Volume 39, Issue 4

Sovereign Ratings and Finance Ministers' Characteristics

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Abstract

We assess the effect of a newly-compiled set of finance ministers´ characteristics on long-term sovereign rating notations. Using a sample of 26 EU countries between 1980-2012, we find that the existence of more focused delegation-oriented fiscal framework, the Minister of Finance being a woman, and the Minister of Finance having a degree in the areas of finance or "hard sciences" contributes to better sovereign ratings, and the opposite in the case of a Law background.

1. Introduction

Economic, institutional, government, and individual characteristics are usually perceived as relevant determinants of capital markets developments, notably regarding sovereign ratings. Indeed, governments are responsible for the implementation of economic policy, especially at the macro and fiscal level, and therefore the behaviour of governments also plays a role as a potential determinant of financial and capital markets outcomes.

For instance, Ministers of Finance are major key players in implementing fiscal and macroeconomic policies and in shaping expectations about their future behavior, since they have the resources notably to produce economic and fiscal forecasts (von Hagen, 2010). Hence, the personal characteristics of those policy makers are quite relevant, namely in terms of academic and professional background, for purposes related to capital markets credibility.

There are broadly two approaches concerning fiscal governance via the Ministry of Finance: delegation and contracts. In the first one the Finance Minister is responsible for the overall budget. In addition, under the contracts approach, Finance Ministers are in charge of managing the budget process.

Moreover, finance Ministers play an important role in determining public deficits (Jochimsen and Thomasius, 2014) and influencing public debt dynamics (Moessinger, 2014). Ganapolsky & Schmukler (1998) show that after a period of high volatility and political turmoil, a change of the Finance Minister reduces the variance of both stock and bond market returns. Hence, possible (positive) spillovers can also occur for sovereign ratings.

On the other hand, several authors addressed the issue of the determinants of sovereign ratings, notably Cantor and Packer (1996), who identified per capita income, GDP growth, inflation, external debt, level of economic development and default history as important determinants for Moody's and S&P. Afonso (2003), who also included a logistic and an exponential transformation of the ratings, in addition to the linear transformation already used in the literature. Mulder and Monfort (2000) generalized the Ordinary Least Squares (OLS) approach to panel data, using a linear transformation of the ratings.

In this context, and to overcome the limitation of OLS regressions with a linear transformation of the ratings, Bissoondoyal-Bheenick (2005) used an ordered probit model.[1] Moreover, Afonso et al. (2008) analysed the determinants of sovereign ratings from the three main agencies by using a linear regression framework (random effects estimation, pooled OLS estimation and fixed effects estimation) versus an ordered probit response framework.[2]

Nevertheless, Afonso et al. (2011) confirm that logistic and exponential transformations to ratings provide little improvement over the linear transformation, not finding evidence of the so-called "cliff effects" (when investors adjust their portfolio composition to select only investment grade securities). They also highlight the difference between short- and long-term determinants, concluding that GDP per capita, GDP growth, government debt and budget balance have a short-term impact, whereas government effectiveness, external debt, foreign reserves and default history influence ratings in the long-run.

Finally, Amstad and Packer (2015) used several explanatory variables as proxies for fiscal, economic and institutional strength, monetary regime, external position and default history and concludes that a small set of factors can largely explain the rating scale.

Our paper can be linked to broader research area that has explored the influence of CEO and CFO characteristics on corporate finance choices, notably their risk-taking profiles. For

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[1] An OLS regression with a linear transformation of the ratings assumes a constant distance between adjacent rating notches. However, ratings represent a qualitative ordinal assessment of a sovereign credit risk, thus the distance between two adjacent ratings may not be the same.

[2] Instead of assuming a rigid shape of the ratings scale, this model estimates the threshold values between rating notches, defining the shape of the ratings curve.

instance, Chava and Purnanandam (2010), using a dataset on executive compensation from 1993 to 2005, report that the risk-taking incentives of chief CEOs and CFOs have a significant impact on firms' financial policies. In addition, there is also another topic in the literature to which our paper can connect with, notably gender issues. For example Li and Zeng (2019), using a large sample of US public firms in the period 2006–2015, report the existence of a negative association between female CFOs and future stock price crash risk.

