

Advanced Macroeconomics

Chapter 5 - Supplementary material

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Are euro area “periphery countries” bankrupt? – The case of Greece



⇒ Allusion to movie “Apocalypse now”

Are euro area “periphery countries” bankrupt? - The case of Greece

- Movie “Apocalypse now”:



- From “The Gardenia Scene in Apocalypse Now”
(<http://classicfilms.suite101.com/article.cfm/the-gardenia-scene-in-apocalypse-now>):
“ ... From the moment he is ordered to kill Kurtz (Marlon Brando), Willard (Martin Sheen) begins to question his mission - and soon all his certainties. The absurdities of Washington's intervention in Vietnam ...”

Are euro area “periphery countries” bankrupt? - The case of Greece

- Important question: Will Germany have a similar experience as Captain Willard ...



Are euro area “periphery countries” bankrupt? – The case of Greece

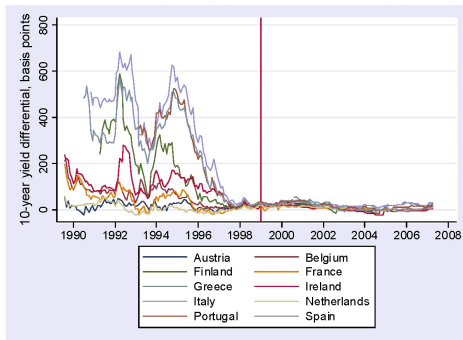
- ... or will the decided intervention turn out to be effective?



Are euro area “periphery countries” bankrupt? – What have “markets” thought until 2007?

- Figure taken from the “World Economic Outlook”:

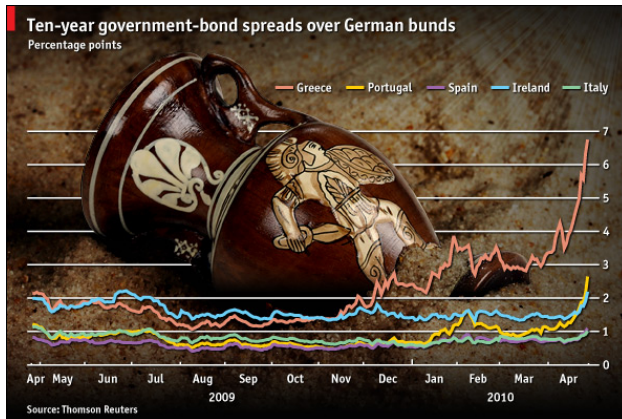
Figure 4. 10-year benchmark bond yield spreads before and after EMU, 1990-2007



Note: Yield differentials are computed relative to the yield on the benchmark German 10-year Bund, based on monthly data (end-of-month observations). Source: Datastream.

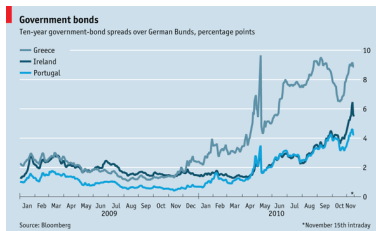
Are euro area “periphery countries” bankrupt? – What do “markets” think?

- Figure taken from “The Economist”:



Are euro area “periphery countries” bankrupt? – What do “markets” think?

- Figure taken from “The Economist, Of inhumand bond spreads (November 15, 2010)”:



- “Model” of interest rates:

$$i = i(\text{economic conditions (fundamentals), liquidity, perceived default risk, “speculation”}) \quad (1)$$

⇒ Markets seem to judge government bonds of several “periphery countries” as being risky.

Are euro area “periphery countries” bankrupt? – What do markets think?

