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Location of banks and their credit ratings

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Abstract

Purpose – This paper aims to examine whether credit ratings of banks are related to their location, i.e. inside or outside the Euro Area.

Design/methodology/approach – The authors estimate a multilevel ordered probit model for banks' credit ratings in 2011 and control for bank-specific factors. They use the overall ratings and the external support ratings provided by Fitch as the dependent variable.

Findings – Banks located in Euro Area member countries, on average, receive a higher credit rating from Fitch than banks located outside the Euro Area. Evidence for a “too-big-to-fail” and a “too-big-to-rescue” effect was also found.

Research limitations/implications – The monetary union effect on banks' credit ratings may be affected by the period under investigation. The ratings refer to August 2011, when the European sovereign debt crisis was at its height. This implies that, if anything, the Economic and Monetary Union (EMU) effect is underestimated.

Practical implications – Large banks in the Euro Area receive higher credit ratings, so they have a competitive advantage over small banks located outside the Euro Area.

Social implications – The present evidence suggests that small European countries with an extensive banking sector will be better off if they are member of the European EMU.

Originality/value – The relationship between location of banks and their credit ratings has hardly been researched before. The present evidence is directly related to a debate in the literature on this issue.

Keywords Credit ratings, Banks, Monetary union

Paper type Research paper

1. Introduction

This paper examines whether credit ratings of banks located inside or outside the Euro Area are different (see [Amtenbrink and de Haan, 2012](#) for a review of research on credit ratings). The location of a bank may affect the likelihood that it receives support from the central bank or the government. However, conflicting views have been put forward as to whether

JEL classification – F30, G21

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banks are better off inside or outside the Euro Area. [Buiter and Sibert \(2008, p. 2\)](#) argue that banks located in the Euro Area profit from the European Central Bank's (ECB) lender-of-last-resort facilities. Referring to Iceland's experience, they argue that the:

[...] only way for a small country like Iceland to have a large internationally active banking sector that is immune to the risk of insolvency triggered by illiquidity caused by either traditional or modern bank runs, is for Iceland to join the EU and become a full member of the Euro Area[1].

If true, this reasoning implies that banks located in the monetary union should receive higher external support and overall ratings than banks located outside the monetary union. However, according to [De Grauwe \(2011, p. 2\)](#), members of a monetary union:

[...] issue debt in a currency over which they have no control. It follows that financial markets acquire the power to force default on these countries. This is not the case in countries that are not part of a monetary union, and have kept control over the currency in which they issue debt.

De Grauwe illustrates this argument by comparing Spain (a Euro Area country) and the UK (a non-Euro Area country). Even though the government debt ratio of the UK has increased more and is higher than that of Spain, financial markets have singled out Spain and not the UK as the country that could get entangled in a government debt crisis. This reasoning implies that countries that are part of a monetary union have less ability to support ailing banks when they are fiscally constrained. If true, this reasoning implies that banks located in the monetary union should receive lower external support and overall ratings than banks located outside the monetary union.

We test both contrasting views by estimating a multilevel model using data for 2011 for a worldwide sample of banks to examine whether the location of banks is related to the probability (as perceived by Fitch) that banks receive external support. The European sovereign debt crisis, which started to unfold in 2010, has raised concerns about the capacity of governments to save their financial sector. So, if there is any suitable point in time to address our research question, it should be the year 2011. This is confirmed by a report of Standard and Poor's, which states that the relation between the credit ratings of European banks and government support has never been more important ([Standard and Poor's, 2011](#)). Unfortunately, only Fitch publishes external support ratings, which we use as our main dependent variable, as it captures the likelihood that a bank will receive government support if it faces financial difficulties. We also run regressions using overall credit ratings provided by Fitch, controlling for the so-called stand-alone rating which reflects the capacity of a bank to meet its financial obligations without external support. The stand-alone rating captures bank-specific factors affecting the overall credit rating.

Our results suggest that, controlling for other factors, banks located in Euro Area member countries receive a higher credit rating from Fitch than banks located outside the Euro Area, thereby providing support for the view of [Buiter and Sibert \(2008\)](#). This is an important result, also from a policy perspective. Take, for instance, the discussion about a Greek exit from the Euro Area. Our results suggest that a "Grexit" will not be beneficial for Greek banks.

The remainder of this paper is organized as follows. Section 2 outlines how our work is related to previous studies. Section 3 describes our methodology and data used, while Section 4 presents our main results and discusses the findings of a sensitivity analysis. Section 5 offers the conclusions.