In this paper, we contribute to literature by assessing to what extent the characteristics of a major policy maker, the Minister of Finance, play a role in the setting by the rating agencies of the long-term sovereign rating notations. Our main results point to the fact that the existence of more focused delegation oriented fiscal framework, the Minister of Finance being a woman, and the Minister of Finance having a degree in the areas of finance or "hard sciences", seems to contribute to a better sovereign rating notation, and the opposite in the case of a Law background.

The remainder of the paper is organized as follows. Section 2 presents the methodology and the data set. Section 3 reports and discusses the empirical results. Section 4 concludes.

2. Methodology and Data

To estimate the impact on credit ratings, $R_{i,t}$, of our set of finance ministers' characteristics, we run the following reduced-form regression:

$$R_{i,t} = \alpha_i + \delta_t + \beta FMC_{i,t} + \gamma X'_{i,t-1} + \pi Y'_{i,t} + \varepsilon_{i,t} \qquad (1)$$

where α_i are country-fixed effects capturing unobserved heterogeneity across countries, and time-unvarying factors; δ_t are time effects to control for global shocks (such as the international oil price or the global business cycle); $FMC_{i,t}$ are the time-varying set of finance ministers' characteristics (see below for details); X_{it} is a vector of macroeconomic variables, lagged to reduce reverse causality.[3] Following the literature (Cantor and Packer, 1996[4]; Monfort and Mulder, 2000; Afonso, 2003; Bissoondoyal-Bheenick, 2005; Canuto, Dos Santos, and Porto, 2012), this vector includes the following key determinants of sovereign ratings (expected sign in parenthesis): real GDP per capita (+), real GDP growth (+), inflation rate (+/-), debt-to-GDP ratio (-), foreign reserves (+), terms-of-trade (+/-), unemployment rate (-).

While earlier papers highlighted the relevance of quantitative macroeconomic variables, qualitative factors were also found to be significant determinants of sovereign ratings by a number of later studies. Bissoondoyal-Bheenick (2005) observed that the qualitative political and social indicators were important ratings' drivers. Butler and Fauver (2006) found that the legal and political institutions of a country significantly affect the ratings. Afonso, Gomes, and Rother (2007) found government effectiveness indicators significant along with macroeconomic variables. Pretorius and Botha (2014) found that in addition to external balance, inflation, GDP growth and foreign reserves, corruption was also a significant determinant of sovereign ratings for 27 African economies. Hence, $Y'_{i,t}$ denotes a vector of political economy and non-economic factors. These include political economy and institutional

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[3] Similar results obtained using contemporaneous regressors (not shown).
[4] The study conducted by Cantor and Packer (1996) is one of the preliminary works in the area of sovereign rating and its determinants. They examined a sample of 49 countries on September 29, 1995, and considered eight economic variables as determinants of the rating provided by Moody's and S&P. They found that six variables, namely, per capita income, GDP growth, inflation, external debt, the level of economic development, and default history significantly affected the sovereign ratings.

proxies such as: the level of democracy (polity2)[5], a variable proxying constraints on the executive (which captures potential veto points on the decisions of the executive), the political system (discrete variable with the following ordering: presidential (0), assembly-elected (1) or parliamentary(2)) and the degree of checks and balances. Governance variables include control for corruption, rule of law, government effectiveness and regulatory quality.[6]

Finally, $\varepsilon_{i,t}$ is an i.i.d. error term with zero mean and constant variance.

In addition we take two aggregate measures as dependent variables: the first, a simple average across the three agencies (Ratings_Avg); the second uses a Principal Component Analysis to extract the common factor (Ratings_PCA).[7]

There are two econometric approaches typically employed in the literature looking at credit ratings determinants. One uses linear regression methods to a linear numerical representation of the ratings (e.g. Cantor and Packer, 1996; Afonso, 2003) since the OLS application is simple and allows for simple generalizations to panel data settings (Mora, 2006). The second uses ordered response models given the fact that ratings are a qualitative ordinal measure and traditional linear estimation techniques are not adequate (for instance, they are biased even in large samples – see Hu et al., 2002; Depken et al., 2007).

