

# Privilege or Burden?

Exploring Long-term Determinants of Country Credit Ratings in  
Industrialized and Emerging Economies

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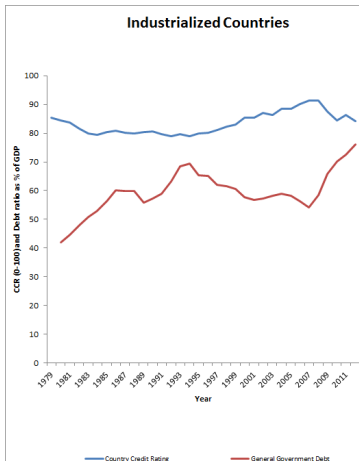
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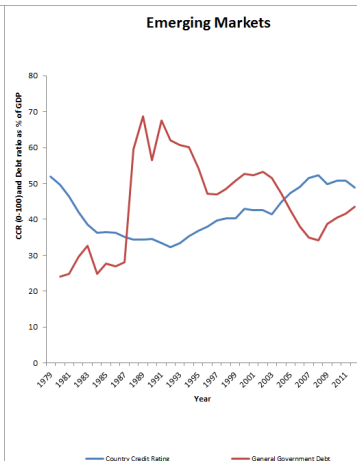
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# Government Debt and Creditworthiness



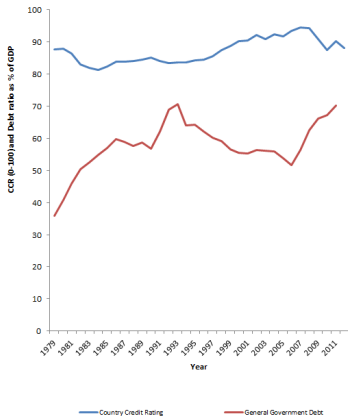
Source: Institutional Investor, International Monetary Fund (WEO)



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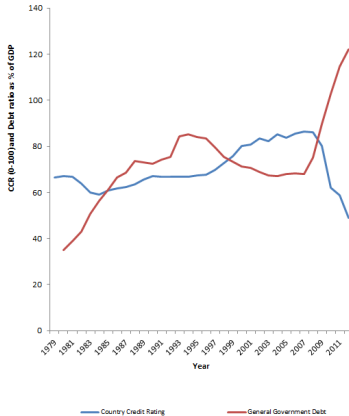
# Government Debt and Creditworthiness

## EMU countries ex GIIPS



Source: Institutional Investor, International Monetary Fund (WEO)

## GIIPS countries



Source: Institutional Investor, International Monetary Fund (WEO)

# Research Questions

- ① What are the main determinants of country credit risk in Industrialized and Emerging Market Economies?
- ② Do peripheral countries (GIIPS) in the EMU enjoy a "debt privilege" or do they suffer from a "debt burden"?
- ③ How does the occurrence of a banking crisis affect the creditworthiness of countries/ country groups?

# Determinants of Country Credit Risk

- 1 **Reinhart, Rogoff, and Savastano (2003):**  
Explaining the phenomenon of "debt intolerance" for Emerging Market Economies and Developing Countries - default occurs already at low ratios of external debt
- 2 **Afonso, Gomes, and Rother (2011):**  
Exploring a sample of "Big Three" ratings ranging from 1995-2005 with random effects - result: EU membership has a positive effect on sovereign ratings
- 3 **Gaertner, Griesbach, and Jung (2011):**  
Severe downgrades of GIIPS countries by rating agencies in 2009-10 cannot be explained by economic fundamentals
- 4 **Reinhart (2002):**  
Sovereign ratings fail to predict banking crises and Emerging Markets suffer more after the crisis event than Industrialized Countries

# Contribution of this Paper

- ① Consideration of **lag dependence** in the endogenous variable
- ② Identification of **long-term determinants** of credit ratings
- ③ Exploring the development of credit risk in **GIIPS Economies**
- ④ Estimating the impact of **banking crises** on sovereign ratings

# The Dependent Variable

- **Country Credit Ratings (CCR)** from the Institutional Investor - weighted survey-based measure of creditworthiness among major creditors
- Scale from 0-100 with increasing values indicating a higher degree of creditworthiness
- Data are published in the Institutional Investor twice a year (March and September) since 1979
- Use of an unbalanced panel including 81 countries with annual observations between 1989-2012



