



Why rating agencies disagree on sovereign ratings

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Received: 21 July 2015 / Accepted: 23 May 2018 / Published online: 25 June 2018
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Abstract

This paper explores why rating agencies disagree on a country's sovereign default risk. Specifically, we analyse the sovereign ratings of four agencies and their interactions on an empirical basis. Our findings indicate that the frequency of split ratings and their lopsidedness are the result of uncertainty and the use of different rating methodologies but not of a home bias. Still, rating agencies treat world regions differently. Finally, a small and subscriber-paid agency appears to be more independent but also more volatile in its rating behaviour than the issuer-paid Big Three (Standard and Poor's, Moody's and Fitch).

Keywords Sovereign credit ratings · Credit rating agencies · Split ratings · International finance

1 Introduction

The recent financial crisis has evoked a revival of the discussion about the role of Credit Rating Agencies (CRAs). During the sovereign debt crisis in Europe, the so called Big Three rating agencies Standard and Poor's, Moody's and Fitch Ratings started to downgrade several euro area economies and even assigned junk status to Ireland, Portugal and Greece. The sudden decline of trust in the solvency of European economies led many politicians to claim that the Big Three did either not realize the true credit risk or that their decisions were biased by political influence.¹

Also, the academic literature has contributed to this debate: For instance, Gaertner et al. (2011) find that ratings in selected euro area economies between 2009 and 2010 ranked 2.3 notches below a hypothetical rating for a country outside the monetary union with the same economic fundamentals. Ferri et al. (1999) show that ratings have been pro-cyclical during the Asian crisis, thereby amplifying the recessions in

¹ See Handelsblatt (January 17, 2012): "The myth of the U.S. conspiracy".

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affected countries. Add to this, Fuchs and Gehring (2017) find that sovereign ratings are subject to a home bias (where home refers to both the location of headquarters and ownership). A home bias exists if the resident agency assigns a rating which is on average one notch higher than the rating of competitors.² Further, by comparing the behaviour of nine agencies, the authors find that cultural distance (for instance language) and economic ties (bank exposure, export interests) with the home country affect the respective country's rating. However, the channels through which the ratings are biased vary substantially across the individual agencies. Finally, the authors admit that most of the variation in ratings is explained by macroeconomic and political fundamentals.

At the same time, the literature on determinants of sovereign credit ratings shows that large parts of the variation can be explained with few macroeconomic variables (see for instance Cantor and Packer 1996). In a related panel analysis for sovereign ratings between 1995 and 2005, Afonso et al. (2011) find that their model (including a set of macroeconomic, political and regional variables) correctly predicts 75% of the ratings (within one notch variation) despite the fact that expectations for future economic development or other qualitative assessments are not taken into account by the respective agency.

Thus, empirical evidence towards the adequacy of sovereign ratings appears to be mixed: In general, ratings seem to map the credit risk of a country quite well; however, during times of crisis, the Big Three have often been accused of reacting too late and to be overly bearish towards a country's creditworthiness. However, compared to the corporate sector, it remains difficult to assess the adequacy of ratings since at least the advanced countries have not defaulted for many years. Therefore, one has to rely on indirect measures of performance such as the relative activity of rating agencies by studying follower-leader behaviour (Hill and Faff 2010) or by comparing whether some regions systematically receive better ratings than others (Fuchs and Gehring 2017). However, recent publications have put less attention to the emergence of split ratings across rating agencies. Do rating agencies disagree more often on the creditworthiness of a specific region than on another? Or do we find that emerging markets are subject to more split ratings than advanced countries due to more volatile economic and political developments? We think that disagreement can have important implications for the affected countries. The uncertain situation of disagreement between rating agencies may scare investors away. Especially if split ratings occur at the threshold between investment and speculative grade, a rating change can have a significant effect on refinancing costs. In case of a downgrade, banks need more equity capital to comply with regulatory frameworks such as Basel. Thereby, refinancing needs of sovereigns become more expensive with higher interest rates. Indeed, Abad et al. (2018) find that split ratings for a sovereign lead to stronger market reactions. Moreover, the fact that only three CRAs largely control the market for sovereign ratings increases the importance of splits (see the market shares provided in 14). The decision to deviate from the other two agencies is more likely to evoke market reactions in the case of three actors compared to a situation with more competitors.

² The authors find that the Big Three exhibit only a weak home bias. Only S&P is shown to rate the USA better than other countries and Fitch exhibits a home bias for both France and the USA (based on ownership and headquarter).

Figure 1 illustrates the downgrades of euro area countries during the sovereign debt crisis. It shows that the Big Three decided almost unanimously on euro area ratings (besides Moody's downgrade for Ireland to speculative-grade status). However, when adding the ratings from a smaller European rating agency named Feri EuroRating, it appears that the agency has started to downgrade the same countries earlier and it assigned junk status to Portugal even 1 year before the Big Three took action. This behaviour shows exactly the opposite of a home bias. Still, it remains to be explained why rating agencies sometimes disagree on sovereign ratings, especially because most information about their creditworthiness is publicly available.

In this paper, we show that disagreement among CRAs is rather a consequence of the use of different rating methods and uncertainty than the result of a home bias. In addition, we find that a small and subscriber-paid rating agency disagrees with the Big Three agencies more than three times as often than the Big Three disagree among themselves. Also, the small agency is clearly more volatile in its rating behaviour by assigning almost twice as many rating changes to the countries in our sample compared to the average Big Three agency.

The paper is organized as follows: Sect. 2 briefly reviews the related literature. Section 3 presents our sample and a classification of ratings and split ratings. In Sect. 4, we show the results for political, macroeconomic and regional determinants of split ratings between the four agencies. In Sect. 5, we explore whether ratings are lopsided across agencies and analyse potential determinants of optimism and pessimism before Section 7 concludes.

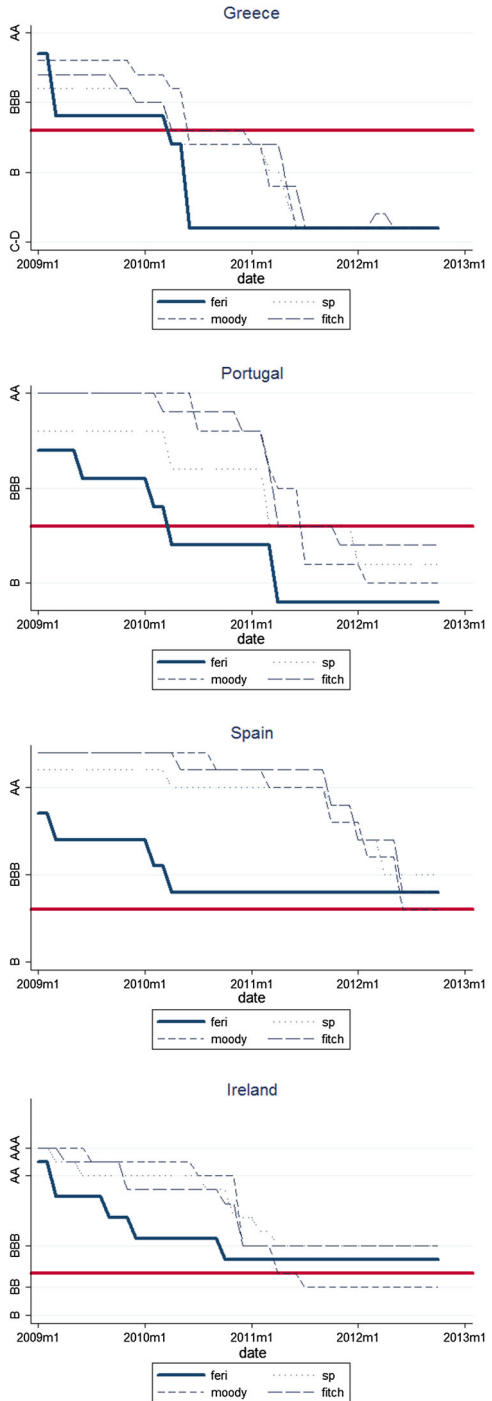
2 Literature review

In principle, we distinguish between three types of explanations for the emergence of split ratings:

