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The importance of conflicts of interest in attributing sovereign credit ratings

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ABSTRACT

Credit rating agencies (CRAs) have been in the regulator's spotlight since the subprime crisis occurred and they remain under criticism due to suspected conflicts of interest that could arise from clients soliciting a rating. The aim of this paper is to contribute to the current discussion on regulatory failures in CRAs' activities by testing the existence of a bias in CRAs' assessment due to conflict of interest. More specifically, we examine whether the solicitation of a rating by a sovereign affects the grade provided by rating agencies. Our empirical results, which are based on a two-step ordered probit for a large set of emerging and industrialized countries, address the issue of self-selection bias for ratings attributed by Standard & Poor's in 2013 and suggest that unsolicited ratings are higher than solicited ones, which goes against the traditional argument of conflict of interest, namely the "blackmail" hypothesis, and supports the idea that CRAs attach an important weight to their reputation in attributing sovereign ratings.

"No response to the crisis would be effective without addressing the role played by rating agencies"
(Luis A. Agilar, S.E.C. Commissioner, July 2014)

"It was not in the short term economic self-interest of either Moody's or S&P to provide accurate credit ratings . . .because doing so would have hurt their own revenues"
(Report by the Senate Permanent Subcommittee on Investigations, 2011)

"The fact that many countries pay for the rating service they receive may raise concerns with regard to conflicts of interest inherent in the issuer-pays model"
(European Commission, November 2010)

1. Introduction

The primary function of credit rating agencies (CRAs) is to provide a reliable assessment of the creditworthiness of borrowers. In financial markets characterized by information asymmetry, this role is crucial because bond issuers need to provide potential investors with signals attesting their good quality (Spence, 1973). The role of CRAs in global financial markets as financial gatekeepers has increased dramatically over the past decades, peaking at 3.1 million of outstanding credit ratings attributed by NRSROs[1] in 2008 to decrease slightly to 2.5 million in 2012.[2] Three dominant international credit rating agencies – Standard & Poor's, Moody's and Fitch – which assess the creditworthiness of companies and countries hold an average of over 96% of the annual market share.[3] Each of the three operate on an issuer-pays model, which means that institutions issuing debt securities aiming to provide additional guarantee to the market about the product quality have often to pay a fee to the agency to be rated.

The debacle of the financial and sovereign debt crises with abysmal performance of rating agencies have one after the other

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[1] Nationally Recognized Statistical Rating Organisations (NRSROs) are credit rating agencies (CRAs) registered by the SEC as "market recognized credible rating agencies" (SEC 7-12-2003).
[2] Number of outstanding credit ratings attributed by NRSROs: 2638094 (2007), 3123748 (2008), 2905824 (2009), 2816599 (2010), 2611582 (2011), 2504584 (2012) (Annual Report on NRSROs, SEC).
[3] SEC Annual Report, December 2013.

called into question the widespread reliance[4] on ratings, urging to rethink the business model of credit rating agencies and the suitability of the regulatory framework designed to guarantee the good functioning of the system. Since then, there is much discussion amongst regulators, policymakers, practitioners and academics about the measures that must be taken to make rating agencies more accountable, rating processes more transparent and to eliminate the risk of conflict of interest. Progresses in that direction however have been slow. As noted by former Pennsylvania congressman, Paul Kanjorski, who was involved in the elaboration of the credit rating section of the Dodd–Frank Act. "The change has been minuscule." "[And] I have to be honest. It was the most disappointing section in the bill."

Against this background, more is certainly needed from the academic community to help revamping the regulatory framework surrounding credit rating agencies. This paper offers to feed the discussion on rating agencies practices by shedding light on one important aspect of the debate: the existence of conflicts of interest in the sovereign bond debt market and more specifically the impact of rating solicitation from sovereigns on the CRAs' assessment.

Over the last decade, credit ratings regulation has been remolded in response to the challenge of regulatory failures as well as social pressures resulting from the occurrence of the recent subprime crisis. The opacity surrounding the elaboration of ratings has raised concerns about the existence of potential biases in the rating assessment process (Benmelech and Dlugosz, 2009) leading to sharp criticism of CRAs by governments and the general public (United States Congress, 2008; European Securities and Markets Authority, 2013). After being blamed for favoring boom-bust cycles during the Asian crisis (Ferri et al., 1999) and for attributing a favorable rating to institutions that turned out to be insolvent during the 2008 financial turmoil (Benmelech and Dlugosz, 2009), CRAs are now being denounced for their early downgrades of sovereign ratings and the likely threat that such downgrades represent for the economic recovery particularly in the USA and in Europe (Staikouras, 2012). Therefore, in line with the G20 objective of leaving no area of financial markets unregulated,[5] policymakers have adopted a new regulatory framework with the aim to enhance the transparency and the accuracy of the credit rating process. The main principles guiding the new wave of regulation initiated by the Credit Rating Agency Act of 2006 in the US are listed in the "IOSCO[6] statement of principles regarding the activities of credit rating agencies" (9-25-2003). Among these principles, our paper focuses particularly on the question of independence of CRAs and concerns regarding conflicts of interest (Baker and Mansi, 2002; Bolton et al., 2012) that may arise in the issuer-pays model (White, 2010). An institution soliciting a rating, i.e. meaning that the institution in question is willing to pay a fee to receive a rating, could receive a better creditworthiness evaluation than if it had not solicited the rating. The better creditworthiness evaluation of a soliciting institution could result either from the larger set of information put at the disposal of the evaluating CRA[7] than in the case of a non-soliciting institution – the evaluation here relying on public information only – or for commercial reasons.[8] Conflicts of interest may arise in the latter case and can make market participants question the reliability of CRAs' ratings (Poon and Firth, 2005; Poon et al., 2009; Bannier et al., 2009; Fulghieri et al., 2013). The question of the impact of solicitation of CRAs' creditworthiness evaluation is well documented in the case of corporate ratings (Poon and Firth, 2005; Poon et al., 2009). To the best of our knowledge, the issue has not been addressed yet for sovereign ratings despite the overwhelming interest attached by governments to upgrades or downgrades of their ratings and their pivotal role in financial markets as they are used as a benchmark against which the credit risk evaluation of corporations, banks or other public entities located in a given country should be compared (Gaillard, 2009; Williams et al., 2013; Borensztein et al., 2013). The existing gap probably stems from the lack of reliable data on country's solicitation, preventing to extend the analysis on corporates to sovereigns. In 2009 though, EU regulatory authorities imposed on CRAs to increase their transparency with respect to different aspects of their policy including whether ratings are solicited or not.[9] Because of delays in the implementation of the reform, data only became available to the general public for some agencies two or three years later. Using this opportunity for identification purposes, our main objective in this paper is to examine whether conflicts of interest exist in the process of sovereign ratings determination and more generally whether or not there is a link between rating solicitation and the final rating. To do so, relying on Standard & Poor's data for 2013, we carry out a two-step ordered probit analysis taking into account the sample selection bias with its origin in the decision to solicit a rating or not. For this empirical analysis, we pay a particular attention to find compiling instruments for the solicitation.

Our results indicate that unsolicited sovereign ratings tend to be higher than solicited ones, advocating then for the rejection of the so-called "blackmail" hypothesis according to which CRAs reward soliciting institutions with a higher rating. In other words, conversely to the conflict of interest's argument, CRAs do not seem to provide better ratings in exchange of a fee for their evaluation work. Rather, solicitation appears to lower the rating given to a country, which supports the reputation argument that CRAs tend to minimize the risk of providing a good rating to a country that may default in the future.

The remainder of the paper is organized as follows. Section 2 presents the literature on sovereign ratings determinants and discusses the hypotheses concerning the impact of solicitation on the ratings attribution process. Section 3 presents the data and the methodology underlying our empirical analysis. Section 5 examines results and Section 6 provides the conclusion.

2. The literature

This section is divided in two parts: the first part presents an overview of the literature on the impact of ratings and their determinants and the second focuses more specifically on the role of solicitation in the rating attribution process as well as on the conflict of interest issue.

2.1. The impact of sovereign ratings and their determinants

The academic literature on sovereign ratings has thus far attempted to address two main questions: What is the impact of sovereign ratings on financial markets, and are the determinants

[4] Illustrating this is the ECB's collateral policy that relies among other factor on the rating of the sovereign having issued the bond (ECB Collateral Policy, www.ecb.europa.eu/paym/coll/html/index.en.html).

[5] In particular, the G20 Declaration on Strengthening the Financial market of April 2009 states than CRAs should be subject to regulatory oversight by the end of 2009.

[6] International Organization of Securities Commissions.

[7] Contractually, the solicitation involves regular meetings with the CRA as well as information sharing. While this argument is likely to play a significant role in the case of corporate bonds, it seems far less relevant for sovereign bonds as the assessment is mainly based on public information such as the macroeconomic development and the financial and institutional environment.

[8] For a complete review of the literature on the microeconomic analysis of the sources of conflict of interest for CRAs see Bolton et al. (2012).

[9] EU Regulation 1060/2009.

of these ratings actually related to a country's fundamental creditworthiness?

The first strand of the literature tends to confirm the significant impact of sovereign ratings changes on financial markets. This is particularly true concerning rating downgrades. Brooks et al. (2004) and Ferreira and Gama (2007) document the asymmetric response of stock markets to sovereign ratings news, i.e. stock markets react negatively to rating downgrades but not to upgrades. Similar results have been found for European bond and CDS spreads (Afonso et al., 2013), even though results regarding CDS spreads do not appear to hold in the case of emerging markets (Ismailescu and Kazemi, 2010 suggest that rating downgrades, contrary to upgrades, being largely anticipated by market participants leave CDS spreads unaffected). Looking at market volatility, Afonso et al. (2013) highlight the significant impact of rating downgrades on stock and bond markets. Another important feature discussed in the literature on the impact of ratings on financial markets concerns the existence of international spillover effects arising from announcements on ratings. This is particularly the case for stock (Kaminsky and Schmukler, 2002), foreign exchange (Alsakka and ap Gwilym, 2012) and bond markets (Christopher et al., 2012). Particularly, in the latter case, Gande and Parsley (2005) demonstrate that negative rating announcements in one country can affect bond spreads in other countries. Arezki et al. (2011) and Afonso et al. (2012) also document contagion effects. Finally, while it is clear that sovereign ratings impact financial markets, no consensus has been reached in the literature concerning the role of the level of development of the country for which a rating announcement is made. Ferreira and Gama (2007) state that emerging countries are more sensitive to rating announcements whereas Brooks et al. (2004) find no evidence supporting that conclusion.

Beyond the impact of sovereign ratings on financial markets, the second essential question addressed in the literature concerns the model used by CRAs in their ratings determination. The question is of particular interest not only given the impact that ratings have on financial markets but also because of the opacity surrounding ratings attribution. While CRAs provide some information concerning the economic determinants they use to establish a rating, almost nothing is said about the precise specification of their ratings underlying model. This methodology evolved slightly over time and, according to CRA's own assessment, did not seem to affect significantly the long term sovereign credit rating evaluation in foreign currency.[10] The pioneers of this part of the literature are Cantor and Packer (1996) who analyzed the determinants of 49 countries' ratings assigned by Moody's and Standard & Poor's in 1995. These authors identified six main determinants for sovereign ratings: per capita income, GDP growth, external debt, inflation, degree of economic development and default history. Many researchers, inspired by Cantor and Packer's seminal work, have tried to improve our understanding of sovereign ratings by attempting to enlarge the set of ratings determinants, as summarized in Table 1. Overall, sovereign ratings determinants can be classified into five wide categories: (i) macroeconomic indicators, e.g. GDP growth or inflation; (ii) public finance indicators, e.g. the government deficit or the amount of public debt; (iii) monetary and external indicators, e.g. the current account balance, foreign reserves or the level of interest rates; (iv) default history, e.g. whether the country defaulted on its debt in the past or not or the number of past default episodes; (v) and qualitative indicators, e.g. the level of corruption or the quality of law enforcement. While a consensus has emerged in the literature concerning the role of macroeconomic indicators (Haque et al., 1996; Eliasson, 2002; Bissoondoyal-Bheenick, 2005), evidence related to public finance, monetary and external indicators remains less conclusive (Min, 1999; Borio and Packer, 2004; Bozic and Magazzino, 2013). Conversely, default history appears to be significant in several papers (Hu et al., 2002; Afonso, 2003; Borio and Packer, 2004; Butler and Fauver, 2006; Afonso et al., 2007; Remolona et al., 2008). Finally, turning to qualitative indicators, they hold a growing importance in academic studies attempting to test CRA statements that not only quantitative determinants enter their evaluation. The results highlight the positive impact of the quality of public institutions on the level of rating (Borio and Packer, 2004; Butler and Fauver, 2006; Afonso et al., 2011).

