from A- average solicited ratings to BBB average unsolicited ratings. There are more sectors where unsolicited ratings are higher than there are sectors with lower unsolicited grades.

[Table 5 about here.]

In order to investigate the effect of the solicitation status on the rating grade, I run the following regression:

$$\text{Rating level}_{i,t} = \alpha + \beta \text{Unsolicited}_{i,t} + \gamma X_{i,t} + \lambda_k + \tau_t + \rho_r + e_{i,t}, \tag{3.1}$$

where the subindex i represents the individual (firm or institution), k represents the sector, r the region, and t is the year. α is a constant, $X_{i,t}$ a vector of controls that may change at the individual level, at the time level or both, and $\text{Unsolicited}_{i,t}$ is a dummy variable that takes the value of 1 if the rating is unsolicited and 0 if it is not. λ_k, τ_t and ρ_r are sector, time, and region fixed effects.

[Table 6 about here.]

[11] I also performed a non-parametric test of equality of the distribution. Results of the Mann-Whitney-Wilcoxon test are significant and go in the same direction qualitatively.

The coefficient of interest - β - measures how much the rating level changes if a rating is defined as unsolicited. A positive number means that the grade is higher for unsolicited ratings than for solicited ratings with similar observable characteristics. Table 6 is the panel regression for all sectors. Overall, the effect of the solicitation status on the rating level is negative and significant. Hence, unsolicited ratings are generally lower despite the numerous sectors in which selection is positive, because the financial sector, where they are negative, is large in the sample (43%). The coefficient β in column (1) is larger than the difference between the '+' and the '-' modifier, but is less than one notch different. Column (2) adds two interaction terms: the effect of having unsolicited ratings in Japan and in the financial sector. This is motivated by the suspicion that financial companies and Japanese companies may have faced particularly biased downward ratings. I confirm that the negative sign of β is driven by these two groups and, once they are taken into account, the baseline for unsolicited ratings becomes positive (see also column (4) for the results using an ordered probit estimation). Column (3) presents the results of a GLS fixed effects estimation. Unsolicited ratings are lower even considering fixed effects at the firm level. However, the fit of the regression is weak.

Running the regression separately for different sectors (financial, non-financial, and government) yields different results. Table 7 shows that the unsolicited status is associated with ratings up to 3.5 points lower in the financial sector and significantly lower in the non-financial sector. In the government sector, on the contrary, unsolicited ratings are higher.

[Table 7 about here.]

In Table 8 I further control for the financial characteristics of the borrower in a reduced subsample of firms (those belonging to the S&P Global 1200 index, the Nikkei 225, and Datastream financial sector composite index).[12]. As expected, I find that the coefficient β is the largest and it is significantly negative for firms belonging to the financial sector - the subsector of banks and insurance companies - and it is also negative for most of the non-financial sectors (industrials, materials, healthcare, technology, and consumer discretionary in order of the magnitude of the effect). Therefore, once we control for the financial

[12]The subsample is not random; it could be biased towards large quoted firms

characteristics of the firm, the positive difference in unsolicited ratings changes sign for consumer discretionary, materials, and technology. For utilities, the effect is still positive (2.19 points difference in favour of unsolicited ratings). In the government sector, we use only the subsample of sovereigns for which we have economic variables as controls. Sovereigns also show a positive and sizeable difference in average ratings in favour of the unsolicited group. This last piece of evidence is difficult to reconcile with theories of a downward bias in unsolicited ratings, and it is more natural to think that selection plays an important role in the differences across groups.[13]

[Table 8 about here.]

The results are consistent if I estimate instead an ordered probit that takes into account only the ordinal difference between rating grades. However, the coefficient of the ordered probit [14] does not have a direct interpretation in terms of rating notches and rating modifiers; thus, I report the linear regression analysis instead.

Selection into the solicitation status has an effect on the equilibrium interest rate. Solicited and unsolicited bonds could have different yields, despite being of the same rating grade, and the theory predicts the direction in which they should go. In the equilibrium with positive selection, markets understand that a high unsolicited rating grade, which reveals a creditworthy type, is less risky than a high solicited grade (which can also be the riskier type). Accordingly, the interest rate they demand on unsolicited bonds should be lower. The opposite is true for the equilibrium with negative selection. In this case, we should expect a higher interest rate on unsolicited bonds with respect to solicited bonds with the same grade, because the expected probability of default (which is unbiased) differs across the two groups. Past empirical literature may have underestimated the importance of selection, assuming that once the rating level has been controlled for there should be no difference in market value or ex-post default probability if only selection was at work. As a result, they attributed any additional effect to a "strategic" component. In order to analyse the market valuation of the solicitation status and whether it changes sign for different sectors

[13]Rating inflation is an explanation of why some ratings could be upward biased. However, since unsolicited ratings are not paid for, this group is the least likely to be subject to rating inflation.

[14]Results are available upon request.

as predicted by the theory, I run the following regression:

$$\text{Stock price}_{i,t} = \delta \text{Unsolicited}_{i,t} + \lambda X_{i,t} + \lambda_k + \tau_t + \rho_r + u_{i,t}, \tag{3.2}$$

where the subindex i represents the individual (firm or institution), k represents the sector, r the region, and t is the year. $X_{i,t}$ a vector of controls that may change at the individual level, at the time level or both and $\text{Unsolicited}_{i,t}$ is a dummy variable that takes the value of 1 if the rating is unsolicited and 0 if it is solicited. λ_k, τ_t, and ρ_r are sector, time, and region fixed effects.