First, split ratings are the consequence of uncertainty towards the true credit risk. Until now, the literature has only focused on banks (Morgan 2002) and non-financial firms (Livingston et al. 2007). The authors find that disagreement is not randomly distributed but that those companies with higher asset opaqueness are more likely to receive split ratings. To our knowledge, determinants of sovereign split ratings have not been studied so far. However, looking at the frequency of rating splits (see Sect. 5.2), it seems that rating agencies have different views on a country's default risk. These may be attributed to the use of different rating models or uncertainty in times of adverse shocks. For instance, one agency may put more weight on the default history and public debt ratio of a country, whereas another primarily considers the economic well-being and political stability in a country. Taking into account the empirical findings during times of crisis, one may also contemplate whether the frequency of split ratings increases when a country is subject to adverse shocks.

Second, prior studies have discussed whether different business models among rating agencies can be a reason for split ratings. Using corporate bond ratings from 1999 to 2013, Bruno et al. (2015) find that a subscriber-funded rating agency (Egan-Jones Rating Company) provides more rating updates than a rating agency that uses the issuer-pays model (Big Three agencies). This observation is robust to the registration

Fig. 1 Sovereign credit ratings during the euro crisis. The rating data have been retrieved from the four rating agencies whereby Feri uses a different rating scale but offers a translation table of their 9-notch-scale to the 21-notch-scale of the Big Three. The red line illustrates the threshold between investment and speculative-grade status



of Egan-Jones as a National Recognized Statistical Rating Organization (NRSRO) in 2007. The authors conclude that the rating behaviour is thus driven by different business models (issuer-pays vs. subscriber funded). Bhattacharya et al. (2014) find that Egan-Jones provides not only more rating updates but also a higher rating quality suggesting that subscriber-funded agencies are even better suited to act in the best interest of investors. In case of sovereign ratings, it is more difficult to measure the rating performance due to a lack of defaults. However, issuer-paid agencies may be acting in the home country's interest in order to keep their mandate, whereas subscriber-funded companies should be primarily interested in satisfying their customers.³

Third, split ratings can be the consequence of a rating agency's inclusion into regulatory frameworks. Many studies find that decisions by the Big Three have an impact on bond rates (Gaertner et al. 2011; Afonso et al. 2012; Alsakka and ap Gwilym 2010; Arezki et al. 2011) and stock prices. That is to say, interest rates often follow rating decisions.⁴ One may suggest that a part of the causal relationship is driven by the quasi-automatic impact on bond rates and stock prices via the inclusion of external ratings in regulatory frameworks: According to the Basel rules, European banks are required to hold a fixed share of investment-grade rated bonds in their portfolio. The decision of a rating agency to downgrade a country close to (or even to) junk status might prompt investors to sell the respective bonds just to comply with the established rules.⁵ In other words, CRAs may have incentives to follow the decisions of other regulated competitors if ratings are included in regulation. Theoretical work by Opp et al. (2013) shows that the inclusion of ratings in regulatory frameworks such as Basel may lead to a rating bias and pro-cyclical behaviour of CRAs whose ratings are used for regulatory purposes. Kisgen and Strahan (2010) support this result by showing that rating agencies certified for regulatory use take the rating behaviour of their certified competitors explicitly into account for their own decisions.⁶

Moreover, CRAs whose ratings are used by regulators may have incentives to be reluctant towards sovereign downgrades when they use sovereign ceiling policies which compel rating agencies not to assign a better rating to a firm than to the sovereign (Borensztein et al. 2013). Adelino and Ferreira (2016) find that the downgrades of banks due to sovereign ceiling policies have significant negative effects on bank lending. This may lead rating agencies to be reluctant towards changes in sovereign credit risk. However, if one of the Big Three agencies takes the first step, competitors face incentives to follow this decision due to expected repercussions on the country's credit risk. On the contrary, a smaller CRA has a higher degree of flexibility (it rates fewer big issuers like large banks and corporate firms (Bhattacharya et al. (2014))) and may thus have less concern to change a country's rating. Moreover, small agencies (like Feri) often follow subscriber-paid business models which means

³ Only a limited number of the Big Three ratings are unsolicited (26.6% in this sample). We find no significant difference across rating agencies between unsolicited and solicited ratings for one particular country. The results are available on request.

⁴ Some of those studies find that the relationship is bi-directional.

⁵ Investors do not necessarily rely on the rules of this standardized approach if they use the internal risk-based approach (IRB).

⁶ The authors find that the certification of a new CRA (DBRS) was followed by rating upgrades from the Big Three for those firms which received higher ratings by DBRS after certification.

they have less concerns to downgrade issuers than issuer-paid agencies (i.e. the Big Three).

We contribute to the literature by exploring major determinants of split ratings for sovereigns across the four agencies. In particular, we investigate two hypotheses why split ratings for countries may exist:

- (1) Split ratings for sovereigns can be explained by model uncertainty when rating agencies measure default risk differently, especially in the presence of large adverse shocks to credit risk.
- (2) Conditional on the place of residence and the ownership, rating agencies assign better ratings to certain geographically and/or economically integrated regions (given the economic and political environment within the respective countries).

3 Data and stylized facts

In this paper, we use monthly sovereign ratings from the Big Three rating agencies and from Feri EuroRating AG, Germany's largest non-bank adviser/asset manager for private and institutional assets. "Appendix" entails a detailed overview of the four agencies (ownership, market share, rated countries). Feri is a small rating agency compared to the Big Three in terms of market share but of comparable size with other small credit rating agencies such as Dominion Bond Rating Services (DBRS) or the Economist Intelligence Unit (EIU).

Exploring these data, we obtain a sample of 54 countries with monthly rating actions ranging from June 1999 to October 2012. The sample comprises 23 industrial countries and 31 emerging market economies and the maximum number of monthly observations for each rating agency is 9016 (Moody's and Feri) country-month observations.⁷ During our sample period of 13 years, we observe between 169 (Moody's) and 393 (Feri) rating changes. For robustness checks, we also considered watch and outlook decisions by the Big Three. However, the great majority of these precede rating changes and thus entail no additional explanatory value for our analysis.

One part of this paper will use annual data due to the fact that a number of political and economic variables are only available on a yearly basis. The sample entails a maximum of 702 annual rating observations per rating agency.

We start by mapping the alphabetical notches into numerical values in order to perform statistical analyses.⁸ A 17 maps the best rating (AAA or AAa) and a 1 the worst (D/D/C). Therefore, lower values indicate a higher default probability. The Big Three ratings have 22 notches when using a linear scale.⁹ Feri uses 11 notches and provides a translation table for comparison with the Big Three. We apply this transformation. The dividing line between investment grade and speculative grade on Feri's scale is between C and D, for S&P and Fitch, the dividing line is between BBB– and BB+, and for Moody's, it runs between the Baa3 and Ba1.

⁷ A country list is provided in "Appendix".

⁸ More details are provided in "Appendix" of this paper.