2.2. Rating solicitation

The main criticism addressed to CRAs have been concerned with the potential conflicts of interest that could arise from the fact that a rating soliciting institution actually pays a fee to have its creditworthiness evaluated (Baker and Mansi, 2002; Bolton et al., 2012). In this context, a soliciting institution could benefit from a higher rating than a non-soliciting institution. In other words, the existence of conflicts of interest in the process of rating determination could bias ratings and in turn cause market participants to question the reliability of CRAs' assessments. In this section, we describe the role of solicitation as an additional determinant of sovereign ratings and how the existence of conflicts of interest can formally be tested. Table 2 summarizes the main elements of this discussion.

The primary hypothesis that our model allows testing of is whether the decision of a country to solicit a rating or not significantly influences the rating attributed by CRAs, henceforth designated H1. H1 has been confirmed in the literature focusing on corporate ratings. In general, empirical evidence indicates that unsolicited ratings tend to be lower than solicited ratings (Poon, 2003; Fairchild et al., 2009; Bannier et al., 2009; Poon and Chan, 2010; Byoun and Shin, 2012). Similar results have been found in the specific case of banks ratings (Poon and Firth, 2005; Poon et al., 2009). The difference of creditworthiness evaluation between a soliciting and an non-soliciting institution could result either from private information put at the disposal of the evaluating CRA or from commercial reasons.

In line with the literature on corporate ratings, two corollary hypothesis to H1 can be tested. These hypotheses are related to the underlying reasons that may explain the differences existing between solicited and unsolicited ratings (see for corporate Bannier et al., 2009; Fulghieri et al., 2013). The second hypothesis H2 relates to the so-called "blackmail" hypothesis according to which rating agencies reward soliciting institutions with higher ratings to incite non-soliciting entities to solicit a rating or to keep as customers soliciting entities (Poon and Firth, 2005). Along these lines, as is discussed in Mukhopadhyay (2006), a CRA may attempt to attract new customers and, in turn, increase its market coverage ratio by providing more generous ratings to soliciting countries (Pagano and Volpin, 2010; Bolton et al., 2012).[11] Interestingly, this hypothesis tends to be rejected empirically for corporations, with authors suggesting that reputation matters more for CRAs than their market share (Gan, 2004; Bannier et al., 2009; Van Roy, 2013). The third hypothesis concerns the predominant role of reputation costs in the rating attribution process for CRAs (H3). This hypothesis supposes that CRAs consider as particularly damageable for their reputation the attribution of a good rating to a country that later defaults especially if the rating has been solicited and therefore if they benefited from full information for doing their analysis. The reputation costs should be particularly important in the case of sovereign ratings in comparison to the case of corporate ratings because of the attention it draws. Governments for instance are extremely

[10] "We expect few changes to existing foreign-currency sovereign ratings from the updated criteria", Standard and Poor's (2011).

[11] This reason appears particularly relevant for new CRAs.

Table 1
Significant determinants of sovereign ratings.

Author(s)	Countries	Period	Macroeconomics	Public finance	Monetary and external indicators	Qualitative indicators
Afonso (2003)	81	2001	GDP per capita, GDP growth, inflation	External debt		Level of economic development, default history
Afonso et al. (2011)	130	1995–2005	GDP per capita, GDP growth	Government debt, external debt	External reserves	Government effectiveness, EU accession, sovereign default indicator
Bissoondoyal-Bheenick (2005)	95	1995–1999	GNP per capita, inflation	Government balance/GDP, debt/GDP	Foreign reserve, net exports/GDP	
Bissoondoyal-Bheenick et al. (2006)	78–94	2001	GDP, inflation		Real interest rate, current account/GDP	Technological development
Borio and Packer (2004)	52	1996–2003	GDP per capita, GDP growth, inflation			Corruption perception index, political risk score, default history
Caceres et al. (2010)	10	2005–2010	Global risk aversion, spillover coefficient,	Debt/GDP	Overall balance	
Cantor and Packer (1996)	49	1995	GDP per capita, GDP growth, inflation	External debt		Economic development, default history
Catao and Sutton (2002)	25	1970–2001	Real GDP growth,	Fiscal balance	Debt services/export ratio, ratio of net international reserve/debt, US interest rate, REER	Policy volatility
Cosset and Roy (1991)	71	1982–1987	GNP per capita, propensity to invest		Net foreign debt/exports	
Eichengreen and Mody (1998)	37	1991–1996	GDP growth	Debt maturity, debt/GNP, deficit/GDP	Debt services/exports, reserves/GNP, US treasury rate	
Eliasson (2002)	38	1996–1999	GDP per capita, GDP growth, inflation	External debt	Current account/GDP, external debt/export	
Ferri et al. (1999)	17	1989–1998	GDP growth	Budget deficit, external debt	Current account balance, foreign exchange reserve	Development level
Haque et al. (1996)	60	1990–2006	GDP growth, inflation		Non gold foreign exchange reserves to imports ratio, current account balance/GDP, international interest rates, export structure	Country's regional location
Hill et al. (2010)	129	1990–2006	Change of GDP growth			Outlook status, last rating evolution, probabilities derived from rating level
Hu et al. (2002)	12–92	1981–1998	Inflation	Debt/GNP	Reserves, debt services/exports	Past default, being a non industrial country
Min (1999)	11	1991–1995	CPI inflation rate	Total external debt/GDP	Issue spread, foreign reserve/GDP, debt service/GDP, imports growth rate, exports growth rate, net foreign assets, terms of trade, nominal exchange rate adjusted by the CPI, Issue size	Private issuer
Monfort and Mulder (2000)	20	1995–1999	Investment/GDP ratio, inflation		Export growth, REER	Crisis indicator
Oliveira et al. (2012)	7	2000–2010	Inflation rate, state of business cycle	Public debt, government investment	Stock return, interest rate, current account balance	
Reisen and von Maltzan (1999)	14	1988–1997			Government bond yields, stock market return, reserves, real exchange rate, terms of trade	Past rating
Remolona et al. (2008)	26	1990–2005	Nominal GDP, GDP per capita, inflation	External debt/GDP	Current account balance/GDP, currency mismatch	Default history, political risk

Note: This table summarizes the literature on the determinants of sovereign ratings.

Table 2
Tested hypothesis.

Hypothesis	Definition	Expected effects
H1	Solicited and unsolicited ratings differ	$\alpha \neq 0$
H2	Blackmail hypothesis	$\alpha < 0$
H3	Reputation costs hypothesis	$\alpha > 0$

Note: Expectation of coefficients related to the following model: $Rating_i = f(S, Z; \alpha, \beta)$ with *Rating* representing the level of sovereign rating; *S* being a dummy variable taking the value 1 if the sovereign rating is unsolicited and, *Z* forming a set of control variables. α and β are the coefficients attached to *S* and *Z*, respectively.

concerned with their rating which is often viewed as a "thermometer" of good or bad orientations of economic policy. Sovereign credit ratings are also under close scrutiny of market participants as they are used as the benchmark against which the credit risk evaluation of institutions or corporations located in a given country is achieved (Gaillard, 2009; Williams et al., 2013; Borensztein et al., 2013). The intense media coverage of controversial rating announcements or of suspicions regarding rating methodologies confirms this and may justify CRAs' cautiousness about their reputation.[12] An example of this is given by the vigorous critics expressed in various newspapers in the aftermath of the Asian crisis that led CRAs to recognize the existence of inadequacies in their rating methodologies (Bonte et al., 1999).[13] In the end, it appears that attributing a good rating for commercial reasons or despite adverse economic information concerning the rated entity can jeopardize CRAs credibility and reputation in case of default of the entity in question. Therefore, H3 states that a CRA being concerned about its reputation would not favor short-term benefits, i.e. the extra fee paid by a new customer attracted by an accommodating rating policy, against long-term costs, i.e. the loss in terms of credibility and reputation that could arise from attributing a favorable rating to a soliciting entity that defaults in the future and for which private information was available. Therefore, CRAs have an incentive to be more conservative in their rating attribution policy for soliciting entities than for non-soliciting entities.

3. Empirical strategy

This paper aims to determine whether solicitation has an impact on sovereign ratings. More precisely, our objective is to look at the existence of a difference between solicited and unsolicited ratings. To this end, we rely on a standard ordered probit model embedding the main determinants for sovereign ratings identified in the literature and discussed in the previous section to which we add a specific variable capturing whether a given country solicited a rating or not, in the vein of Poon and Firth (2005) and Poon et al. (2009) in the context of corporate ratings.

3.1. The treatment effect problem

One specific issue concerning the solicitation process is that each country must decide whether to solicit a rating depending on the expected benefit for the country in terms of the level of rating that it could receive from CRAs. Consequently, the decision to solicit a rating cannot be considered to be independent from the economic situation of the country and the level of the final rating. In other words, a so-called treatment effect is caused by the decision to solicit a rating and introduces a sample selection bias.

Sample selection bias may appear when the decision to adopt a "treatment" (in this case the solicitation of a rating) is not independent from the outcome and usually causes estimators to be inconsistent. Importantly, a self-selection bias can exist even if the sample covers the entire population, which is the case in our study, where almost all countries form part of our sample (see next section for details on our data). We tackle the sample selection bias issue by adopting a two-step estimation procedure for our ordered probit model in the same vein as Poon and Chan (2010) and Van Roy (2013) in the context of corporate ratings, which is based on the Heckman's correction procedure. In the first step, intended to compute the Mill's ratio, we explain the solicitation decision using a set of ratings' determinants to which we add an instrument. In the second step, ratings are estimated based on a set of potential determinants. We refer in the following subsection to the first equation as the selection equation and the second equation as the main or the outcome equation.

3.2. Instrumenting the solicitation

The choice of the extra instrument in the selection equation is not trivial. Yet, as widely discussed in the literature (see among others Angrist and Pischke, 2008 or Kai and Prabhala, 2007), its quality is crucial for obtaining sound econometric results. Which instrument would be most suitable for instrumenting the solicitation? The difficulty to identify appropriate instrumental variables in empirical applications is well documented in the literature. Two conditions need to be satisfied for an instrumental variable to be deemed as valid: (i) the *relevance condition* as depicted by a high level of correlation of the instrument with the variable that is instrumented (Eq. (1)) and (ii) the independence of the instrument from the error term of the main Equation (Eq. (3)), known as the *exclusion restriction*. Both conditions are important. The former is related to the question of so-called weak instruments, i.e. instrumental variables that are only weakly related to the treatment status (Stock et al., 2002, for a survey). The latter concerns potential bias in estimated parameters if selected instruments fail to be orthogonal to the error term of the main equation. As we know, in the absence of natural experiment as is often the case in economics, it is very difficult to provide unassailable evidence regarding both the power of potential instruments and their exogeneity. In practice therefore, one usually relies on a combination of both statistical and *a priori* arguments based on economic theory to support the validity of the instruments. Along these lines, the use of instrumental variable should be viewed as a necessary step to improve our confidence in the empirical results as it helps dealing with potential bias in the estimates when some of the regressors are suspected to be endogenous. Still, we need also to keep in mind when interpreting the final results the inherent limit of such an approach and more specifically our inability to be fully certain that the instruments are valid. In what follows, we analyze in depth the validity of our main instrument along with alternative ones. For this, we start with economic arguments before presenting statistical tests. Eventually, we propose in a last step to assess the solidity of our conclusions to the choice of the instrument with a robustness analysis based on alternative instruments.

A classical family of instruments used in the macroeconomic and financial literature relies on the geographical distance (see Hall and Jones, 1999; Frankel and Romer, 1999; Bekaert et al., 2013; Lambert, 2015; Shan et al., 2014). In general, the rationale behind the use of the geographical distance as a valid instrument relies on the fact that it is predetermined meaning that is neither influenced

[12] However, one should mention that sovereign ratings usually are recognized to be of good quality as is stated by the IMF in its 2010 Global Financial Stability Report (IMF, 2010) in which it is highlighted that over the past 30 years, defaulting countries have been rated systematically below investment grade for a year beforehand.

[13] On December 11, 1997, in an article entitled "Risk beyond measures", *The Economist* wrote "Moody's [...] declared that no South Korean bonds now qualify as "investment grade" long after the press had reported that Koreas' central bank was nearly out of foreign-currency reserves". The newspaper then added that the "[rating] agencies are continuing to downgrade Japanese financial institutions for reasons that have been widely commented upon for months, if not years" and that "three months after the collapse of the Thai currency [...] did the two agencies [Moodys and Standard & Poor's] strip the A-rating from the government's bonds".

nor caused by the variable of interest in the main equation. In our study, we rely on the same rationale to build a valid instrument for rating solicitation in the Heckman two-step estimation procedure. Along the lines of the literature mentioned above, we decide to use the distance of countries to the main financial centers as an instrument of the decision to solicit a rating.

