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DETERMINANTS OF SOVEREIGN BONDS RATINGS: A ROBUSTNESS ANALYSIS

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ABSTRACT

Several studies have attempted to deduce the determinants of sovereign bond ratings. In this study, Extreme Bounds Analysis is applied to approximately 30 factors proposed by the literature in order to assess their robustness with a focus on the relative importance that economic and political variables receive in the shaping of the ratings. We find that policies that constrain the public sector are among the most robust. Variables such as rule of law, openness to economic flows, central bank independence, and market friendly policies are found to be more robustly correlated with the ratings than foreign reserves, fiscal deficit, sovereign bond yields, and economic growth.

Keywords: Credit Rating Agencies, Extreme Bounds Analysis, Financial Globalization, International Political Economy, Sovereign Bond Ratings

JEL classification numbers: C52, E44, F30, G15, H63

I. INTRODUCTION

During the last two decades, the world witnessed the increasing importance of a new group of organizations referred to as Credit Rating Agencies (CRA). Their sovereign bonds ratings have been shown to affect the cost that rated countries face when borrowing (Cantor and Packer, 1996), the amount of foreign direct investments and bank inflows (Janicki and Wunnava, 2004; Kim and Wu, 2011), the development of their financial sector (Kim and Wu, 2008), and the domestic stock market (Brooks *et al.*, 2004). The influence that CRAs have on capital flows derives from the informational content of their ratings but, more importantly, is reinforced by the incorporation of that rating in financial regulations both in the USA and the EU (Bruner and Abdelal, 2005; Staikouras, 2012) which makes them an organic component of the global political economy (Sinclair, 2005).

It is no wonder that the amount of literature devoted to these ratings is growing. Of particular interest is the degree to which bond ratings reflect not just economic fundamentals but also a preference towards specific policy choices. An expanding number of studies support that, beyond an estimate of the probability of default, the ratings actually mirror preferences towards certain policies (Sinclair, 1994; Murphy, 2000; Kerwer, 2002; Bruner and Abdelal, 2005; Sinclair, 2005; Paudyn, 2013). This perspective elevates ratings from a mere reflection of ‘creditworthiness’

to a direct interference with national policy. With the importance that the ratings receive, this literature emphasizes the implications of the operation of CRAs for the global political economy. Recommendations towards policy makers to adopt market oriented policies in order to improve their ratings are not uncommon, especially in developing countries (Biglaiser and DeRouen Jr, 2007; Biglaiser and Staats, 2012). The important question that remains is how influential policy and political variables vis-à-vis economic fundamentals are in the rating process. Do policies actually shape rating assessments?

The primary aim of this study is to assess the relative importance that variables pertaining to political, economic, and policy characteristics have on the ratings. In deducing the determinants of the ratings, the literature has mainly focused on two broad categories of variables regarding the 'ability to repay' (or economic risk) as captured by measures of economic fundamentals and 'willingness to repay' (or political risk) reflected in the policy choices and the general political setting of the rated states. Approximately 30 variables are proposed, thus far, as significant determinants of the ratings. With no 'true' empirical model or underlying theory upon which to base estimation strategy, the significance of many of these variables depends upon the specification and samples that are used.

Beginning with a comprehensive review of most of the previous studies, the robustness of all variables is simultaneously assessed employing the Extreme Bound Analysis (EBA) as proposed by Sala-i-Martin (1997). This involves regressing every variable on all possible combinations of all other indicators proposed in the literature while including in every regression a standard set of control variables that are considered robust. Therefore, more than 8000 regressions were run for every variable to test their sensitivity against all other variables as well as throughout different specifications and samples. This resulted in extracting an overarching lesson from the empirical literature on sovereign bond ratings regarding their short- and long-run determinants and their evolution in the post-2008 global economy. In addition, apart from the variables previously considered by the literature, a number of new relevant ones were introduced along with a rationale of why these new variables call for consideration.

