# Fiscal policies and financial markets

**António Afonso**
(ISEG/UL-University of Lisbon;
UECE-Research Unit on Complexity and Economics)

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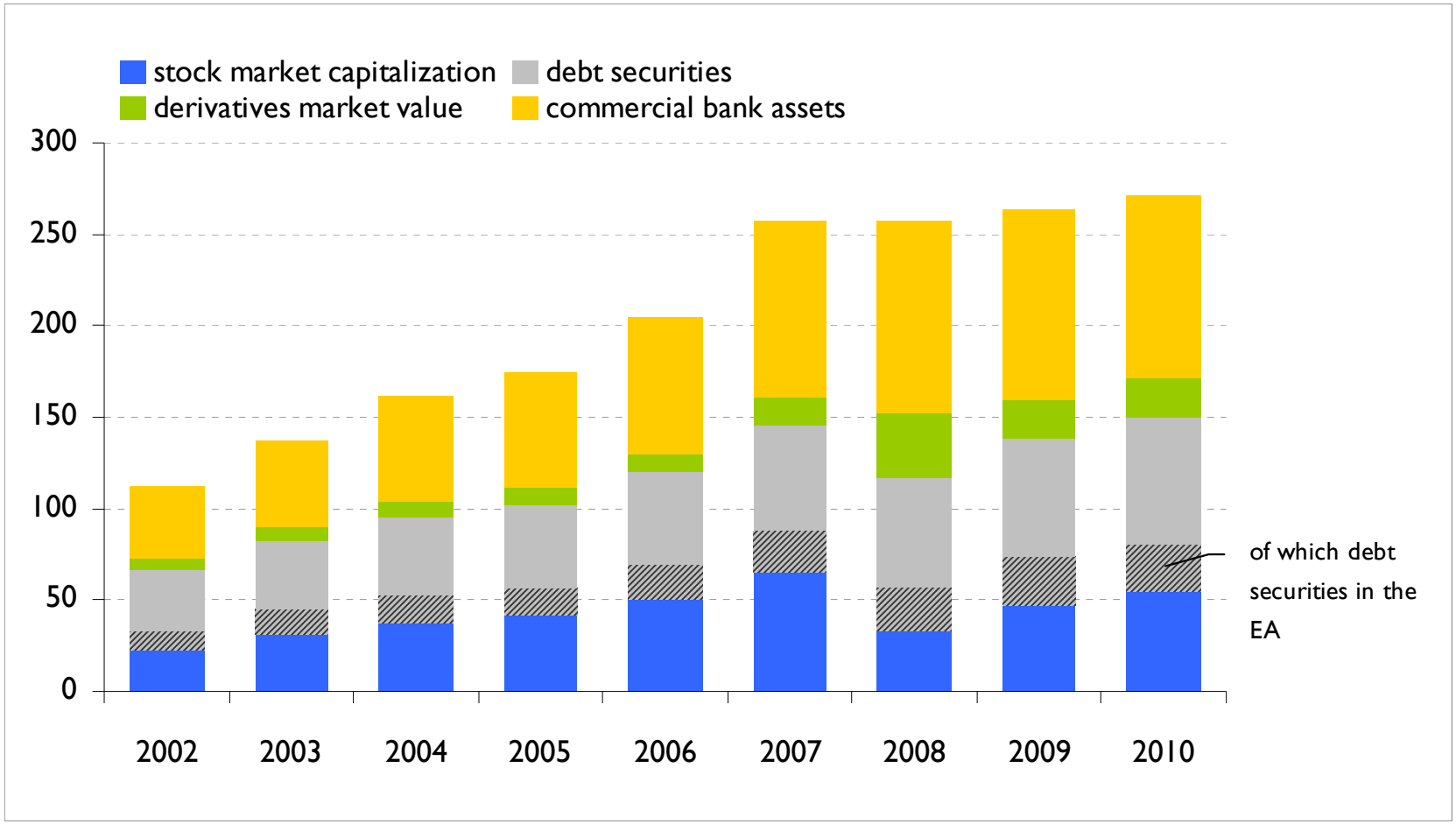
# Role of financial markets

- Monitor fiscal policies by attaching a price to tradable government obligations
  - distinct from rules-based approach to guide policy makers;
- Outstanding size of government bond markets;
- Annual roll-over needs;
- Continuous trade in secondary market generates real-time pricing of sovereign risk:
  - bond spreads;
  - CDS;
- Rating agencies.