⁹ We follow Gttler and Wahrenburg (2007) and Afonso et al. (2011) in restricting the scale to 17 values since there are few observations in the lowest range.

Table 1 Classification of ratings

	(1)	(2)	(3)	(4)
	S&P	Moody's	Fitch	Feri
AAA/Aaa/AAA	2188 (179)	2515 (204)	2093 (170)	1756 (142)
Investment grade	4399 (351)	4473 (327)	4473 (360)	5388 (435)
Speculative grade	2042 (167)	2108 (170)	2018 (164)	1550 (125)
Observations	8629 (697)	8694 (702)	8584 (693)	8694 (702)

This table summarizes monthly observations of ratings (end-of-year observations in brackets) across CRAs according to the three rating categories AAA/investment grade/speculative grade

In order to compare rating differences across CRAs, the most convenient approach would be to use the transformation in Table 15. However, we cannot ensure that the values in the provided diagram by Feri are perfectly comparable. For instance, we are not able to verify that a letter B+ on the Feri scale is comparable to the letter A on the Big Three scale. Also with regard to the Big Three, we have no guarantee that the distance between each notch is treated the same across agencies.¹⁰ For that reason, we classify the rating scales into broader categories as to ensure a better comparability. In the roughest classification, we distinguish between three classes (see Table 1): First, we separate the best possible rating category (AAA) from those ratings considered as investment grade (while lower than AAA). The third category entails country-year observations with speculative-grade ratings. This approach has two advantages: First, we ensure that ratings are better comparable across agencies. In particular, the Big Three are most exposed to financial market attention when they assign rating changes across the three categories, namely if they withdraw AAA status or push a country below investment grade. Second, the balanced number of ratings in each category enables us to exploit differences in the rating behaviour among industrialized countries (AAA/investment grade) and emerging markets (investment grade/ speculative grade). Despite the loss of a number of observations at this stage, we think that a conservative approach of comparing ratings across agencies makes our results more robust against measurement errors. A more segmented classification is provided in “Appendix” and has been used for the mean-comparison tests in Sect. 5 and for the analysis of split ratings among the Big Three.

Table 2 presents the share of split ratings as a percentage of total ratings across the four agencies. The split ratings are based on monthly data, and we use the broad classification of three categories (AAA–investments grade–speculative grade). The results for the Big Three when using the full rating scale are presented in “Appendix”.

We observe that Feri disagrees with the Big Three at least in every third case. As opposed to this, the Big Three show split ratings among each other in not even every tenth case. This share increases to 33–44% when we use the full rating scale. The use of annual data shows slightly larger shares across all pairs of agencies.

The share of split ratings across the four agencies indicates that Feri has a different perception towards country risk than the Big Three. However, the results do not explain

¹⁰ For instance, S&P's may be more hesitant to push a country to junk status (BBB- to BB+) than to assign a downgrade within the range of investment-grade ratings.

Table 2 Split ratings across rating agencies

	(1)	(2)	(3)	(4)
	Split Feri (%)	Split S&P's (%)	Split Moody's (%)	Split Fitch (%)
Feri	–	33	37	32
Standard and Poor's	33	–	9	6
Moody's	37	9	–	9
Fitch ratings	32	6	9	–

This table presents percentages of monthly split ratings according to the three categories AAA/investment grade/speculative grade. A summary of rating splits among the Big Three by using the full rating scale is shown in "Appendix"

Table 3 Split ratings across regions

	(1)	(2)	(3)	(4)	(5)
	Feri S&P (%)	Feri Moody (%)	Feri Fitch (%)	Split Big Three (%)	Observations
Western Europe ex EMU	30	35	26	9	824
EMU	24	29	27	10	1729
US/Canada	28	34	25	13	322
Asia and Pacific (ind.)	28	43	22	46	772–805
Asia (emerg.)	33	32	36	9	1242–1253
Latin America	43	47	43	6	1123–1127
Eastern Europe	42	44	40	11	2083–2116
Africa incl. Israel	22	31	22	10	483

This table shows monthly split ratings across selected regions by applying the three-scale classification in Table 1. A detailed list of countries and regional affiliation is provided in "Appendix"

to us whether the observed differences are region specific or randomly distributed. We shed more light on this issue in the next section. Also, we need to explore if one agency is in general more optimistic or pessimistic than the other.

4 Determinants of split ratings

We now turn to show how often rating agencies disagree on a region's rating. Table 3 provides an overview of the absolute number of rating splits across regions by using the three rating classes defined above. Two facts are worth mentioning:

The descriptive results show that Feri disagrees more often on a rating across every region except for the developed Asian and Pacific countries. Thus, different opinions on credit risk are not restricted to specific areas. Also, disagreement does not seem to depend on a region's level of economic development. Even the reverse is true for the Big Three who disagree on average more often on developed countries' ratings (first four lines) than on emerging markets. We should keep in mind that the disagreement moves along the lines of AAA versus investment grade and investment grade versus speculative grade. Rating changes within these classes are ignored at this stage. We

provide a robustness check in “Appendix”, which shows rating splits among the Big Three across regions by using the full rating scale. The results show the smallest share of disagreement among S&P’s and Moody’s.

We also observe an unusual frequency of split ratings across the Big Three in developed Asian and Pacific countries (close to 50% of the observations). The large share of splits is mainly driven by Australia and New Zealand. In the following, we test whether specific regions still show a higher probability to experience split ratings when we control for the macroeconomic stance on the country level, the political environment and adverse shocks to country risk.

In the empirical analysis, we distinguish between disagreement at the threshold of AAA versus investment-grade and investment-grade versus speculative-grade ratings. Thereby, we can distinguish between different impact factors such as a country’s history of debt restructurings. Also, rating agencies may use different thresholds in their models before assigning AAA-status or investment-grade status. We also perform a robustness analysis when we analyse split ratings across the complete rating scale (according to Table 15) above and below investment grade for the Big Three. We carry out two separate regressions by using a multivariate probit model to identify the determinants of observed split ratings.

$$\Pr(\text{Split AAA}_{ij,t}) = F(\text{macro}_{k,t}, \text{region}, \Delta\text{CCR}_{k,t}) + e_{ij,t} \quad (1)$$

and

$$\Pr(\text{Split InvJunk}_{ij,t}) = F(\text{macro}_{k,t}, \text{region}, \text{default}_k, \Delta\text{CCR}_{k,t}) + e_{ij,t}. \quad (2)$$

The binary variable is equal to one if agencies disagree on a country’s rating in 1 year and we assume that the error terms are normally distributed. The assumption of a logistic distribution has neither a significant effect on the size of the marginal effects nor on the confidence levels.¹¹ Then, we restrict the sample to countries with a rating split between AAA and below. We exclude a country if it has never been assigned a AAA rating.¹² In the second probit model, we measure the probability of a country to receive a split rating at the threshold between investment and speculative-grade status. No country except for Ireland has experienced a rating transition from AAA to speculative grade during the sample period.

Next, we use a number of exogenous variables in order to test for uncertainty and different rating methodologies. In general, rating agencies apply two risk concepts to determine sovereign risk: First, political risk which determines the willingness to repay debt and second, economic risk which mirrors the country’s ability to repay. Both variables are considered in the rating agencies’ methodologies.¹³

¹¹ Logit estimation results are available from the author on request.

¹² Besides the emerging market economies, this applies also to a number of industrialized countries, namely Greece, Israel, Portugal, South Korea and the Eastern European countries.

¹³ For instance, Fitch Ratings describe political risk as “the risk that the sovereign authorities will lack the political capacity and will to mobilize resources necessary to honour their financial obligations” (Fitch 2014). The other agencies provide similar concepts (Moody’s (2013), Standard and Poor’s (2013)).