Table 9 presents the effect of solicitation on sovereign yields. The coefficient of the solicitation status is negative, indicating that the sovereign yields of a borrower with an unsolicited rating are lower than those of a borrower with a solicited rating for the same rating level. This means that borrowers receiving an unsolicited rating have to pay less for their debt, consistent with the market beliefs that they are more creditworthy because of positive selection in unsolicited ratings.

[Table 9 about here.]

For the other sectors, the effect of solicitation status on stock price can be found in Table 10. An unsolicited rating is associated, when significant, to a lower valuation of the company in the stock market compared to the same solicited ratings in the same sector.

[Table 10 about here.]

Summing up, some sectors are arguably more visible than others or induce the rating agencies to issue more unsolicited ratings. Firms in those sectors may react to the higher chance of receiving an unsolicited rating. In particular, less creditworthy borrowers are those whose incentives to avoid ratings are the highest. The fact that they will take steps in that direction modifies the quality of the pool of borrowers rated without solicitation.

I have shown that the sovereign sector is the clearest example in my sample of positive selection of more creditworthy borrowers into the group of unsolicited ratings. That makes the average rating grade higher for sovereigns with unsolicited ratings vis-à-vis solicited ratings. Controlling for the fundamentals of the country does not eliminate this gap, but

addressing the composition effects, including fixed effects, at the country level lowers the difference between solicited and unsolicited ratings. These findings yield support for the selection hypothesis in this sector. I also show that the sovereign yields associated with unsolicited ratings may be lower than solicited ratings for the same rating grade in a model of pure selection without strategic considerations. In the other sectors, on the contrary, unsolicited ratings are lower grades than solicited ratings, looking at borrowers with similar financial characteristics. Market participants seem to take this into account, as shown by the difference in the stock price of borrowers with unsolicited ratings with respect to solicited rating for the same grade.

4 Conclusion

In this paper, I study the extent to which selection is one of the driving factors behind the differences in rating grades and other credit market outcomes between borrowers with solicited and unsolicited rating status. In a model with truth-telling rating agencies and the possibility to veto the revelation of the rating, the equilibrium is characterised by opposing results in the rating grade gap between solicited and unsolicited ratings, depending on the parameters. These findings are in line with what we observe in the data for different credit markets. In the financial sector, selection of less creditworthy borrowers into unsolicited status makes unsolicited ratings grades lower on average than those with solicited ratings. However, in the government sector we see a positive selection of borrowers into unsolicited ratings. Using a panel of S&P long-term issuer ratings, I find that controlling for the firm's identity (as a proxy of the borrowers' type) eliminates part of the effect of the solicitation status. This is consistent with the selection hypothesis that I postulate in this paper. Moreover, in the sectors mentioned above, the valuation of the borrowers' creditworthiness (proxied by the debt yields for sovereigns and the stock price for firms) is higher (lower) for unsolicited ratings if selection in unsolicited ratings is positive (negative).

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APPENDIX

A Equilibrium conditions in the model without ancillary services

According to the beliefs, the lenders' price function is as follows:

$$q(s,\sigma) = \begin{cases} q(0,0) = \beta\left[\frac{\theta\xi\lambda_A+(1-\theta)(1+\gamma^*(\xi-1))\lambda_B}{\theta\xi+(1-\theta)(1+\gamma^*(\xi-1))}\right] \\ q(0,H) = \beta\left[\frac{\theta\lambda_A+(1-\theta)p\lambda_B}{\theta+(1-\theta)p}\right] \\ q(0,L) = \beta\lambda_B \\ q(1,H) = \beta\lambda_A \\ q(1,L) = \beta\lambda_B. \end{cases} \tag{A.1}$$

The condition for $s^*(A)=1$ is $q(1,H)D+\lambda_A(R-D)+(1-\lambda_A)r-\phi(D,\gamma^*) > q(0,0)D+\lambda_A(R-D)+(1-\lambda_A)r$, that is, the payoff for soliciting and obtaining a rating H with probability 1 for a fee $\phi(D,\gamma^*)$ is higher than the payoff of remaining without a rating. Substituting the expressions for $q(\cdot)$ from (A.1) and for γ^*, we obtain:

$$\phi < \beta\left(1-\frac{\theta\xi}{\theta\xi+(1-\theta)\left(1+\left(\frac{(1-\theta)c+\theta\alpha_1}{-2\theta\alpha_2 D}+\frac{1}{2}\right)(\xi-1)\right)}\right)\lambda_A D - \\ -\beta\frac{(1-\theta)\left(1+\left(\frac{(1-\theta)c+\theta\alpha_1}{-2\theta\alpha_2 D}+\frac{1}{2}\right)(\xi-1)\right)}{\theta\xi+(1-\theta)\left(1+\left(\frac{(1-\theta)c+\theta\alpha_1}{-2\theta\alpha_2 D}+\frac{1}{2}\right)(\xi-1)\right)}\lambda_B D.$$