Financial markets (2/5)

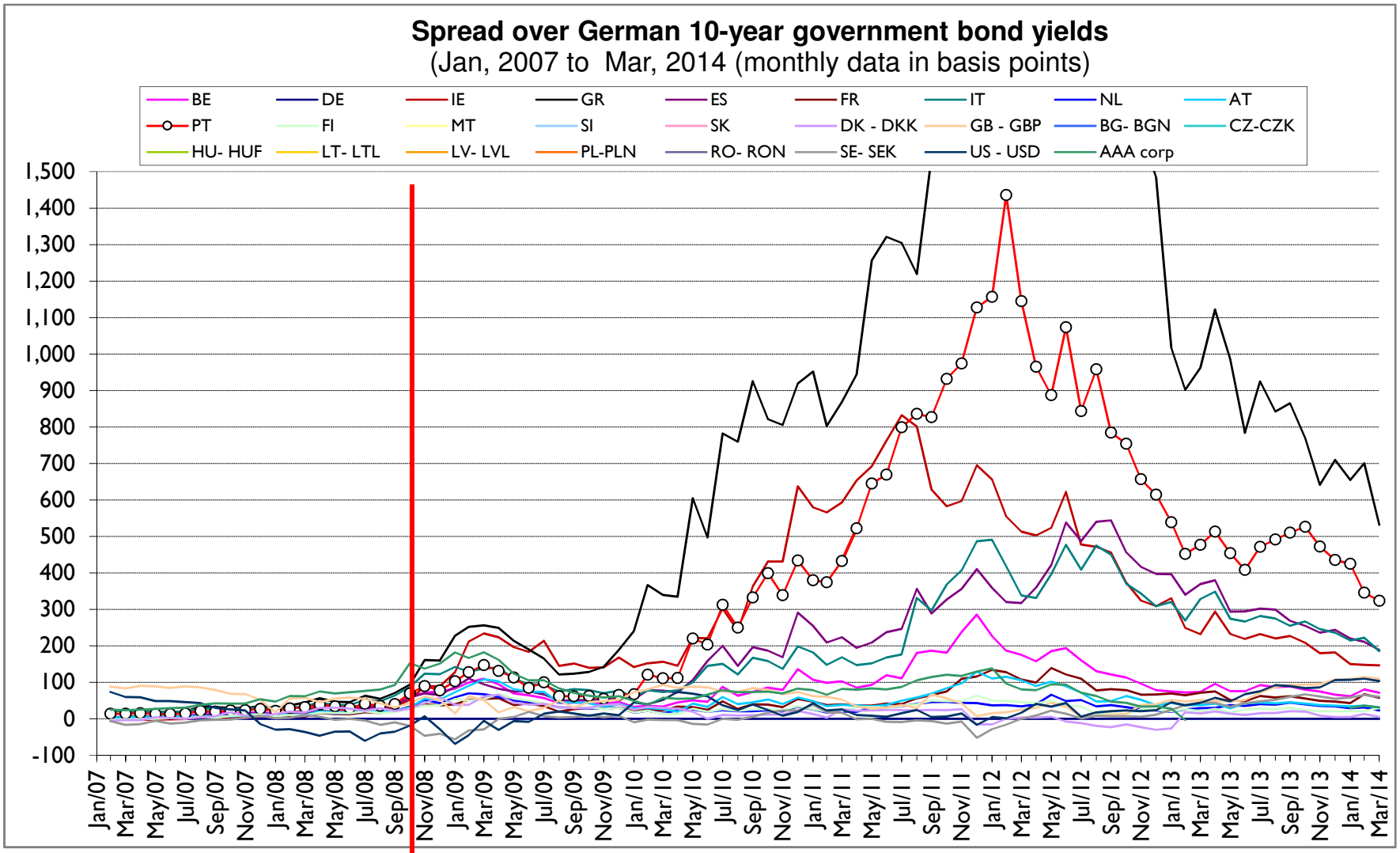
## Selected indicators on the size of the capital markets

(2002 - 2010; trillions of U.S. dollars)




Sources: Bank for International Settlements and International Monetary Fund.
Note: Derivatives market value is the gross market value of OTC traded derivatives.