- Rating schemes:

Default risk information: Measures (taken from Mishkin, 2009)

	Rating			Definitions
	Moody's	S&P	Fitch	
Investment-grade securities	Aaa	AAA	AAA	Prime Maximum Safety
	Aa1	AA+	AA+	High Grade High Quality
	Aa2	AA	AA	
	Aa3	AA-	AA-	
	A1	A+	A+	Upper Medium Grade
	A2	A	A	
	A3	A-	A-	
Junk bonds	Baa1	BBB+	BBB+	Lower Medium Grade
	Baa2	BBB	BBB	
	Baa3	BBB-	BBB-	
	Ba1	BB+	BB+	Non Investment Grade
	Ba2	BB	BB	
	Ba3	BB-	BB-	
	B1	B+	B+	Highly Speculative
	B2	B	B	
	B3	B-	B-	
	Caa1	CCC+	CCC	Substantial Risk
	Caa2	CCC	—	In Poor Standing
	Caa3	CCC-	—	
	Ca	—	—	
	C	—	—	Extremely Speculative
	—	—	DDO	May be in Default
	—	—	DD	Default
	—	D	D	—

- Default risk as evaluated by S&P (November 2010):

⇒ Germany: AAA

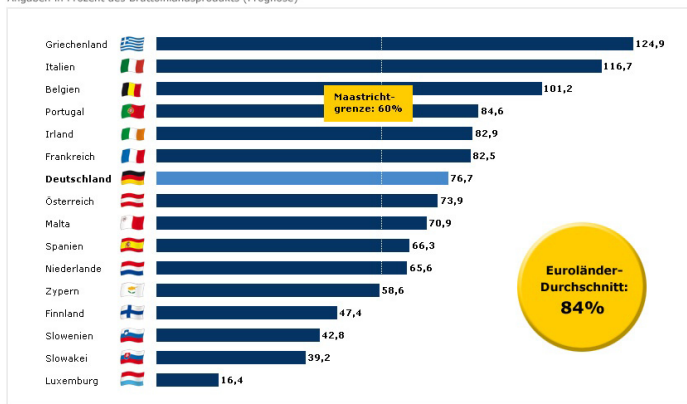
⇒ Spain: AA; Italy: A+; Ireland: A; Portugal: A-; Greece: BB+

Are euro area “periphery countries” bankrupt? - Some facts about their fiscal deficits

- EU debt levels (Source: Der Spiegel):

Staatsschulden der Euro-Länder 2010

Angaben in Prozent des Bruttoinlandsprodukts (Prognose)



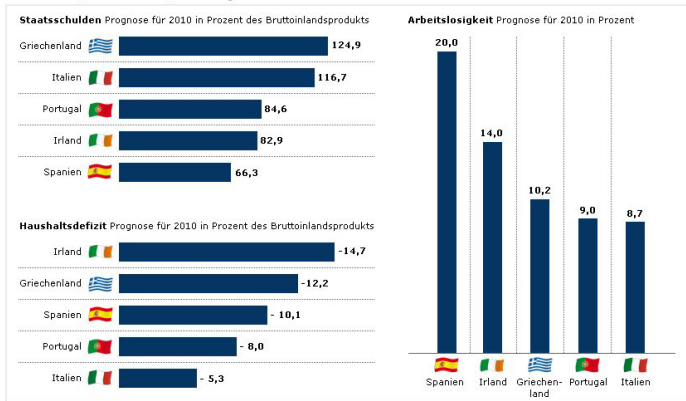
Quelle: EU-Kommission

Are euro area “periphery countries” bankrupt? - Some facts about their fiscal deficits

- Deficits of the most troubled countries (Source: Der Spiegel):

Die Euro-Wackelkandidaten

Staatsschulden, Haushaltsdefizit, Arbeitslosigkeit



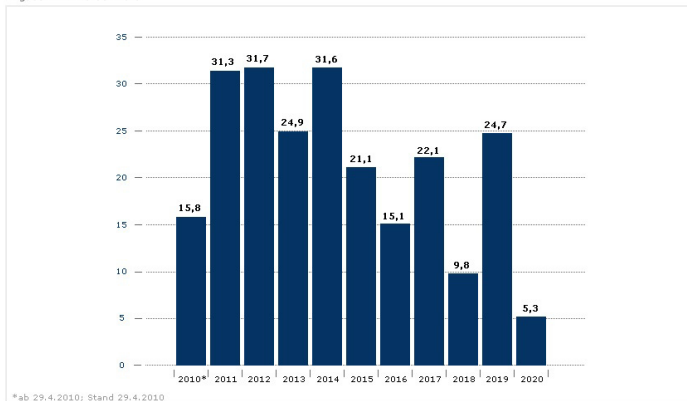
Quelle: EU-Kommission

Are euro area “periphery countries” bankrupt? - Some facts about their fiscal deficits