The results suggest a simple yet compelling conclusion. Political variables are as robust as economic variables. Particularly, it was found that the most robust policies were those reflecting the degree to which governments are constrained in favour of the market. We conclude that ratings do appear to favour certain policies over others which is a necessary condition for considering the ratings as potential 'agents of convergence who . . . try to enforce "best practice" or "transparency" around the globe' (Sinclair, 2005, p. 71).

The structure of the paper is as follows. In Section II, the quantitative and some of the qualitative research performed thus far focusing on the variables that have emerged as important in this debate is reviewed. In Sections III, IV, and VI, the data and method used is described, and the results of our sensitivity analysis is presented. The last section places the results in the literature and concludes by providing a discussion of their implications.

II. DETERMINANTS OF SOVEREIGN CREDIT RATINGS

II.1 Economic Fundamentals (economic risk)

According to the two influential agencies¹, sovereign ratings are produced following both a quantitative as well as a qualitative assessment of each country, and both agencies provide some

¹As in many other studies, we focus on the ratings published by Moody's and Standard and Poor's. These two agencies encompass approximately 80 percent of the bond rating market.

information as to which variables are relevant in their country risk assessments. Nevertheless, due to lack of transparency, there is no concrete knowledge of which variables are actually used, what their relative weight is and, perhaps more importantly, since there is a substantial amount of qualitative work involved in the ratings, how much of the variation in the ratings these variables can explain.

In the past decade, a number of scholars have assumed this challenge. The literature can be summarized by focusing on those variables that measure the *ability* of a sovereign to honour its debt obligations. Candidate variables, in this aspect, are naturally those measuring the indebtedness of a government such as debt levels as well as those measuring its wealth including GDP per capita or GDP growth. Beginning with the first study (Cantor and Packer, 1996), this strand of literature contends that a significant portion of the ratings can be explained by using six factors pertaining to economic fundamentals. Specifically, per capita income, GDP growth, inflation, external debt, level of economic development, government debt, external reserves, and previous occurrences of default can account for over 90 percent of credit rating variation. Further research essentially confirmed these results, however, also creates uncertainty regarding their universality. Economic variables are only one element of the ratings, and their importance seems to vary over the years and level of economic development, i.e., economic variables matter more for less developed countries with income per capita and inflation being the most relevant determinants (Afonso, 2003; Bissoondoyal-Bheenick, 2005).

Other macroeconomic variables have also been used. Inflation has been considered, from the beginning, as a signal for 'structural problems' in a government's finances. Fiscal and external balances are two additional variables ascertained to be significant determinants of the ratings in a number of studies (Ferri, Liu and Stiglitz, 1999) while not in others (Cantor and Packer, 1996). Furthermore, the depth and efficiency of a country's financial system (operationalized as the ratio of domestic credit to GDP) has also been found to be a significant determinant (Alexe *et al.*, 2003). Finally, we include sovereign bond yields as a market oriented variable drawing from the studies that document an interdependence between CRAs and financial market participants (Reisen and Von Maltzan, 1999; Afonso *et al.*, 2012). Table A.1 in the Appendix summarizes 19 earlier studies that provide information on which variables were determined as significant and what samples were used. With regard to methodology, various techniques have been employed. Panel data, cross country OLS, and ordered response models have been used in a number of studies albeit two studies have shown that results are not greatly affected by the use of different methodologies (Afonso, 2003; Afonso, Gomes and Rother, 2011).

II.2 Policy and political factors (political risk)

When political factors are concerned, things become a bit more complicated. What scholars attempt to capture with these variables is a state's *willingness* rather than ability to repay its debt. This willingness is not directly measurable and can only be proxied. Researchers have recognized that a significant amount of the rating scores reflects some degree of subjective judgments (Ferri, Liu and Stiglitz, 1999; Bruner and Abdelal, 2005; Sinclair, 2005) from the agencies' perspectives. Indeed, the agencies themselves note that there is a great deal of qualitative input in the ratings and that solely examining economic variables cannot provide a comprehensive picture of the ability and willingness to repay (Bruner and Abdelal, 2005, p. 198).