On the other hand, for $s^*(B)=0$, paying the fee to solicit a rating, which is H with a probability p and L with a probability $1-p$, is not worthwhile for type B: $q(0,0)D+\lambda_B(R-D)+(1-\lambda_B)r > p\left[q(1,H)D+\lambda_B(R-D)+(1-\lambda_B)r\right]+(1-p)\left[q(1,L)D+\lambda_B(R-D)+(1-\lambda_B)r\right]-\phi(D,\gamma^*)$. Substituting and rearranging, we obtain the following condition:

$$\phi > \beta\left(p-\frac{\theta\xi}{\theta\xi+(1-\theta)\left(1+\left(\frac{(1-\theta)c+\theta\alpha_1}{-2\theta\alpha_2 D}+\frac{1}{2}\right)(\xi-1)\right)}\right)\lambda_A D + \\ +\beta\left((1-p)-\frac{(1-\theta)\left(1+\left(\frac{(1-\theta)c+\theta\alpha_1}{-2\theta\alpha_2 D}+\frac{1}{2}\right)(\xi-1)\right)}{\theta\xi+(1-\theta)\left(1+\left(\frac{(1-\theta)c+\theta\alpha_1}{-2\theta\alpha_2 D}+\frac{1}{2}\right)(\xi-1)\right)}\right)\lambda_B D$$

The two conditions verify the proposed equilibrium choices $s^*(A)=1$ and $s^*(B)=0$. This confirms the beliefs in equilibrium, and off-equilibrium beliefs $\mu(1,L)$ are free to be set arbitrarily.

B Equilibrium conditions in the model with ancillary services

According to the beliefs, the lenders' price function is as follows:

$$q(s,g)=\begin{cases} q(0,0)=\beta\left[\frac{2\theta\xi\lambda_A+(1-\theta)(\xi+1)\lambda_B}{2\theta\xi+(1-\theta)(\xi+1)}\right] \\ q(0,H)=\beta\lambda_A \\ q(0,L)=\beta\lambda_B \\ q(1,H)=\beta\left[\frac{2\theta(1-\xi)(1-\gamma^*)\lambda_A+(1-\theta)(1-\xi)(p+\epsilon)\lambda_B}{(1-\xi)[2\theta(1-\gamma^*)+(1-\theta)(p+\epsilon)]}\right] \\ q(1,L)=\beta\lambda_B. \end{cases} \tag{B.1}$$

The condition for $s^*(A,0)=1$, under such beliefs, is as follows: $q(1,H)D+\lambda_A(R-D)+(1-\lambda_A)r-\phi(D,\gamma^*)>q(0,0)D+\lambda_A(R-D)+(1-\lambda_A)r$. Substituting the expressions for $q(\cdot)$ from (B.1) and for γ^*, we obtain:

$$\phi<\beta\left[\frac{2\theta(1-\xi)\left(1-\left(\frac{(1-\theta)c+\theta\alpha_1}{-2\theta\alpha_2 D}+\frac{1}{2}\left(\frac{1}{2}+\frac{1}{2\theta}\right)\right)\right)\lambda_A+(1-\theta)(1-\xi)(p+\epsilon)\lambda_B}{(1-\xi)\left[2\theta\left(1-\left(\frac{(1-\theta)c+\theta\alpha_1}{-2\theta\alpha_2 D}+\frac{1}{2}\left(\frac{1}{2}+\frac{1}{2\theta}\right)\right)\right)+(1-\theta)(p+\epsilon)\right]}-\right.$$
$$\left.-\frac{2\theta\xi\lambda_A+(1-\theta)(\xi+1)\lambda_B}{2\theta\xi+(1-\theta)(\xi+1)}\right]D. \tag{B.2}$$

The condition above is the same to guarantee $s^*(A,1)=1$, whether the assessment is $m=h$ or $m=l$. Moreover, the condition for $s^*(B,1)=1$ if $m=h$ is: $(p+\epsilon)q(1,H)D+(1-p-\epsilon)q(1,L)D+\lambda_A(R-D)+(1-\lambda_A)r-\phi(D,\gamma^*)>q(0,0)D+\lambda_A(R-D)+(1-\lambda_A)r$. Thus,

$$\phi<\beta\left[(p+\epsilon)\frac{2\theta(1-\xi)\left(1-\left(\frac{(1-\theta)c+\theta\alpha_1}{-2\theta\alpha_2 D}+\frac{1}{2}\left(\frac{1}{2}+\frac{1}{2\theta}\right)\right)\right)\lambda_A+(1-\theta)(1-\xi)(p+\epsilon)\lambda_B}{(1-\xi)\left[2\theta\left(1-\left(\frac{(1-\theta)c+\theta\alpha_1}{-2\theta\alpha_2 D}+\frac{1}{2}\left(\frac{1}{2}+\frac{1}{2\theta}\right)\right)\right)+(1-\theta)(p+\epsilon)\right]}+\right. \tag{B.3}$$
$$\left.+(1-p-\epsilon)\lambda_B-\frac{2\theta\xi\lambda_A+(1-\theta)(\xi+1)\lambda_B}{2\theta\xi+(1-\theta)(\xi+1)}\right]D:=\bar{\phi}.$$

Since $\lambda_B<\lambda_A$, condition (B.3) is more restrictive than condition (B.2). If type B wants to solicit a rating after an assessment $m=h$, then type A wants to solicit a rating as well.