# Financial markets (3/5)



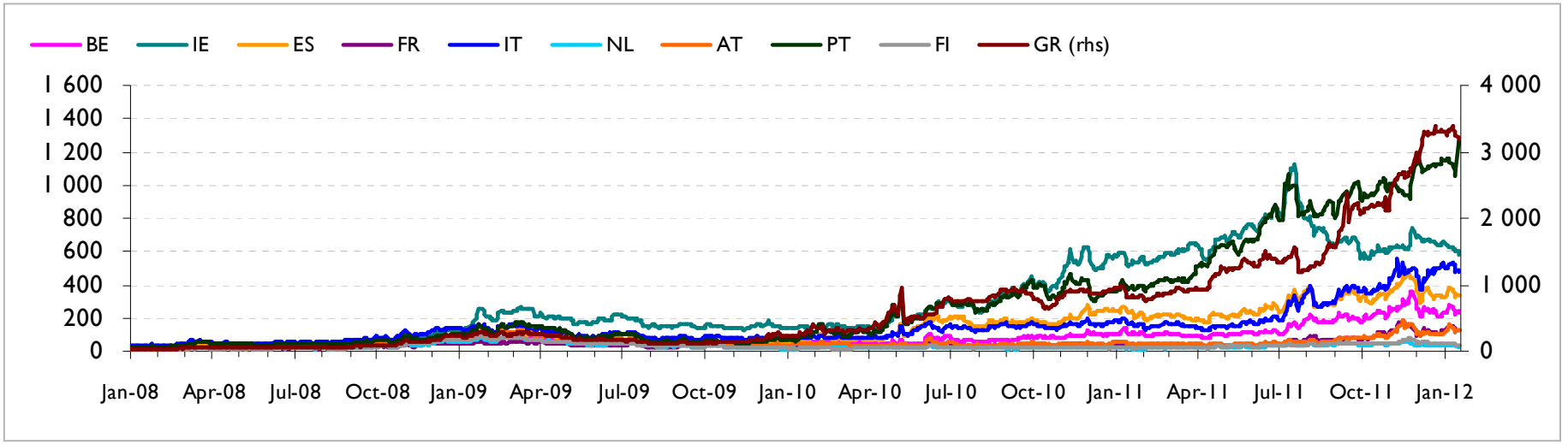

15th Sept, 2008 - Lehman Brothers' bankruptcy.

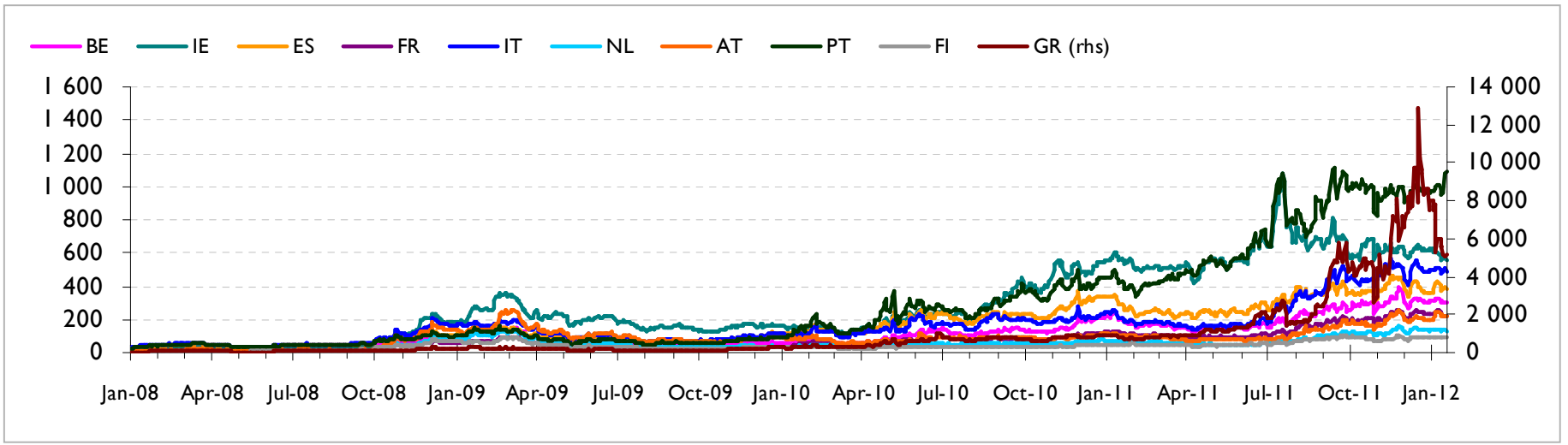
Source: Datastream.