The number of papers focusing on political determinant of ratings is not as voluminous as their more economic oriented counterparts. Regime type and executive ideology are two variables that have been tested but were not found significant in most cases (Archer, Biglaiser and DeRouen, 2007; Biglaiser and DeRouen, 2007), though there is no concrete resolution (Beaulieu, Cox

and Saiegh, 2012). Other relevant variables are the levels of (perceived) corruption used to proxy the quality of governance (Mellios and Paget-Blanc, 2006) as well as other institutional variables such as the strength of the legal system and the rule of law (Biglaiser and Staats, 2012). Finally, indicators from the World Bank such as the Government Effectiveness Indicator (capturing, among other things, the independence of the civil service from political pressure and the credibility of the government commitment to its policies) are found to be significant throughout (Afonso, Gomes and Rother, 2011).

While the need to incorporate variables capable of capturing the willingness to repay is generally accepted, there is not much consensus on which variables should be used and why. Sinclair (2005) offers a broader framework for thinking about which variables are relevant. Originating from the USA, ratings reflect certain preferences towards a US model of financial orthodoxy emphasizing policies promoting openness of the economy, protection of property rights, and a separation of the financial sector from politics (Sinclair, 1994; Murphy, 2000; Kerwer, 2002; Bruner and Abdelal, 2005; Sinclair, 2005). Using a sample of Latin American countries, Biglaiser and DeRouen (2007) find trade reforms to be robustly correlated to higher ratings while other proxies of financial orthodoxy are not significant. Is there no 'mental framework' after all?

Our position is that, in order to make sense of this debate, we must identify how the agencies understand the 'willingness to repay'. Biglaiser and Staats (2012), for example, argue that good institutions (rule of law, impartial courts, and property rights protection) matter because they build a good reputation for governments and decrease the political risk. Moody's argue that, when looking at the institutional environment of the rated country, the interest is on the level at which political, social, and legal institutions constrain the executive's willingness to repay its debt, i.e., 'the stronger the institutions, the greater the constraint' (Moody's, 2008, p. 8). Standard and Poor's states that what matters is the respect towards the interests of the creditors rather than the domination of the public sector (Standard and Poor's, 2008). The public sector is considered as being prone to 'policy errors' thus transparency and predictability are required as well as a stable market to constrain and correct them. What is then important is the degree to which political control over the economy, especially the financial sector, is limited through a well-established set of checks and balances. The more constraint on the executive body, the more feasible it is to avoid 'sudden and adverse changes' (Moody's, 2008, p. 8).

In accordance with this opinion, several variables are introduced that have not been previously tested. First, the degree of central bank independence is proposed. Delegation of monetary power to an independent authority is a signal of credible commitment that makes policy choices more predictable by separating monetary policy from politics. We use the turnover rate of central bank governors, a window of ten years, as our measure. This variable has previously also been used as a proxy for the extent of political interference with the central bank (Keefer and Stasavage, 2003; Klomp and de Haan, 2010). Second, the degree of the freedom of press is used as it assists with the identification and correction of policy errors (Standard and Poor's, 2008). In addition, we use the Regulatory Quality Index that is produced by the World Bank and captures perceptions regarding the degree to which the economy is regulated by the government.

Finally, to capture the degree of market oriented policies, we use several variables from the Index of Economic Freedom produced by the Heritage Foundation and the Wall Street Journal. In particular, variables that measure fiscal freedom (taxation related policies), government spending, business freedom (the degree of regulation at doing business), financial freedom (banking system regulations), and investment freedom (regulation of both internal and external flows of capital). A more detailed description of all variables can be found in Table A.2 in the Appendix.