# Set of Control Variables

## Domestic Sector:

- GDP per capita (real, bn. dollar)
- Inflation (3 year avg) (annual % change)
- GDP growth (3 year avg) (annual % change)
- Investment (as % of GDP)
- Unemployment (as % of total workforce)

## External Sector:

- External Balance (3 year avg, as % of GDP)
- Reserves (as % of imports)
- External Debt (public and private as % of GDP)

## Government Sector:

- General Government Debt (as % of GDP)
- International Debt Securities Government (as % of GDP)
- Fiscal Balance (net, as % of GDP)

## Dummy Variables:

- Banking Crises
- GIIPS country, European Monetary Union (EMU), Industrialized Countries, Emerging Market Countries, OECD

# Country Sample

## Industrialized Countries

Australia	Luxembourg
Austria	Netherlands
Belgium	New Zealand
Canada	Netherlands
Denmark	Norway
Finland	Portugal
France	Singapore
Germany	South Korea

## Emerging Markets

Argentina	Czech Rep.
Bahamas	Dominican Rep.
Bahrain	Ecuador
Barbados	Egypt
Belarus	El Salvador
Belize	Estonia
Bolivia	Georgia
Brazil	Greece
Bulgaria	Hungary
Chile	Iceland
China	Indonesia
Colombia	Israel
Costa Rica	Jamaica
Croatia	Jordan

## Emerging Markets cont.

Kazakhstan	Romania
Latvia	Russia
Lithuania	Seychelles
Malaysia	Slovakia
Mauritius	Slovenia
Mexico	South Africa
Moldova	Thailand
Morocco	Trinidad & Tobago
Nigeria	Tunisia
Pakistan	Turkey
Panama	Ukraine
Paraguay	Uruguay
Peru	Venezuela
Philippines	Vietnam
Poland	

# Empirical Strategy

## 1 Panel GMM (Determinants of Country Risk):

$$\begin{aligned}
 CCR_{it} = & \alpha_i + \gamma CCR_{i,t-1} + \delta IndCoun * CCR_{i,t-1} + \sum_{k=1}^K \beta_k x_{k,it} \\
 & + \sum_{j=1}^J \beta_j x_{j,it-1} + \sum_{m=1}^M \beta_m IndCoun * x_{m,it} + \sum_{n=1}^N \beta_n IndCoun * x_{n,it-1} + \mu_t + \epsilon_{it}
 \end{aligned} \tag{1}$$

## 2 Panel GMM (Impact of Government Debt on GIIPS country risk):

$$\begin{aligned}
 CCR_{it} = & \alpha_i + \gamma CCR_{i,t-1} + \beta_1 GOVDEBT_{it} + \sum_{k=1}^K \beta_k x_{k,it} + \sum_{j=1}^J \beta_j x_{j,it-1} \\
 & + GIIPS * GOVDEBT_{i,99-2008} + GIIPS * GOVDEBT_{i,2009-12} + \mu_t + \epsilon_{it}
 \end{aligned} \tag{2}$$

## 3 Panel GMM (Impact of Banking Crises on CCRs):

$$CCR_{it} = \alpha_i + \gamma CCR_{i,t-1} + \sum_{k=1}^K \beta_k x_{k,it} + \sum_{j=1}^J \beta_j x_{j,it-1} + BankCris_{it-1} + \mu_t + \epsilon_{it} \tag{3}$$

# Empirical Strategy

## 1 Panel GMM (Determinants of Country Risk):

$$\begin{aligned}
 CCR_{it} = & \alpha_i + \gamma CCR_{i,t-1} + \delta IndCoun * CCR_{i,t-1} + \sum_{k=1}^K \beta_k x_{k,it} \\
 & + \sum_{j=1}^J \beta_j x_{j,it-1} + \sum_{m=1}^M \beta_k IndCoun * x_{m,it} + \sum_{n=1}^N \beta_n IndCoun * x_{n,it-1} + \mu_t + \epsilon_{it}
 \end{aligned} \tag{1}$$

## 2 Panel GMM (Impact of Government Debt on GIIPS country risk):

$$\begin{aligned}
 CCR_{it} = & \alpha_i + \gamma CCR_{i,t-1} + \beta_1 GOVDEBT_{it} + \sum_{k=1}^K \beta_k x_{k,it} + \sum_{j=1}^J \beta_j x_{j,it-1} \\
 & + GIIPS * GOVDEBT_{i,99-2008} + GIIPS * GOVDEBT_{i,2009-12} + \mu_t + \epsilon_{it}
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# Empirical Strategy