Financial markets (4/5)

## **10-yr sovereign bond spreads** (upper chart) **and CDS spreads on sovereign 10Y debt** (lower chart)

(1 Jan 2008 – 17 Jan 2012; basis points)

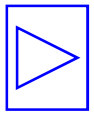



Sources: Bloomberg and Thomson Reuters Datastream.

## Relevant breaks

• From 2007:08 onwards, acknowledged in the literature as the starting of the global credit crunch, first large ECB emergency loan provided to European banks in response to increasing pressures in the interbank market on 9/8/2007.



• From 2009:03 onwards, very substantial upward revisions by the EC of projected debt ratios (spring of 2009): markets were officially aware of the costs of fiscal activism.

Afonso et al. (2014).

## Financial Stress Index - FSI (1/4)

- Developed by the IMF (Balakrishnan et al., 2009), an approximation to potential instability of financial markets (updated by Cardarelli et al., 2009).
- 7 indicators in 3 groups, the composite index is constructed as sum of the normalized values.

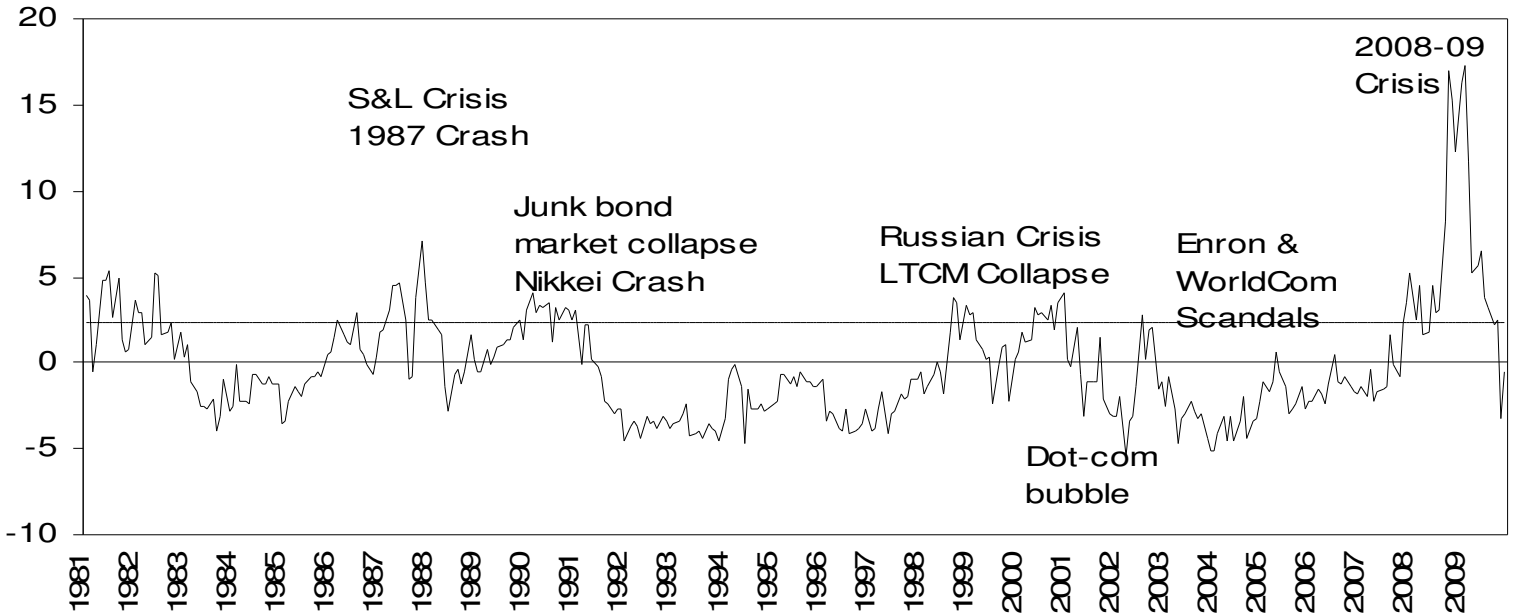
1. Bank related stress: Beta of banking sector showing the perception of risk of the banking sector compared to other sectors in the economy, the TED spread (difference between the short-term interbank interest rate and treasury bills rate), and inverted term structure.
2. Securities related stress: Corporate bond spread, stock market returns, and stock-market volatility.
3. Exchange rate stress: Exchange rate volatility.