Our reasoning goes as follows. Investors tend to invest in countries or companies they are familiar with (Beugelsdijk and Frijns, 2010). This can be explained for instance by the fact that analysts resident in a country tend to make more precise earnings forecasts for firms in that country than analysts who are not resident (Bae et al., 2008). More generally, investors have to collect less extra information and then to incur lower cost in order to properly assess the value of financial assets as asymmetry of information decreases with the proximity (i.e. inverse distance). This mechanism actually underlies the so-called home bias or regional bias that materializes in a very low degree of diversification in international equity markets (French and Poterba, 1991). One important consequence of the latter is the lower level of investment of investors in regions that are geographically far away from their location or from financial centers, as is well documented in the literature on the financial center bias, i.e. the fact that companies far from financial centers are more likely to go public than their provincial counterparts (see for instance Wójcik, 2009).

In this context, countries that are the hosts of major international financial centers or countries that are close to these centers might have an advantage when issuing debt because potential international investors are more likely to be familiar with issuers next by. Conversely, countries that are far away from the main international financial centers may have to make more efforts to obtain visibility on financial markets to get known by international investors and soliciting a rating from established credit rating agencies can be seen as a part of this effort. In this respect, the geographic distance from a country to the main international centers being predetermined – as in the context of trade, economic performance or financial integration – can be considered to be a good candidate to instrument the decision of a country to solicit a rating or not.

We build an instrument called *Distance*, that is a variable that captures the shortest distance to one of the main three financial centers, namely New York, London and Hong Kong according to the Global Financial Centres Index. This index is often used for ranking financial centers in terms of competitiveness and is compiled by the Z/Yen Group, which is a London-based think tank.[14]. Besides the *Distance* variable that is our main instrument, we also consider a set of alternative instruments, namely the membership to the OECD or to the G20 and the quality of the statistics provided by the rated countries (respectively OECD, G20 and StatQual). The definition of each instrument is displayed in Table B.8.

Equipped with this, we now turn to formal statistical validity tests with respect to both the *relevance condition* and the *exclusion restriction*. As is usually done in the literature, the first condition is tested by assessing the explanatory power of the selected instruments. One simple approach consists in calculating the *F*-statistic by estimating in the first stage equation a model constraining the parameter attached to the instrument or the set of instruments to zero and an unconstrained model. The literature considers (Staiger and Stock, 1997), as a rule of thumb, that a strong instrument requires a *F*-statistic larger than 10 (see results for the main models in Tables 4 and 5, and the corresponding *F*-statistics of the selection equation in Table B.7). As an alternative, Stock and Yogo (2005) offer an improvement of the 10 rule-of-thumb by providing a specific testing procedure with tabulated critical values for assessing the presence of weak instruments. The test however has been developed in a linear two-stage least squares setting. In accordance, we need to slightly modify our estimation procedure to implement it. We do it by considering the first stage equation as a linear probability model. The Stock and Yogo (2005) test is then performed by estimating the model by ordinary least square. Overall, the results provide additional support for the relevance of our instruments as the large majority of combinations of our instruments (*Distance*, StatQual, G20 and OECD) is subject to a bias lower than 10%. Table B.9 displays the statistics for the different cases. Next, we look at the exclusion restriction. In general, the exogeneity of the instrument is tested by applying the well-known Sargan test. As for the Stock and Yogo test, however, this test does not accommodate nonlinear specifications in its original form. To deal with this issue, we consider the second stage equation as linear and estimate the model (i.e. ordered probit) by ordinary least squares (OLS). The residuals of these estimations are then used for implementing the Sargan over-identification test. These tests, performed on the entire set of combinations for four instruments (*Distance*, StatQual, G20 and OECD), confirm that we cannot reject the exogeneity of our instruments (see Table B.10).

Without being fully satisfactory as we need to ignore the nonlinearity of the models,[15] the results given by the Stock and Yogo test as well as the Sargan test improve our confidence regarding the validity of our instruments.

In a final step, we assess how sensitive our results are to the choice of the instrument. For this, we complement our study with a robustness analysis by considering the alternative instruments one another and eventually all together. For the sake of clarity, results are only reported for the benchmark model (see Table B.11). The rest of the estimations are available upon request.

3.3. The Heckman selection correction procedure

Our empirical analysis relies on Eqs. (1)–(5). For further details on probit and ordered probit models, see Greene (2002). Eqs. (1) and (2) correspond to the first step of our empirical strategy. Eqs. (3), (5) and (6) hold for the step 2 while Eq. (4) describes the computation of the Mill's ratio:

$$S_i^* = \gamma_1 + \sum_{j=2}^{m+1} X_{ji}\gamma_j + \epsilon_i \tag{1}$$

Equation (1) corresponds to the **solicitation decision equation**. S_i^* is a latent continuous variable capturing the benefit of solicitation for country *i*. γ_1 and γ_j are parameters to be estimated and X_{ji} is a vector of explanatory variables described in Section 4 which also contain our instrument variable, i.e. *Distance*, that captures the minimal distance between a given country and its closest main financial center. ϵ_i constitutes the error term. Importantly, S_i^* being unobservable, we estimate a probit model taking the form of Eq. (2):

$$P(S_i = 1) = P(S_i^* > 0) = \Phi(W_i) \tag{2}$$

$S_i = 1$ if the rating is unsolicited, i.e. the benefit of not soliciting a rating is positive, and 0 otherwise. Φ is the standard normal probability cumulative distribution function. $W_i = \gamma_1 + \sum_{j=2}^{m+1} X_{ji}\gamma_j$.

Eq. (3) is the **outcome equation** and focuses on the identification of sovereign ratings determinants.

$$R_i^* = \beta_1 + \sum_{j=2}^{m} \beta_j Z_{ji} + \alpha S_i + \delta\lambda_i + \xi_i \tag{3}$$

[14] http://www.zyen.com/.

[15] We know from the literature that the linear probability model has some limitations such as its inefficiency (Horrace and Oaxaca, 2006).

Table 3
Variables definition.

Variable	Definition
Variables of interest	
Rating	Ordinal variable representing the rating of the country in foreign currency.
No solicitation	Dummy variable that takes the value 1 if the country did not solicit a rating.
Economic indicators	
GDP per capita	GDP per capita, current prices, dollars.
GDP growth	GDP growth in constant prices, expressed in percent change.
Inflation	Inflation, annual percentages change of average consumer prices.
Fiscal indicators	
Budget government balance	General government balance.
Debt	General government gross debt expressed as a percentage of the GDP.
Monetary and external indicators	
Current account balance	Current Account Balance, percent of GDP.
Rating difference	Dummy variable, takes the value 1 if the country has a better rating in its own currency.
Default history	
Default history	Dummy variable that takes the value 1 if a country experienced at least one technical default or rescheduling period since 1950.
Qualitative indicators	
Violence	Score value of the political stability and absence of violence index of the worldwide governance indicator.
Voice accountability	Score value of the voice and accountability index of the worldwide governance indicator.
Government efficiency	Score value of the government effectiveness index of the worldwide governance indicator.
Regulatory quality	Score value of the regulatory quality index of the worldwide governance indicator.
Rule of law	Score value of the rule of law index of the worldwide governance indicator.
Control of corruption	Score value of the control of corruption index of the worldwide governance indicator.

Note: Data extracted from the World Economic Outlook, 2012 and from the World Bank (WGI).

R_i^* is a latent continuous variable representing the creditworthiness of a country i, which is evaluated by CRAs in the process of rating determination. Z_j is a vector of determinants, which are presented in Table 3 of Section 4. α, β and δ are parameters to be estimated and the variable λ is the inverse Mills ratio, which is introduced to correct the sample selection bias and is computed as in Eq. (4), consistent with (Greene, 2002):

$$\begin{cases} \lambda_i = \dfrac{\phi(Q_i)}{\Phi(Q_i)} & \text{if } S_i = 1 \\ \lambda_i = -\dfrac{\phi(Q_i)}{1-\Phi(Q_i)} & \text{if } S_i = 0 \end{cases} \tag{4}$$

$$Q_i = \frac{\hat{\gamma_1} + \sum_{j=2}^{m+1} X_{ji}\hat{\gamma_j}}{\hat{\sigma_\epsilon}}$$

where $\hat{\gamma_1}$ and $\hat{\gamma_j}$ are obtained by estimating Eq. (2). ϕ and $\hat{\sigma_\epsilon}$ correspond to the standard normal probability density function and the standard deviation of the error term ξ in Eq. (3), respectively.[16] As for S_i^*, R_i^* is unobservable. Therefore, we rely on R_i that holds for the rating of country i and that is computed as in Eq. (5):

$$R_i = \begin{cases} 1 & \text{if } R_i^* \le \mu_1 \\ 2 & \text{if } \mu_1 < R_i^* \le \mu_2 \\ 3 & \text{if } \mu_2 < R_i^* \le \mu_3 \\ 4 & \text{if } \mu_3 < R_i^* \le \mu_4 \\ 5 & \text{if } \mu_4 < R_i^* \le \mu_5 \\ 6 & \text{if } \mu_5 < R_i^* \le \mu_6 \\ 7 & \text{if } R_i^* > \mu_6 \end{cases} \tag{5}$$

μ_1 to μ_6 are thresholds to be estimated and that must be reached by the latent variable R_i^* for the ordinal variable R_i to jump from one category, i.e. a rating, to another. Details on the transformation of ratings into ordinal variables is presented in Appendix A.2. Finally, the ordered probit that is estimated is described by Eq. (6):

$$\begin{aligned} P(R_i = 1) &= \Phi(\mu_1 - U_i) \\ P(R_i = 2) &= \Phi(\mu_2 - U_i) - \Phi(\mu_1 - U_i) \\ &\vdots \\ P(R_i = 6) &= \Phi(\mu_6 - U_i) - \Phi(\mu_5 - U_i) \\ P(R_i = 7) &= 1 - \Phi(\mu_6 - U_i) \end{aligned} \tag{6}$$

Note that $U_i = \beta_1 + \sum_{j=2}^{m} \beta_j Z_{ji} + \alpha S_i + \delta\lambda_i$.

4. Data and variables

Governments have asked new regulations on CRAs to increase their accountability.[17] A sound illustration of this is that since 2009, in Europe, CRAs are obliged to disclose whether ratings are solicited or not.[18] As a consequence of this regulation change,[19] investors know in theory about potential conflicts of interest. However because of delays in the implementation of the reform, data only became available in 2011. Moreover, the quality of this information depends on the CRA and its interpretation of the regulation. In this market, S&P and Moody's gets the lion's share accounting for around 70% of the market,[20] Fitch being the third notable actor. Among S&P and Moody's, the latter does not provide information about solicitation and only discloses its access to private information rather than about solicitation itself. In this respect, only Standard & Poor's provides suitable information regarding solicitation, strictly speaking. Standard & Poor's being the market leader for sovereign ratings, our empirical work focuses on data made available by this company.

[16] Given the structure of the model and the nature of the observed data, σ_ϵ cannot be estimated. As a result, we follow the approach taken in traditional softwares such as LIMDEP by normalizing it to 1.0 for the two-step maximum likelihood estimation (see LIMPDEP User's Manual, 2002, p.640).

[17] For example, the establishment of the credit rating office at the SEC with the Dodd–Franck Act (2010), or the European Securities Market Authority in Europe (2009) to supervise CRAs.

[18] Staikouras (2012) provides a comprehensive discussion relevant to the EU Regulation 1060/2009 related to CRAs. In particular, the author presents the four new requirements relevant to the disclosure of unsolicited ratings: "(a) CRAs should disclose their policies and procedures regarding unsolicited ratings; (b) unsolicited ratings should be clearly identified as such and should be distinguished from solicited ratings by appropriate means; (c) unsolicited ratings should include a statement regarding whether the rated entity or related third party participated in the rating process and whether the CRA had access to the accounts and other relevant internal documents of the rated entity or a related third party; and (d) CRAs are required to provide to the ESMA on an annual basis a list of their ratings during the year, including the proportion of unsolicited ratings among them".

[19] EU Regulation 1060/2009.

[20] CRA's Market share calculation according to Article 8d of the CRA Regulation, European Securities and Markets Authority (ESMA), December 2013.

Along these lines, our dependent variable R_i is computed as the average of the rating on long-term debt issued in foreign currency disclosed in 2013 by Standard & Poor's.[21] Data on the rating solicitation status of countries under study comes from the same source. Table A.1 in Appendix A presents the distribution of sovereign ratings depending on whether countries solicited a rating or not. It can be observed that while countries with the lowest level of rating, i.e. CCC and SD, are less represented, the distribution of countries soliciting a rating vs. countries not soliciting a rating is quite well-balanced across ratings levels.