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 & + \sum_{j=1}^J \beta_j x_{j,it-1} + \sum_{m=1}^M \beta_m IndCoun * x_{m,it} + \sum_{n=1}^N \beta_n IndCoun * x_{n,it-1} + \mu_t + \epsilon_{it}
 \end{aligned} \quad (1)$$

## 2 Panel GMM (Impact of Government Debt on GIIPS country risk):

$$\begin{aligned}
 CCR_{it} = & \alpha_i + \gamma CCR_{i,t-1} + \beta_1 GOVDEBT_{it} + \sum_{k=1}^K \beta_k x_{k,it} + \sum_{j=1}^J \beta_j x_{j,it-1} \\
 & + GIIPS * GOVDEBT_{i,99-2008} + GIIPS * GOVDEBT_{i,2009-12} + \mu_t + \epsilon_{it}
 \end{aligned} \quad (2)$$

## 3 Panel GMM (Impact of Banking Crises on CCRs):

$$CCR_{it} = \alpha_i + \gamma CCR_{i,t-1} + \sum_{k=1}^K \beta_k x_{k,it} + \sum_{j=1}^J \beta_j x_{j,it-1} + BankCris_{it-1} + \mu_t + \epsilon_{it} \quad (3)$$

# Determinants of Country Risk - Base Model

Table : Industrialized Countries vs. Emerging Markets

	(1) System GMM	(2) Diff. GMM
L.Rating	0.618*** (12.45)	0.534*** (11.91)
L2.Rating	0.0643 (1.64)	0.117*** (3.59)
L.Rating - ind.	0.170*** (3.91)	0.108 (1.45)
GDP per capita	0.000390*** (3.06)	0.000364*** (3.50)
Growth, 3year avg.	0.540*** (7.87)	0.501*** (6.34)
CPI, 3year avg.	-0.0319 (-1.05)	-0.0292 (-1.15)
Unemployment	-0.115 (-0.94)	-0.275** (-2.01)
<b>Gen. Government Debt</b>	<b>-0.0897***</b> (-3.83)	<b>-0.106***</b> (-4.16)
External Gov. Debt	0.0758** (2.01)	0.0353 (1.02)
External Balance, 3year avg	-0.0302 (-0.33)	0.104 (1.37)
Total Investment	0.138** (2.16)	0.151** (2.31)

	(1) System GMM	(2) Diff. GMM
GDP p.c. - ind.	-0.000362*** (-2.80)	-0.000324*** (-3.06)
Growth - ind.	0.228 (1.50)	0.129 (0.96)
CPI - ind.	0.0846 (0.44)	0.129 (0.60)
Unemployment - ind.	-0.489** (-2.39)	-0.408 (-1.63)
<b>Gov. Debt - ind.</b>	<b>0.0746**</b> (2.53)	<b>0.0666</b> (1.43)
External Bal. - ind.	0.101 (0.72)	0.118 (0.76)
Investment - ind.	-0.0886 (-0.96)	0.121 (0.85)
Constant	13.15*** (4.34)	17.77*** (4.77)
N	1230	1149
arm1	-6.108	-6.295
arm2	1.039	-0.0543

t statistics in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Determinants of Country Risk in the EU

Table : Credit Risk in EU countries

	(1) System GMM EU	(2) Diff. GMM EU
L.Rating	0.736*** (22.38)	0.657*** (16.30)
L.Rating - eu.	0.101 (1.58)	-0.00728 (-0.12)
GDP per capita	0.000234*** (3.39)	0.000227*** (3.02)
Growth, 3year avg.	0.359*** (4.69)	0.316*** (4.11)
CPI, 3year avg.	-0.0588 (-1.61)	-0.0440 (-1.50)
Unemployment	-0.163 (-1.35)	-0.365*** (-2.63)
<b>Gen. Government Debt</b>	<b>-0.0500***</b> (-2.75)	<b>-0.102***</b> (-4.67)
External Gov. Debt	0.0506 (1.19)	0.0915** (2.05)
External Balance, 3year avg	-0.00858 (-0.11)	0.0837 (1.23)
Total Investment	0.142** (2.19)	0.141** (2.26)