On the other hand, for $s^*(B,0)=0$, paying the fee to solicit a rating, which is H with a probability p and L with a probability $1-p$, is not worthwhile for type B: $q(0,0)D+\lambda_B(R-D)+(1-\lambda_B)r>p\left[q(1,H)D+\lambda_B(R-D)+(1-\lambda_B)r\right]+(1-p)\left[q(1,L)D+\lambda_B(R-D)+(1-\lambda_B)r\right]-$

$\phi(D,\gamma^*)$. Substituting and rearranging, we obtain the following condition:

$$\phi > \beta\Bigg[p\frac{2\theta(1-\xi)\left(1-\left(\frac{(1-\theta)c+\theta\alpha_1}{-2\theta\alpha_2 D}+\frac{1}{2}\left(\frac{1}{2}+\frac{1}{2\theta}\right)\right)\right)\lambda_A+(1-\theta)(1-\xi)(p+\epsilon)\lambda_B}{(1-\xi)\left[2\theta(1-\left(1-\left(\frac{(1-\theta)c+\theta\alpha_1}{-2\theta\alpha_2 D}+\frac{1}{2}\left(\frac{1}{2}+\frac{1}{2\theta}\right)\right)\right))+(1-\theta)(p+\epsilon)\right]}+ \\ +(1-p)\lambda_B-\frac{2\theta\xi\lambda_A+(1-\theta)(\xi+1)\lambda_B}{2\theta\xi+(1-\theta)(\xi+1)}\Bigg]D:=\underline{\phi}. \tag{B.4}$$

And, if they receive a negative assessment $m=l$, type B prefers again not to solicit a rating $s^*(B,1)=0$: $q(0,0)D+\lambda_B(R-D)+(1-\lambda_B)r > (p-\epsilon)\left[q(1,H)D+\lambda_B(R-D)+(1-\lambda_B)r\right]+(1-p+\epsilon)\left[q(1,L)D+\lambda_B(R-D)+(1-\lambda_B)r\right]-\phi(D,\gamma^*)$. Thus,

$$\phi > \beta\Bigg[(p-\epsilon)\frac{2\theta(1-\xi)\left(1-\left(\frac{(1-\theta)c+\theta\alpha_1}{-2\theta\alpha_2 D}+\frac{1}{2}\left(\frac{1}{2}+\frac{1}{2\theta}\right)\right)\right)\lambda_A+(1-\theta)(1-\xi)(p+\epsilon)\lambda_B}{(1-\xi)\left[2\theta\left(1-\left(\frac{(1-\theta)c+\theta\alpha_1}{-2\theta\alpha_2 D}+\frac{1}{2}\left(\frac{1}{2}+\frac{1}{2\theta}\right)\right)\right)+(1-\theta)(p+\epsilon)\right]}+ \\ +(1-p+\epsilon)\lambda_B-\frac{2\theta\xi\lambda_A+(1-\theta)(\xi+1)\lambda_B}{2\theta\xi+(1-\theta)(\xi+1)}\Bigg]D. \tag{B.5}$$

Since $\epsilon>0$, if $\theta(D,\gamma^*)$ satisfies condition (B.4) it also satisfies (B.5) .

Conditions (B.3) and (B.4) verify the proposed equilibrium choices. These choices confirm the equilibrium beliefs. Off-equilibrium beliefs $\mu(0,L)$ are set to be equal to 0.

C S&P Long-Term Issuer Credit Ratings

Category AAA: An obligor rated 'AAA' has extremely strong capacity to meet its financial commitments. 'AAA' is the highest issuer credit rating assigned by S&P.

Category AA: An obligor rated 'AA' has very strong capacity to meet its financial commitments. It differs from the highest-rated obligors only to a small degree.

Category A: An obligor rated 'A' has strong capacity to meet its financial commitments but is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than obligors in higher-rated categories.

Category BBB: An obligor rated 'BBB' has adequate capacity to meet its financial commitments. However, adverse economic conditions or changing circumstances are more likely to weaken the obligor's capacity to meet its financial commitments.

Category BB: An obligor rated 'BB' is less vulnerable in the near term than lower-rated obligors. However, it faces major ongoing uncertainties and exposure to adverse business, financial, or economic conditions that could lead to the obligor's inadequate capacity to meet its financial commitments.

Category B: An obligor rated 'B' is more vulnerable than the obligors rated 'BB', but the obligor currently has the capacity to meet its financial commitments. Adverse business, financial, or economic conditions will likely impair the obligor's capacity or willingness to meet its financial commitments.

Category CCC: An obligor rated 'CCC' is currently vulnerable and is dependent upon favourable business, financial, and economic conditions to meet its financial commitments.

Category CC: An obligor rated 'CC' is currently highly vulnerable.