- Greek debt (Source: Der Spiegel):

Wann die griechischen Staatsanleihen fällig werden

Angaben in Milliarden Euro

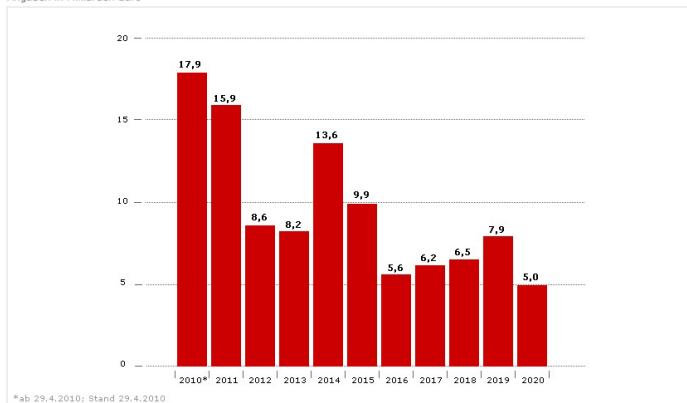


Quelle: Bloomberg

Are euro area “periphery countries” bankrupt? - Some facts about their fiscal deficits

- Portuguese debt (Source: Der Spiegel):

Wann die portugiesischen Staatsanleihen fällig werden
Angaben in Milliarden Euro



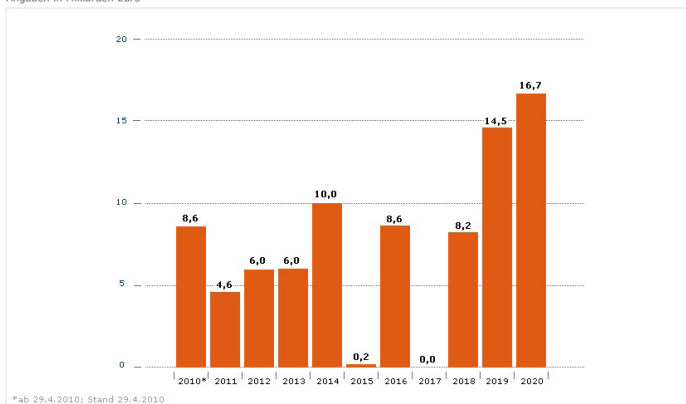
Quelle: Bloomberg

Are euro area “periphery countries” bankrupt? - Some facts about fiscal deficits

- Irish (Source: Der Spiegel):

Wann die irischen Staatsanleihen fällig werden

Angaben in Milliarden Euro



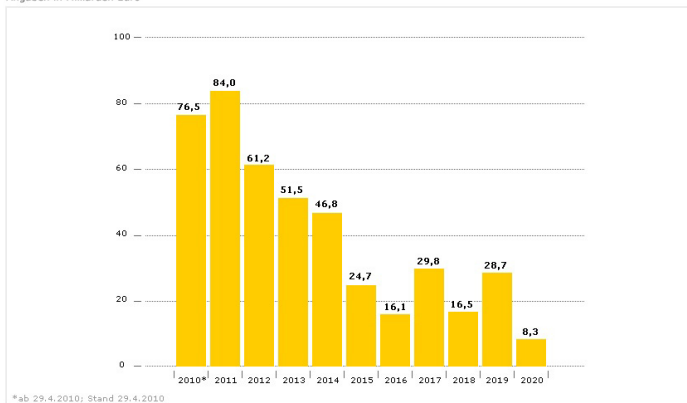
Quelle: Bloomberg

Are euro area “periphery countries” bankrupt? - Some facts about their fiscal deficits

- Spanish debt (Source: Der Spiegel):