2. Related studies

To the best of our knowledge, the only study that has dealt with similar issues as the present paper is [Sironi \(2003\)](#). This author has touched upon the issue of monetary union membership when studying whether bank risk is adequately reflected in subordinated notes and debts spreads of European banks in the period 1991-2000. Dividing his sample into Euro Area and non-Euro Area countries, he reports that “too-big-to-fail” (TBTF) benefits were present for banks located in Euro Area countries in the period 1991-1996 but not thereafter, while these benefits were never present for banks in non-Euro Area countries. He attributes this result to the loss of independent monetary policy of countries in the monetary union and the foundation of the Stability and Growth pact. According to Sironi, both features of the monetary union put constraints on the capacities of governments to save an ailing bank.

Similar to the present paper, [Caporale *et al.* \(2012\)](#) model bank ratings assigned by Fitch. These authors incorporate a country index to establish whether country-specific factors affect bank ratings using a sample of 681 international banks over the period 2000-2007. They find strong evidence of country effects on bank ratings such that banks in some countries have systematically higher ratings than others. Using the same sample, also [Bellotti *et al.* \(2011\)](#) model bank ratings assigned by Fitch and include a country indicator to capture country-specific variations in ratings under the rationale that a bank’s rating is related to the country in which it is based. Inclusion of this country effect substantially raises the ability of their ordered probit model to accurately predict international bank ratings relative to models that exclude country effects. Different from the current paper, both studies do not examine differences between banks located in countries inside and outside the European monetary union.

[Caporale *et al.* \(2011\)](#) analyze differences between bank ratings of Fitch between “old” and “new” EU countries. Their hypothesis is that banks from “old” EU countries that have the same financial position as those from “new” EU countries have higher ratings. This could reflect differences in country risk (given that bank ratings cannot exceed sovereign ratings) or differences in legal and regulatory factors. These authors report that “new” EU countries typically have lower ratings than “old” EU countries, after controlling for financial variables. Also this study does not examine differences across countries inside and outside the Euro Area.

A final related study is by [Hau *et al.* \(2013\)](#), who examine credit ratings assigned to banks in Europe and the USA by the three largest credit rating agencies (CRAs) over 1990-2011. These authors focus on the quality of ratings by comparing the ranking of banks’ credit ratings and the ranking of banks based on expected default two years later. They find that bank characteristics significantly affect rating quality. [Hau *et al.* \(2013\)](#) also show that CRAs tend to assign more favorable ratings to large banks so their results provide evidence for the “too-big-to-fail” problem. In our analysis, we will therefore control for bank size.

3. Methodology

Rating agencies make a distinction between the likelihood that a bank receives external support and the capacity of a bank to meet its financial obligations without any external support (stand-alone capacity). The overall rating takes into account a bank’s chances to receive external support and its stand-alone capacity. Only Fitch publishes a rating on the

likelihood of external support as well. According to the Fitch Web site, external support ratings:

[...] do not assess the intrinsic credit quality of a bank. Rather they communicate the agency's judgment on whether the bank would receive support should this become necessary. These ratings are exclusively the expression of Fitch Ratings' opinion even though the principles underlying them may have been discussed with the relevant supervisory authorities and/or owners[2].

This study uses Fitch's external support ratings as the dependent variable, as well as the overall ratings provided by Fitch[3]. The stand-alone ratings are used as the control variable in models for the overall ratings. Data on credit ratings were retrieved from Bankscope[4]. Appendix 1 shows the number of banks and their location used in our analysis. Data availability determines our sample.

As credit ratings are presented in an ordinal way, we follow previous studies such as Afonso *et al.* (2011, 2012) and estimate the effect of bank location in an ordered probit model. The overall rating of Fitch has 21 notches, while the scale of the stand-alone rating runs from 1 to 10. Fitch's external support rating runs from 1 to 5, with 1 being the highest attainable notch, meaning that a bank has a high likelihood of receiving external support. For the sake of comprehensibility, the external support scale is inverted so that a value of 5 reflects the highest likelihood of support. The correlation between Fitch's stand-alone and external support ratings for the banks in our sample is only 0.26, confirming that these ratings measure different dimensions of banks' credit risk.