Table 3 details the determinants for the sovereign ratings examined in this paper, which belong to the five wide categories of determinants identified in the literature. Data are obtained from the World Economic Outlook database (IMF). Default history is obtained from Standard & Poor's[22] and Worldwide Governance Indicators are obtained from the World Bank. Relying on this data, we specify a standard and a forward-looking model.

In the standard model, all variables are computed as the average of their last three observations, consistent with Poon (2003) for corporations and Afonso et al. (2011) for sovereigns.[23] The rationale behind this approach is that despite CRAs efforts to continuously monitor economic developments in one given country, the "current" economic situation of a country can hardly be assessed using contemporaneous data, which usually is released with a substantial delay. Therefore, relying on a three-year average rather than only on the last observation for our ratings determinants appears to be an appropriate way of assessing the trend followed by macroeconomic fundamentals in the country under study. This approach is also consistent with CRAs claim to primarily focus on the countries' long-term perspectives. Note that in an attempt to test the robustness of our results, we also computed our variable averages over the last five years.

In addition to the specification described in the preceding lines, we also consider a "forward-looking model". This model completes the information obtained from economic developments having occurred in the past three years with foreseen macroeconomic evolutions. That is, this specification is based not only on ratings determinants past observations but also on their expected future value.[24] Forecasts are obtained from the IMF. The rationale behind this specification comes from CRAs' own claims on the importance of the forward-looking dimension in their rating determination process. In particular, Standard & Poor's states that its creditworthiness assessment reflects also "forward-looking opinions about credit risk" that "express the agency's opinion about the ability and willingness of an issuer, such as a corporation or state or city government, to meet its financial obligations in full and on time."[25]

To the best of our knowledge, no attempt has been made thus far either to analyze the role of solicitation in the context of sovereign ratings, i.e. what our standard model attempts to do, or to examine the role of forecasts in the process of sovereign ratings determination, i.e. an issue that we address with our forward-looking specification. In this respect, we expect our results to provide an interesting contribution to the literature by improving our understanding of the way sovereign ratings are determined.

[21] The countries being studied together and their rating and their solicitation status can be found in Table C.1 in Appendix C.

[22] Default or rescheduling data from Reinhart and Rogoff (2013) was also included as an alternative variable without influencing the results. These tables are made available upon request to the corresponding author.

[23] If we define X as the quantitative macroeconomic variable, we define $\overline{X}_{2013} = (X_{2010} + X_{2011} + X_{2012})/3$.

[24] We define $\overline{X}_{2013} = (X_{2010} + X_{2011} + X_{2012} + X^F_{2013} + X^F_{2014} + X^F_{2015})/6$. X^F_{2013}, X^F_{2014} and X^F_{2015} are forecast variables.

[25] Standard & Poor's Ratings Definition, November 2013.

5. Results

Our main results are summarized in Tables 4 and 5 that concern the standard model with Standard & Poor's sovereign ratings for 2013 being a function of determinants taken at their last three observations average, which allows the assessment of the role of solicitation in the creditworthiness evaluation process. Tables B.1 to B.6 in Appendix B contain our results for the forward-looking model as well as for our robustness checks. In each case, the top of the tables is related to the first step of our empirical process, i.e. the estimation of the solicitation decision equation using a probit specification. The results for the second step of the estimation procedure are at the bottom of the tables, i.e. the estimation of the outcome equation using an ordered probit specification. As a reminder, the two-step procedure aims to address the sample selection bias issue. Note that in all tables, specifications 1, 3, 5, 7, 9 and 11 correspond to the standard or forward-looking model including one of the Worldwide Governance Indicators, i.e. Violence, Voice Accountability, Government Efficiency, Regulatory Quality and Rule of Law. These indicators could not be included simultaneously because of multicollinearity issues (see Appendix A.3). Specifications 2, 4, 6, 8, 10 and 12 are parsimonious specifications excluding insignificant variables. Note that we test for parameters heterogeneity using interaction variables without bringing any evidence for it.[26]

5.1. Standard model

The results for the first step of the estimation procedure indicate that countries distant from the main financial centers tend to solicit a rating more than countries located near a financial center. Therefore, the distance to the closest financial center appears to be an indicator of the need for distant countries to make more efforts to attract investors and soliciting a rating can be seen as a part of these efforts. In other words, countries that are located closer to financial centers benefit from a large visibility on financial markets that is likely to ease their debt issuing process and reduces their need to provide potential investors with signals such as ratings. Along these lines, our results support the idea that the marginal gain of soliciting a rating is weaker for countries in which information concerning their economic situation is easily available to investors than for "distant" countries.

Another interesting result is that countries displaying a high GDP growth rate tend not to solicit a rating, i.e. the coefficient of the *GDP growth* variable is positive and significant. In other words, favorable economic conditions encourage governments to refuse to pay a fee to get rated. On the other hand, the coefficient of the *Debt* variable exhibits a positive sign with a lower level of significance, signaling that indebted countries tend to reduce their inclination to solicit a rating.

Looking at the results for the second step, the significance of the inverse Mills ratio confirms the existence of a self-selection bias that is corrected by our two-step procedure. More importantly, it appears that unsolicited ratings tend, on average, to be higher than solicited ones, i.e. the variable *No solicitation* has a positive and significant coefficient, which supports the non-rejection of H1. Interestingly, this feature goes against what is usually found in the literature for corporate ratings that highlights the existence of a negative rating premium (Poon, 2003; Fairchild et al., 2009; Bannier et al., 2009; Poon and Chan, 2010; Byoun and Shin, 2012; Fulghieri et al., 2013). Furthermore, this result supports the existence of a positive premium for unsolicited sovereign ratings with respect to solicited ones and supports the rejection of the

[26] Results are not reported here for the sake of brevity but are available upon request.

Table 4
Results of the two step ordered probit model with 3 years data.

	(1)	(2)	(3)	(4)	(5)	(6)
Step 1: Probit estimation of the decision equation						
Distance	−6.95***	−6.95***	−7.68***	−7.68***	−6.66***	−6.66***
Constant	−2.12**	−2.12**	−2.77***	−2.77***	−2.25**	−2.25**
GDP per capita (/100,000)	2.56**	2.56**	1.18	1.18	1.98	1.98
GDP growth	0.29**	0.29**	0.43***	0.43***	0.31**	0.31**
Inflation	0.00	0.00	0.02	0.02	0.00	0.00
Budget government balance	−0.02	−0.02	−0.01	−0.01	−0.02	−0.02
Debt	0.01**	0.01**	0.02**	0.02**	0.01*	0.01*
Current account balance	−0.04	−0.04	−0.04	−0.04	−0.04	−0.04
Rating difference	−0.04	−0.04	0.11	0.11	0.02	0.02
Default history	−0.08	−0.08	−0.20	−0.20	−0.06	−0.06
Violence	−0.29	−0.29	–	–	–	–
Voice and accountability	–	–	0.62	0.62	–	–
Government efficiency	–	–	–	–	0.07	0.07
Regulatory quality	–	–	–	–	–	–
Rule of law	–	–	–	–	–	–
Control of corruption	–	–	–	–	–	–
Pseudo R^2	0.34	0.34	0.36	0.36	0.33	0.33
Step 2: Ordered probit model						
Indicator of self selection bias						
Inverse mills ratio	−2.26***	−1.99***	−3.13***	−2.68***	−2.58***	−2.31***
Indicator of the absence of solicitation						
No solicitation	4.03***	3.55***	5.20***	4.41***	4.66***	4.22***
Economic indicators						
GDP per capita (/100,000)	4.70***	5.20***	4.69***	4.96***	0.75	–
GDP growth	−0.07	–	−0.07	–	−0.03	–
Inflation	−0.03	–	−0.03	–	0.00	–
Public finance indicators						
Budget government balance	0.01	–	0.03	–	0.05	–
Debt	−0.02***	−0.01***	−0.02***	−0.02***	−0.02***	−0.02***
Monetary and external indicators						
Current account balance	0.04*	0.04**	0.05**	0.06***	0.06***	0.08***
Rating difference	0.82**	0.85***	0.80**	0.80**	0.39	–
Default history						
Default history	−0.23	–	−0.25	–	−0.03	–
Qualitative indicators						
Violence	0.39**	0.43**	–	–	–	–
Voice and accountability	–	–	0.41**	0.55***	–	–
Government efficiency	–	–	–	–	1.74***	1.87***
Pseudo R^2	0.35	0.34	0.39	0.38	0.45	0.44

Note: A total of 105 observations. The results of the ordered probit regression with explanatory variables as a mean of the last three years.
* Significance level of 10%.
** Significance level of 5%.
*** Significance level of 1%.

Table 5
Results of the two-step ordered probit model with 3 years data (continued).

	(7)	(8)	(9)	(10)	(11)	(12)
Step1: Probit estimation of the decision equation						
Distance	−6.74***	−6.74***	−6.68***	−6.68***	−6.70***	−6.70***
Constant	−2.19**	−2.19**	−2.23**	−2.23**	−2.22**	−2.22**
GDP per capita	2.11	2.11	1.97	1.97	1.90	1.90
GDP growth	0.31**	0.31**	0.31**	0.31**	0.31**	0.31**
Inflation	0.00	0.00	0.00	0.00	0.00	0.00
Budget government balance	−0.02	−0.02	−0.02	−0.02	−0.02	−0.02
Debt	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**
Current account balance	−0.04	−0.04	−0.04	−0.04	−0.04	−0.04
Rating difference	0.03	0.03	0.03	0.03	0.03	0.03
Default history	−0.07	−0.07	−0.06	−0.06	−0.06	−0.06
Violence	–	–	–	–	–	–
Voice and accountability	–	–	–	–	–	–
Government efficiency	–	–	–	–	–	–
Regulatory quality	−0.01	−0.01	–	–	–	–
Rule of law	–	–	0.06	0.06	–	–
Control of corruption	–	–	–	–	0.07	0.07
Pseudo R^2	0.33	0.33	0.33	0.33	0.33	0.33
Step 2: Ordered probit model						
Indicator of self selection bias						
Inverse mills ratio	−2.49***	−2.45***	−2.72***	−2.48***	−2.90***	−2.50***
Indicator of the absence of solicitation						
No solicitation	4.55***	4.50***	4.87***	4.47***	5.25***	4.58***

Table 5 (*Continued*)

	(7)	(8)	(9)	(10)	(11)	(12)
Economic indicators						
GDP per capita (/100,000)	1.32	–	1.35	–	0.80	–
GDP growth	0.00	–	−0.04	–	−0.08	–
Inflation	0.02	–	−0.01	–	−0.02	–
Public finance indicators						
Budget government balance	0.04	–	0.05	–	0.04	–
Debt	−0.02***	−0.02***	−0.02***	−0.02***	−0.02***	−0.02***
Monetary and external indicators						
Current account	0.07***	0.09***	0.05**	0.08***	0.06***	0.08***
Rating difference	0.29	–	0.69**	0.66**	0.67**	0.64**
Default history						
Default history	0.03	–	−0.05	–	−0.08	–
Qualitative indicators						
Regulatory quality	1.95***	2.02***	–	–	–	–
Rule of law	–	–	1.41***	1.58***	–	–
Control of corruption	–	–	–	–	1.22***	1.38***
Pseudo R^2	0.45	0.42	0.44	0.43	0.42	0.41

Note: A total of 105 observations. The results of the ordered probit regression with explanatory variables as a mean of the last three years.

* Significance level of 10%.

** Significance level of 5%.

*** Significance level of 1%.

"blackmail" hypothesis (H2) according to which CRAs reward soliciting institutions with a higher rating. Conversely, this element tends to confirm the intuition behind the reputation costs hypothesis (H3) according to which CRAs tend to minimize the risk of providing a good rating to a country soliciting their assessment that may default in the future. This major difference about the weight attached to the reputation with respect to corporate ratings might be explained at least partially by the wide coverage received by sovereign credit ratings from the medias. More precisely, failing to detect a severe problem likely to trigger a country default for an agency having a full information (i.e. private and public) to carry out its analysis might significantly damage its reputation. Concerning other determinants, our results are consistent with the literature. Particularly, we find that the *Debt* variable capturing the level of public debt and the *Current account* variable have a negative and positive sign, respectively. Other variables such as *GDP per capita* and *Rating difference*, play a significant though not robust role. Finally, concerning the governance indicators, our estimates suggest that they are important determinants of sovereign ratings. More precisely the variables *Absence of violence*, *Voice and accountability*, *Government efficiency*, *Regulatory quality*, *Rule of law* and *Control of corruption* all have a positive and significant impact on the level of rating.