Therefore, in the context of an ordered response model, an unobserved latent variable R_{it}^* has a linear form and depends on the same variables as before:

$$R_{it}^* = \alpha_i + \delta_t + \beta FMC_{i,t} + \gamma X'_{i,t-1} + \varepsilon_{i,t} \tag{2}$$

with cut-off points to draw up the boundaries of each rating category, and the final rating notation is given by:

$$R_{it} = \begin{cases} AAA \ (Aaa) & if & R_{it}^* > c_{20} \\ AA+ \ (Aa1) & if & c_{16} > R_{it}^* > c_{19} \\ AA \ (Aa2) & if & c_{15} > R_{it}^* > c_{18} \\ \vdots & & \\ < C & if & c_1 > R_{it}^* \end{cases} \tag{3}$$

The difference between the cut off points determines a non-linearity (i.e. it might be easier to move from AA to AA+, than the subsequent move to AAA.

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[5] This is a summary indicator of institutional quality (whose core is computed by subtracting the autocracy score from the democracy score, resulting in an unified polity scale ranging from +10 (strongly democratic) to -10 (strongly autocratic).

[6] Control for corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Government effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Finally, Regulatory quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.

[7] A likelihood ratio test was used to examine the "sphericity" case. This test comfortably rejects sphericity at the 1 percent level.

For our empirical analysis, we rely on two main estimators: OLS with robust standard errors clustered at the country level and for robustness purposes two ordered models (probit and logit) estimated using maximum likelihood using a robust variance-covariance matrix to account for serial correlation (see Afonso et al., 2011 for details).

Regarding the dataset of the characteristics of Ministers of Finance, we draw on Afonso and Guedes (2014). Some stylised facts of the Ministers' of Finance academic background, in terms of share in the overall data sample, are: Economics (39.8 percent); Law (21.3 percent); Management (7.0 percent); Finance/Accounting (10.4 percent); other Social Sciences (7.9 percent); "Hard Sciences" (4.6 percent) no formal education (8.9 percent). The average age of Finance Ministers was around 51 years old, the average tenure was about 2 years[8], and 4 percent of Finance Ministers were women[9]. For the purpose of the empirical analysis, we code the academic background characteristics as follows: Economics, degree1; Law, degree2; Management, degree3; Finance/Accounting, degree4; Other social sciences, degree5; "Hard sciences", degree6.[10]

Our sample consists of a total of 26 advanced countries between 1980-2012.[11] Data on our dependent variable, $R_{i,t}$, includes data from the three main rating agencies, S&P, Moody´s and Fitch Ratings attributed at 31st December.[12] We group the qualitative sovereign rating notations in 21 categories by putting together the few observations below C, which are given the value one, while AAA observations receive the value 21 (see Table A1 in the appendix).

All macroeconomic and fiscal variables are retrieved from the IMF´s World Economic Outlook Database. Institutional, political economy and non-economy variables come from World Bank´s Database on Political Institutions and World Bank´s Governance Indicators.

3. Empirical Results

Table 1 reports the baseline results for the estimation of specification (1), using the average ratings from the three main rating agencies.[13] The core determinants turn out to have the expected effect, notably increases in per capita GDP and in the foreign reserves, as well as improvements in the terms of trade contribute to the increase in the sovereign rating. On the other hand, higher debt-to-GDP ratio, inflation rate and unemployment imply a worsening of the credit ratings.

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[8] This corresponds to the number of years a Finance Minister has been consecutively in charge.

[9] Dummy variable, equal to 1 in years where the Finance Ministers is a woman, 0 otherwise.

[10] Information was collected regarding the academic background of Finance Ministers (or Ministers of Economics, depending on who is in charge of fiscal policy in each country).

[11] United Kingdom, Austria, Belgium, Denmark, France, Germany, Italy, Luxembourg, Netherlands, Sweden, Finland, Greece, Ireland, Malta, Portugal, Spain, Cyprus, Bulgaria, Czech Republic, Slovak Republic, Estonia, Latvia, Hungary, Lithuania, Slovenia, Poland.

[12] Some studies compared the ratings of the agencies. For instance, Hill, Brooks, and Faff (2010) compared the variation in credit quality assessment by S&P, Moody's and Fitch and found that the rating agencies vary in their assessments usually by one or two notches. Iyengar (2012) compared the ratings of Moody's and S&P and found most of the determinants to be similar between the two agencies.