Category SD and D: An obligor rated 'SD' (selective default) or 'D' is in default on one or more of its financial obligations including rated and unrated obligations but excluding hybrid instruments classified as regulatory capital or in nonpayment according to terms. A 'D' rating is assigned when S&P believes that the default will be a general default and that the obligor will fail to pay all or many of its obligations as they come due. An 'SD' rating is assigned when S&P believes that the obligor has selectively defaulted on a specific issue or class of obligations but it will continue to meet its payment obligations on other issues or classes of obligations in a timely manner.

Category R: An obligor rated 'R' is under regulatory supervision owing to its financial condition. With pending regulatory supervision, the regulators may have the power to favour one class of obligations over others or pay some obligations and not others.

Category NR: An issuer designated 'NR' is not rated.

The ratings from 'AA' to 'CCC' may be modified by the addition of a plus (+) or minus (-) sign to show relative standing within the major rating categories.

D Definition of the economic variables

Current account balance (Percent of GDP): Current account is all transactions other than those in financial and capital items. The major classifications are goods and services, and income and current transfers. The focus of the BOP is on transactions (between an economy and the rest of the world) in goods, services, and income.

General government total expenditure (Percent of GDP): Total expenditure consists of total expense and the net acquisition of nonfinancial assets.

General government gross debt (Percent of GDP): Gross debt consists of all liabilities that require payment or payments of interest and/or principal by the debtor to the creditor at a date or dates in the future. This includes debt liabilities in the form of SDRs, currency and deposits, debt securities, loans, insurance, pensions and standardized guarantee schemes, and other accounts payable.

General government primary net lending/borrowing (Percent of GDP): Primary net lending/borrowing is net lending (+)/borrowing (-) plus net interest payable/paid (interest expense minus interest revenue).

General government revenue (Percent of GDP): Revenue consists of taxes, social contributions, grants receivable, and other revenue. Revenue increases a government's net worth, which is the difference between its assets and liabilities.

GDP, current prices PPP (international dollars, millions): Expenditure-based GDP is total final expenditures at purchasers' prices (including the f.o.b. value of exports of goods and services), less the f.o.b. value of imports of goods and services. Based on purchasing-power-parity valuation of the country's GDP.

Inflation, average consumer prices (Percent change): Annual percentages of average consumer prices are year-on-year changes.

Population (Millions): For census purposes, the total population of the country consists of all persons falling within the scope of the census. In the broadest sense, the total may comprise either all usual residents of the country or all persons present in the country at the time of the census.

Unemployment rate (Percent of total labour force): Unemployment rate can be defined by either the national definition, the ILO harmonized definition, or the OECD harmonized definition. The OECD harmonized unemployment rate gives the number of unemployed persons as a percentage of the labour force (the total number of people employed plus unemployed). As defined by the International Labour Organization, unemployed workers are those who are currently not working but who are willing and able to work for pay, who are currently available to work, and who have actively searched for work.

Table 1: Summary statistics of the main variables.

	count	mean	sd	min	max
Rating level	90304	13.20339	4.420669	0	21
Unsolicited dummy	90272	.0421615	.2009585	0	1
Rating outlook	90304	-.0197555	.1958778	-1	1
Ebitd	10541	.1264743	1.365207	-1.432603	55.31935
Total assets	10827	2.108278	16.24348	7.00e-08	310.4507
Total debt	10785	.5414933	4.494472	0	118.9319
Debt over capital	10780	46.00989	83.67059	-374.88	7864.71
Stock price	11338	2915.85	40024.19	.1875	1805000
Number employees	10169	47860.29	100206.1	0	2300000
Current account	1889	-3.314591	12.02259	-65.031	63.835
Revenue	1901	30.74142	14.30769	2.236	160.191
Expenditure	1901	32.65045	13.27919	4.27	127.29
Primary lending	1823	-.8385677	6.853355	-75.657	123.486
Gross debt	1858	49.14064	36.23789	0	482.764
Population	1899	36.462	136.3822	.009	1382.71
GDP	1910	80623.54	602207.2	.026	9433034
Inflation	1906	5.724953	12.99689	-72.729	379.849

Note: Rating level refers to the long-term foreign currency issuer ratings by S&P between 2007 and 2016. Ratings have been transformed into a numerical scale from 0 (D/SD) to 21 (AAA). Unsolicited dummy is a dummy variable that takes the value of 1 if the rating is unsolicited and 0 if the rating is solicited. Rating outlook is a categorical variable that takes value of 1 if it is a positive outlook, -1 if it is negative, and 0 otherwise. Ebitd (earnings before interest and debt), total assets, total debt, and stock price are expressed in local currency. Debt over capital is the ratio of total debt to total capital. Number of employees is the number of workers in the firm. Current account, revenue, expenditure, primary lending, and gross debt are are expressed as a percentage of GDP, population figures are expressed in millions, GDP is expressed in purchasing-power-parity dollars, and inflation is expressed as a percentage.The first column presents the number of observations, the second presents the mean value, the third presents the standard deviation, and the fourth and fifth columns present the minimum and maximum value respectively. Source: Bloomberg, Datastream and IMF.

Table 2: Number of S&P issuer ratings by solicitation status and sector.