Wann die spanischen Staatsanleihen fällig werden

Angaben in Milliarden Euro

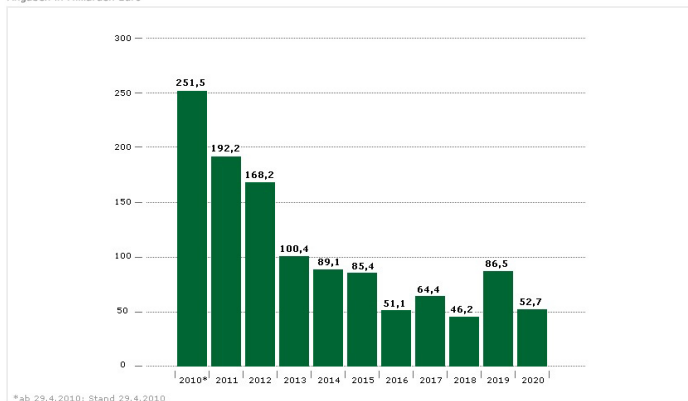


Quelle: Bloomberg

Are euro area “periphery countries” bankrupt? - Some facts about fiscal deficits

- Italian debt (Source: Der Spiegel):

Wann die italienischen Staatsanleihen fällig werden
Angaben in Milliarden Euro



Quelle: Bloomberg

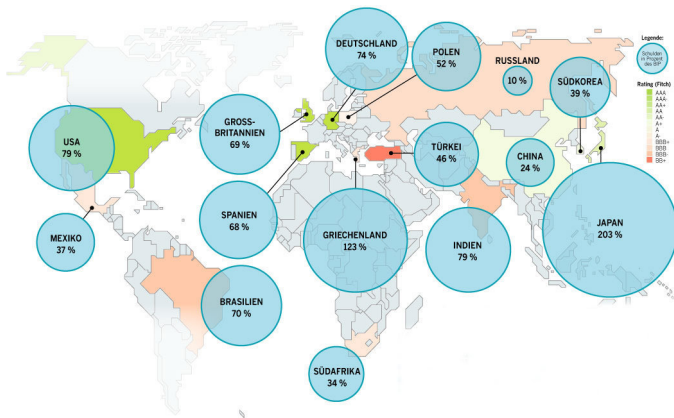
Are euro area “periphery countries” bankrupt? - Some facts about their fiscal deficits

- Net foreign asset positions (Source: The Economist):



Are euro area “periphery countries” bankrupt? - Some facts about fiscal deficits

- World debt:



Are euro area “periphery countries” bankrupt? – Some facts about fiscal deficits

- Selected (projected) deficits for 2010 (Source: The Economist):

	Trade balance* latest 12 months, \$bn	Current-account balance		Currency units, per \$		Budget balance % of GDP 2010†	Interest rates, %	
		latest 12 months, \$bn	% of GDP 2010†	Apr 28th	year ago		3-month latest	10-year gov't bonds, latest
United States	–532.9 Feb	–419.9 Q4	–3.2	–	–	–11.1	0.27	3.77
Japan	+61.3 Feb	+157.1 Feb	+3.4	94.1	97.0	–8.0	0.24	1.29
China	+150.1 Mar	+284.4 Q4	+5.2	6.83	6.83	–2.9	1.94	3.22
Britain	–130.0 Feb	–28.8 Q4	–1.1	0.66	0.68	–12.8	0.67	3.99
Canada	–1.8 Feb	–36.6 Q4	–1.8	1.01	1.20	–4.6	0.39	3.74
Euro area	+41.3 Feb	–63.3 Feb	–0.2	0.76	0.75	–7.2	0.65	2.97
Austria	–5.0 Jan	+7.5 Q3	+1.5	0.76	0.75	–5.0	0.65	3.44
Belgium	+18.9 Jan	+2.7 Dec	–0.2	0.76	0.75	–6.6	0.66	3.60
France	–59.0 Feb	–58.1 Feb	–2.1	0.76	0.75	–8.4	0.65	3.32
Germany	+198.9 Feb	+173.8 Feb	+5.3	0.76	0.75	–5.6	0.65	2.99
Greece	–43.6 Feb	–40.9 Feb	–6.9	0.76	0.75	–9.4	0.65	9.76
Italy	–7.7 Feb	–66.8 Feb	–2.5	0.76	0.75	–5.3	0.65	4.08
Netherlands	+48.1 Feb	+42.8 Q4	+5.3	0.76	0.75	–6.2	0.65	3.27
Spain	–67.8 Feb	–79.9 Jan	–3.8	0.76	0.75	–11.5	0.65	4.11