5.2. Forward-looking model and robustness checks

We now turn to the forward-looking specification (for the sake of brevity, results are reported in Tables B.1 and B.2 in Appendix B), which introduces forecast variables that are viewed in the literature as potential determinants of sovereign ratings (Bissoondoyal-Bheenick, 2005). Forecasts have the advantage of better reflecting future risk of default and therefore complement well the information obtained from past economic developments. Furthermore, the forward-looking specification is a good response to CRAs claims that their creditworthiness assessment is also a forward-looking process. Interestingly, our results confirm the main conclusions described in the previous section and particularly the fact that unsolicited ratings tend on average to be higher than solicited ratings.

We conducted three sets of estimates to test the robustness of the standard model discussed here above. First, we extended the number of previous observations used to compute the average of ratings determinants from three to five (in the interest of parsimony, results are listed in Tables B.3 and B.4 in Appendix B). Second, we removed Heavily Indebted Poor Countries (HIPC) from the sample (see Tables B.5 and B.6 in Appendix B).[27] The rationale here is that ordered probit estimates can be biased in the presence of outliers. In our context, these outliers could be either countries with an extremely low level of debt or countries experiencing an unsustainable level of debt. As the level of public debt is bounded by zero on one side, we only withdrew countries with a high level of public debt. Finally, relying on the first specification of the standard model (Tables 4 and 5), we tested three alternative instruments namely *StatQual*, *G20* and *OECD* that respectively capture the quality of the statistical system in a given country (according to IMF standards) and the G20 and OECD memberships (Table B.11). These variables were acceptable candidates to instrument the decision to solicit a rating according to the correlation condition, i.e. a high level of correlation of the instrument with the instrumented variable, but potentially less regarding the exclusion restriction condition, i.e. the independence of the instrument with respect to the error term of the main equation. However, the difficulty to identify a good instrument in the empirical framework makes particularly interesting to see whether our main conclusions remain unchanged with alternative though weaker instruments.

Overall, our results and conclusions remain unchanged, particularly the fact that solicitation negatively influences ratings. The results are reported in Appendix B in Tables B.1, B.2, B.3, B.4 and B.11.

6. Conclusion

CRAs have been under tighter regulator's scrutiny since the subprime crisis occurred. One of the main regulators' preoccupation arises from concerns about potential conflicts of interest due to the risk of seeing a rating soliciting institution benefiting from a higher creditworthiness evaluation than a non-soliciting institution. This issue is well-documented in the case of corporate ratings (Poon et al., 2009; Poon and Firth, 2005) but has not been addressed yet in the case of sovereign ratings. The main objective of this paper is to contribute to the current debate on the accuracy and transparency of sovereign credit ratings and to examine whether conflicts of interest exist in the context of these particular ratings. To do so, we rely on Standard & Poor's 2013 data for sovereign ratings on

[27] These countries experience an unsustainable level of debt and are eligible for repayment facilities from the World Bank and the IMF. In our sample, 10 countries were registered as HIPC: Benin, Bolivia, Burkina Faso, Cameroon, Ghana, Honduras, Mozambique, Senegal, Uganda and Zambia.

long-term debt issued in foreign currency as well as on solicitation. This analysis is made possible by the implementation of new regulations, particularly in Europe, aimed at increasing the transparency and accountability of CRAs by requiring them to disclose whether a particular rating is solicited.

The empirical analysis conducted in this paper relies on an ordered probit model that is estimated using a two-step procedure to cope with the sample selection bias arising from the fact that the decision to solicit a rating cannot be considered to be independent from the economic situation of the country that ultimately underlies the level of the final rating. Our method is similar to Van Roy (2013) and Poon and Chan (2010) and based on Heckman's correction procedure. Along these lines, we estimate a standard model in which all variables are computed as the average of their last three observations which allows the assessment of the impact of the trend followed by macroeconomic fundamentals on the country's rating. We also estimated a forward-looking model that completes the information obtained from past economic developments with foreseen macroeconomic evolutions and is aimed at testing CRAs claims that their creditworthiness evaluation is a forward-looking process. One of the main challenges of the two-step procedure lies in the selection of a valid instrument or set of valid instruments for the first-step equation. As is known in economics, the choice and the assessment of potential instrumental variables is a difficult task. In accordance, we approach the problem from different angles. First, we discuss in full the exogeneity and relevance of our main instrument, namely the geographical distance to the main financial hubs. Then, we implement usual statistical validity tests. Eventually, we perform a robustness analysis with alternative instruments. Without being unassailable, this procedure might allow to provide compelling evidences to support our results and conclusions.

The results for the first step indicate that distant countries tend less to solicit a rating, suggesting that the marginal gain of soliciting a rating is weaker for countries for which information is made easily available to investors. We also find that favorable economic conditions, captured by the GDP growth, act as an incentive not to pay a fee for getting a rating. Moreover, our results indicate that indebted countries tend not to solicit a rating. Eventually, formal statistical tests tend to support the validity of our instruments.

Looking at the second step of our estimation procedure, we obtain a significant inverse Mills ratio that corrects for the sample selection bias that is originated by the decision to solicit a rating. More importantly, our results indicate that unsolicited ratings tend, on average, to be higher than solicited ones, which goes against what is highlighted in the literature for corporate ratings (Fairchild et al., 2009; Fulghieri et al., 2013; Poon, 2003; Byoun and Shin, 2012; Bannier et al., 2009; Poon and Chan, 2010).

This result advocates for the rejection of the so-called "blackmail" hypothesis according to which CRAs reward soliciting institutions with higher ratings and rather tends to confirm the reputation cost hypothesis that CRAs minimize the risk of providing a good rating to a country that may default in the future. In other words, this result tends to confirm that marketing reasons do not significantly influence sovereign credit rating grades, while reputation matters. Other determinants such as the level of public debt or the current account contribute to the rating determination, which is consistent with the literature. This is also the case for governance indicators that suggest that the quality of public institutions has a positive impact on the level of rating. Finally, the estimation of the forward-looking model confirms our main conclusions and supports the idea that completing the information obtained from past economic developments with forecasts matters for the understanding of ratings determination.

Overall, our findings contribute to the recent discussion on CRAs regulatory framework. This discussion has drawn increased interest in the aftermath of the recent financial crisis as credit rating agencies were confronted to severe critics from policymakers and the general public because of their lack of transparency and the existence of potential biases in their assessment. Responding to this, policymakers in both sides of the Atlantic called for restrictions on the role of CRAs and for an increased regulation of their activity. Reforms were initiated in Europe with the EU Regulation 1060/2009 and in the United-States with the implementation of the Dodd–Frank Act.[28] As noted by former Pennsylvania congressman Paul Kanjorski, though, further efforts still need to be done. Among the persistent sources of criticism stands out the issuer-payer system according to which the issuer can pay to be rated by the agency. Although, our empirical procedure does not allow to conclude on the absence of any kind of conflict of interest, our results mitigate the argument in the case of sovereigns as the solicitation of a rating by a country does not lead to a higher grade.

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Appendix A. Tables

A.1. Distribution of ratings by level and solicitation

Table A.1
Distribution of ratings by level and solicitation.

Rating	Solicited/unsolicited	Occurrence	Frequency
AAA	Solicited	7	7%
	Unsolicited	6	6%
AA	Solicited	9	9%
	Unsolicited	3	3%
A	Solicited	11	10%
	Unsolicited	0	0%
BBB	Solicited	19	18%
	Unsolicited	2	2%
BB	Solicited	21	20%
	Unsolicited	1	1%
B	Solicited	22	21%
	Unsolicited	2	2%
CCC	Solicited	1	1%
	Unsolicited	0	0%
SD	Solicited	1	1%
	Unsolicited	0	0%
Total		105	
	Solicited	91	87%
	Unsolicited	14	13%

Note: Data collected from the Standard & Poor's Website, March 2013.

A.2. Rating correspondence for the ordered probit model

Table A.2
Rating correspondence for the ordered probit model.

Rating	Ordinal value
AAA	7
AA	6
A	5
BBB	4
BB	3
B	2
CCC or below	1

[28] "Regulatory Implementation of the Statement of Principles Regarding the Activities of Credit Rating Agencies" (IOSCO 2010).

A.3. Correlation between World Governance Indicators

Table A.3
Pearson correlation coefficients between qualitative variables.

	Violence	Voice accountability	Government efficiency	Regulatory quality	Rule of law
Voice accountability	0.67				
Government efficiency	0.71	0.77			
Regulatory quality	0.66	0.76	0.94		
Rule of law	0.75	0.76	0.96	0.92	
Control of corruption	0.76	0.77	0.94	0.89	0.96

Appendix B.
Forward-looking specification and robustness checks

Table B.1
Results of the two-step ordered probit model with forecasts.

	Step 1: Probit estimation of the decision equation					
	(1)	(2)	(3)	(4)	(5)	(6)
Distance	−5.83***	−5.83***	−6.11***	−6.11***	−5.47***	−5.47***
Constant	−2.07**	−2.07**	−2.81***	−2.81***	−2.28**	−2.28**
GDP per capita (/100,000)	2.31*	2.31*	1.07	1.07	1.71	1.71
GDP growth	0.25**	0.25**	0.40**	0.40**	0.28**	0.28**
Inflation	0.01	0.01	0.04	0.04	0.02	0.02
Budget government balance	−0.01	−0.01	0.00	0.00	−0.02	−0.02
Debt	0.01*	0.01*	0.01**	0.01**	0.01*	0.01*
Current account balance	−0.02	−0.02	−0.02	−0.02	−0.02	−0.02
Rating difference	0.00	0.00	0.18	0.18	0.05	0.05
Default history	−0.08	−0.08	−0.16	−0.16	−0.04	−0.04
Violence	−0.27	−0.27	–	–	–	–
Voice and accountability	–	–	0.56	0.56	–	–
Government efficiency	–	–	–	–	0.12	0.12
Regulatory quality	–	–	–	–	–	–
Rule of law	–	–	–	–	–	–
Control of corruption	–	–	–	–	–	–
Pseudo R^2	0.29	0.29	0.31	0.31	0.29	0.29
	Step 2: Ordered probit model					
Indicator of self selection bias						
Inverse mills ratio	−2.49***	−2.25***	−3.23***	−2.79***	−2.85***	−2.57***
Indicator of the absence of solicitation						
No solicitation	4.56***	4.12***	5.62***	4.82***	5.29***	4.82***
Economic indicators						
GDP per capita (/100,000)	4.85***	5.32***	4.85***	5.19***	1.13	–
GDP growth	−0.07	–	−0.08	–	0.00	–
Inflation	−0.05	–	−0.05	–	−0.02	–
Public finance indicators						
Budget government balance	0.00	–	0.04	–	0.07	–
Debt	−0.02***	−0.01***	−0.02***	−0.02***	−0.02***	−0.02***
Monetary and external indicators						
Current account balance	0.04*	0.04**	0.05*	0.06***	0.05**	0.09***
Rating difference	0.80**	0.87***	0.80**	0.81**	0.42	–
Default history						
Default history	−0.19	–	−0.20	–	−0.02	–
Qualitative indicators						
Violence	0.36**	0.43**	–	–	–	–
Voice and accountability	–	–	0.36*	0.52***	–	–
Government efficiency	–	–	–	–	1.66***	1.84***
Pseudo R^2	0.36	0.35	0.40	0.39	0.46	0.44

Note: A total of 105 observations. Results of the ordered probit regression with explanatory variables as a mean of the last three years and next three years' forecasts except for qualitative variables.

* Significance level of 10%.
** Significance level of 5%.
*** Significance levels of 1%.

Table B.2
Results of the two step ordered probit model with forecasts (continued).

	Step1: Probit estimation of the decision equation					
	(7)	(8)	(9)	(10)	(11)	(12)
Distance	−5.59***	−5.59***	−5.52***	−5.52***	−5.54***	−5.54***
Constant	−2.19**	−2.19**	−2.23**	−2.23**	−2.22**	−2.22**
GDP per capita	1.92	1.92	1.77	1.77	1.66	1.66
GDP growth	0.27**	0.27**	0.28**	0.28**	0.28**	0.28**
Inflation	0.02	0.02	0.02	0.02	0.02	0.02
Budget government balance	−0.02	−0.02	−0.02	−0.02	−0.02	−0.02
Debt	0.01*	0.01*	0.01*	0.01*	0.01*	0.01*
Current account balance	−0.02	−0.02	−0.02	−0.02	−0.02	−0.02
Rating difference	0.07	0.07	0.07	0.07	0.07	0.07
Default history	−0.06	−0.06	−0.05	−0.05	−0.04	−0.04
Violence	–	–	–	–	–	–
Voice and accountability	–	–	–	–	–	–
Government efficiency	–	–	–	–	–	–
Regulatory quality	0.00	0.00	–	–	–	–
Rule of law	–	–	0.07	0.07	–	–
Control of corruption	–	–	–	–	0.10	0.10
Pseudo R^2	0.29	0.29	0.29	0.29	0.29	0.29
	Step 2: Ordered probit model					
Indicator of self selection bias						
Inverse mills ratio	−2.64***	−2.63***	−2.84***	−2.66***	−3.03***	−2.72***
Indicator of the absence of solicitation						
No solicitation	4.97***	5.00***	5.25***	4.96***	5.65***	5.14***
Economic indicators						
GDP per capita (/100,000)	1.76	–	1.58	–	1.39	–
GDP growth	0.03	–	−0.02	–	−0.06	–
Inflation	0.00	–	−0.03	–	−0.05	–
Public finance indicators						
Budget government balance	0.06	–	0.06	–	0.05	–
Debt	−0.02***	−0.02***	−0.02***	−0.02***	−0.02***	−0.02***
Monetary and external indicators						
Current account	0.06**	0.09***	0.05*	0.08***	0.06**	0.09***
Rating difference	0.31	–	0.70**	0.66**	0.67**	0.65**
Default history						
Default history	0.05	–	−0.03	–	−0.07	–
Qualitative indicators						
Regulatory quality	1.87***	1.99***	–	–	–	–
Rule of law	–	–	1.31***	1.54***	–	–
Control of corruption	–	–	–	–	1.09***	1.33***
Pseudo R^2	0.42	0.46	0.44	0.43	0.42	0.41

Note: A total of 105 observations. The results of the ordered probit regression with explanatory variables as a mean of the last three years and next three years' forecasts except for qualitative variables.
* Significance level at 10%.
** Significance level at 5%.
*** Significance level at 1%.