[13] Results remain qualitatively unchanged if instead of the average we use one of the three independent rating agencies´ rating classification as the dependent variable. Table A2 provides robustness to alternative estimators and dependent variables.

Table 1 – Baseline Effect of Ministers´ Characteristics on Sovereign Debt Ratings: Baseline (average ratings from the three main rating agencies)

Specification / Regressors	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Real GDP per capita (t-1)	-0.459	-0.065	-0.037	1.705	1.756**	2.005***	4.152	4.395***	4.652***
	(0.493)	(0.160)	(0.150)	(1.618)	(0.738)	(0.694)	(3.148)	(1.348)	(1.330)
Real GDP growth (t-1)	0.051	0.073	0.098	0.118**	0.119***	0.102***	0.249**	0.249***	0.234***
	(0.068)	(0.061)	(0.064)	(0.052)	(0.036)	(0.035)	(0.096)	(0.065)	(0.067)
Inflation rate (t-1)	-0.010***	-0.009***	-0.008***	-0.000	-0.000	0.000	0.001	0.001	0.001
	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Terms-of-trade (t-1)	0.056	0.094***	0.092***	0.068***	0.073***	0.080***	0.043*	0.045**	0.051***
	(0.079)	(0.032)	(0.035)	(0.024)	(0.017)	(0.018)	(0.023)	(0.017)	(0.018)
Debt-to-GDP ratio (t-1)	-0.008	-0.020***	-0.021***	-0.052***	-0.052***	-0.052***	-0.042**	-0.042***	-0.043***
	(0.017)	(0.007)	(0.007)	(0.017)	(0.010)	(0.010)	(0.015)	(0.009)	(0.009)
Foreign reserves (t-1)	1.076***	0.665***	0.568***	0.224	0.224*	0.204	0.217	0.214*	0.211
	(0.291)	(0.167)	(0.175)	(0.174)	(0.128)	(0.133)	(0.161)	(0.132)	(0.136)
Unemployment rate (t-1)	-0.356***	-0.318***	-0.287***	-0.069	-0.069*	-0.075*	-0.026	-0.024	-0.029
	(0.121)	(0.045)	(0.044)	(0.067)	(0.039)	(0.039)	(0.074)	(0.039)	(0.039)
female_it		1.509***	1.453***		0.467**	0.601***		0.565***	0.685***
		(0.447)	(0.382)		(0.188)	(0.215)		(0.218)	(0.248)
age		0.008	0.007		-0.013	-0.019**		-0.006	-0.011
		(0.016)	(0.016)		(0.009)	(0.010)		(0.009)	(0.010)
tenure		0.191***	0.199***		0.001	-0.000		-0.014	-0.016
		(0.055)	(0.054)		(0.026)	(0.027)		(0.024)	(0.025)
delegation		2.029***	1.777***		6.996***	7.401***		8.047***	8.338***
		(0.361)	(0.376)		(0.523)	(0.579)		(0.576)	(0.620)
degree1			-1.759***			0.274			0.158
			(0.482)			(0.205)			(0.187)
degree2			-0.640			-0.237			-0.266
			(0.439)			(0.193)			(0.212)
degree3			-1.319*			-0.147			0.110
			(0.738)			(0.339)			(0.378)
degree4			-2.768***			0.853**			0.325
			(0.813)			(0.335)			(0.380)
degree5			-0.136			-0.187			-0.110
			(0.532)			(0.267)			(0.299)
degree6			-0.791			0.744**			0.597
			(0.672)			(0.366)			(0.384)
Country Effects	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Time Effects	No	No	No	No	No	No	Yes	Yes	Yes
Number of Observations	352	352	352	352	352	352	352	352	352
R-squared	0.322	0.388	0.437	0.881	0.882	0.888	0.901	0.902	0.905

Notes: Estimation by Ordinary Least Squares. Regarding degrees one has the following labelling: Economics, degree1; Law, degree2; Management, degree3; Finance/Accounting, degree4; Other social sciences, degree5; "Hard sciences", degree6. Constant term as well as country and time effects (where applicable) omitted for reasons of parsimony. Robust standard errors clustered at the country level in parenthesis. *, **, *** denote statistical significance at the 10, 5 and 1 percent level, respectively.