III. DATA AND METHODS

Unlike previous studies that attempt to select those variables that reproduce the ratings more closely or focus on the significance of one particular variable, this paper is concentrated on the sensitivity of earlier results. That is, we are interested in corroborating the statistical significance of the effect of an explanatory variable under different combinations of other control variables. One method for doing this is by using Extreme Bounds Analysis as proposed by Sala-i-Martin (1997) which is used extensively in political economy (e.g. Sturm, Berger and De Haan, 2005; Dreher, Sturm and De Haan, 2008). To perform EBA, the following general type regression is performed:

$$Rating_{i,t} = \beta_X X_{i,t-1} + \beta_M M_{i,t-1} + \beta_D D_{i,t-1}$$

where the rating is explained by the set of variables M identified in the literature as the most robust determinants of ratings (more on this below) while D contains all other variables that have been found to be more or less significant. X contains the variable of interest chosen each time from the pool of all possible regressors. A regression is run for every X containing the M variables (consistently) as controls, year specific effects, and all possible combinations of the variables in D taken in combinations of three. All control variables are lagged a year in order to mitigate endogeneity. The original extreme bounds test (Leamer, 1983) for variable X consists of testing whether the upper bound (β_X plus two standard deviations) and the lower bound (β_X minus two standard deviations) are of the same sign. If they are, the variable is considered as a robust predictor of the bond ratings.

Sala-i-Martin (1997) indicates that this is a difficult test for many variables and proposes considering the entire distribution of β_X rather than focusing on its extreme values. After running all regressions for all variables, the average β_X (the partial correlation of the variable with the ratings), the average standard error, and the proportion of times this variable is significant at the 5 percent level are reported. To conclude whether the variable is a robust predictor of the ratings, the Cumulative Distribution Function of β_X at point zero ($CDF(0)$) is calculated for every regression and averaged over all regressions. This is essentially a measurement of the concentration of the distribution of the coefficient on either side of zero (i.e., the $CDF(0)$ is presented when most of the distribution lies below zero and $1-CDF(0)$ when the distribution is concentrated above zero). Thus $CDF(0)$ always lies between 0.5 and 1. If the $CDF(0)$ statistic is above 0.95, the variable is considered robust.

The estimation strategy for the baseline results is based on OLS applied to cross-section time series and tests for the short-run significance of the variables under scrutiny. This is motivated by pointing out that the ratings are a relative measure of default probability and meant to be an ordered ranking of country risk (Moody's, 2009; Standard and Poor's, 2009). Using a fixed effects estimation would disregard the essential component of the variables' variation (i.e., between country variation), and it has been considered as not being informative in the past (Afonso, 2003). Random effects, on the other hand, are inconsistent at times due to the possible correlation of the country effects with the regressors. We take the ratings directly from publications of the rating firms and gather information from 1975–2012 for Moody's and Standard and Poor's for a varying number of countries as more are added each year.² The ratings are recoded as a numeric variable ranging from 1 depicting the limited number of ratings that fall below "B-" up to 17 that depicts the highest possible rating score.³

²Thus our sample varies through different specifications depending on data availability. This is the reason why we report the unweighted $CDF(0)$ following, among others, Sturm and de Haan (2002)

³This follows, among others, Afonso (2001, 2003), Archer, Biglaister and DeRouen (2007), Beaulieu, Schrage and Block (2012), Biglaister and Staats (2012) and Block and Vaaler (2002).

TABLE 1
Top ten correlates of the rating

<i>Variables</i>	<i>Standard and Poor's</i>	<i>Variables</i>	<i>Moody's</i>
Government Effectiveness	0.87	Government Effectiveness	0.87
Corruption	0.85	Rule of Law	0.86
Rule of Law	0.85	Regulatory Quality	0.85
Regulatory Quality	0.85	Corruption	0.84
GDP pc	0.84	GDP pc	0.83
Property Rights	0.77	Property Rights	0.76
Economic Flows Restrictions	0.69	Economic Flows Restrictions	0.68
Political Stability	0.63	Political Stability	0.64
Business Freedom	0.62	Domestic Credit	0.63
Domestic Credit	0.62	Business Freedom	0.60

Further results on time averaged data are based on OLS. This approach captures both the essential part of the variation across countries and subtracts business cycle effects from the data which allows focusing on long-run determinants of bond ratings. The averaged data are calculated using the 2000–12 sample for both rating agencies. Finally, the analysis is repeated on cross-section time series spanning from 2009–2012 to investigate whether the 2008 economic crisis affected the behaviour of the CRAs regarding the short-term determinants of their ratings.