The dynamics of public debt

- The debt of public households evolves over time as follows:

$$B_{t+1} = B_t + D_t \quad (2)$$

with:

- B_t : Debt level of the public household at the beginning of period t
 - D_t : Deficit of a country in period t .
- In a given period D_t is given by:

$$D_t = G_t + r_t B_t - T_t - \left(\frac{\Delta M_t}{P_t} \right) \quad (3)$$

with:

- G_t : Government spending in period t
 - $r_t B_t$: Interest rate payments on existing debt in period t .
 - T_t : Tax income in period t .
 - $\left(\frac{\Delta M_t}{P_t} \right)$: Seignorage (income from printing money) in period t .

The dynamics of public debt

- Dividing both sides of the above equation by nominal GDP Y_t and real variables with small letters one obtains:

$$\frac{B_{t+1}}{Y_t} = \frac{B_t}{Y_t} + \frac{D_t}{Y_t} \iff \frac{B_{t+1}}{\frac{Y_{t+1}}{(1+\pi_t)(1+\gamma_t)}} = \frac{b_t}{y_t} + \frac{d_t}{y_t} \iff \quad (4)$$

$$(1 + \pi_t)(1 + \gamma_t) \frac{b_{t+1}}{y_{t+1}} = \frac{b_t}{y_t} + \frac{d_t}{y_t},$$

where π_t denotes the inflation rate and γ_t denotes the real growth rate of GDP.

- For moderate values of π_t and γ_t we can write:

$$(1 + \pi_t)(1 + \gamma_t) = 1 + \pi_t + \gamma_t + \pi_t\gamma_t \approx 1 + \pi_t + \gamma_t. \quad (5)$$

- We thus can write:

$$(1 + \pi_t + g_t) \left(\frac{b_{t+1}}{y_{t+1}} \right) = \frac{b_t}{y_t} + \frac{d_t}{y_t}, \quad (6)$$

\implies Equation which describes the dynamics of debt-to-GDP ratio.

The dynamics of public debt

- Assume that one wants to fix the long-run debt level at the value $\overline{\left(\frac{b}{y}\right)}$, i.e. one wants to have:

$$\frac{b_t}{y_t} = \frac{b_{t+1}}{y_{t+1}} = \dots = \overline{\left(\frac{b}{y}\right)}. \quad (7)$$

- Question: Which deficit level, $\overline{\left(\frac{d}{y}\right)}$ is compatible with this level of debt?

\implies Answer: Set $\frac{b_t}{y_t} = \frac{b_{t+1}}{y_{t+1}} = \overline{\left(\frac{b}{y}\right)}$ in the equation describing the dynamics of the debt-to-GDP ratio and solve for $\frac{d}{y}$:

$$(1 + \pi_t + \gamma_t) \overline{\left(\frac{b}{y}\right)} = \overline{\left(\frac{b}{y}\right)} + \overline{\left(\frac{d}{y}\right)} \iff \overline{\left(\frac{d}{y}\right)} = (\pi + \gamma) \overline{\left(\frac{b}{y}\right)} \quad (8)$$

- Rearranging yields:

$$\overline{\left(\frac{b}{y}\right)} = \frac{1}{\pi + \gamma} \overline{\left(\frac{d}{y}\right)} \quad (9)$$

The fiscal stance of selected EMU countries

Table: Fiscal stance in EMU

Country	Average: 1997 - 2011				Average: 2007 - 2011			
	B/Y	D/Y	ΔY	$(B/Y)^*$	B/Y	D/Y	ΔY	$(B/Y)^*$
Belgium	101.4	-1.7	3.5	47.9	95.7	-3.6	2.1	175.7
France	66.1	-3.9	3.3	115.4	76.5	-6.2	2.1	291.4
Germany	66.1	-2.5	1.9	130.1	73.4	-2.6	1.4	188.2
Greece	102.7	-6.1	6.6	93.3	110.6	-8.9	3.8	230.8
Ireland	45.4	-1.6	7.2	22.9	59.0	-8.6	-2.0	-
Italy	110.3	-3.3	3.2	103.2	112.7	-4.0	1.6	258.1
Luxembourg	10.1	1.4	6.8	-20.8	17.2	-0.8	4.3	19.3
Netherlands	57.6	-1.4	4.2	34.3	62.1	-3.0	1.8	164.1
Portugal	62.5	-4.2	4.3	99.3	75.0	-5.5	1.7	328.9
Spain	52.8	-2.4	5.6	42.6	51.0	-5.6	1.6	353.6
Euro area	72.5	-2.8	3.3	85.1	77.7	-4.3	1.7	251.7
UK	50.0	-3.9	4.4	90.0	65.9	-9.3	2.2	421.5
U.S.		-3.9	4.6	84.9		-8.1	2.7	297.5