Table 4 Descriptive statistics of explanatory variables (annual frequency)

	(1) Obs.	(2) Mean	(3) SD	(4) Min.	(4) Max.
Log GDP per capita	702	9.64	0.82	7.19	11
Government debt	685	52.5	32.49	3.7	230.3
External debt	299	128.45	79.32	23.43	452.52
Political stability	702	0.27	0.89	-2.39	1.67
Government effectiveness	702	0.82	0.88	-1.19	2.43
Δ Country credit rating (CCR)	702	-1.34	3.08	-30.1	0
Economic growth	702	3.42	3.86	-17.7	18.3
External balance	702	0.02	6.74	-25.2	26.9
Fiscal balance	687	-1.94	4.48	-30.9	18.8

In the following, we include two determinants of political uncertainty in the empirical model: (1) *Political stability* measures the probability of a government to be destabilized by unconstitutional or violent means. If political stability is endangered rating agencies may face uncertainty about future political developments within the country or on future governments. (2) *Government effectiveness* captures the ability of a government to provide public services, the degree of independence from political pressures and government credibility (Kaufmann et al. 2010). If government effectiveness is low, rating agencies are assumed to face uncertainty with respect to the formal capacity of the government to service its debt.

We also use determinants for economic uncertainty: First, a higher (1) *GDP per capita* should reduce the uncertainty towards a country's ability to repay its debt due to a large tax base. Second, a low ratio of (2) *government debt to GDP* reduces uncertainty as well as a positive (3) *fiscal* and (4) *external balance* and high (5) *GDP growth*. We also control for (6) *past debt restructurings* where a past restructuring on domestic or external debt (after 1970–1999) increases uncertainty. We use the database on sovereign haircuts by Cruces and Trebesch (2013).

Finally, we include a measure for adverse shocks to a country's default risk within a given year. If a country is subject to adverse shocks, we assume that rating agencies face a greater uncertainty with regard to the ability to repay its loans. In the model, we use the Institutional Investor's country credit rating (7) *CCR* which is based on a semi-annual survey among institutional investors and weighted by their exposure to sovereign risk. The variable enters the regression as year-on-year changes whereby only negative values are considered.¹⁴ A positive coefficient indicates that adverse shocks to country risk increase the split probability. A negative coefficient signals that the rating agencies respond in line with investors to publicly available information. Descriptive statistics on all exogenous variables are presented in Table 4.

Table 5 provides the results obtained from the probit regression on AAA-level splits. Columns (1) and (2) present results for the split probabilities for Feri versus the Big Three, and columns (3) and (4) present split probability results among the Big Three.

¹⁴ Positive values are set equal to zero.

Table 5 Split ratings AAA versus Non-AAA

	(1) Split Feri-Big Three	(2) Split Feri-Big Three	(3) Split Big Three	(4) Split Big Three
CCR shock	-0.0159 (-1.40)	-0.0209 (-1.26)	-0.0160 (-1.13)	-0.0233 (-1.26)
EMU	0.216 (1.19)	0.147 (1.22)	0.0735 (0.69)	-0.0475 (-0.47)
Western Europe	0.104 (0.45)	0.140 (0.80)	0.0239 (0.20)	-0.0247 (-0.21)
Asian and Pacific (adv.)	0.430** (2.46)	0.399*** (4.50)	0.450*** (4.43)	0.344*** (4.51)
Log GDP per capita		-0.482* (-1.74)		-0.541** (-2.42)
Government debt		0.000942 (0.80)		-0.000320 (-0.56)
Fiscal balance		0.00435 (0.37)		-0.00161 (-0.23)
External balance		-0.0244** (-2.33)		-0.00799 (-1.28)
GDP growth		-0.00738 (-0.45)		0.00593 (0.45)
Government effectiveness		0.235 (1.05)		0.0937 (0.91)
Political stability		0.113 (0.69)		0.0571 (0.60)
Observations	247	247	234	234
Pseudo R ²	0.068	0.185	0.234	0.370
AIC	326.7	300.6	218.2	194.9
BIC	340.8	339.2	232.1	232.9
Correctly classified	63.16	71.66	82.05	85.47
χ^2 -value Wald test	8.093	43.42	22.09	107.8

This table presents annual split probabilities for advanced economies at the threshold between AAA and below. We use a bivariate probit model with a dummy variable equal to one if two (types of) agencies disagree on the rating category (AAA/Non-AAA) in 1 year. Positive coefficients reflect an increase in the split probability, and negative coefficients indicate a decrease. The coefficients are expressed as average marginal effects. Standard errors are clustered on the country level
t Statistics in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

The results for split ratings among the Big Three when using the full rating scale are provided in “Appendix”. The coefficients are expressed as average marginal effects. The interpretation of the coefficients differs between discrete (i.e. regions) and continuous independent variables (i.e. macroeconomic and political regressors). For example, being a member of the Asian and Pacific region increases the probability of disagree-

ment among Feri and the Big Three by 0.399 percentage points (*ceteris paribus*), whereas a 1% increase of log GDP per capita lowers the probability of disagreement by 0.48 per cent (see column (2)). The model prediction quality ranges between 63 and 85% of the observed split ratings if we use a threshold probability of 0.5.

We find that countries in the Asian and Pacific region experience a higher probability to receive a split rating than other regions. In contrast to S&P's and Moody's, Fitch has never assigned AAA-status to these countries. Also, the Big Three are often discordant on Japan's credit risk with S&P's being the most pessimistic agency. The results in Table 19 show that disagreement for the Asian and Pacific region is driven by split ratings between Moody's and Fitch. As opposed to this, we find no significant increase in the probability of disagreement towards the European Monetary Union or to other Western European countries. GDP per capita reduces disagreement across all rating agencies (rich countries such as Norway or Switzerland always received AAA-status). Adverse shocks to country risk have no significant effect on disagreement among the agencies.

Taken together, the findings for splits on AAA-status do not suggest that the rating agencies disagree more often on country risk in the euro area. What is new, on the other hand, is that the frequency of disagreement increases among Asian and Pacific countries, confirming the descriptive result in Table 3. The insignificance or negative signs of the macroeconomic coefficients indicates that the four agencies attribute relatively equal weights to these factors.

Table 6 presents the results for splits between investment- and speculative-grade ratings. Split ratings among Feri and the Big Three are shown to be more likely in Eastern Europe and Latin America, however, the regional coefficients become insignificant if we include other independent variables. We also find no indication for systematic disagreement among the Big Three agencies. However, S&P's and Moody's seem to disagree more frequently over ratings for Eastern Europe if we use the full rating scale (see Table 20). A previous debt restructuring leads to more consistency among Big Three ratings. This indicates unanimous sanctioning of previous defaulters by the Big Three.

To sum up, the results on split ratings lead us to suggest that disagreement among rating agencies decreases with a log of GDP per capita. The Big Three tend to agree on ratings for countries with a debt restructuring in the past, whereas high political stability increases disagreement. In addition, we find that regional splits are more likely to be observed in Asian and Pacific countries and in Eastern Europe (at least for S&P's and Moody's). Short-term economic developments (fiscal balance, external balance, GDP growth) do not affect disagreement across CRAs.

The split results give us no yet an indication for the direction of disagreement. In the following, we explore whether agencies tend to be more optimistic or pessimistic in their rating behaviour across regions.