Table B.3
Results of the two step ordered probit model with 5 years data.

	Step 1: Probit estimation of the decision equation					
	(1)	(2)	(3)	(4)	(5)	(6)
Distance	−5.94***	−5.94***	−6.38***	−6.38***	−5.58**	−5.58**
Constant	−1.55**	−1.55**	−1.96**	−1.96**	−1.75**	−1.75**
GDP per capita (/100,000)	1.92	1.92	0.41	0.41	1.17	1.17
GDP growth	0.17*	0.17*	0.28**	0.28**	0.19*	0.19*
Inflation	0.02	0.02	0.05	0.05	0.03	0.03
Budget government balance	−0.04	−0.04	−0.04	−0.04	−0.05	−0.05
Debt	0.01*	0.01*	0.01*	0.01*	0.01	0.01
Current account balance	0.01	0.01	0.02	0.02	0.01	0.01
Rating difference	0.12	0.12	0.27	0.27	0.14	0.14
Default history	−0.05	−0.05	−0.14	−0.14	−0.01	−0.01
Violence	−0.23	−0.23	–	–	–	–
Voice and accountability	–	–	0.63	0.63	–	–
Government efficiency	–	–	–	–	0.20	0.20
Regulatory quality	–	–	–	–	–	–
Rule of law	–	–	–	–	–	–
Control of corruption	–	–	–	–	–	–
Pseudo R^2	0.29	0.29	0.31	0.31	0.29	0.29
	Step 2: Ordered probit model					
Indicator of self selection bias						
Inverse mills ratio	−1.92***	−1.75***	−2.22***	−1.90***	−2.50***	−2.38***

Table B.3 (*Continued*)

	(1)	(2)	(3)	(4)	(5)	(6)
Indicator of the absence of solicitation						
No solicitation	3.70***	3.36***	4.05***	3.43***	4.83***	4.62***
Economic indicators						
GDP per capita (/100,000)	4.36***	5.11***	4.49***	6.44***	0.15	
GDP growth	−0.06	–	−0.06	–	−0.01	–
Inflation	−0.05	–	−0.05	–	−0.02	–
Public finance indicators						
Budget government balance	0.00	–	0.02	–	0.07*	0.06*
Debt	−0.02***	−0.01***	−0.02***	−0.01***	−0.02***	−0.02***
Monetary and external indicators						
Current account balance	0.05**	0.05***	0.05***	0.04***	0.06***	0.06***
Rating difference	0.76**	0.85***	0.67**	0.75**	0.32	–
Default history						
Default history	−0.21	–	−0.24	–	−0.01	–
Qualitative indicators						
Violence	0.37**	0.43**	–	–	–	–
Voice and accountability	–	–	0.33	–	–	–
Government efficiency	–	–	–	–	1.80***	1.92***
Pseudo R^2	0.36	0.35	0.40	0.39	0.46	0.44

Note: 105 observations. Results of the ordered probit regression with explanatory variables as a mean of the last five years.
* Significance level at 10%.
** Significance level at 5%.
*** Significance level at 1%.

Table B.4
Results of the two-step ordered probit model with 5 years data (continued).

	Step 1: Probit estimation of the decision equation					
	(7)	(8)	(9)	(10)	(11)	(12)
Distance	−5.64***	−5.64***	−5.64***	−5.64***	−5.68***	−5.68***
Constant	−1.74**	−1.74**	−1.65**	−1.65**	−1.64**	−1.64**
GDP per capita	1.29	1.29	1.23	1.23	1.03	1.03
GDP growth	0.19*	0.19*	0.19*	0.19*	0.19*	0.19*
Inflation	0.03	0.03	0.03	0.03	0.03	0.03
Budget government balance	−0.05	−0.05	−0.05	−0.05	−0.05	−0.05
Debt	0.01*	0.01*	0.01*	0.01*	0.01*	0.01*
Current account balance	0.01	0.01	0.01	0.01	0.01	0.01
Rating difference	0.14	0.14	0.16	0.16	0.17	0.17
Default history	0.00	0.00	−0.02	−0.02	−0.01	−0.01
Violence	–	–	–	–	–	–
Voice and accountability	–	–	–	–	–	–
Government efficiency	–	–	–	–	–	–
Regulatory quality	0.15	0.15	–	–	–	–
Rule of law	–	–	0.12	0.12	–	–
Control of corruption	–	–	–	–	0.17	0.17
Pseudo R^2	0.30	0.30	0.30	0.30	0.30	0.30
	Step 2: Ordered probit model					
Indicator of self selection bias						
Inverse mills ratio	−2.50***	−2.58***	−2.42***	−2.13***	−2.66***	−2.25***
Indicator of the absence of solicitation						
No solicitation	4.86***	5.01***	4.65***	4.12***	5.16***	4.39***
Economic indicators						
GDP per capita (/100,000)	0.48	–	0.62	–	0.11	–
GDP growth	0.02	–	−0.03	–	−0.06	–
Inflation	0.01	–	−0.04	–	−0.05	–
Public finance indicators						
Budget government balance	0.07*	0.07*	0.05	–	0.04	–
Debt	−0.02***	−0.02***	−0.02***	−0.02***	−0.02***	−0.02***
Monetary and external indicators						
Current account	0.07***	0.07***	0.06***	0.08***	0.07***	0.08***
Rating difference	0.24	–	0.63*	0.62**	0.56*	0.58*
Default history						
Default history	0.04	–	−0.04	–	−0.07	–
Qualitative indicators						
Regulatory quality	2.06***	2.07***	–	–	–	–
Rule of law	–	–	1.36***	1.53***	–	–
Control of corruption	–	–	–	–	1.25***	1.40***
Pseudo R^2	0.45	0.45	0.42	0.41	0.42	0.41

Note: A total of 105 observations. The results of the ordered probit regression with explanatory variables as a mean of the last five years.
* Significance level at 10%.
** Significance level at 5%.
*** Significance level at 1%.

Table B.5
Results of the two-step ordered probit model excluding highly indebted countries.

	Step 1: Probit estimation of the decision equation					
	(1)	(2)	(3)	(4)	(5)	(6)
Distance	−6.81***	−6.81***	−7.47***	−7.47***	−6.45***	−6.45***
Constant	−2.14**	−2.14**	−2.90***	−2.90***	−2.29**	−2.29**
GDP per capita (/100,000)	0.29**	0.29**	0.45***	0.45***	0.31**	0.31**
GDP growth	0.29**	0.29**	0.45***	0.45***	0.31**	0.31**
Inflation	0.00	0.00	0.02	0.02	0.00	0.00
Budget government balance	−0.02	−0.02	−0.01	−0.01	−0.03	−0.03
Debt	0.01**	0.01**	0.02**	0.02**	0.01*	0.01*
Current account balance	−0.04	−0.04	−0.04	−0.04	−0.04	−0.04
Rating difference	−0.06	−0.06	0.07	0.07	−0.01	−0.01
Default history	−0.07	−0.07	−0.17	−0.17	−0.04	−0.04
Violence	−0.28	−0.28	–	–	–	–
Voice and accountability	–	–	0.66	0.66	–	–
Government efficiency	–	–	–	–	0.08	0.08
Regulatory quality	–	–	–	–	–	–
Rule of law	–	–	–	–	–	–
Control of corruption	–	–	–	–	–	–
Pseudo R^2	0.32	0.32	0.34	0.34	0.31	0.31
	Step 2: Ordered probit model					
Indicator of self selection bias						
Inverse mills ratio	−2.12***	−1.93***	−3.05***	−2.62***	−2.45***	−2.27***
Indicator of the absence of solicitation						
No solicitation	3.76***	3.41***	4.99***	4.24***	4.38***	4.08***
Economic indicators						
GDP per capita (/100,000)	4.33***	4.80***	4.41***	4.67***	0.82	-
GDP growth	−0.05	–	−0.07	–	−0.01	–
Inflation	−0.03	–	−0.04	–	−0.01	–
Public finance indicators						
Budget government balance	0.00	–	0.03	–	0.04	–
Debt	−0.02***	−0.01***	−0.02***	−0.02***	−0.02***	−0.02***
Monetary and external indicators						
Current account balance	0.04*	0.04**	0.05**	0.06***	0.06**	0.08***
Rating difference	0.72**	0.76**	0.71**	0.71**	0.35	–
Default history						
Default history	−0.27	–	−0.31	–	−0.07	–
Qualitative indicators						
Violence	0.42**	0.47***	–	–	–	–
Voice and accountability	–	–	0.38*	0.54***	–	–
Government efficiency	–	–	–	–	1.66***	1.80***
Pseudo R^2	0.34	0.33	0.39	0.37	0.43	0.42

Note: A total of 95 observations. The results of the ordered probit regression with explanatory variables as a mean of the last three years excluding highly indebted countries.
* Significance level at 10%.
** Significance level at 5%.
*** Significance level at 1%.

Table B.6
Results of the two-step ordered probit model excluding highly indebted countries (continued).

	Step 1: Probit estimation of the decision equation					
	(7)	(8)	(9)	(10)	(11)	(12)
Distance	−6.52***	−6.52***	−6.47***	−6.47***	−6.49***	−6.49***
Constant	−2.24**	−2.24**	−2.27**	−2.27**	−2.25**	−2.25
GDP per capita	2.09	2.09	1.95	1.95	1.88	1.88
GDP growth	0.31**	0.31**	0.31**	0.31**	0.31**	0.31**
Inflation	0.00	0.00	0.00	0.00	0.00	0.00
Budget government balance	−0.03	−0.03	−0.02	−0.02	−0.03	−0.03
Debt	0.01*	0.01*	0.01*	0.01*	0.01*	0.01*
Current account balance	−0.04	−0.04	−0.04	−0.04	−0.04	−0.04
Rating difference	0.00	0.00	−0.01	−0.01	−0.01	−0.01
Default history	−0.05	−0.05	−0.04	−0.04	−0.04	−0.04
Violence	–	–	–	–	–	–
Voice and accountability	–	–	–	–	–	–
Government efficiency	–	–	–	–	–	–
Regulatory quality	0.15	0.15	–	–	–	–
Rule of law	–	–	0.12	0.12	–	–
Control of corruption	–	–	–	–	0.17	0.17
Pseudo R^2	0.31	0.31	0.31	0.31	0.31	0.31
	Step 2: Ordered probit model					
Indicator of self selection bias						
Inverse mills ratio	−2.32***	−2.45***	−2.55***	−2.45***	−2.76***	−2.43***
Indicator of the absence of solicitation						
No solicitation	4.20***	4.44***	4.52***	4.35***	4.94***	4.38***

Table B.6 (*Continued*)

	(7)	(8)	(9)	(10)	(11)	(12)
Economic indicators						
GDP per capita (/100,000)	1.16	–	0.83	–	0.71	–
GDP growth	0.04	–	−0.01	–	−0.06	–
Inflation	0.02	–	−0.02	–	−0.03	–
Public finance indicators						
Budget government balance	0.03	–	0.04	–	0.03	–
Debt	−0.02***	−0.02***	−0.02***	−0.02***	−0.02***	−0.02***
Monetary and external indicators						
Current account	0.07***	0.09***	0.05**	0.07***	0.06***	0.08***
Rating difference	0.21	–	0.61*	0.59*	0.60*	0.58*
Default history						
Default history	−0.02	–	−0.12	–	−0.10	–
Qualitative indicators						
Regulatory quality	2.00***	2.01***	–	–	–	–
Rule of law	–	–	1.44***	1.58***	–	–
Control of corruption	–	–	–	–	1.17***	1.34***
Pseudo R^2	0.45	0.44	0.42	0.42	0.41	0.40

Note: A total of 95 observations. The results of the ordered probit regression with explanatory variables as a mean of the last three years excluding highly indebted countries.