GDP per capita and inflation were selected as the M variables, that is, the variables included as controls in every regression. These variables enjoy some agreement with regard to their significance in this debate (Afonso, 2003; Bissoondoyal-Bheenick, 2005). Before discussing the results, Table 1 presents correlations at the bivariate level as a first step towards understanding the determinants of the ratings. Interestingly, we find that the ratings correlate much more to variables pertaining to political factors and constraints on the size of public sector than they do with most variables reflecting economic fundamentals. The ten variables with higher correlation coefficients for both Moody's and Standard and Poor's ratings are indicated for economy of space.

The only two economic variables that appear in the top ten is GDP per capita (in logs) and Domestic Credit as percentage of GDP. The World Bank indicators dominate the ranking as they receive four out of the ten places (Government Effectiveness, Rule of Law, Regulatory Quality and Political Stability). This is not a surprise as analysts from the agencies have confirmed that they consult these indicators (Biglaiser and Staats, 2012). The other variables pertain to economic policies (Property Rights, Economic Flows Restrictions) or institutional structure (Business Freedom, Corruption Perceptions). There is some evidence that economic fundamentals are just one element of the entire situation. Acknowledging the limitations of simple correlations, the results of the sensitivity analysis is presented in the next section.

IV. BASELINE RESULTS

We start the analysis using all available data spanning from 1975 up to and including 2012. The outcomes of this analysis are summarized in Tables 2 and 3 where the variables that passed the *CDF* (0) test are noted. As previously described, the average beta (*Beta Aver.*) in Column 2 depicts the partial correlation of that particular variable with the ratings. Column 3 shows the

TABLE 2
EBA results for Moody's ratings

<i>Variable</i>	<i>Beta (Aver.)</i>	<i>St. Error (Aver.)</i>	<i>Sign %</i>	<i>CDF(0)</i>	<i>Obs (Aver.)</i>	<i>VIF (Aver.)</i>
Regulatory Quality	2,93	0,24	100	0,999	752	5,72
Government Effectiveness	2,72	0,21	100	0,999	733	5,38
External Debt	-0,01	0,00	98	0,996	405	1,35
GDP (logs)	0,57	0,04	99	0,996	874	1,33
Rule of Law	2,04	0,20	98	0,986	744	5,30
Investment	0,09	0,01	94	0,985	886	1,20
Government Debt	-0,01	0,00	94	0,983	488	1,19
Executive Election	-0,73	0,26	85	0,982	870	1,05
Fiscal Freedom	-0,04	0,00	91	0,979	853	1,65
Domestic Savings	0,06	0,00	93	0,977	868	1,48
Central Bank Independence	-2,87	0,75	89	0,975	842	1,20
Growth	0,09	0,02	87	0,970	873	1,52
Current Account	0,06	0,01	88	0,969	482	1,35
Economic Flows Restrictions	0,03	0,00	91	0,963	867	2,00

Note: 'Beta (Aver.)' and 'St. Error (Aver.)' give the average coefficient and the standard error, respectively over all regressions. 'Sign %' indicates the percentage of total regressions in which the variable is statistically significant at the five percent level. 'CDF (0)' depicts the result of the CDF test. Values higher than 0,95 indicate a robust association to the dependent variable. 'Obs (Aver.)' describes the average number of observations and 'VIF (Aver.)' the average Variance Inflation Factor over all regressions.

average standard error (*St. Error*) Columns 4 and 5 depict the proportion of times that the variable is significant (*Sign %*) and the cumulative distribution test (*CDF(0)*), respectively. The final two columns describe the number of average observations (*Obs Aver.*) and the average Variance Inflation Factor (*VIF Aver.*) as a check for multicollinearity.