5 Are sovereign ratings lopsided?

During the euro crisis, policy makers have expressed the expectation that a European-based rating agency would publish a more unbiased view about European countries than rating agencies with headquarters in the USA. Accordingly, one should expect

Table 6 Split ratings speculative versus investment grade

	(1) Split Feri- Big Three	(2) Split Feri- Big Three	(3) Split among Big Three	(4) Split among Big Three
CCR shock	−0.0190** (−2.26)	−0.0139 (−1.24)	−0.00665 (−1.64)	−0.00959 (−1.39)
Eastern Europe	0.351** (2.52)	0.197 (1.35)	0.0490 (0.81)	0.0357 (0.65)
Asia	0.245 (1.26)	−0.244 (−1.22)	0.00804 (0.12)	−0.109 (−1.46)
Latin America	0.343** (2.20)	0.107 (0.71)	0.00179 (0.03)	0.0315 (0.47)
Log GDP per capita		−0.239*** (−2.75)		−0.0933** (−1.96)
Government debt		−0.0000862 (−0.05)		0.000236 (0.28)
Past debt restructuring		−0.0954 (−0.90)		−0.0720* (−1.74)
Fiscal balance		0.00185 (0.18)		0.00235 (0.45)
External balance		−0.00196 (−0.38)		−0.0000333 (−0.01)
GDP growth		−0.00587 (−0.63)		0.00109 (0.20)
Government effectiveness		−0.155 (−1.28)		−0.0607 (−0.82)
Political stability		−0.0103 (−0.16)		0.0543* (1.65)
Observations	468	449	468	449
Pseudo R ²	0.070	0.191	0.013	0.069
AIC	611.4	527.4	361.7	316.1
BIC	628.0	576.7	378.3	365.4
Correctly classified	62.39	74.83	87.18	88.86
χ^2 -value Wald test	9.169	19.86	3.706	38.24

This table presents annual split probabilities for countries at the threshold between investment grade and junk status. We use a probit model with a dummy variable equal to one if two (kinds of) agencies disagree on the rating category (Investment Grade/Junk status) in 1 year. Positive coefficients reflect an increase in the split probability, and negative coefficients indicate a decrease. The coefficients are expressed as average marginal effects. Standard errors are clustered on the country level

t Statistics in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

that the US-based agencies assign better ratings to their immediate neighbours. Given the recent criticism by European politicians, we first examine rating differences in the

Table 7 Mean comparison of ratings to the world

Country group	(1) Feri-S&P	(2) Feri-Moody's	(3) Feri-Fitch	Observations
<i>1999–2012</i>				
All countries	0.18***	0.12***	0.19***	702
Industrialized countries	−0.1***	−0.16***	−0.09***	299
Emerging economies	0.12***	0.11***	0.11***	403
<i>Great moderation (1999–2007)</i>				
All countries	0.36***	0.33***	0.35***	486
Industrialized countries	0.02	−0.03	−0.02	207
Emerging economies	0.62***	0.60***	0.58***	279
<i>Crisis period (2008–2012)</i>				
All countries	−0.22***	−0.32***	−0.16***	216
Advanced countries	−0.37***	−0.46***	−0.34***	92
Emerging economies	−0.11***	−0.22***	−0.02	124

Differences of the ratings are based on the transformation in Table 1; positive coefficients indicate a better rating average compared to Feri; significance levels of *T* test are given as ***, ** and * representing 1, 5 and 10%, respectively

Table 8 Mean comparison of ratings within the euro area

Rating agencies	(1) Feri-S&P	(2) Feri-Moody's	(3) Feri-Fitch	Observations
<i>1999–2012</i>				
Euro area	−0.18***	−0.31***	−0.25***	137
GIIPS	−0.17**	−0.38***	−0.25***	63
Non-GIIPS	−0.22***	−0.11*	−0.26***	87
<i>Great moderation (1999–2007)</i>				
Euro area	0.03	−0.09	−0.08	89
GIIPS	0.05	−0.12	−0.09	43
Non-GIIPS	0.02	−0.07	−0.07	46
<i>Crisis period (2008–2012)</i>				
Euro area	−0.58***	−0.71***	−0.56***	48
GIIPS	−0.65***	−0.95***	−0.6***	20
Non-GIIPS	−0.54***	−0.54***	−0.54***	28

Differences of the ratings are based on the transformation in Table 1; positive coefficients indicate a better rating average compared to Feri; significance levels of *T* test are given as ***, ** and * representing 1, 5 and 10%, respectively

euro area. A rating is defined as lopsided if it is higher or lower than the ratings of the other agencies in the sample.

First, we explore the rating differences in industrialized and emerging markets and with respect to the euro area in particular. Tables 7 and 8 show the mean comparisons of rating differences between Feri and the Big Three. The coefficients indicate that

Feri has assigned more positive ratings to emerging markets (between 1999 and 2007) and it had a more pessimistic view on industrialized countries (only during the crisis). Within the euro area (Table 8), we observe no significant difference across the agencies during the Great Moderation, but a strong decline in both euro area groups (GIIPS and non-GIIPS countries) between 2008 and 2012.

These preliminary findings indicate that Feri tends to be more pro-cyclical in its rating behaviour than the Big Three and that it surprisingly perceives the entire euro area as a more risky asset. On the contrary, Fuchs and Gehring (2017) find that in general rating agencies give preferential treatment to their home country and to countries with close cultural and economic ties to the home country.¹⁵

We also differ from Fuchs and Gehring (2017) by using a different definition of the home bias: They reproduce the rating models used by each agency and compare their results with the actual ratings. If the predicted rating is lower than the actual rating, the authors define this as a home bias. In this paper, we focus instead on the determinants of disagreement across agencies. Specifically, we ask whether the observed optimistic/pessimistic stance of a rating agency relative to competitors can be explained by the use of different rating models (for instance by assigning different weights to economic or political factors) or to the belonging to the home region. The identification of a home bias on the country level is not possible due to the limited variation across the four rating agencies with respect to the ratings for the USA, Germany and France. Thus, we stick to the previously defined regions in order to find out whether rating agencies are subject to a systematic upward/downward bias.

In Table 9, we summarize the share of months in which a CRA had a more pessimistic stance compared to all competitors across regions.¹⁶ In the case of Feri, we use the three-scale classification of Table 1. The comparison among the Big Three is based on the scale of alphabetical notches. For instance, we consider a more pessimistic stance for Feri if the agency assigns investment grade, whereas all Big Three agencies assign AAA-status. In case of the Big Three, we already attribute a negative stance if one agency assign B+, whereas another one assigns a B. Therefore, the percentages in column (1) are not based on the same classification as those in columns (2)–(4). As shown in Table 2, Feri disagrees more often with the Big Three than the Big Three among themselves.

The descriptive findings indicate that Feri is more often pessimistic compared to the Big Three in Western Europe, Eastern Europe and North America with more than 20% of the rating assignments below all Big Three ratings. Standard and Poor's takes the lead by having most often a pessimistic stance towards the euro area, whereas Moody's exhibits a large negative bias towards Latin America and emerging Asia. Fitch Ratings has the most pessimistic stance to industrialized Asian and Pacific countries.

The findings for optimism in Table 10 show that Feri assigns more often higher ratings to emerging Asia and Latin America than the Big Three. Moody's takes the optimistic lead in the case of EMU, Eastern Europe, Africa and in the Asian and Pacific region.

¹⁵ The home bias has not been identified for Feri and Moody's and it is shown to hold for Fitch in France and the USA at the same time (ownership and headquarter).

¹⁶ We compare the ratings of each Big Three agency only with its large competitors and not with Feri in order to be able to apply the full rating scale.