Regarding the specific characteristics of the Ministries of Finance, we find that when they are women there is a positive effect towards sovereign credit ratings, and the same is true for tenure of the Ministries (the latter in the case of specifications 2-3). In addition, the academic background of the Ministry of Finance in the area of Finance (taking into account country fixed effects in the estimation procedure), seems to contribute to attain higher rating levels. Moreover, delegation in the budget procedure increases the rating notations. In addition, we also assessed the relevance of non-economic determinants, and we re-estimated accordingly by adding variables such as, for instance, degree of democracy, corruption, rule of law, government effectiveness, retrieved from the World Bank´s Database on Political Institutions. The results in Table 2 show that, while the baseline conclusions, mentioned above, still hold, better performance in terms of government effectiveness, checks and balances and regulatory quality also improve sovereign ratings.

Table 2 – Effect of Ministers´ Characteristics on Sovereign Debt Ratings: Sensitivity to the inclusion on Non-Economic Factors:

Specification Regressors	(1)	(2)	(3)	(4)	(5)	(6)
Real GDP per capita (t-1)	-0.412***	-0.353***	3.871***	1.425	3.083***	3.734**
	(0.122)	(0.082)	(0.544)	(1.076)	(0.998)	(1.763)
Real GDP growth (t-1)	0.034	0.091**	0.068**	0.082**	0.068*	0.199***
	(0.045)	(0.042)	(0.027)	(0.032)	(0.037)	(0.064)
Inflation rate (t-1)	-0.004***	-0.004***	-0.000	0.001*	-0.000	0.002*
	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
Terms-of-trade (t-1)	0.033	0.083***	0.040***	0.072***	0.034***	0.048***
	(0.033)	(0.022)	(0.011)	(0.018)	(0.012)	(0.018)
Debt-to-GDP ratio (t-1)	-0.013**	-0.018***	-0.017**	-0.059***	-0.011*	-0.054***
	(0.006)	(0.005)	(0.007)	(0.010)	(0.006)	(0.010)
Foreign reserves (t-1)	0.509***	0.370***	0.061	0.013	0.098	-0.012
	(0.128)	(0.129)	(0.081)	(0.136)	(0.086)	(0.141)
Unemployment rate (t-1)	-0.146***	-0.189***	-0.010	-0.075*	-0.023	-0.038
	(0.030)	(0.037)	(0.027)	(0.046)	(0.028)	(0.049)
female_it	0.292	1.089***	0.033	0.622**	-0.135	0.626**
	(0.251)	(0.313)	(0.140)	(0.268)	(0.163)	(0.275)
age	0.030*	0.034***	0.001	-0.006	0.007	-0.002
	(0.017)	(0.012)	(0.007)	(0.012)	(0.007)	(0.012)
tenure	0.116**	0.024	-0.009	-0.026	-0.024	-0.041
	(0.054)	(0.042)	(0.018)	(0.031)	(0.019)	(0.029)
delegation	0.488	1.572***	5.514***	2.691*	4.426***	4.531***
	(0.369)	(0.324)	(1.401)	(1.504)	(1.425)	(1.430)
degree1	-1.690***	0.570**	0.227	0.465*	0.357**	0.346
	(0.486)	(0.278)	(0.158)	(0.247)	(0.139)	(0.218)
degree2	-0.538	0.669***	0.039	0.082	0.241	0.005
	(0.492)	(0.234)	(0.173)	(0.220)	(0.154)	(0.227)
degree3	-0.245	0.432	-0.021	0.367	0.112	0.559
	(0.719)	(0.534)	(0.245)	(0.520)	(0.226)	(0.508)
degree4	-2.953***	0.125	0.793**	0.796**	0.719**	0.375
	(0.661)	(0.406)	(0.351)	(0.320)	(0.327)	(0.352)
degree5	0.103	0.293	0.011	0.263	0.158	0.277
	(0.576)	(0.410)	(0.175)	(0.337)	(0.162)	(0.337)
degree6	-1.733***	0.880**	0.039	1.017**	-0.121	0.876*
	(0.653)	(0.355)	(0.258)	(0.452)	(0.218)	(0.449)
Political Economy						
Polity2	1.624***		0.181*		0.016	
	(0.365)		(0.098)		(0.100)	
Constraints on the Executive	-2.969***		1.093***		1.071***	
	(0.504)		(0.298)		(0.379)	
Political System	1.694***		1.205*		1.698**	
	(0.259)		(0.669)		(0.692)	
Checks and Balances	0.766***		0.307***		0.373***	
	(0.090)		(0.059)		(0.064)	
Governance						
Control for corruption		0.338		0.022		-0.248
		(0.478)		(0.634)		(0.622)
Government Effectiveness		2.602***		1.155*		0.655
		(0.490)		(0.592)		(0.686)
Rule of Law		0.494		0.598		0.650
		(0.778)		(1.024)		(1.027)
Regulatory Quality		0.813		2.312***		2.322***
		(0.586)		(0.762)		(0.769)
Country Effects	No	No	Yes	Yes	Yes	Yes
Time Effects	No	No	No	No	Yes	Yes
Number of Observations	295	274	295	274	295	274
R-squared	0.637	0.813	0.956	0.902	0.962	0.913