Regarding Moody's, the situation is not very different than that presented when simple correlations are used. Again, policy variables comprise the bulk of the variables that are robustly correlated with the ratings. With the exception of the Political Stability Index, all other World Bank indicators pass the *CDF (0)* test which further confirms the reliance of the ratings on these measures. Since GDP per capita is included in every regression, it can be contended that the effect of these indicators is over and above their correlation with a country's development level (more on this below). Government Effectiveness and Regulatory Quality - two variables essentially capturing perceptions of the degree of the independence of the civil and public service from political pressures, the degree of market friendliness of policy formulation, and the credibility of the government's commitment to such policies - are among the most robust variables. Rule of Law is also a robust variable capturing perceptions regarding, among others, the quality of contract enforcement and property rights. Higher scores on these variables result in higher ratings. The number of times that these variables are statistically significant further supports their prominence.

Another group of variables capturing policies is obvious. Central Bank Independence is a robust variable. The delegation of monetary power to an independence agency is something desirable from the rating agencies. This is valid while controlling for inflation levels. Restrictions on economic flows are equally important in this debate as argued consistently by many scholars

TABLE 3
EBA results for Standard and Poor's ratings

<i>Variable</i>	<i>Beta (Aver.)</i>	<i>St. Error (Aver.)</i>	<i>Sign %</i>	<i>CDF(0)</i>	<i>Obs (Aver.)</i>	<i>VIF (Aver.)</i>
Regulatory Quality	2,86	0,22	100	0,999	786	5,58
Government Effectiveness	2,71	0,19	100	0,999	768	5,08
GDP (logs)	0,57	0,04	100	0,994	911	1,35
External Debt	−0,00	0,00	96	0,993	431	1,36
Rule of Law	2,12	0,19	99	0,991	776	4,91
Current Account	0,08	0,01	95	0,989	512	1,35
Government Debt	−0,01	0,00	96	0,989	495	1,21
Domestic Savings	0,06	0,00	96	0,988	903	1,54
Central Bank Independence	−3,53	0,71	95	0,985	869	1,15
Fiscal Freedom	−0,04	0,00	93	0,979	885	1,64
Economic Flows Restrictions	0,04	0,00	94	0,973	904	2,20
Sovereign Bond Yield	−0,27	0,04	91	0,966	425	2,13
Investment	0,06	0,01	87	0,964	905	1,17
Growth	0,09	0,02	85	0,964	910	1,50
Corruption Perceptions	0,61	0,07	90	0,960	830	4,95

Note: 'Beta (Aver.)' and 'St. Error (Aver.)' give the average coefficient and the standard error, respectively over all regressions. 'Sign %' indicates the percentage of total regressions in which the variable is statistically significant at the five percent level. 'CDF(0)' depicts the result of the CDF test. Values higher than 0,95 indicate a robust association to the dependent variable. 'Obs (Aver.)' describes the average number of observations and 'VIF (Aver.)' the average Variance Inflation Factor over all regressions.

(Murphy, 2000; Kerwer, 2002; Bruner and Abdelal, 2005; Biglaiser and DeRouen, 2007) and can cause a decrease in rating scores. Utilizing the degree in which the government restricts these flows rather than openness levels, we infer that it is again attitudes (i.e., policies) towards openness that matter. Finally, Fiscal Freedom as measured by top marginal tax on personal and corporate income as well as the total tax burden as a percentage of GDP is a robust predictor and receives a negative sign. Countries with higher taxes (hence, lower values of the index) achieve higher rating scores. On theoretical grounds, this result appears counter intuitive to the 'constrained public sector' perspective of the ratings, however, one explanation for it is that Scandinavian and Central European states are both among the highest ranked and higher taxing countries.

Regarding economic fundamentals, the level of indebtedness is an important determinant, as expected, related to lower ratings. On the other hand, the growth of GDP per capita and the size of the economy (GDP levels) are associated with higher ratings. Growth suggests that a country's existing debt burden will become easier to service over time (Cantor and Packer, 1996, p. 39) while bigger countries are thought to be more diversified (Borio and Packer, 2011). In general, the size of the economy has not received much attention in this debate. Investment, a measure of the growth potential of the economy and domestic savings as well as a measure of the structure of the economy are both significant determinants. Finally, the Current Account balance and the dummy for Executive Election year are also robust correlates of Moody's ratings. Concerning

the Standard and Poor's ratings, results are essentially the same. The only primary difference is that the variables of Sovereign Bond Yield and Corruption Perceptions are now robust predictors while the Executive Election dummy is not.