* Significance level at 10%.

** Significance level at 5%.

*** Significance level at 1%.

Table B.7
F-stat of the selection equation.

	(1–2)	(3–4)	(5–6)	(7–8)	(9–10)	(11–12)
F-Statistic	12.56***	12.82***	11.20***	11.54***	11.60***	11.92***

Note: The *F*-statistic is computed from the unconstrained and constrained. The former includes all the variable of the first stage equation of Tables 4 and 5. The latter includes the same variables but the distance.

Table B.8
Definition of alternative instruments.

Name	Definition	Source
Distance	Minimal distance of each country with the closest financial center	Qatar Financial Center Authority
StatQual	Index of Statistical quality measured by the adoption of different IMF data dissemination standard ranging in terms of quantity, quality and frequency from GDDS[a] to the SDDS[a] plus standard. Therefore, the variable takes the values 3, 2 and 1 if the country adopted the SDDS plus, SDDS or GDDS IMF statistics dissemination standard	IMF
G20	Membership to the G20, dummy variable that takes the value 1 if the country is a member of the G20	G20
OECD	Membership to the OECD, dummy variable that takes the value 1 if the country is a member of the OECD	OECD

Note: In addition to the our main instrument, namely Distance, alternative instruments have been used for checking the robustness of our results. This table displays the label of those instruments as well as their definition and the sources of the data. StatQual stands for statistical quality. It depicts how reliable and up-to-date data provided by a country are. The intuition behind this instrument is that countries with poor quality statistics may solicit a rating to provide investors with better information. Membership to the OECD and the G20 are also used as an instrument. In both cases, it should enhance member countries visibility in financial markets, reducing their need to provide potential investors with signals such a ratings.

[a] SDDS and GDDS correspond to Special Data Dissemination Standard and General Data Dissemination System, respectively.

Table B.9
The results of Stock and Yogo weak identification test.

Instruments	(1)	(3)	(5)	(7)	(9)	(11)
Distance OECD G20	10.964	10.774	10.904	10.96	11.001	11.079
5% maximal IV relative bias	13.91	13.91	13.91	13.91	13.91	13.91
10% maximal IV relative bias	9.08	9.08	9.08	9.08	9.08	9.08
20% maximal IV relative bias	6.46	6.46	6.46	6.46	6.46	6.46
Distance G20 StatQual OECD	10.691	10.774	10.694	10.795	10.824	10.904
5% maximal IV relative bias	13.91	13.91	13.91	13.91	13.91	13.91
10% maximal IV relative bias	9.08	9.08	9.08	9.08	9.08	9.08
20% maximal IV relative bias	6.46	6.46	6.46	6.46	6.46	6.46
Distance OECD StatQual	3.251	2.825	3.036	3.153	3.148	3.118
5% maximal IV relative bias	13.91	13.91	13.91	13.91	13.91	13.91
10% maximal IV relative bias	9.08	9.08	9.08	9.08	9.08	9.08
20% maximal IV relative bias	6.46	6.46	6.46	6.46	6.46	6.46

Table B.9 (*Continued*)

Instruments	(1)	(3)	(5)	(7)	(9)	(11)
G20 StatQual OECD	9.661	9.459	9.653	9.714	9.716	9.781
5% maximal IV relative bias	13.91	13.91	13.91	13.91	13.91	13.91
10% maximal IV relative bias	9.08	9.08	9.08	9.08	9.08	9.08
20% maximal IV relative bias	6.46	6.46	6.46	6.46	6.46	6.46

Note: This table reports the *F*-statistic and the Stock–Yogo weak identification test values to identify the maximal relative bias of the two-stage estimator relative to OLS. Each column corresponds to an alternative specification for the first stage-equation of the Heckman estimation procedure. This test requires to include at least three instruments to evaluate the maximal relative bias. The critical value is a function of the number of included endogenous regressors, the number of instrumental variables, and the desired maximal size of a 5% *F*-test. As an example, if one considers 0.10 as the maximum acceptable bias (i.e. we accept a bias of 10% with respect to OLS), for a model including one endogenous variable and three instruments, the critical value is 9.08. Thereby, the instrument is not considered weak if its first stage *F*-statistic is larger than that. The first value displayed in the upper left part of the table, 10.964 means that the maximal relative bias is below 10%. Accordingly, we can conclude that it is not considered as a weak instrument.

Table B.10
Results of the two step ordered probit model with 3 years data and alternative instruments.

	Step 1: Probit estimation of the decision equation					
	(1)	(2)	(3)	(4)	(5)	(6)
Distance	−6.95***	–	–	–	−6.99***	−5.76**
StatQual	–	1.71***	–	–	–	0.95
G20	–	–	1.80***	–	–	1.37**
OECD	–	–	–	1.24*	–	0.53
Constant	−2.12**	−6.49***	−2.34***	−3.31***	−1.92**	−2.91*
GDP per capita (/100,000)	2.56**	2.54E−5*	0.00	1.32	2.21*	1.16
GDP growth	0.29**	0.33**	0.06	0.19**	0.29**	0.29
Inflation	0.00	−0.01	0.01	0.02	−0.01	−0.01
Budget government balance	−0.02	−0.06	−0.03	−0.04	0.01	0.01
Debt	0.01**	0.01	0.00	0.01	0.01*	0.01
Current account balance	−0.04	−0.04	0.01	0.01	−0.36	−0.02
Rating difference	−0.04	0.46	−0.62	0.17	−0.07	−0.94
Default history	−0.08	−0.77	−0.55	−0.28	−0.14	−0.47
Violence	−0.29	−0.21	0.00	−0.14	−0.23	−0.20
Pseudo R^2	0.34	0.3667	0.38	0.25	0.31	0.49
	Step 2: Ordered probit model					
Indicator of self selection bias						
Inverse mills ratio	−2.26***	−1.34***	−1.35***	−2.35***	−2.51***	−2.19***
Indicator of the absence of solicitation						
No solicitation	4.03***	2.63***	2.59***	4.67***	4.92***	3.29***
Economic indicators						
GDP per capita (/100,000)	4.70***	4.29***	0.00***	3.10**	3.7***	4.97***
GDP growth	−0.07	−0.03	−0.03	−0.08	−0.09	−0.04
Inflation	−0.03	−0.03	−0.03	−0.04*	−0.03	−0.03
Public finance indicators						
Budget government balance	0.01	−0.02	−0.01	0.00	0.02	−0.01
Debt	−0.02***	−0.01***	−0.01***	−0.02***	−0.02***	−0.01***
Monetary and external indicators						
Current account balance	0.04*	0.05**	0.04**	0.04**	0.04*	0.05**
Rating difference	0.82**	0.77**	0.75**	−0.11	0.82**	0.84***
Default history						
Default history	−0.23	−0.28	−0.28	−0.25	−0.22	−0.28
Qualitative indicators						
Violence	0.39**	0.39**	0.36**	0.39**	0.28	0.42***
Pseudo R^2	0.35	0.33	0.33	0.42	0.33	0.37

Note: A total of 105 observations. The results of the ordered probit regression with explanatory variables as a mean of the last three years depending on the instrument used in the first step. Estimation (1), (2), (3) and (4) correspond to the estimation with the Distance, StatQual, OECD and G20 instruments, respectively. Estimation (5) reports the results of estimation (1) without considering the three main financial centers in the sample (i.e. 103 observations). Estimation (6) reports the results of the estimation with the entire set of potential instruments.

* Significance level of 10%.
** Significance level of 5%.
*** Significance level of 1%.

Table B.11
J-Stat of the Sargan–Hansen overidentification tests.

Instrument included	(1)	(3)	(5)	(7)	(9)	(11)
Distance – StatQual – G20 – OECD	*5.177*	*5.009*	*3.150*	*2.468*	*2.678*	*3.581*
	(0.159)	(0.171)	(0.369)	(0.481)	(0.444)	(0.310)
Distance – Statqual – G20	*2.961*	*3.896*	*1.586*	*1.869*	*2.499*	*2.867*
	(0.228)	(0.143)	(0.453)	(0.393)	(0.287)	(0.239)
Distance – StatQual – OECD	*1.817*	*0.924*	*2.730*	*2.079*	*1.575*	*1.397*
	(0.403)	(0.630)	(0.256)	(0.354)	(0.455)	(0.497)
Distance – G20 – OECD	*4.526*	*4.998*	*1.817*	*0.704*	*1.974*	*3.518*
	(0.104)	*(0.082)*	*(0.403)*	*(0.703)*	*(0.373)*	*(0.172)*

Table B.11 (*Continued*)

Instrument included	(1)	(3)	(5)	(7)	(9)	(11)
Distance – StatQual	0.473	0.315	1.260	1.449	1.502	1.050
	(0.492)	*(0.575)*	*(0.262)*	*(0.229)*	*(0.220)*	*(0.306)*
Distance – G20	2.279	3.896**	0.504	0.294	1.880	2.856*
	(0.131)	*(0.048)*	*(0.478)*	*(0.589)*	*(0.170)*	*(0.091)*
Distance – OECD	1.670	0.630	0.998	0.294	0.147	0.504
	(0.196)	*(0.427)*	*(0.318)*	*(0.588)*	*(0.701)*	*(0.478)*

Note: This table reports the *J*-statistic of the overidentification tests depending on the instruments included as exogenous regressors. Each column corresponds to an alternative specification for the first stage-equation of the Heckman estimation procedure. The corresponding *p*-values are reported in brackets. The absence of significance of *J*-statistics means that the null hypothesis regarding the validity of overidentifying restrictions cannot be rejected.

Appendix C. Sovereign credit ratings

Table C.1
Sovereign credit ratings and solicitation status.

Country	Rating	Unsolicited	Country	Rating	Unsolicited	Country	Rating	Unsolicited
Albania	B+	0	France	AA+	1	Nigeria	BB–	0
Argentina	B–	1	Gabonese Republic	BB–	0	Norway	AAA	0
Australia	AAA	1				Oman	A	0
Austria	AA+	0	Ghana	B	0	Pakistan	B–	0
Azerbaijan	BBB–	0	Georgia	BB–	0	Panama	BBB	0
Bahamas	BBB	0	Germany	AAA	1	Paraguay	BB–	0
Bahrain	BBB	0	Greece	B–	0	Peru	BBB	0
Barbados	BB+	0	Guatemala	BB	0	Philippines	BB+	0
Belarus	B–	0	Honduras	B+	0	Poland	A–	0
Belgium	AA	1	Hong Kong	AAA	0	Portugal	BB	0
Belize	SD	0	Hungary	BB	0	Qatar	AA	0
Benin	B	0	Iceland	BBB–	0	Romania	BB+	0
Bolivia	BB–	0	India	BBB–	1	Russia	BBB	0
Botswana	A–	0	Indonesia	BB+	0	Saudi Arabia	AA–	0
Brazil	BBB	0	Ireland	BBB+	0	Senegal	B+	0
Bulgaria	BBB	0	Israel	A+	0	Serbia	BB–	0
Burkina Faso	B	0	Italy	BBB+	1	Singapore	AAA	1
Cambodia	B	1	Jamaica	B–	0	Slovakia	A	0
Cameroon	B	0	Japan	AA–	0	Slovenia	A	0
Canada	AAA	0	Jordan	BB	0	South Africa	BBB	0
Cape Verde	B+	0	Kazakhstan	BBB+	0	Spain	BBB–	0
Chile	AA–	0	Kenya	B+	0	Suriname	BB–	0
China	AA–	0	Kuwait	AA	0	Sweden	AAA	0
Colombia	BBB–	0	Latvia	BBB	0	Switzerland	AAA	1
Costa Rica	BB	0	Lebanon	B	0	Thailand	BBB+	0
Croatia	BB+	0	Lithuania	BBB	0	Trinidad &Tobago	A	0
Cyprus	CCC+	0	Luxembourg	AAA	0	Tunisia	BB	0
Czech Republic	AA–	0	Macedonia	BB	0	Turkey	BB	1
Denmark	AAA	0	Malaysia	A–	0	Uganda	B+	0
Dominican Republic	B+	0	Malta	BBB+	0	Ukraine	B	0
			Mexico	BBB	0	United Kingdom	AAA	1
Ecuador	B	0	Montenegro	BB–	0	United States of	AA+	1
Egypt	B–	0	Morocco	BBB–	0	America		
El Salvador	BB–	0	Mozambique	B+	0	Uruguay	BBB–	0
Estonia	AA–	0	Netherlands	AAA	1	Vietnam	BB–	0
Finland	AAA	0	New Zealand	AA	0	Zambia	B+	0

Note: Column Unsolicited takes value 1 when the rating is unsolicited.