Notes: Estimation by Ordinary Least Squares. Regarding degrees one has the following labelling: Economics, degree1; Law, degree2; Management, degree3; Finance/Accounting, degree4; Other social sciences, degree5; "Hard sciences", degree6. Constant term as well as country and time effects (where applicable) omitted for reasons of parsimony. Robust standard errors clustered at the country level in parenthesis. *, **, *** denote statistical significance at the 10, 5 and 1 percent level, respectively.

In Table 3, we report the results from the analysis using as dependent variable the separate rating notations from each of the three rating agencies, their simple average value and also the (first) common factor from the Principal Component Analysis. In addtion, we also assess the probability of rating changes via an ordered Probit and Logit analysis.

Table 3 – Effect of Ministers´ Characteristics on Sovereign Debt Ratings: Robustness to alternative estimators and dependent variables

Specification	(1)	(2)	(3)	(4)	(5)	(6)
Estimator	OLS	OLS	OLS	OLS	Ordered Probit	Ordered Logit
Dependent variable	S&P	Moodys	Fitch	Ratings_PCA	Ratings_Avg	Ratings_Avg
Regressors						
Real GDP per capita (t-1)	5.377***	4.023***	3.020**	0.929***	4.468***	10.071***
	(1.061)	(1.515)	(1.181)	(0.266)	(1.424)	(3.372)
Real GDP growth (t-1)	0.176***	0.258***	0.227***	0.047***	0.112***	0.211*
	(0.050)	(0.072)	(0.061)	(0.013)	(0.044)	(0.111)
Inflation rate (t-1)	-0.001	0.001	0.001	0.000	0.001*	0.002
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.002)
Terms-of-trade (t-1)	0.045***	0.043**	0.046**	0.010***	0.032*	0.053*
	(0.016)	(0.020)	(0.018)	(0.004)	(0.018)	(0.033)
Debt-to-GDP ratio (t-1)	-0.037***	-0.037***	-0.037***	-0.009***	-0.050***	-0.097***
	(0.007)	(0.009)	(0.008)	(0.002)	(0.010)	(0.025)
Foreign reserves (t-1)	0.158	0.344**	0.212*	0.042	0.117	0.063
	(0.132)	(0.155)	(0.130)	(0.027)	(0.105)	(0.251)
Unemployment rate (t-1)	-0.015	-0.037	-0.040	-0.006	-0.077**	-0.061
	(0.037)	(0.043)	(0.035)	(0.008)	(0.034)	(0.073)
female_it	0.761***	0.703***	0.464*	0.137***	0.138	-0.047
	(0.229)	(0.262)	(0.260)	(0.050)	(0.276)	(0.536)
age	-0.007	-0.017	-0.006	-0.002	-0.011	-0.004
	(0.010)	(0.012)	(0.009)	(0.002)	(0.012)	(0.027)
tenure	-0.042**	-0.012	0.015	-0.003	0.075*	0.084
	(0.021)	(0.029)	(0.027)	(0.005)	(0.039)	(0.086)
delegation	8.906***	7.738***	8.029***	1.671***	15.333***	35.096***
	(0.529)	(0.691)	(0.529)	(0.124)	(1.185)	(2.806)
degree1	0.061	0.075	0.157	0.032	-0.079	0.090
	(0.183)	(0.239)	(0.205)	(0.037)	(0.303)	(0.614)
degree2	-0.464**	-0.230	-0.266	-0.054	-0.454	-0.367
	(0.208)	(0.254)	(0.215)	(0.042)	(0.338)	(0.707)
degree3	0.141	-0.156	0.358	0.023	0.149	0.004
	(0.352)	(0.419)	(0.340)	(0.076)	(0.522)	(1.016)
degree4	0.383	0.237	0.608	0.066	0.394	0.880
	(0.350)	(0.448)	(0.405)	(0.076)	(0.467)	(1.011)
degree5	-0.135	-0.367	-0.091	-0.022	-0.214	-0.009
	(0.282)	(0.362)	(0.285)	(0.060)	(0.545)	(1.224)
degree6	0.357	0.521	0.495	0.119	0.439	0.929
	(0.347)	(0.362)	(0.414)	(0.077)	(0.593)	(1.249)
Country effects	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	390	380	362	352	352	352
R-squared	0.909	0.874	0.906	0.906		