We use Fitch's overall and external support ratings of the banks in our sample as dependent variables. A multilevel regression is run, because the variables are measured at different levels (banks and countries) so that observations at the bank level cannot be treated independently of each other. Ignoring the multilevel structure of the data can potentially lead to biased standard errors of the coefficients at the country level, as they would be based on overestimated sample sizes. The model estimated is:

$$Rating_{i,j} = \beta_{i,j} + \beta_1 MonetaryUnion_{i,j} + \beta_2 X_i + \beta_3 Y_j + \vartheta_{i,j} \quad (1)$$

Where the subscript i refers to bank i and the subscript j refers to country j . *MonetaryUnion* is a dummy variable taking the value of 1 when a bank's home country is part of the Euro Area. This dummy variable picks up differences in credit ratings between banks located in Euro Area countries and that of banks located in non-Euro Area countries. The vector X contains bank-specific control variables and the vector Y contains country-specific control variables, while ϑ is the error term.

The regressions contain several bank-specific control variables taken from Bureau Van Dijk's Bankscope (2011). *Stand_Alone_i* is Fitch's stand-alone credit rating of a bank, which measures the intrinsic capacity of a bank to honor its financial obligations. It is included in the model for the overall ratings to control for bank-specific determinants of credit ratings. The stand-alone ratings also pick up variation in the operating environments of banks (Fitchratings, 2011, p. 25)[5].

Systemic_Size_i is calculated as a bank's total liabilities relative to its home country's gross domestic product (GDP)[6]. As pointed out by Boyd and Runkle (1993), failure of a large bank is supposedly more feared by supervisors than failure of a small bank, as the former is more likely to result in macroeconomic externalities. Banks that are "too-big-to-fail" receive a *de facto* government guarantee, which will be reflected in their riskiness as perceived by CRAs[7]. Hau *et al.* (2013) provide evidence for this. Such a

government guarantee reduces market discipline by decreasing investors' incentives to monitor and price the risk-taking of TBTF banks (Acharya *et al.*, 2013; Belkhir, 2013). In addition, TBTF financial institutions can borrow at costs that do not reflect the risks otherwise inherent in their operations (Brewer and Jagtiani, 2013). However, recently, some studies have pointed out that banks may also be "too big to be rescued". If governments are fiscally constrained, they may have insufficient means to bail out a failing large bank. Demirgüç-Kunt and Huizinga (2013) find evidence for this, as the governments' fiscal position affects banks' credit default swap spreads during times of financial upheaval. Similarly, Correa *et al.* (2014) report that sovereign rating changes have a significant, non-linear and robust impact on bank excess stock returns. This effect is stronger for sovereign downgrades than for upgrades. Their results suggest that banks with more government support before the rating event tend to experience a significantly larger fall in excess stock returns. In view of these studies, we test for a non-linear relationship between bank size and external support ratings by including the squared size measure.

Subsidiary_i is a dummy that is one for subsidiaries and that captures possible support from a parent bank[8]. Subsidiaries often rely on lifelines from their parent bank, which decrease their credit risk.

State Bank_i is a dummy variable that is one if a bank is state-owned, and zero otherwise. Being state-owned probably reduces a bank's credit risk as well.

The following country-specific variables are included. First, *LagPublic_Debt_i*, which expresses the lagged public debt-to-GDP ratio of a bank's home country. It is included as a proxy for the fiscal capacity of a country to absorb a banking crisis (Demirgüç-Kunt and Huizinga, 2013). The reason to include a lagged value is to control for reverse causation.

Second, the variable *GDP_per_Capita_i* (measured in \$10,000) controls for different levels of economic development of countries[9].

The variance inflation factor (VIF) test did not suggest the presence of multicollinearity problems (Appendix 2).

4. Results

Table I shows Fitch credit ratings for banks located in countries inside and outside the Euro Area (see Appendix 1 for a list of countries and the number of banks included per

Rating	Scale range	N	Outside Euro Area				Inside Euro Area				
			Mean	SD	Minimum	Maximum	N	Mean	SD	Minimum	Maximum
Fitch overall rating	1-21	483	13.13	3.76	3	21	174	14.45	3.20	6	20
Fitch external support rating	1-5	616	2.90	1.65	1	5	248	3.99	1.22	1	5
Fitch stand-alone rating	1-10	483	5.75	1.75	1	9	174	5.42	1.71	1	9

Notes: This table presents summary statistics of the various ratings being studied in this paper for banks inside and banks outside the Euro Area. The first column shows the scale of the ratings. The next columns show the number of banks (N), the mean rating, the standard deviation and the minimum and maximum rating for banks outside the Euro Area. The next columns give the same statistics for banks inside the Euro Area. Country origin of the banks is shown in Appendix 1