The fiscal stance of EMU countries - Macroeconomic implications: The case of Spain

- **Spain - 2010 Article IV Consultation, Concluding Statement of the Mission Madrid, May 24, 2010:**

Spain's economy needs far-reaching and comprehensive reforms. The challenges are severe: a dysfunctional labor market, the deflating property bubble, a large fiscal deficit, heavy private sector and external indebtedness, anemic productivity growth, weak competitiveness, and a banking sector with pockets of weakness. Ambitious fiscal consolidation is underway, recently reinforced and front-loaded. This needs to be complemented with growth-enhancing structural reforms, building on the progress made on product markets and the housing sector, especially overhauling the labor market. A bold pension reform, along the lines proposed by the government, should be quickly adopted. Consolidation and reform of the banking system needs to be accelerated. Such a comprehensive strategy would be helped by broad political and social support, and time is of the essence.

The fiscal stance of EMU countries - Macroeconomic implications: The case of Spain

- **Fitch Downgrades Spain to 'AA+' (quote taken from http://www.fitchratings.com/index_fitchratings.cfm):**

Fitch Ratings downgraded Spain's long-term foreign and local currency Issuer Default Ratings (IDRs) to 'AA+' from 'AAA'. The process of adjustment to a lower level of private sector and external indebtedness will materially reduce the rate of growth of the Spanish economy over the medium-term, factors that largely precipitated the rating downgrade.

The fiscal stance of EMU countries - New York Times, December 2, 2010

- **Euro Zone Is Imperiled by North-South Divide, New York Times:**

The European Union and the 16 nations that use the euro face two crises. One is the immediate problem of too much debt and government spending. Another is the more fundamental divide, roughly north and south, between the more competitive export countries like Germany and France and the uncompetitive, deficit countries that have adopted the high wages and generous social protections of the north without the same economic ethos of strict work habits, innovation, more flexible labor markets and high productivity.

The highly indebted countries of the euro zone “can’t grow their way out of debt,” Mr. Turner said, nor can they devalue to make their exports more competitive. “No one in these countries can make the same product for a price that competes” with Hungary, let alone Turkey or China.

Government debt and hyperinflations (Reinhardt and Rogoff, 2008)

Table 3. Inflation and Domestic Debt: Selected Episodes, 1917–1994

Country	Year	Inflation	Domestic debt/GDP	Base Money/GDP	Domestic debt/ Total domestic liabilities
Some Hyperinflations					
Argentina	1989	3079.5	25.6	16.4	61.2
Brazil	1987	228.3	164.9	9.8	94.4
	1990	2947.7	155.1	7.1	95.6
Germany	1920	66.5	52.6	19.4	73.0
	1923	22220194522.37	0.0	0.0	1.0
High Inflations					
Greece	1922	54.2	53.0	34.3	60.7
	1923	72.6	41.3	32.7	55.9
Italy	1917	43.8	79.1	24.1	76.6
	1920	56.2	78.6	23.5	77.1
Japan	1944	26.6	236.7	27.8	89.5
	1945	568.1	266.5	74.4	78.2
Norway	1918	32.5	79.3	86.4	47.9
	1920	18.1	106.9	65.6	62.3
Philippines	1981	13.1	10.4	6.6	61.1
	1984	46.2	11.0	13.9	44.2
Turkey	1990	60.3	14.7	7.4	66.6
	1994	106.3	20.2	7.1	73.9

Sources: See Reinhardt and Rogoff (2008, Appendix I). Money and Debt stock refer to levels at the beginning of each episode.