Notes: Alternative estimators and dependent variables identified in rows 2 and 3, respectively. Specifications 1-3 are estimated with Ordinary Least Squares using alternatively as dependent variables the ratings from S&P, Moodys or Fitch agencies, instead of the average used in the baseline. Specification 4 uses as dependent variable the variable created using Principal Component Analysis as described in the main text as estimates with Ordinary Least Squares. Specifications 5-6 employ the average rating used in the baseline as dependent variable, which is an ordinal variable and, as a result, employ alternatively an ordered Probit and Logit models to estimate its determinants. Regarding degrees one has the following labelling: Economics, degree1; Law, degree2; Management, degree3; Finance/Accounting, degree4; Other social sciences, degree5; "Hard sciences", degree6. Constant term as well as country and time effects omitted for reasons of parsimony. Robust standard errors clustered at the country level in parenthesis. *, **, *** denote statistical significance at the 10, 5 and 1 percent level, respectively.

Results from the individual estimation per rating agency confirm the baseline findings in terms of the core determinants of the ratings, already mentione above (columns 1, 2, and 3 in Table 3). However, in terms of the characteristics of the Ministers, a degree in Law seems to lower rating notation in the case of Standard & Poor's.

Turning to the estimation results from ordered models, we do not find any statistical significance vis-à-vis sovereign ratings regarding the academic characteristics of Ministers. When we peform an additional sensitivity analysis (results available from the authors), adding finance ministers´ characteristics one at a time, we find similar outcomes, notably regarding the detrimental rating assessment from having an academic background in Law.

4. Conclusion

Finance Ministers play an important role in determining public deficits and influencing public debt dynamics. As a result, they shape investors´ expectations regarding the pricing of risk over bond issuance as their credibility and policies may affect yields. In this paper, we empirically evaluated to what extent the characteristics of a major policy maker, the Minister of Finance, are relevant in the setting by the rating agencies of the long-term sovereign rating notations.

Looking at a sample of 26 EU countries over more than 30 years, we uncover that the existence of a more focused delegation oriented fiscal framework, the Minister of Finance being a woman, and the Minister of Finance having a degree in the areas of finance or "hard sciences", seems to improve the sovereign rating notation, while the opposite takes place if the Minister has a Law background. Results are robust to alternative estimators and sensitivity analyses.

Some policy implications can be drawn from our results. For instance, the presence of women as ministers of finance would imply, on average from the results, an additional rating notch in the country rating. In addition, the existence of a more delegation orientated fiscal framework also would improve the ratings by more than one notch.

The set of results in our paper are valid for the EU countries, which might not be translated to other countries. Therefore, regarding future research, it would be interesting to consider another country sample, for instance, emerging market countries, where the characteristics of the ministers of finance might be different, together with different non-economic factors that can impinge on sovereign ratings.