Sector	Solicited	Unsolicited	Total
Communications	4118	18	4136
	(99.6)	(0.4)	(100.0)
Consumer discretionary	7906	129	8035
	(98.4)	(1.6)	(100.0)
Consumer staples	2841	20	2861
	(99.3)	(0.7)	(100.0)
Energy	4375	8	4383
	(99.8)	(0.2)	(100.0)
Finance	40728	3356	44084
	(92.4)	(7.6)	(100.0)
Government	4745	148	4893
	(97.0)	(3.0)	(100.0)
Health care	2549	56	2605
	(97.9)	(2.1)	(100.0)
Industrials	5198	20	5218
	(99.6)	(0.4)	(100.0)
Materials	4743	26	4769
	(99.5)	(0.5)	(100.0)
Technology	2716	13	2729
	(99.5)	(0.5)	(100.0)
Utilities	6347	12	6359
	(99.8)	(0.2)	(100.0)
Total	86266	3806	90072
	(95.8)	(4.2)	(100.0)

Note: Ratings are long-term foreign currency issuer ratings issued by S&P between 2007 and 2016. Unsolicited ratings are those marked 'pi' or 'u', and all other ratings are solicited. The first column reports the number of ratings with 'solicited' status. The second column reports the number of ratings with 'unsolicited' status. Percentages are in parenthesis. Source: Bloomberg.

Table 3: Number of S&P ratings between 2011 and 2016 split by solicitation status and sector.

	Solicited						
	2011	2012	2013	2014	2015	2016	TOTAL
Communications	407	404	409	418	408	419	2465
Consumer discretionary	740	771	835	900	917	923	5086
Consumer staples	267	280	315	329	317	312	1820
Energy	417	456	505	538	527	496	2939
Finance	4000	4058	4183	4300	4352	4303	25196
Government	468	487	483	477	467	453	2835
Healthcare	242	254	266	282	276	269	1589
Industrials	487	493	553	607	621	620	3381
Materials	440	472	514	545	548	548	3067
Technology	257	275	295	320	320	328	1795
Utilities	631	634	642	654	665	673	3899
TOTAL	8356	8584	9000	9370	9418	9344	54072
	Unsolicited						
	2011	2012	2013	2014	2015	2016	TOTAL
Communications	0	1	3	3	2	0	9
Consumer discretionary	9	8	8	8	8	7	48
Consumer staples	2	2	1	1	1	1	8
Energy	0	0	0	1	1	1	3
Finance	347	341	329	175	170	168	1530
Government	25	24	25	25	26	22	147
Healthcare	6	5	5	6	6	6	34
Industrials	0	0	0	0	0	0	0
Materials	0	0	0	0	0	0	0
Technology	0	1	3	3	3	3	13
Utilities	0	0	0	0	0	0	0
TOTAL	389	382	374	222	217	208	1792

Note: Ratings are long-term foreign currency issuer ratings by S&P. Unsolicited ratings are those marked 'pi' or 'u', and all other ratings are solicited. The first panel reports the number of ratings with 'solicited' status. The second panel reports the number of ratings with 'unsolicited' status. The columns labelled 'total' are the number of ratings by sector for all years and the rows labelled 'total' are the number of ratings in a given year. Source: Bloomberg.

Table 4: S&P ratings by solicitation status and geographical area.

Region	Solicited	Unsolicited	Total
North America	42943	2447	45390
	(94.6)	(5.4)	(100.0)
Central-South America	3952	59	4011
	(98.5)	(1.5)	(100.0)
Asia	8740	427	9167
	(95.3)	(4.7)	(100.0)
Europe	27110	734	27844
	(97.4)	(2.6)	(100.0)
Oceania	3068	47	3115
	(98.5)	(1.5)	(100.0)
Africa	653	92	745
	(87.7)	(12.3)	(100.0)
Total	86466	3806	90272
	(95.8)	(4.2)	(100.0)

Percentages in Parentheses

Note: Ratings are long-term foreign currency issuer ratings by S&P between 2007 and 2016. Unsolicited ratings are those marked 'pi' or 'u', and all other ratings are solicited. The first column reports the number of ratings with 'solicited' status. The second column reports the number of ratings with 'unsolicited' status. Percentages are in parenthesis. Source: Bloomberg.

Table 5: Difference in mean ratings between solicited and unsolicited ratings.

	Solicited		Unsolicited		Difference	
	Mean	Std.dev.	Mean	Std.dev.	Mean diff.	t-test
Communications	9.85	3.45	11.53	2.21	-1.68**	(-3.12)
Consumer discretionary	10.09	4.04	11.19	4.06	-1.10**	(-3.01)
Consumer staples	11.17	3.79	11.20	3.44	-0.03	(-0.04)
Energy	11.06	3.87	7.29	4.03	3.77*	(2.47)
Finance	15.37	3.28	12.72	3.19	2.65***	(46.09)
Government	16.09	4.49	18.36	3.78	-2.26***	(-7.07)
Health care	11.04	4.39	9.98	2.04	1.06***	(3.70)
Industrials	11.19	3.90	12.20	1.15	-1.01***	(-3.85)
Materials	10.22	3.19	12.85	1.78	-2.63***	(-7.46)
Technology	10.19	3.68	12.54	2.03	-2.34**	(-4.14)
Utilities	13.56	2.63	18.83	0.39	-5.27***	(-44.98)
Observations	85268		3800		89068	

Note: Rating level is the long-term foreign currency issuer ratings by S&P between 2007 and 2016. Ratings have been transformed into a numerical scale from 0 (D/SD) to 21 (AAA). Unsolicited dummy is a dummy variable that takes value 1 if the rating is unsolicited and 0 if the rating is solicited. Significance * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Solicitation status effect on the rating level (pooled regression).