Table 9 Number of negative deviations towards other CRAs

	(1) Feri Pes. (%)	(2) S&P Pes. (%)	(3) Moody Pes. (%)	(4) Fitch Pes. (%)	(5) Observations
Western Europe ex. EMU	25	0.1	0	9	824
EMU	15	18	5	6	1729
North America	21	5	0	11	322
Asia and Pacific (industr.)	1	12	9	16	805
Latin America	5	1	37	9	1127
Eastern Europe	24	13	14	7	2116
Asia (em. markets)	0	13	15	7	1288
Africa incl. Israel	0	0	10	6	483
Average share of pessimism	11	8	11	9	

This table displays country-month observations in which a rating agency has assigned lower ratings to specific regions than its competitors. Due to the different scales, we compare Feri's ratings with those of the Big Three along the pre-defined three rating categories, whereas we compare the Big Three only among themselves by using the full rating scale for the Big Three

Table 10 Number of positive deviations towards other CRAs

	(1) Feri Opt. (%)	(2) S&P Opt. (%)	(3) Moody Opt. (%)	(4) Fitch Opt. (%)	(5) Observations
Western Europe ex. EMU	0.4	0.2	7	0	824
EMU	7	4	11	3	1729
North America	0	4	1	0	322
Asia and Pacific (industr.)	6	12	27	20	805
Latin America	37	14	11	10	1127
Eastern Europe	12	14	35	7	2116
Asia (em. markets)	27	10	7	15	1288
Africa incl. Israel	21	0	41	3	483
Average share of optimism	14	7	18	7	

This table displays country-month observations in which a rating agency has assigned higher ratings to specific regions than its competitors. Due to the different scales, we compare Feri's ratings with those of the Big Three along the pre-defined three rating categories, whereas we compare the Big Three only among themselves by using the full rating scale for the Big Three

Taking the findings of both tables together, three observations are worth mentioning: First, we observe that rating agencies are more likely to “lean against the wind” in emerging market economies than in advanced countries. However, this may also be a consequence of more volatile economic and political conditions in those regions. Second, the Big Three are more often optimistic towards advanced countries, whereas Feri has more frequently assigned better ratings to the emerging world (except for Eastern Europe). Also, it was more often pessimistic with regard to advanced economies which may explain the early downgrades of euro area countries during the euro crisis. Third, we observe that Moody's appears to be most likely to deviate from common rating

assignments among the Big Three. Also, it turns out that pessimism is more dispersed across agencies and regions than optimism.

Next, we include the same set of macroeconomic variables as in the analysis of split ratings except for the country credit rating (CCR). Again, we use two probit models by defining the dependent variable as one if a rating agency assigns a lower rating than its competitors. In the second model, the dependent variable is equal to one when a rating agency is a higher rating than competitors. We apply the same classification of ratings as before but use annual instead of monthly rating observations.

$$\Pr(\text{pessimism}_{ij,t}) = F(\text{macro}_{k,t}, \text{region}, \text{default}_k) + e_{ij,t}. \quad (3)$$

and

$$\Pr(\text{optimism}_{ij,t}) = F(\text{macro}_{k,t}, \text{region}, \text{default}_k) + e_{ij,t} \quad (4)$$

We do not include North American countries and Africa due to the small number of observations. Also, Western Europe is dropped in most specifications due to missing optimistic/pessimistic observations. Table 11 presents the probit results for a negative rating bias. The coefficients are expressed as average marginal effects analogous to our previous estimations on split ratings.

Our probit models explain 90% of the pessimistic deviations correctly if we choose a threshold probability of 0.5. The results show that Feri is less often pessimistic than the Big Three towards the Asian and Pacific region, countries with high growth, large debt ratios and a positive current account. The pessimism towards European countries shown in Table 9 now appears to be captured by the macroeconomic variables. With regard to S&P's, we find that the agency has more often a pessimistic stance towards Asian and Pacific countries, the euro area and Eastern Europe than the other two of the Big Three. The probability to be more pessimistic than Moody's and Fitch declines if a country underwent a debt restructuring in the past. On the contrary, Moody's frequently assigns lower ratings to previous defaulters than its competitors. Then, they appear to be more bearish on Latin America than the others. Also, we find relatively more pessimistic views on the euro area and the Asian and Pacific region. Moody's assigned lower ratings particularly to Belgium and Estonia, whereas S&P's had a more negative assessment on Austria, Finland and France. In the Asian and Pacific region, S&P's was more pessimistic especially towards Japan but also on New Zealand and South Korea, whereas Moody's assigned relatively low ratings to Singapore. Fitch Ratings shows no negative bias towards any region.

Table 12 presents the probit results for a positive rating bias. We find that Feri is more often optimistic on euro area members. This result surprises as they were the first to downgrade crisis countries during the euro crisis. For instance, Belgium received a higher rating for many years by Feri compared to the Big Three. Furthermore, countries with high GDP per capita, high political stability and from emerging Asia have a lower probability of receiving optimistic assessments, whereas a higher debt ratio and a current account surplus increase the probability to be treated more favourably by Feri. Compared to Moody's and Fitch, S&P's shows a higher probability to be optimistic

Table 11 Probit results for a negative bias

	(1) Feri Neg.	(2) S&P Neg.	(3) Moody Neg.	(4) Fitch Neg.
Log GDP per capita	0.115* (1.88)	-0.0714 (-1.52)	-0.108*** (-3.13)	0.0613 (1.16)
Government debt	-0.00322*** (-3.63)	0.000628 (1.23)	-0.000975 (-1.41)	-0.0000329 (-0.05)
Fiscal balance	-0.00176 (-0.39)	-0.000447 (-0.11)	-0.00184 (-0.31)	0.000675 (0.17)
External balance	-0.00890*** (-3.09)	0.00400 (1.36)	0.00118 (0.40)	-0.00138 (-0.55)
GDP growth	-0.0163*** (-3.88)	-0.00245 (-0.74)	0.00429** (1.98)	-0.000847 (-0.19)
Past debt restructuring	-0.0665 (-1.07)	-0.0921** (-2.15)	0.115*** (3.85)	-0.0573 (-1.53)
Political stability	0.0294 (1.01)	-0.0279 (-1.13)	-0.0129 (-0.59)	0.0107 (0.41)
Western Europe	0.0531 (0.68)			-0.00725 (-0.11)
EMU	0.00668 (0.09)	0.240*** (2.64)	0.254*** (3.02)	-0.0312 (-0.43)
Asian and Pacific (adv.)	-0.283*** (-2.97)	0.189** (2.24)	0.258*** (2.83)	0.0483 (0.59)
Latin America	0.0140 (0.15)	-0.00422 (-0.05)	0.178** (2.25)	0.118 (1.31)
Eastern Europe	0.0825 (0.98)	0.228*** (2.69)	0.0961 (1.18)	0.0564 (0.92)
Asia		0.0708 (0.85)	0.0222 (0.26)	0.121 (1.06)
Observations	676	676	676	676
Pseudo R ²	0.274	0.156	0.243	0.047
AIC	419.6	373.7	380.7	384.8
BIC	473.8	427.9	434.9	443.5
Correctly classified	86.69	90.83	89.05	92.01
χ^2 -value Wald test	103.2	29.31	142.1	15.80

This table displays the probit results for the probability to have a more pessimistic stance on a country's rating. The binary variable takes the value one in all years when the respective CRA assigns a lower rating (class) than competitors. Standard errors are clustered on the country level
t statistics in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

towards credit risk in Latin America, Eastern Europe and emerging Asia. Fitch takes the optimistic lead towards the euro area and the Asian and Pacific region.