Finally, putting GDP per capita and Inflation through the same test as all of the other variables, we find that they are highly robust for both agencies with values of CDF (0) close to 1. An interesting observation for both agencies is that variables such as Budget Deficit, Foreign Reserves, and Exports Growth are not robust predictors. This is contrary to a number of previous studies (Ferri, Liu and Stiglitz, 1999; Afonso, Gomes and Rother, 2011) but not all of them (Cantor and Packer, 1996). Furthermore, variables relating to financial and investment freedom also do not reach significant levels. This could be due to overlapping information between these variables and those produced by the World Bank.

V. FURTHER ROBUSTNESS CHECKS

V.1 Averaged Data

The results in the previous section indicated the short run correlates of sovereign bond ratings. This subsection utilizes the averaged data for both rating agencies spanning the period 2000–12. For economy of space, the results are summarized in Table 4. Particularly, we note the number of times that a variable was found to be robust in our analysis through different samples and agencies. We also separate the variables into two groups in accordance with the literature. With regard to economic fundamentals, two groups were distinguished. Variables measuring the indebtedness of a country (External Debt, Government Debt) and those characterizing the economy's development and size (GDP per capita and GDP levels) are found to be robust in all settings as is the level of Domestic Savings. Current account balance is only significant for the Standard and Poor's data while Domestic Investment is not significant for either agency.

Examining the robust variables measuring the willingness to repay, the World Bank indicators, in particular those that capture perception regarding the independence of the civil service from political pressure and the credibility of the government commitment to private-sector-friendly policies (Government Effectiveness, Regulatory Quality) as well as the strength of the court system and the enforcement of contracts and property rights (Rule of Law) are again highly robust. In addition, Restrictions on Economic Flows and Corruption perceptions are robust correlates for both rating agencies while Fiscal Freedom is only significant for the Moody's sample. Lastly, Central Bank Independence does not appear to be a long term correlate of bond ratings. The level of Inflation is one variable that was not included in any of the previous groups. This is because it can be considered as either an economic fundamental indicator or simply as a variable signalling the government's preferences over monetary policy. In either case, however, it is a very relevant variable for the ratings.

V.3 Post 2008 Sample

To determine whether the behaviour of the rating agencies changed following the global economic crisis of 2008, we focus on data covering the years 2009–12. The results are practically unchanged. Almost all of the variables that were found to be robust correlates of the ratings in the previous samples again pass the CDF (0) test in this setting. One exception is the Restrictions of Economic Flows that appears to diminish in significance during the post crisis period. Nevertheless, the behaviour of the rating agencies between the post- and pre-crisis periods seems to be consistent.

TABLE 4
Summary of EBA results

Variables	Moody's			Standard and Poor's		
	Full Sample	Averaged Data	Post 2008	Full Sample	Averaged Data	Post 2008
<i>Political Risk (Willingness to Repay)</i>						
Regulatory Quality	x	x	x	x	x	x
Government Effectiveness	x	x	x	x	x	x
Rule of Law	x	x	x	x	x	x
Corruption Perceptions		x	x	x	x	x
Central Bank Independence	x		x	x		x
Economic Flows Restrictions	x	x		x	x	
Fiscal Freedom	x	x		x		x
Executive Elections	x					
Government Freedom						
Property Rights						
Executive Ideology						
Business Freedom						
Financial Freedom						
Investment Freedom						
Political Rights						
Press Freedom						
Political Stability						
<i>Economic Risk (Ability to Repay)</i>						
GDP per capita	x	x	x	x	x	x
Inflation	x	x	x	x	x	x
GDP (logs)	x	x	x	x	x	x
External Debt	x	x	x	x	x	x
Domestic Savings	x	x	x	x	x	x
Government Debt	x	x	x	x	x	x
Current Account	x		x	x	x	x
Domestic Investment	x		x	x		x
Growth	x			x		
Sovereign Bond Yield				x		
Default						
Domestic Credit						
Budget Deficit						
Export Growth						
Government Revenue						
Foreign Reserves						
Exchange Rate						

Note: This table summarizes the results of EBA analysis through the different samples. Each column refers to the particular sample, and each line to a specific variable. An 'x' indicates that the variable at hand passes the $CDF(0)$ test in that particular set up.