	(1) System GMM EU	(2) Diff. GMM EU
GDP p.c. - eu.	-0.000180** (-2.46)	-0.000166** (-2.06)
Growth - eu.	0.523*** (3.21)	0.186 (1.23)
CPI - eu.	-0.211 (-0.93)	-0.576*** (-3.10)
Unemployment - eu.	-0.445*** (-3.51)	0.0285 (0.23)
<b>Gov. Debt - eu.</b>	<b>0.0395</b> (1.35)	<b>-0.0596*</b> (-1.77)
External Bal. - eu.	0.522*** (3.35)	0.383*** (2.68)
Investment - eu.	0.0682 (0.42)	0.340** (2.46)
Constant	11.56*** (3.93)	22.50*** (6.26)
N	1233	1152
arm1	-6.754	-6.440
arm2	1.369	1.350

t statistics in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Determinants of Country Risk in the EMU

Table : Credit Risk in EMU countries

	(1) System GMM EMU	(2) Diff. GMM EMU
L.Rating	0.776*** (23.45)	0.523*** (12.93)
L2.Rating		0.143*** (4.44)
L.Rating - emu.	0.0978 (1.45)	0.145** (2.43)
GDP per capita	0.000202*** (3.85)	0.000175*** (3.26)
Growth, 3year avg.	0.484*** (7.29)	0.501*** (7.13)
CPI, 3year avg.	-0.0847* (-1.96)	-0.0319 (-1.18)
Unemployment	-0.193* (-1.67)	-0.399*** (-3.42)
<b>Gen. Government Debt</b>	<b>-0.0136</b> (-0.73)	<b>-0.104***</b> (-5.13)
External Gov. Debt	0.0519 (0.93)	0.0401 (1.01)
External Balance, 3year avg	-0.00742 (-0.10)	0.123* (1.93)
Total Investment	0.158** (2.33)	0.156** (2.46)

	(1) System GMM EMU	(2) Diff. GMM EMU
GDP p.c. - emu.	-0.000146** (-2.31)	-0.000126** (-2.00)
Growth - emu.	0.794** (2.44)	0.411 (1.35)
CPI - emu.	0.120 (0.17)	-0.215 (-0.31)
Unemployment - emu.	-0.141 (-1.06)	0.0910 (0.73)
<b>Gov. Debt - emu.</b>	<b>-0.0335</b> (-0.98)	<b>-0.102***</b> (-2.96)
External Bal. - emu.	-0.241* (-1.76)	-0.182 (-0.94)
Investment - emu.	-0.0653 (-0.31)	-0.176 (-1.02)
Constant	8.182*** (2.68)	22.07*** (5.82)
N	1233	1149
arm1	-6.910	-6.562
arm2	1.607	-0.605

t statistics in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



# Debt Privilege or Burden for the GIIPS?

Table : GIIPS countries &amp; Government Debt

	(1)	(2)	(3)	(4)
	System GMM EM	Diff. GMM EM	System GMM IC	Diff. GMM IC
L.Rating	0.734*** (19.82)	0.672*** (17.91)	0.632*** (12.58)	0.610*** (11.49)
L2.Rating			0.368*** (4.70)	0.256*** (3.79)
L3.Rating			-0.190*** (-4.13)	-0.206*** (-3.26)
L4.Rating				0.0971** (2.18)
GDP per capita	0.000311*** (4.42)	0.000263*** (4.30)	0.0000798*** (4.03)	0.0000701*** (3.36)
Growth, 3year avg.	0.301*** (4.30)	0.286*** (4.66)	0.690*** (8.21)	0.607*** (6.23)
CPI, 3year avg.	-0.123*** (-3.31)	-0.184*** (-4.59)	-0.222*** (-3.67)	-0.377*** (-3.38)
Total Investment	0.0722* (1.80)	0.110*** (3.11)	0.116*** (2.68)	0.111 (1.07)
Unemployment	-0.0237 (-0.16)	-0.286*** (-2.59)	0.0154 (0.15)	-0.450** (-2.23)
External Balance, 3year avg	-0.0594 (-1.21)	0.0111 (0.28)	-0.0463 (-0.70)	0.125 (1.50)
Fiscal Balance, 3year avg	0.0775* (1.87)	0.0652*** (2.64)	0.140** (2.21)	0.0309 (0.41)
<b>Gen. Government Debt</b>	<b>-0.0485***</b> (-3.53)	<b>-0.0472***</b> (-2.76)	<b>0.0146</b> (0.76)	<b>-0.00429</b> (-0.15)
<b>Gov Debt 1997-2008 GIIPS</b>	<b>0.0478***</b> (2.95)	<b>0.0220**</b> (2.51)	<b>0.0175</b> (1.64)	<b>0.0159</b> (1.23)
<b>Gov Debt 2009-2012 GIIPS</b>	<b>-0.0590***</b> (-3.04)	<b>-0.0607***</b> (-3.41)	<b>-0.107***</b> (-5.06)	<b>-0.0839***</b> (-3.45)
Constant	11.73*** (3.71)	17.38*** (6.11)	9.225*** (3.08)	18.61*** (3.36)
N	1074	998	577	557
arm1	-5.958	-5.928	-2.984	-2.993
arm2	0.734	0.759	1.045	1.777