Table I.
Credit ratings

country; the Appendix also indicates which countries are part of the Euro Area). The means of the overall credit ratings are higher for banks based in the Euro Area. As the stand-alone ratings of banks located in countries inside the Euro Area and those of banks located in countries outside the Euro Area are very similar, the difference in the overall ratings stems from the difference in the support rating[10]. This is confirmed by Fitch's external support ratings. Banks in the Euro Area have an average external support rating of 3.99, while the figure for banks outside the Euro Area is 2.90. This higher support rating for Euro Area banks is unlikely to be caused by a larger government support received during the crisis, as bank bailouts were not unique to the Euro Area. The difference in the support rating must rather be sought in the varying willingness and ability of sovereigns to provide aid. Apart from Euro Area membership, the willingness and ability of sovereigns to support ailing banks may also depend on bank size. The average size (proxied by bank liabilities divided by GDP) for banks outside the Euro Area is 0.076, while the average size for banks inside the Euro Area is 0.034. So including size in the regression models is important to control for these differences in relative bank size.

Table II shows our ordered probit estimation results. In Column (1), the overall rating is the dependent variable, while in Column (2), the external support rating is the dependent variable. In this specification, the stand-alone rating is not included as an explanatory variable. The following conclusions can be drawn from the regressions. First, the results indicate that banks in the Euro Area are considered by Fitch to be more likely to receive external support than banks outside the Euro Area. Also, the average overall rating of a bank located in the Euro Area is higher than that of a bank located outside the Euro Area. Our results therefore provide support for Buiter and Sibert's (2008) view that it is beneficial for banks to be located in a country in the Euro Area.

Explanatory variable	(1) Fitch overall rating Ordered probit	(2) Fitch external support rating Ordered probit	(3) Fitch external support rating Ordered probit
Monetary union	0.822 (6.38)**	0.889 (7.13)**	0.395 (2.52)*
Liabilities/GDP 2010	1.695 (4.03)**	3.587 (6.44)**	5.000 (8.33)**
(Liabilities/GDP 2010) ²	-0.594 (-2.38)*	-1.201 (-3.59)**	-1.754 (-5.10)**
Stand-alone rating	0.844 (20.57)**		
GDP per capita 2009 (measured in \$10,000)	0.269 (6.10)**	0.125 (3.55)**	-0.058 (-1.58)
Public debt 2009	0.002 (1.52)	0.003 (1.83)	
State bank	0.931 (6.16)**	0.904 (6.41)**	1.058 (7.29)**
Subsidiary	0.372 (4.03)**	0.634 (6.62)**	0.633 (6.02)**
Sovereign rating			0.112 (6.71)**
Number of banks	657	832	823
Number of countries	74	77	75

Notes: This table presents ordered probit estimates; dependent variables: Fitch overall and support ratings; *t*-statistics are given in parentheses, while the coefficients show marginal effects; *, ** denotes significance at the 5 and 1% level, respectively

Table II.
Estimation results:
baseline regressions

Second, our results suggest a hump-shaped relationship between bank size and credit ratings. An increase in the ratio of a bank's liabilities relative to its home country's GDP first increases the support rating, indicating a higher likelihood of support (TBTF). The negative coefficient of the quadratic term, however, implies that the positive marginal effect on the external support rating of increasing size decreases and becomes eventually negative (too-big-to-rescue).

The coefficients of the other two bank-specific dummies are positive and significant at the 1 per cent level. State-owned banks and subsidiaries have, on average, a higher chance to receive external support. Finally, banks located in rich countries are associated with higher probabilities of external support.

We have done several robustness tests to examine whether our main findings are robust. First, sovereign credit ratings reflect a country's creditworthiness and they can serve as a proxy for a country's capacity to bail out failing banks. [Borensztein et al. \(2007\)](#) and [Gande and Parsley \(2005\)](#) document that sovereign debt constitutes a relevant benchmark for domestic interest rates, affecting the cost of corporate borrowings. We have, therefore, redone the regressions shown in [Table II](#), including sovereign credit ratings. The public debt ratio is excluded from this specification, because this variable is likely to be picked up by the sovereign rating ([Afonso et al., 2011](#)). Column (3) in [Table II](#) shows the outcomes using the support rating as the dependent variable. In line with the results of previous studies, the coefficient of the sovereign rating is significant. It turns out that the coefficient of the monetary union dummy is lower compared to the results reported in Column (2), but remains significant at the 5 per cent level.