Table 12 Probit results for a positive bias

	(1) Feri Pos.	(2) S&P Pos.	(3) Moody Pos.	(4) Fitch Pos.
Log GDP per capita	-0.242*** (-6.07)	-0.0163 (-0.47)	0.0503 (0.68)	-0.0573* (-1.93)
Government debt	0.00239*** (3.09)	0.000284 (0.56)	0.000945 (1.25)	0.000274 (0.78)
Fiscal balance	0.00643 (1.25)	-0.000795 (-0.16)	-0.0106* (-1.68)	0.00637* (1.74)
External balance	0.00758** (2.27)	-0.00115 (-0.48)	-0.0120** (-2.50)	-0.00270 (-1.23)
GDP growth	0.00603 (1.34)	0.000743 (0.30)	-0.00252 (-0.52)	-0.00426** (-2.14)
Past debt restructuring	0.0830 (1.59)	0.0998* (1.89)	-0.0681 (-0.92)	0.0344 (1.22)
Political stability	-0.0525** (-2.07)	0.0656*** (2.79)	-0.0279 (-0.52)	-0.0813*** (-3.60)
Western Europe	0.191* (1.67)		-0.0222 (-0.16)	
EMU	0.259*** (2.68)	0.0825 (1.38)	-0.146 (-1.17)	0.147** (2.27)
Asian and Pacific (adv.)	0.0966 (0.79)	0.113* (1.64)	0.126 (0.87)	0.270*** (2.84)
Latin America	0.0566 (0.74)	0.145** (2.23)	0.0195 (0.12)	0.0485 (1.05)
Eastern Europe	0.0189 (0.21)	0.129** (1.98)	0.184 (1.52)	0.0754 (1.39)
Asia	-0.200** (-2.06)	0.144 (1.64)	-0.00485 (-0.03)	0.0206 (0.36)
Observations	676	676	676	676
Pseudo R^2	0.491	0.154	0.177	0.268
AIC	323.3	334.2	586.7	277.5
BIC	382.1	388.4	645.4	331.7
Correctly classified	90.98	92.31	81.36	92.75
χ^2 -value Wald test	96.78	33.96	78.15	101.6

This table displays the probit results for the probability to have a more optimistic stance on a country's rating. The binary variable takes the value one in all years when the respective CRA assigns a higher rating (class) than competitors. Standard errors are clustered on the country level
t statistics in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

In contrast to widespread political presumptions, our results do not point to the existence of a home bias across the four rating agencies. If anything, rating agencies

have different opinions on certain regions at certain times. However, even within regions, we observe varying optimism and pessimism across agencies. This said, the empirical results indicate that S&P's and Moody's have a more pessimistic opinion towards the euro area and the Asian and Pacific countries than Feri and Fitch. For Latin America, Asia and Eastern Europe, we find rather mixed results with no systematic pattern across agencies. One may attribute this finding to the higher economic volatility in these countries which is mirrored by higher uncertainty across rating agencies. Finally, it appears that Moody's takes more often a pessimistic stance on a country's credit risk, whereas Fitch tends to be more optimistic in its general rating behaviour.

6 Concluding remarks

The purpose of this paper is to explore why rating agencies have different perceptions of country credit risk. The rating behaviour of four agencies suggests that belonging to a particular world region or the membership in the European Monetary Union neither leads to a higher split probability nor do rating agencies assign systematically lower or higher ratings to particular regions as a consequence of the so-called home bias. In other words, our findings indicate that sovereign ratings are not shaped by the origin or the ownership of the rating agency. Thus, the issuer-pays model does not constitute a conflict of interest for sovereign ratings. This is possibly because fees for sovereign ratings are relatively low compared to fees for structured finance products. Also, the agencies produce unsolicited ratings.¹⁷

In addition, we find that all four agencies appear to disagree especially often in their assessment towards the Asian and Pacific region, in particular with respect to New Zealand, Australia and Japan. Also, Moody's is the relatively most pessimistic agency, whereas Fitch tends to be more optimistic on sovereign credit risk across the sample period.

Besides, the subscriber-funded European agency Feri appears to be more volatile in its rating behaviour whereas the Big Three seem to be more hesitant to change a rating in the first place. On the one hand, a more volatile rating assignment speaks against the reliability of Feri's ratings versus those of the Big Three. On the other hand, the early downgrades of euro area economies may lead investors to suggest that the small rating agency is equipped with a better working early-warning system. Alternatively, one could argue that a less-influential agency which is paid by subscribers feels less compelled to maintain a rating than agencies whose ratings are used for regulatory purposes and who are (often) paid by issuers.

To conclude, our analysis does not support the notion that rating agencies have deliberately caused or at least aggravated the sovereign debt crisis in the euro area and might thus contribute to soothe concerns of European politicians. However, the inclusion in regulatory frameworks and the sheer size of agencies may have led to some unintended pro-cyclicality. Of course, we do not claim that this conclusion should be

¹⁷ Feri produces only unsolicited ratings and the Big Three also have a share of 10–20% unsolicited ratings across all country groups and regions.

adopted to other asset classes such as structured finance products where the issuer-pays model is of much more importance.

Appendix

See Tables 13, 14, 15, 16, 17, 18, 19 and 20.

Table 13 Country table by region 1999–2012

Industrialized region	Countries	Emerging markets region	Countries
European Monetary Union		Eastern Europe	
	Austria		Bulgaria
	Belgium		Croatia
	Estonia (since 2011)		Czech Republic
	Finland		Estonia (until 2010)
	France		Hungary
	Germany		Latvia
	Greece (since 2001)		Lithuania
	Ireland		Poland
	Italy		Romania
	Portugal		Russia
	Slovak Rep. (since 2009)		Slovak Rep. (until 2008)
	Slovenia (since 2007)		Slovenia (until 2006)
	Spain		Turkey
Western Europe			Ukraine
	Denmark	Latin America	
	Greece (until 2000)		Argentina
	Norway		Brazil
	Sweden		Chile
	Switzerland		Colombia
	UK		Mexico
North America			Peru
	Canada		Venezuela
	USA	Asia (emerging)	

Table 13 continued

Industrialized region	Countries	Emerging markets region	Countries
Asian and Pacific (industr.)			China
			India
	Australia		Indonesia
	Japan		Malaysia
	New Zealand		Philippines
	Singapore		Thailand
			Vietnam
		Africa/Near East	
			Egypt
			Israel
		South Africa	

Table 14 Overview rating agencies

	(1) Standard and Poor's	(2) Moody's	(3) Fitch ratings	(3) Feri EuroRating
Headquarters	New York, USA	New York, USA	New York, USA; London, UK	Bad Homburg, Germany
Ownership	Publicly traded	Publicly traded	Privately-owned (50% US and 50% French)	Privately-owned (100% German)
Ratings since	1949	1949	1994	1999
Sovereigns rated	125	113	101	56
EU market share in 2014 ^a	40.42%	34.67%	16.8%	0.64%

^aCalculation from ESMA, based on revenues from credit ratings and ancillary services

Table 15 Rating

Transformation. *Source:* Feri Rating GmbH, Standard and Poor's, Moody's, Fitch

(1) Rating notation	(2) Feri	(3) S&P/Fitch	(4) Moody's
AAA/AAA/Aa1	17	17	17
AA/AA+/Aa1	16	16	16
AA/AA/Aa2	16	15	15
A/AA-/Aa3	13.5	14	14
B+/A+/A1	12	13	13
B+/A/A2	12	12	12
B/A-/A3	10.5	11	11
C/BBB+/Baa1	9	10	10
C/BBB/Baa2	9	9	9
C/BBB-/Baa3	9	8	8