	(1) Rating level	(2) Rating level	(3) Rating level	(4) Rating level	(5) Rating level
Unsolicited dummy	-1.847***	-1.659***	0.333*	-1.427***	-2.568***
	(0.0608)	(0.0564)	(0.176)	(0.237)	(0.511)
Unsolicited × Dummy Japan=1			-0.170		1.634***
			(0.310)		(0.581)
Unsolicited × Dummy Finance=1			-2.278***		0.310
			(0.185)		(0.758)
Other covariates	No	No	No	Yes	Yes
Observations	90072	90072	90072	7714	7714
Year FE	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	Yes	No	Yes
R-squared	0.34	0.45	0.45	0.27	0.27
F-statistic	1874.79	442.04	438.66	49.62	48.16

Note: Rating level is the long-term foreign currency issuer ratings by S&P between 1996 and 2016. Ratings have been transformed into a numerical scale from 0 (D/SD) to 21 (AAA). Unsolicited dummy is a dummy variable that takes the value of 1 if the rating is unsolicited and 0 if the rating is solicited. Unsolicited×Dummy Japan is the interaction between the Unsolicited dummy and a dummy that takes value the value of 1 for Japan and 0 otherwise. Unsolicited×Dummy Finance is the interaction between the Unsolicited dummy and a dummy that takes the value of 1 for the financial sector and 0 otherwise. Significance * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Solicitation status effect on the rating level by sector.

	Financial sector			Non-financial sector			Government		
	(1) Rating level	(2) Rating level	(3) Rating level	(4) Rating level	(5) Rating level	(6) Rating level	(7) Rating level	(8) Rating level	(9) Rating level
Unsolicited dummy	-3.096***	-3.060***	-2.892***	0.189	-0.231	-0.120	3.067***	3.029***	0.403**
	(0.0569)	(0.0567)	(0.0510)	(0.218)	(0.268)	(0.259)	(0.321)	(0.332)	(0.181)
Unsolicited × Dummy Japan=1		1.070**	0.977**		-1.448***	-1.523***		-2.453**	-0.904
		(0.533)	(0.469)		(0.475)	(0.458)		(1.157)	(0.572)
Observations	44084	44084	44084	41095	41095	41095	4893	4893	4893
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Subsector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	Yes	No	No	Yes	No	No	Yes
R-squared	0.24	0.25	0.42	0.17	0.17	0.23	0.34	0.35	0.85
F-statistic	566.33	566.34	253.82	354.21	348.01	109.30	120.69	115.02	175.00

Note: Rating level is the long-term foreign currency issuer ratings by S&P between 1996 and 2006 (between 2011 and 2016 for the government sector). Ratings have been transformed into a numerical scale from 0 (D/SD) to 21 (AAA). Unsolicited dummy is a dummy variable that takes the value of 1 if the rating is unsolicited and 0 if the rating is solicited. Unsolicited×Dummy Japan is the interaction between the Unsolicited dummy and a dummy that takes the value of 1 for Japan and 0 otherwise. Unsolicited×Dummy Finance is the interaction between the Unsolicited dummy and a dummy that takes the value of 1 for the financial sector and 0 otherwise. Standard errors are in parenthesis. Significance * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Solicitation status effect on the rating level by subsector.

	Bank	Insurance	Industrials	Utilities	Cons. discretionary	Materials	Technology	Healthcare	Sovereign
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Rating level	Rating level	Rating level	Rating level	Rating level	Rating level	Rating level	Rating level	Rating level
Unsolicited dummy	-1.809***	-1.678**	-1.410***	2.191***	-0.922***	-1.437***	-1.127**	-1.236**	2.073***
	(0.412)	(0.677)	(0.276)	(0.809)	(0.284)	(0.312)	(0.496)	(0.594)	(0.436)
Ebitd over assets	51.04***	4.248	8.154***	0.273	9.679***	5.164***	2.222***	8.906***	
	(5.931)	(3.106)	(1.203)	(2.062)	(0.710)	(0.975)	(0.502)	(0.981)	
Assets	0.0144***	0.0000707	0.00789***	-0.0106	-0.000507	-0.0379**	0.00000110	-0.00146	
	(0.00360)	(0.0000632)	(0.00277)	(0.0627)	(0.000531)	(0.0169)	(0.00000593)	(0.000998)	
Net debt over assets	-3.318***	-5.170***	-2.004***	3.954***	-2.995***	-7.030***	-0.925	-5.911***	
	(0.563)	(1.532)	(0.584)	(0.965)	(0.312)	(0.714)	(0.610)	(0.598)	
Revenue over assets	-36.90***	-0.566	-0.255	0.418	-1.081***	-0.385*	-1.837***	-0.431***	
	(3.456)	(0.740)	(0.169)	(0.290)	(0.129)	(0.225)	(0.324)	(0.0967)	
Debt over capital	0.0468***	-0.0194**	-0.0120**	-0.0799***	-0.000568*	-0.00224	-0.0334***	-0.0158***	
	(0.00553)	(0.00763)	(0.00484)	(0.00838)	(0.000303)	(0.00454)	(0.00637)	(0.00597)	
Number employees	0.00000580***	0.0000259***	0.0000132***	0.00000426**	0.00000710***	0.00000611***	0.0000121***	0.0000423***	
	(0.000000768)	(0.00000180)	(0.000000628)	(0.00000178)	(0.000000582)	(0.00000172)	(0.00000104)	(0.00000243)	
Economics covariates	No	No	No	No	No	No	No	No	Yes
Observations	1560	703	1479	911	1900	1161	906	1016	1602
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.35	0.36	0.41	0.44	0.24	0.28	0.29	0.46	0.59
F-statistic	26.98	12.55	33.05	23.40	19.36	14.36	12.46	28.39	65.52