t statistics in parentheses

\* p &lt; 0.1, \*\* p &lt; 0.05, \*\*\* p &lt; 0.01

# The impact of Banking Crises

Table : The impact of Banking Crises on Ratings

	(1) System GMM	(2) Diff. GMM
L.Rating	0.548*** (11.39)	0.470*** (9.92)
L2.Rating	0.0983** (2.48)	0.133*** (3.50)
L.Rating - ind.	0.103** (2.34)	0.0225 (0.35)
GDP per capita	0.000165 (1.04)	0.000264** (2.06)
Growth, 3year avg.	0.416*** (3.68)	0.332*** (3.53)
CPI, 3year avg.	-0.0619 (-1.51)	-0.0683** (-2.07)
Unemployment	-0.389*** (-2.59)	-0.530*** (-2.96)
Gen. Government Debt	-0.117*** (-4.93)	-0.128*** (-5.34)
External Gov. Debt	0.130*** (2.86)	0.105** (2.36)
External Balance, 3year avg	-0.142 (-1.12)	0.0213 (0.29)
Total Investment	0.0554 (0.65)	0.0859 (1.04)
<b>Banking Crisis</b>	<b>-0.120</b> (-0.21)	<b>-0.0923</b> (-0.13)
<b>L.Banking Crisis</b>	<b>-3.631***</b> (-4.01)	<b>-2.974***</b> (-3.35)

	(1) System GMM	(2) Diff. GMM
GDP p.c. - ind.	-0.000115 (-0.72)	-0.000198 (-1.52)
Growth - ind.	0.00376 (0.02)	-0.0193 (-0.14)
CPI - ind.	-0.0258 (-0.12)	-0.0556 (-0.25)
Unemployment - ind.	-0.131 (-0.77)	-0.227 (-0.82)
Gov. Debt - ind.	0.104*** (3.66)	0.0737* (1.80)
External Bal. - ind.	0.218 (1.36)	0.182 (1.10)
Investment - ind.	-0.0469 (-0.49)	0.0693 (0.46)
<b>Banking Crisis - ind.</b>	<b>-0.653</b> (-0.84)	<b>-0.995</b> (-1.14)
<b>L.Banking Crisis - ind.</b>	<b>0.369</b> (0.34)	<b>0.849</b> (0.85)
Constant	23.25*** (6.57)	30.17*** (7.32)
N	845	790
arm1	-5.357	-5.334
arm2	1.105	0.438

t statistics in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Determinants of Country Risk

- ① Ratings are path- dependent and mainly determined by variations in GDP per capita, economic growth, investment, and government debt
- ② Ratings decline with rising Government Debt in Emerging Markets - the coefficient for Industrialized Countries is negative but not significant
- ③ We observe a negative and significant coefficient for Government Debt in member countries of the European Monetary Union

# "Debt Privilege" for the GIIPS?

- 1 Sovereign Credit Ratings in the GIIPS react negative to changes in Government Debt since 2009 (compared to IC and EM countries)
- 2 After the entry into the common currency area the GIIPS experienced a "debt privilege" compared to Emerging Markets

# The impact of Banking Crises

- 1 Banking Crises have a lagged impact on country ratings (confirms the result by Reinhart (2002))
- 2 We observe no significant difference in the impact of banking crises across Industrialized and Emerging Market economies (in contrast to Reinhart (2002))

# Future Research

- Testing for interaction effects
- Endogenizing Industrialized Countries/ Emerging Markets
- Identifying other potential sources for cross-country difference in ratings, for instance regional trade agreements

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