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APPENDIX

List of countries

United Kingdom, Austria, Belgium, Denmark, France, Germany, Italy, Luxembourg, Netherlands, Sweden, Finland, Greece, Ireland, Malta, Portugal, Spain, Cyprus, Bulgaria, Czech Republic, Slovak Republic, Estonia, Latvia, Hungary, Lithuania, Slovenia, Poland.

Table A1 – Quantitavive ordinal credit rating transformation

	Ordinal scale	S&P	Moody's	Fitch
Highest quality	21	AAA	Aaa	AAA
High quality	20	AA+	Aa1	AA+
	19	AA	Aa2	AA
	18	AA-	Aa3	AA-
Strong payment capacity	17	A+	A1	A+
	16	A	A2	A
	15	A-	A3	A-
Adequate payment capacity	14	BBB+	Baa1	BBB+
	13	BBB	Baa2	BBB
	12	BBB-	Baa3	BBB-
Likely to fulfil obligations, ongoing uncertainty	11	BB+	Ba1	BB+
	10	BB	Ba2	BB
	9	BB-	Ba3	BB-
High credit risk	8	B+	B1	B+
	7	B	B2	B
	6	B-	B3	B-
Very high credit risk	5	CCC+	Caa1	CCC+
	4	CCC	Caa2	CCC
	3	CCC-	Caa4	CCC-
Near default with possibility of recovery	2	CC	Ca	CC
	1	C	C	C
Default	0	SD/D		DDD/DD/D

Table A2 – Effect of Ministers´ Characteristics on Sovereign Debt Ratings: adding each characteristic one at a time

Specification Regressors	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Real GDP per capita (t-1)	4.323***	4.211***	4.165***	4.152***	4.053***	4.120***	4.181***	4.153***	4.145***	4.355***
	(1.364)	(1.337)	(1.363)	(1.356)	(1.376)	(1.347)	(1.361)	(1.359)	(1.348)	(1.338)
Real GDP growth (t-1)	0.250***	0.248***	0.251***	0.249***	0.248***	0.245***	0.253***	0.244***	0.249***	0.247***
	(0.064)	(0.064)	(0.064)	(0.064)	(0.063)	(0.061)	(0.064)	(0.068)	(0.064)	(0.064)
Inflation rate (t-1)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Terms-of-trade (t-1)	0.043**	0.045**	0.043**	0.043**	0.047***	0.046***	0.041**	0.042**	0.043**	0.043**
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Debt-to-GDP ratio (t-1)	-0.042***	-0.042***	-0.043***	-0.042***	-0.042***	-0.043***	-0.042***	-0.042***	-0.042***	-0.043***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Foreign reserves (t-1)	0.215*	0.218*	0.216*	0.217*	0.228*	0.220*	0.221*	0.202	0.218*	0.220*
	(0.130)	(0.130)	(0.131)	(0.130)	(0.132)	(0.128)	(0.130)	(0.136)	(0.129)	(0.129)
Unemployment rate (t-1)	-0.022	-0.027	-0.026	-0.026	-0.030	-0.026	-0.026	-0.027	-0.029	-0.024
	(0.038)	(0.039)	(0.038)	(0.038)	(0.037)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)
female_it	0.565***									
	(0.217)									
age		-0.006								
		(0.009)								
tenure			-0.020							
			(0.023)							
delegation				7.918***						
				(0.567)						
degree1					0.161					
					(0.161)					
degree2						-0.316*				
						(0.184)				
degree3							0.186			
							(0.295)			
degree4								0.244		
								(0.378)		
degree5									-0.229	
									(0.243)	
degree6										0.442
										(0.355)
Country effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Observations	352	352	352	352	380	380	380	380	380	380
R-squared	0.902	0.901	0.901	0.901	0.869	0.869	0.869	0.869	0.870	0.870

Notes: Economics, degree1; Law, degree2; Management, degree3; Finance/Accounting, degree4; Other social sciences, degree5; "Hard sciences", degree6. Constant term as well as country and time effects (where applicable) omitted for reasons of parsimony. Clustered standard errors in parenthesis. *, **, *** denote statistical significance at the 10, 5 and 1 percent level, respectively.