References

Afonso, A., 2003. Understanding the determinants of sovereign debt ratings: evidence for the two leading agencies. J. Econ. Finance 27, 56–74.

Afonso, A., Furceri, D., Gomes, P., 2012. Sovereign credit ratings and financial markets linkages: application to European data. J. Int. Money Finance 31 (3), 606–638.

Afonso, A., Gomes, P., Rother, P., 2007. What "Hides" Behind Sovereign Debt Ratings? Working Paper Series 0711, European Central Bank.

Afonso, A., Gomes, P., Rother, P., 2011. Short- and long-run determinants of sovereign debt credit ratings. Int. J. Finance Econ. 16 (1), 1–15.

Afonso, A., Gomes, P., Taamouti, A., 2013. Sovereign credit ratings, market volatility, and financial gains. Comput. Stat. Data Anal.

Alsakka, R., ap Gwilym, O., 2012. Foreign exchange market reactions to sovereign credit news. J. Int. Money Finance 31, 845–864.

Angrist, J.D., Pischke, J.-S., 2008. Mostly Harmless Econometrics: An Empiricist's Companion. Princeton University Press.

Arezki, R., Candelon, B., Sy, A., 2011. Sovereign Rating News and Financial Markets Spillovers: Evidence from the European Debt Crisis. CESifo Working Paper Series 3411, IMF Working Paper.

Bae, K.-H., Stulz, R.M., Tan, H., 2008. Do local analysts know more? A cross-country study of the performance of local analysts and foreign analysts. J. Finan. Econ. 88 (3), 581–606.

Baker, H.K., Mansi, S.A., 2002. Assessing credit rating agencies by bond issuers and institutional investors. J. Business Finance Account. 29 (9–10), 1367–1398.

Bannier, C.E., Behr, P., Güttler, A., 2009. Rating opaque borrowers: why are unsolicited ratings lower? Rev. Finance.

Bekaert, G., Harvey, C.R., Lundblad, C.T., Siegel, S., 2013. The European union, the euro, and equity market integration. J. Finan. Econ. 109 (3), 583–603.

Benmelech, E., Dlugosz, J., 2009. The Credit Rating Crisis. Working Paper 15045, National Bureau of Economic Research.

Beugelsdijk, S., Frijns, B., 2010. A cultural explanation of the foreign bias in international asset allocation. J. Banking Finance 34 (9), 2121–2131.

Bissoondoyal-Bheenick, E., 2005. An analysis of the determinants of sovereign ratings. Glob. Finance J. 15, 251–280.

Bissoondoyal-Bheenick, E., Brooks, R., Yip, A.Y., 2006. Determinants of sovereign ratings: a comparison of case-based reasoning and ordered probit approaches. Glob. Finance J. 17 (1), 136–154.

Bolton, P., Freixas, X., Shapiro, J., 2012. The credit ratings game. J. Finance 67 (1), 85–111.

Bonte, R., Bisignano, J., Dierick, F., Domeau, N., Embersit, J., Kalies, M., Mann, F., Miles, C., Packer, F., Volk, T., Vori, S., 1999. Supervisory Lessons To Be Drawn from the Asian crisis. Technical Report. Basel Committee on Banking Supervision Working Paper.
Borensztein, E., Cowan, K., Valenzuela, P., 2013. Sovereign ceilings "lite"? The impact of sovereign ratings on corporate ratings. J. Banking Finance 37 (11), 4014–4024.
Borio, C., Packer, F., 2004. Assessing New Perspectives on Country Risk. Technical Report, BIS Quarterly Review.
Bozic, V., Magazzino, C., 2013. Credit rating agencies: the importance of fundamentals in the assessment of sovereign ratings. Econ. Anal. Policy 43, 157–176.
Brooks, R., Faff, R.W., Hillier, D., Hillier, J., 2004. The national market impact of sovereign rating changes. J. Banking Finance 28 (1), 233–250.
Butler, A.W., Fauver, L., 2006. Institutional environment and sovereign credit ratings. Finan. Manage. 35 (3), 53–79.
Byoun, S., Shin, Y.S., 2012. Information content of unsolicited credit ratings: evidence from Japanese firms. Asia-Pac. J. Finan. Stud. 41 (1), 59–86.
Caceres, C., Guzzo, V., Segoviano Basurto, M.A., 2010. Sovereign Spreads: Global Risk Aversion, Contagion or Fundamentals ? In: Technical Report. IMF Working Paper.
Cantor, R., Packer, F., 1996. Determinants and impact of sovereign credit ratings. Econ. Policy Rev. 2 (2), 37–53.
Catao, L., Sutton, B., 2002. Sovereign Defaults: The Role of Volatility. In: Technical Report. IMF Working Paper.
Christopher, R., Kim, S.-J., Wu, E., 2012. Do sovereign credit ratings influence regional stock and bond market interdependencies in emerging countries? J. Int. Finan. Markets Inst. Money 22 (4), 1070–1089.
Cosset, J.-C., Roy, J., 1991. The determinants of country risk ratings. J. Int. Business Stud. 22 (1), 135–142.
Eichengreen, B., Mody, A., 1998. What Explains Changing Spreads on Emerging-Market Debt: Fundamentals or Market Sentiment? In: Working Paper 6408, National Bureau of Economic Research.
Eliasson, A.-C., 2002. Sovereign Credit Ratings. Technical Report. Deutsche Bank Working Papers.
European Securities and Markets Authority, 2013. Credit Rating Agencies. Technical Report. ESMA's Assessment of Governance, Conflicts of Interest, Resourcing Adequacy and Confidentiality Controls.
Fairchild, L.M., Flaherty, S.M.V., Shin, Y.S., 2009. Analysis of unsolicited credit ratings in Japan: new evidence from moody's. Rev. Pac. Basin Finan. Markets Policies 12 (1), 103–123.
Ferreira, M.A., Gama, P.M., 2007. Does sovereign debt ratings news spill over to international stock markets? J. Banking Finance 31 (10), 3162–3182.
Ferri, G., Liu, L.-G., Stiglitz, J.E., 1999. The procyclical role of rating agencies: evidence from the east Asian crisis. Econ. Notes 28 (3), 335–355.
Frankel, J.A., Romer, D.H., 1999. Does trade cause growth? Am. Econ. Rev. 89 (3), 379–399.
French, K.R., Poterba, J.M., 1991. Investor diversification and international equity markets. Am. Econ. Rev. 81 (2), 222–226.
Fulghieri, P.A., Strobl, G., Xia, H., 2014. The economics of solicited and unsolicited credit ratings. Rev. Finan. Stud. 27 (2), 484–518.
Gaillard, N., 2009. The determinants of Moody's sub-sovereign ratings. Int. Res. J. Finance Econ.
Gan, Y., 2004. Why Do Firms Pay for Bond Ratings When They Can Get Them for Free? Technical Report. Working Paper, Wharton School, University of Pennsylvania.
Gande, A., Parsley, D.C., 2005. News spillovers in the sovereign debt market. J. Finan. Econ. 75 (3), 691–734.
Greene, W.H., 2002. LIMDEP Version 8.0 Econometric Modeling Guide, vol. 2. Econometric Software, Plainview, NY.
Hall, R.E., Jones, C.I., 1999. Why do some countries produce so much more output per worker than others? Q. J. Econ. 114 (1), 83–116.
Haque, N.U., Kumar, M.S., Mark, N.C., Mathieson, D.J., 1996. The Economic Content of Indicators or Developing Country Creditworthiness. Technical Report IMF Working Papers.
Hill, P., Brooks, R., Faff, R., 2010. Variations in sovereign credit quality assessments across rating agencies. J. Banking Finance 34 (6), 1327–1343.
Horrace, W.C., Oaxaca, R.L., 2006. Results on the bias and inconsistency of ordinary least squares for the linear probability model. Econ. Lett. 90 (3), 321–327.
Hu, Y.-T., Kiesel, R., Perraudin, W., 2002. The estimation of transition matrices for sovereign credit ratings. J. Banking Finance 26 (7), 1383–1406.
IMF, 2010. Global Financial Stability Review. Technical Report. IMF.
Ismailescu, I., Kazemi, H., 2010. The reaction of emerging market credit default swap spreads to sovereign credit rating changes. J. Banking Finance 34, 2861–2873.
Kai, L., Prabhala, N.R., 2007. Self-selection models in corporate finance*. In: Eckbo, B.E. (Ed.), Handbook of Empirical Corporate Finance, Handbooks in Finance. Elsevier, San Diego, pp. 37–86 (Chapter 2).
Kaminsky, G., Schmukler, S.L., 2002. Emerging market instability: do sovereign ratings affect country risk and stock returns? World Bank Econ. Rev. 16 (2), 171–195.
Lambert, T., 2015. Lobbying on Regulatory Enforcement Actions: Evidence from Banking. Technical Report. Louvain School of Management Working Paper 2015/07.
Min, H.G., 1999. Determinants of Emerging Market Bond Spreads: Do Eco Fundamentals Matter? Technical Report, World Bank Policy Research Working Paper.
Monfort, B., Mulder, C., 2000. Using Credit Rating for Capital Requirements on Lending to Emerging Market Economies: Possible Impact of a New Basel Accord. Technical Report. IMF Working Paper.
Mukhopadhyay, B., 2006. Existence of unsolicited ratings. Asia-Pac. Finan. Markets 13 (3), 207–233.
Oliveira, L., Curto, J.D., Nunes, J.P., 2012. The determinants of sovereign credit spread changes in the euro-zone. J. Int. Finan. Markets Inst. Money 22 (2), 278–304.
Pagano, M., Volpin, P., 2010. Credit ratings failures and policy options. Econ. Policy 25 (62), 401–431.
Poon, W.P., 2003. Are unsolicited credit ratings biased downward? J. Banking Finance 27 (4), 593–614.
Poon, W.P., Lee, J., Gup, B.E., 2009. Do solicitations matter in bank credit ratings? Results from a study of 72 countries. J. Money Credit Banking 41 (2–3), 285–314.
Poon, W.P.H., Chan, K.C., 2010. Solicited and Unsolicited Credit Ratings: A Global Perspective. Working Papers id:3112, eSocialSciences.
Poon, W.P.H., Firth, M., 2005. Are unsolicited credit ratings lower? International evidence from bank ratings. J. Business Finance Account. 32 (9-10), 1741–1771.
Reinhart, C.M., Rogoff, K.S., 2013. Financial and Sovereign Debt Crises: Some Lessons Learned and Those Forgotten. Technical Report. IMF Working Paper.
Reisen, H., von Maltzan, J., 1999. Boom and Bust and Sovereign Ratings. OECD Publishing, OECD Development Centre Working Papers 148.
Remolona, E.M., Scatigna, M., Wu, E., 2008. A ratings-based approach to measuring sovereign risk. Int. J. Finance Econ. 13 (1), 26–39.
Shan, S.C., Tang, D.Y., Winton, A., 2014. Do Credit Derivatives Lower the Value of Creditor Control Rights? Evidence from Debt Covenants. Technical Report. SFS Cavalcade 2015.
Spence, M., 1973. Job market signaling. Q. J. Econ. 87 (3), 355–374.
Staiger, D., Stock, J., 1997. Instrumental variables regression with weak instruments. Econometrica 65 (3), 557–586.
Staikouras, P.K., 2012. A theoretical and empirical review of the EU regulation on credit rating agencies: in search of truth, not scapegoats. Finan. Markets Inst. Instr. 21 (2), 71–155.
Standard, Poor's, 2011. Sovereign Government Rating Methodology and Assumptions. Technical Report. Standard & Poor's.
Stock, J.H., Wright, J.H., Yogo, M., 2002. A survey of weak instruments and weak identification in generalized method of moments. J. Business Econ. Stat. 20 (4), 518–529.
Stock, J.H., Yogo, M.,2005. Testing for weak instruments in linear iv regression. In: Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg. Cambridge University Press, pp. 80–108.
United States Congress, 2008. Credit Rating Agencies and the Financial Crisis. Technical report, House of Representatives Committee on Oversight and Government Reform.
Van Roy, P., 2013. Is there a difference between solicited and unsolicited bank ratings and, if so, why? J. Finan. Serv. Res. 44 (1), 53–86.
White, L.J., 2010. Markets: the credit rating agencies. J. Econ. Perspect. 24 (2), 211–226.
Williams, G., Alsakka, R., ap Gwilym, O., 2013. The impact of sovereign rating actions on bank ratings in emerging markets. J. Banking Finance 37 (2), 563–577.
Wójcik, D., 2009. Financial centre bias in primary equity markets. Cambr. J. Regions Econ. Soc. 2 (2), 193–209.