Table 15 continued

(1) Rating notation	(2) Feri	(3) S&P/Fitch	(4) Moody's
D/BB+/Ba1	7	7	7
D/BB/Ba2	7	6	6
D/BB-/Ba3	7	5	5
D-/B+/B1	4	4	4
D-/B/B2	4	3	3
D-/B-/B3	4	2	2
E/CCC+/Caa1	1	1	1
E/CCC/Caa2	1	1	1
E/CCC-/Caa3	1	1	1
E-/CC/Ca	1	1	1
E-/C/Ca	1	1	1
Default/Default/C	1	1	1

Rating transformation based on the Feri translation table

Table 16 Classification of ratings

	(1) S&P	(2) Moody's	(3) Fitch	(4) Feri
AAA/Aaa/AAA	179	191	169	142
AA/Aa/AA	95	89	104	118
A/A/A-B	122	129	117	145
BBB/Baa/C	134	122	141	172
BB/Ba/D	113	112	110	52
B/B/D-	43	50	43	34
CCC-D/Caa-D/E-E-	16	8	11	39

Table 17 Split ratings across the Big Three (full rating scale)

	(1) Monthly splits (%)	(2) Annual splits (%)	(3) Total observations
S&P's versus Moody's	44	56	3819 (697)
S&P's versus Fitch	33	48	2813 (693)
Moody's versus Fitch	43	54	3730 (693)

This table summarizes the percentage of split ratings according to the full rating scale as presented in Table 15. The annual splits presented in column (2) are based on averages of annual ratings

Table 18 Split ratings across regions (full rating scale)

	(1) S&P's versus Moody's (%)	(2) S&P's versus Fitch (%)	(3) Moody's ver- sus Fitch (%)
Western Europe ex EMU	7	9	15
EMU	33	30	24
US/Canada	9	19	11
Asia and Pacific (ind.)	47	53	63
Asia	40	44	36
Latin America	56	32	63
Eastern Europe	69	40	60
Africa incl. Israel	51	9	58
Average split probability	39	29.5	41

This table summarizes the percentage of split ratings in different regions across the Big Three agencies. We use the full rating scale as presented in Table 15. The annual splits presented in column (2) are based on averages of monthly rating observations between 1999 and 2012

Table 19 Split ratings AAA versus investment grade

	(1) Split S&P's-Moody	(2) Split S&P's-Fitch	(3) Split Fitch-Moody	(4) Split Big Three
Log GDP per capita	-0.979*** (-4.12)	-0.635** (-2.23)	-0.695** (-2.28)	-0.891*** (-2.85)
Government debt	0.00122 (1.45)	0.000416 (0.48)	0.000481 (0.76)	0.000474 (0.56)
Fiscal balance	-0.0105 (-1.36)	-0.0106 (-1.47)	-0.0153** (-2.05)	-0.0106 (-1.43)
External balance	0.00101 (0.18)	0.00145 (0.17)	-0.00741 (-1.25)	-0.00420 (-0.56)
GDP growth	0.0166 (1.19)	0.0298** (2.19)	0.00171 (0.17)	0.0158 (1.07)
Government effectiveness	-0.162 (-1.33)	-0.00843 (-0.06)	0.0407 (0.23)	-0.0218 (-0.13)
Political stability	0.109 (1.03)	0.0283 (0.29)	0.0597 (0.59)	0.0854 (0.72)
CCR shock	-0.0196 (-1.58)	-0.0347*** (-2.74)	-0.0111 (-1.07)	-0.0250* (-1.79)
EMU	-0.0972 (-0.98)	-0.148 (-1.00)	-0.150 (-1.13)	-0.148 (-1.02)

Table 19 continued

	(1) Split S&P's-Moody	(2) Split S&P's-Fitch	(3) Split Fitch-Moody	(4) Split Big Three
Western Europe	−0.0576 (−0.50)	−0.0886 (−0.55)	0.0143 (0.11)	−0.0592 (−0.37)
Asian and Pacific (adv.)	0.137 (1.48)	0.132 (0.78)	0.275*** (2.90)	0.278** (2.48)
Observations	234	234	234	234
Pseudo R ²	0.474	0.266	0.466	0.439
AIC	163.2	215.9	167.6	188.2
BIC	201.2	253.9	205.6	226.3
Correctly Classified	85.47	78.63	85.90	85.04
χ^2 -value Wald test	92.32	114.6	388.3	129.9

This table presents annual split probabilities for countries by using the full rating scale as presented in Table 15. We restrict the sample to countries which have never experienced a speculative-grade rating during the sample period (except for Ireland). We use a probit model with a dummy variable equal to one if two agencies disagree on a country's rating in one particular year (at least in 1 month of the respective year). Positive coefficients reflect an increase in the split probability, and negative coefficients indicate a decrease. The coefficients are expressed as marginal effects. Standard errors are clustered on the country level. The results of test statistics are provided at the bottom

t statistics in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table 20 Split ratings speculative versus investment grade

	(1) Split S&P's-Moody	(2) Split S&P's-Fitch	(3) Split Fitch-Moody	(4) Split Big Three
Log GDP per capita	0.0676 (0.72)	0.0969 (1.07)	0.0746 (0.76)	0.0657 (0.77)
Government debt	0.00190 (1.11)	0.000390 (0.26)	0.000296 (0.17)	0.000957 (0.65)
Past debt restructuring	0.0521 (0.66)	−0.123 (−1.45)	0.0139 (0.14)	0.0117 (0.15)
Fiscal balance	0.00980 (1.08)	0.0261** (2.19)	0.00615 (0.60)	0.0135 (1.61)
External balance	0.000388 (0.06)	0.00569 (0.87)	0.00103 (0.16)	0.00114 (0.18)
GDP growth	0.00505 (0.70)	−0.00857 (−1.13)	0.00777 (1.09)	0.00230 (0.40)
Government effectiveness	−0.0484 (−0.46)	−0.217** (−2.14)	−0.0760 (−0.71)	−0.103 (−1.06)
Political stability	0.0431 (0.57)	0.0666 (1.39)	−0.0631 (−0.91)	0.0257 (0.41)

Table 20 continued

	(1) Split S&P's-Moody	(2) Split S&P's-Fitch	(3) Split Fitch-Moody	(4) Split Big Three
CCR shock	− 0.00450 (− 0.58)	− 0.0168** (− 2.12)	− 0.0137* (− 1.75)	− 0.00843 (− 1.31)
Eastern Europe	0.250*** (2.63)	0.143 (1.24)	0.199 (1.59)	0.213** (2.28)
Asia	0.0900 (0.53)	0.147 (0.78)	− 0.0314 (− 0.17)	0.0696 (0.42)
Latin America	0.0977 (0.85)	0.0702 (0.51)	0.103 (0.75)	0.0620 (0.54)
Observations	449	449	449	449
Pseudo R ²	0.068	0.060	0.062	0.079
AIC	508.0	595.8	555.1	438.2
BIC	557.3	645.1	604.4	487.5
Correctly classified	73.05	63.03	71.49	79.73
χ^2 -value Wald test	17.55	44.19	21.68	22.18

This table presents annual split probabilities for countries by using the full rating scale as presented in Table 15. We restrict the sample to countries which have experienced both investment-grade and speculative-grade ratings during the sample period. We use a probit model with a dummy variable equal to one if two agencies disagree on a country's rating in one particular year (at least in 1 month of the year)

t statistics in parentheses

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

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