## Financial Stress Index - FSI (2/4)

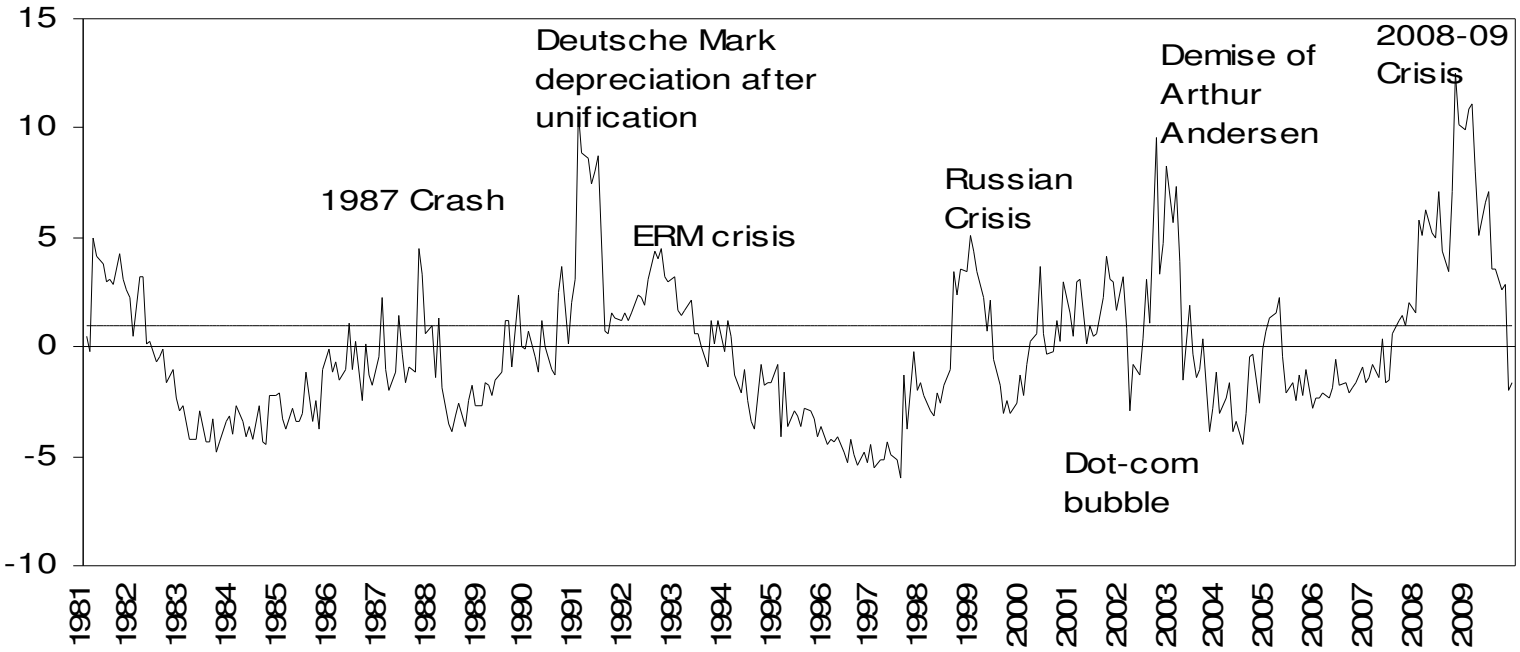
$$\textit{FSI} = \beta + \textit{TED spreads} + \textit{Inverted terms spreads} + \textit{Corporate debt spreads} + \textit{Stock market returns} + \textit{Stock market volatility} + \textit{Exchange market volatility}$$

- A value of zero implies neutral financial market conditions on average across the sub-indices, while positive values imply financial strain (i.e. prices are on average above means or trends).
- A value of 1 indicates a one-standard deviation from average conditions across sub-indices.
- A value of 1 or higher has in the past been associated with a crisis.