Second, the use of the stand-alone rating to control for bank-specific factors may be criticized. Following previous studies, we have, therefore, included the following bank-specific variables: equity/assets, pre-tax profits/assets, impaired loans/gross loans and loan loss reserves/gross loans. As shown in the first column of [Table III](#), replacing the stand-alone rating by these bank-specific variables yields a lower estimate of the coefficient on the monetary union dummy, but it remains significant at the 1 per cent level.

Third, the control group of non-Euro Area countries does not only differ from Euro Area countries in terms of economic development, but also regarding financial regulation and quality of governance. GDP per capita might fail to capture these country differences. Therefore, as a further robustness check, we include governance and financial regulation indexes in the regressions. Both variables were constructed using information from the Economic Freedom of the World database of the Fraser Institute ([Gwartney et al., 2011](#)) and the International Country Risk Guide[11]. Including these variables reduces the magnitude of the coefficient on the monetary union dummy, but it remains significant at the 1 per cent level, as shown in Column (2) of [Table III](#).

As there is no consensus in the literature on how to measure bank size, we finally used an alternative proxy for systemic size, namely, the ratio of a bank's liabilities to the liabilities of the banking sector as a whole. This again does not affect our major findings concerning the impact of the location of the bank, although the coefficient of this alternative size indicator is now significant at the 5 per cent level instead of the 1 per cent level (Column 3 of [Table III](#)).

Explanatory variable	(1) Fitch overall rating Ordered probit	(2) Fitch external support rating Ordered probit	(3) Fitch external support rating Ordered probit
Monetary union	0.442 (3.66)**	0.727 (6.21)**	0.482 (4.17)**
Size	2.398 (5.85)**	3.933 (7.49)**	0.596 (2.24)*
Size ²	−0.999 (3.91)**	−1.338 (−4.10)**	−0.094 (−2.32)*
Equity/assets 2010	−0.134 (−0.20)		
Impaired loans/loans 2010	−3.058 (−4.42)**		
Profits/assets 2010	3.893 (3.57)**		
Reserves/loans 2010	−0.002 (−0.12)		
GDP per capita 2009 (measured in \$10,000)	0.424 (12.53)**	−0.165 (−2.59)**	0.294 (8.59)**
Public debt 2009	0.005 (3.23)**	0.003 (1.67)	0.004 (2.81)**
State bank	0.623 (4.32)**	0.983 (6.93)**	0.911 (6.67)**
Subsidiary	0.331 (3.85)**	0.658 (6.91)**	0.600 (6.44)**
Governance		0.439 (5.49)**	
Bank regulation		0.354 (5.52)**	
Number of banks	735	817	882
Number of countries	74	72	83

Notes: This table presents ordered probit estimates; dependent variables: Fitch overall and support ratings; *t*-statistics are given in parentheses, while the coefficients show marginal effects; *, ** denotes significance at the 5 and 1% level, respectively; in Columns (1) and (2), size is measured by liabilities/GDP in 2010; in Column (3), it is measured as liabilities/total banking sector liabilities

Table III.
Estimation results:
sensitivity
regressions

5. Concluding comments

Our results are broadly in line with [Buiter and Sibert's \(2008\)](#) argument that banks located in the Euro Area are better off because they receive a higher credit rating, when controlling for systemic relevance and other bank-specific factors and characteristics of the home country. In our view, this is an important result, also from a policy perspective. Take, for instance, the discussion about a Greek exit from the Euro Area. Our results suggest that this will not be beneficial for Greek banks. For other EU member countries considering entry into the Euro Area, this might be yet another reason for joining.

The monetary union effect on banks' credit ratings may be affected by the period under investigation. Our ratings refer to August 2011, when the European sovereign debt crisis was at its height. This implies that, if anything, the effect of location is underestimated. At the time, several countries in the Euro Area saw their borrowing conditions worsening rapidly, making it less likely that banks located in these countries would receive support from their government. Still, future research might include ratings over later years to examine whether our findings hold if more recent observations are taken up.

Notes

1. Member countries of the European Union (EU) can join the Euro Area (i.e. introduce the Euro and have a common monetary policy executed by the ECB) once they meet the so-called convergence criteria which relate to the sustainability of public finances, low inflation and exchange rate stability (see Chapter 3 in [de Haan et al., 2012](#) for further details). So before a country can join the monetary union, it has to become a member of the EU.