V4. World Bank Variables

Finally, one last test is conducted. Recently, Beaulieu, Cox and Saiegh (2012) claimed that the weak effect of political variables (in their case Regime Type) on the level of bond ratings could be due to several issues including selection effects, overlapping information between economic and political variables, samples based only on developing countries, or all of the above. While selection effects seem statistically significant, the inclusion of GDP per capita as a control variable appears to have the most detrimental impact on the effect of the (one) political variable they control for.⁴ The authors point out that political variables may be working through their effect on economic fundamentals.

Our results thus far provide substantial support for political and policy related variables on the ratings even while possible selection effects could be present. Our control of GDP per capita in every regression also does not change that. As a final test, the three main World Bank variables (Regulatory Quality, Government Effectiveness, and Rule of Law) are regressed on GDP per capita and EBA is performed on the residuals from these regressions. That is, we use only that part of the variance in these political variables that is not explained by differences in the levels of economic development. The results do not change, and all indicators again receive high scores on the $CDF(0)$ statistic.⁵ Our primary conclusion that political variables are strong predictors of rating grades remains valid.

VI. CONCLUSIONS

Credit Rating Agencies are considered as a catalytic force in the global economy. Several authors expressed the view that, through their structural power, agencies could act as 'agents of convergence' and stimulate certain policy choices on behalf of states that strive to achieve good ratings (Sinclair, 1994; Datz, 2004; Elkhoury, 2008). Whether this convergence is, in fact, occurring and is indeed driven by the agencies' operations is an issue not addressed in this paper. What is offered in this paper is a first step towards this direction by providing some evidence that the necessary condition for this to be valid is satisfied. That is, it is demonstrated that the agencies do exhibit preferences towards certain policies.

In particular, institutional environments that are market friendly and constrain the public sector as well as policies that separate politics from the economy are rewarded with higher ratings by the agencies. This is in contrast with the prevailing belief (at least in the quantitative part of this debate) that economic fundamentals are the driving force behind rating assessments. Until recently, policies and political variables were not considered as significant determinants of the ratings (Biglaiser and Staats, 2012). The results in this paper suggest that, when differences in specifications in terms of both variables as well as included countries are taken into account, political variables and policies are among the most robust determinants of sovereign bond ratings.

With the increasing importance of the ratings especially amid a financial crisis, these results stress the significance of previous remarks regarding the implications of the existence of the ratings. Primarily, the incorporation of the ratings in the regulatory scheme of advanced economies certainly transforms the ratings from mere 'opinions' to powerful judgments (Sinclair, 1994; Bruner and Abdelal, 2005). These judgments have the power to restructure the portfolios of market participants which can subsequently have significant implications for both sovereign and

⁴In their results, correcting for selection bias does not make much difference as long as GDP per capita is included in the regression.

⁵Results are available upon request.

private debt issuers particularly in developing countries. Considering that ratings reward certain policy choices over others, it might seem easier for governments that would like to improve their relative standing to engage in reforms rather than decrease their debt levels or strive for higher growth rates.

The implications of these findings are of particular interest to social scientists preoccupied with the effects of globalization and international competition on policy autonomy. Traditionally, studies of policy convergence have focused on three instances of globalization including the multinational character of production, trade in goods and services, and financial capital mobility *per se* (Garret, 1998, pp. 791–93). We content that the role of non-state actors (in this instance, the Credit Rating Agencies) has not received adequate attention with regard to its effects on policy autonomy.

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SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article at the publisher's website:

APPENDIX A

Table A1: Previous studies on the determinants of sovereign bond ratings.

Table A2: Variables used in EBA analysis.

Table A3: Countries and years by rating agencies.

APPENDIX B

Figure B1: Distribution of estimated coefficients for exchange rate.

Figure B2: Distribution of estimated coefficients for government debt.