Note: Rating level is the long-term foreign currency issuer ratings by S&P. Ratings have been transformed into a numerical scale from 0 (D/SD) to 21 (AAA). Unsolicited dummy is a dummy variable that takes the value of 1 if the rating is unsolicited and 0 if the rating is solicited. Unsolicited×Dummy Japan is the interaction between the Unsolicited dummy and a dummy that takes the value of 1 for Japan and 0 otherwise. Unsolicited×Dummy Finance is the interaction between the Unsolicited dummy and a dummy that takes the value of 1 for the financial sector and 0 otherwise. Standard errors are in parenthesis. Significance * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Effect of the solicitation status on sovereign yields.

	(1) Sovereign yield	(2) Sovereign yield	(3) Sovereign yield	(4) Sovereign yield
Unsolicited dummy	-0.379	-1.171***	-0.431*	-1.138***
	(0.277)	(0.253)	(0.248)	(0.398)
Rating level	-0.577***		-0.289***	-0.393***
	(0.0443)		(0.0483)	(0.0977)
Current account		-0.0691**	-0.0111	-0.178***
		(0.0345)	(0.0314)	(0.0388)
Gross debt		0.00806	-0.00272	-0.0844***
		(0.00506)	(0.00421)	(0.0140)
Primary lending		-0.0150	-0.0890*	-0.0813**
		(0.0495)	(0.0458)	(0.0376)
Revenue		-0.0545***	-0.0129	0.0673
		(0.0110)	(0.0117)	(0.0564)
GDP		-0.602***	-0.381***	1.425***
		(0.107)	(0.0971)	(0.509)
Inflation		0.164***	0.121**	-0.0265
		(0.0591)	(0.0516)	(0.0173)
Population		0.0251***	0.0194***	-0.272***
		(0.00532)	(0.00511)	(0.0700)
Unemployment rate		0.204***	0.132***	0.373***
		(0.0371)	(0.0341)	(0.0632)
Country FE	No	No	No	Yes
Observations	348	308	308	308
R-squared	0.52	0.58	0.65	0.87
F-statistic	105.29	38.10	38.28	29.81

Note: Sovereign yield is the annual interest rate on government bonds. Ratings have been transformed into a numerical scale from 0 (D/SD) to 21 (AAA) for S&P and from 1 (C) to 21 (Aaa) for Moody's. Unsolicited dummy is a dummy variable that takes the value of 1 if the rating is unsolicited and 0 if the rating is solicited. Standard errors are in parenthesis. Significance * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 10: Effect of solicitation status on stock prices in several sectors.

	Bank	Insurance	Industrials	Utilities	Cons. discretionary	Materials	Technology	Healthcare
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Stock price	Stock price	Stock price	Stock price	Stock price	Stock price	Stock price	Stock price
Unsolicited dummy	-1578.5***	1766.5	-343.0**	-3085.2*	-14832.0***	-48956.5***	-32726.3	-362.1**
	(240.6)	(4431.4)	(164.7)	(1723.4)	(2229.4)	(5619.9)	(20918.8)	(144.0)
Rating level	29.96*	3252.4***	9.982	-157.3**	-201.4	1302.9***	1460.2	41.07***
	(15.38)	(326.7)	(13.09)	(73.57)	(173.8)	(487.2)	(1223.7)	(5.971)
Rating outlook	106.4	-9038.2**	40.54	255.5	-1013.5	1170.3	3974.9	209.7**
	(183.4)	(3818.5)	(180.7)	(564.9)	(2419.6)	(6141.2)	(20917.5)	(97.41)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1793	1176	1569	954	2002	1302	1002	1115
R-squared	0.15	0.19	0.35	0.17	0.11	0.16	0.05	0.41
F-statistic	11.14	10.64	31.54	7.53	8.69	9.14	1.98	30.87

Note: Stock price is the price of a share of the firm on the stock market. Rating level is the long-term foreign currency issuer ratings by S&P. Ratings have been transformed into a numerical scale from 0 (D/SD) to 21 (AAA). Unsolicited dummy is a dummy variable that takes the value of 1 if the rating is unsolicited and 0 if the rating is solicited. Standard errors are in parenthesis. Significance * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.