2. See: www.fitchratings.com/jsp/general/RatingsDefinitions.faces?context=5&detail=505&context_ln=5&detail_ln=500
3. Fitch calls its stand-alone rating the bank individual rating and its overall rating is named the long-term issuer default rating.
4. The accessed version of the database only allowed downloading the most recent rating, the rating issued before the most recent rating and the date at which the most recent rating was issued. As the dates of issuance differ between banks, only the most recent ratings are used. The ratings for this study were obtained in August 2011.
5. In our base model reported in Table II, we assume that this variable captures all other bank-specific determinants of its external support and overall ratings. In one of the sensitivity tests reported in Table III, we instead include the following alternative bank-specific determinants, following previous studies: equity/assets, pre-tax profits/assets, impaired loans/gross loans and loan loss reserves/gross loans.
6. In the sensitivity analysis, we also use bank liabilities relative to the size of the total banking sector as an alternative indicator of size.
7. See Strahan (2013) for an excellent review of the “too-big-to-fail” discussion.
8. In order to identify whether a bank is a subsidiary or in state hands, Bankscope’s ultimate owner data set is used.
9. In one of the sensitivity tests reported in Table III, we also include governance and financial regulation indicators drawn from the Fraser Institute as additional country-specific control variables.
10. More than 40 percent of the variation in the overall rating of Fitch cannot be explained by the variation in the stand-alone ratings, indicating that the rating agency considers external support as an important factor influencing a bank’s overall credit rating.
11. For the financial regulation index, the following indicators of the Fraser Institute’s Economic Freedom index were used: credit market regulation, ownership of banks, foreign bank competition and interest rate controls. The data are from www.freetheworld.com. The governance index consists of the following indicators of the International Country Risk Guide (ICRG): corruption, bureaucracy, democratic accountability and law and order. For each index, a principal component analysis was carried out to check whether the indicators captured a similar dimension before being merged into an index. ICRG data are not freely available. For details see: www.prsgroup.com/about-us/our-two-methodologies/icrg

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Further reading

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Appendix 1

Table AI.
Overview of banks in
our sample

Country	No. of banks
Armenia	1
Argentina	3
Austria ^a	12
Australia	16
Azerbaijan	2
Belgium ^a	15
Bulgaria	2
Brazil	25
Belarus	2
Canada	15
Switzerland	8
Chile	3
China	21
Colombia	3
Costa Rica	2
Czech Republic	1
Germany ^a	44
Denmark	2
Dominican Republic	3
Egypt	3
Spain ^a	45
Finland ^a	1
France ^a	39
United Kingdom	50
Georgia	2
Greece ^a	9
Guatemala	1
Hong Kong	2
Hungary	2
Indonesia	6
Ireland ^a	9
Israel	3
India	10
Italy ^a	46
Jordan	5
Japan	19
Kenya	1
South Korea	12
Kazakhstan	7
Lebanon	3
Sri Lanka	1
Morocco	3
Mexico	11
Malaysia	11
Niger	1

(continued)

Country	No. of banks	Banks and their credit ratings
Nigeria	7	231
The Netherlands ^a	14	
Norway	11	
Panama	6	
Peru	2	
Philippines	6	
Poland	4	
Portugal ^a	8	
Romania	2	
Russia	35	
Sweden	12	
Singapore	7	
Slovenia ^a	5	
El Salvador	1	
Thailand	12	
Tunisia	3	
Turkey	16	
Taiwan	1	
Ukraine	4	
United States	177	
Uruguay	3	
Venezuela	3	
Vietnam	2	
South Africa	9	

Note: ^a Euro Area country in 2011

Table AI.

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Table AII.
Variance inflation
factor: VIF test for
base specification
with Fitch external
support rating as
dependent variable

Regressor	VIF	1/VIF
Public debt	1.25	0.798306
GDP per capita	1.11	0.901402
State bank dummy	1.20	0.833338
Subsidiary dummy	1.20	0.834533
Monetary union dummy	1.20	0.834249
Liabilities/GDP 2010	1.05	0.948328
Note: Mean VIF 1.17		

Table AIII.
Variance inflation
factor: VIF test for
base specification
with Fitch overall
rating as dependent
variable

Regressor	VIF	1/VIF
Public debt	1.25	0.801479
GDP per capita	1.41	0.711325
State bank dummy	1.19	0.839844
Subsidiary dummy	1.16	0.864937
Monetary union dummy	1.20	0.831895
Liabilities/GDP 2010	1.09	0.919514
Fitch stand-alone rating	1.39	0.721348
Note: Mean VIF 1.24		

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