# Financial Stress Index - FSI (3/4)

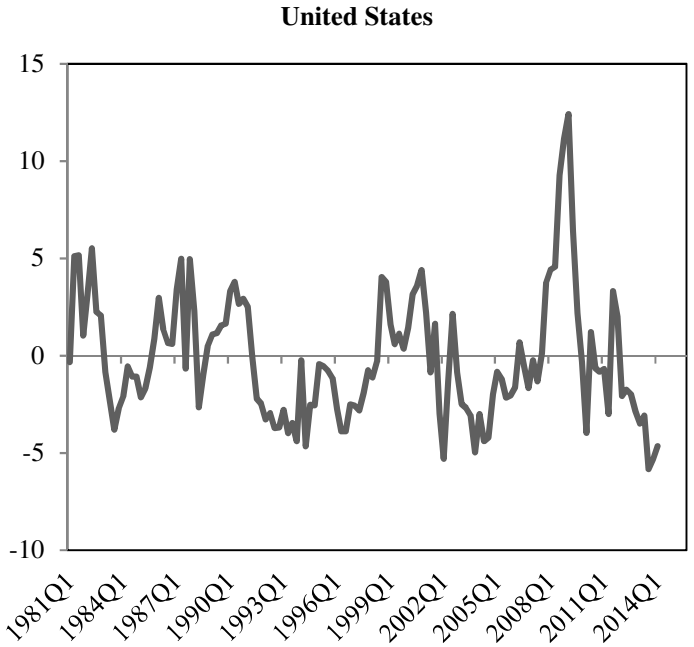


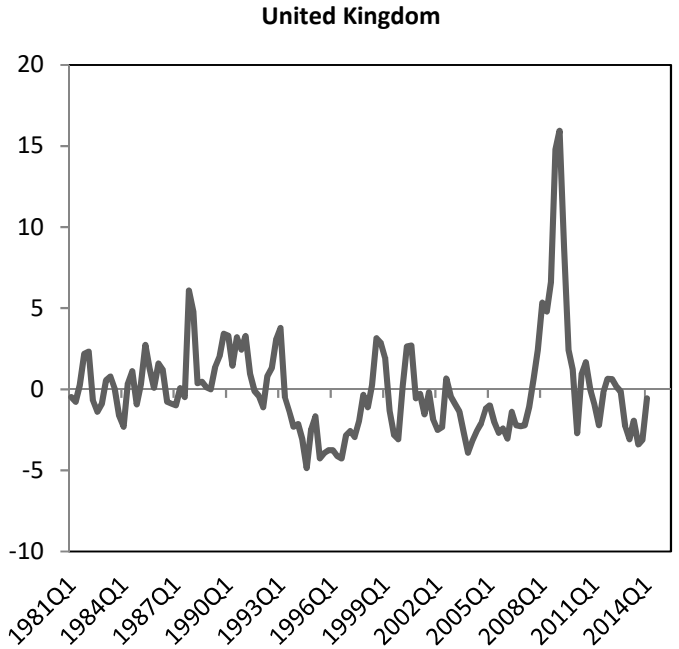

**FSI U.S.**

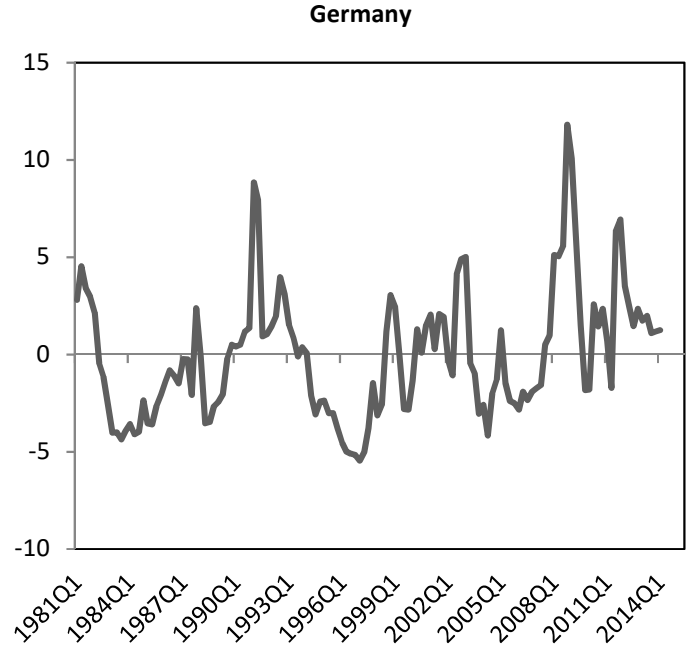


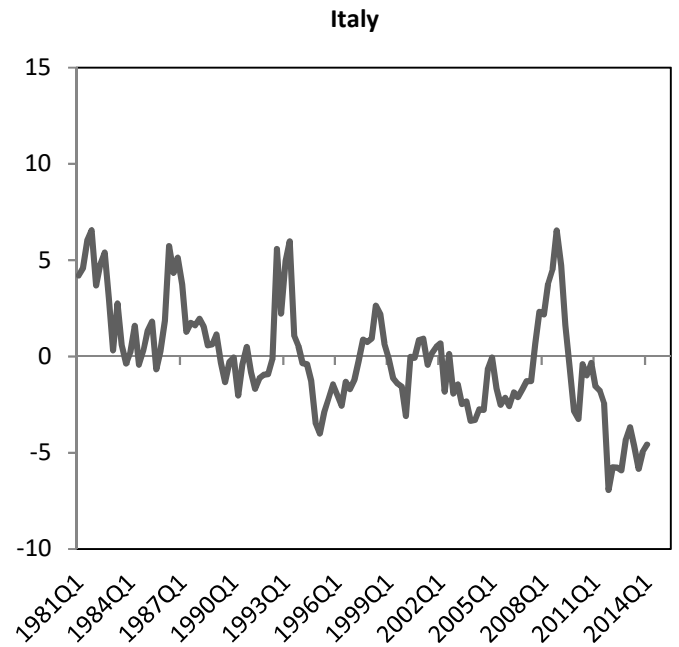

**FSI DE**

# Financial Stress Index - FSI (4/4)




Source: Afonso et al. (2016)

Risks determine spreads in government bond markets

1. Exchange rate risk: unexpected exchange rate changes (ceased for euro area investors).
2. Liquidity risk: ability to carry out transactions without affecting the price.
3. Credit risk: default event.
4. Other factors (e.g., taxes, issuance procedures).

Crucial for bond pricing: quantity of risks and market price of risk taking (global risk aversion).

## Sovereign risk (2/2)

- Objective: indicator for default risk of sovereign issuer.
- Ratings by major agencies (S&P, Moody's, Fitch) are required quality signal for many investors.
- Main aspects:
  - consistency across countries;
  - medium-term approach: "rating through the cycle"
  - comprehensive assessment of financial strength: macroeconomics, institutions, policies, possible shocks.

Ratings' methodology (e.g. Moody's): condense all information that may affect default risk into one indicator: qualitative decision

- Macroeconomics;
- Institutional development;
- Financial strength;
- Vulnerability to shocks.

Decision making by committee

- Proposal by lead analyst;
- Peer review by sovereign but also non-sovereign experts.

## Caveats of ratings

- Few suppliers of global sovereign bond ratings (S&P, Moody's, Fitch);
- Accounting rules give much power to ratings agencies;
- In the past little supervision of ratings agencies;
- Bond issuer pays for rating: conflict of interest;
- Accuracy of sovereign ratings difficult to quantify (lack of observations).

## Sovereign ratings (3/11)

- Currently the European Securities and Markets Authority (ESMA) is exclusively responsible for the registration and supervision of Credit Rating Agencies in the European Union.

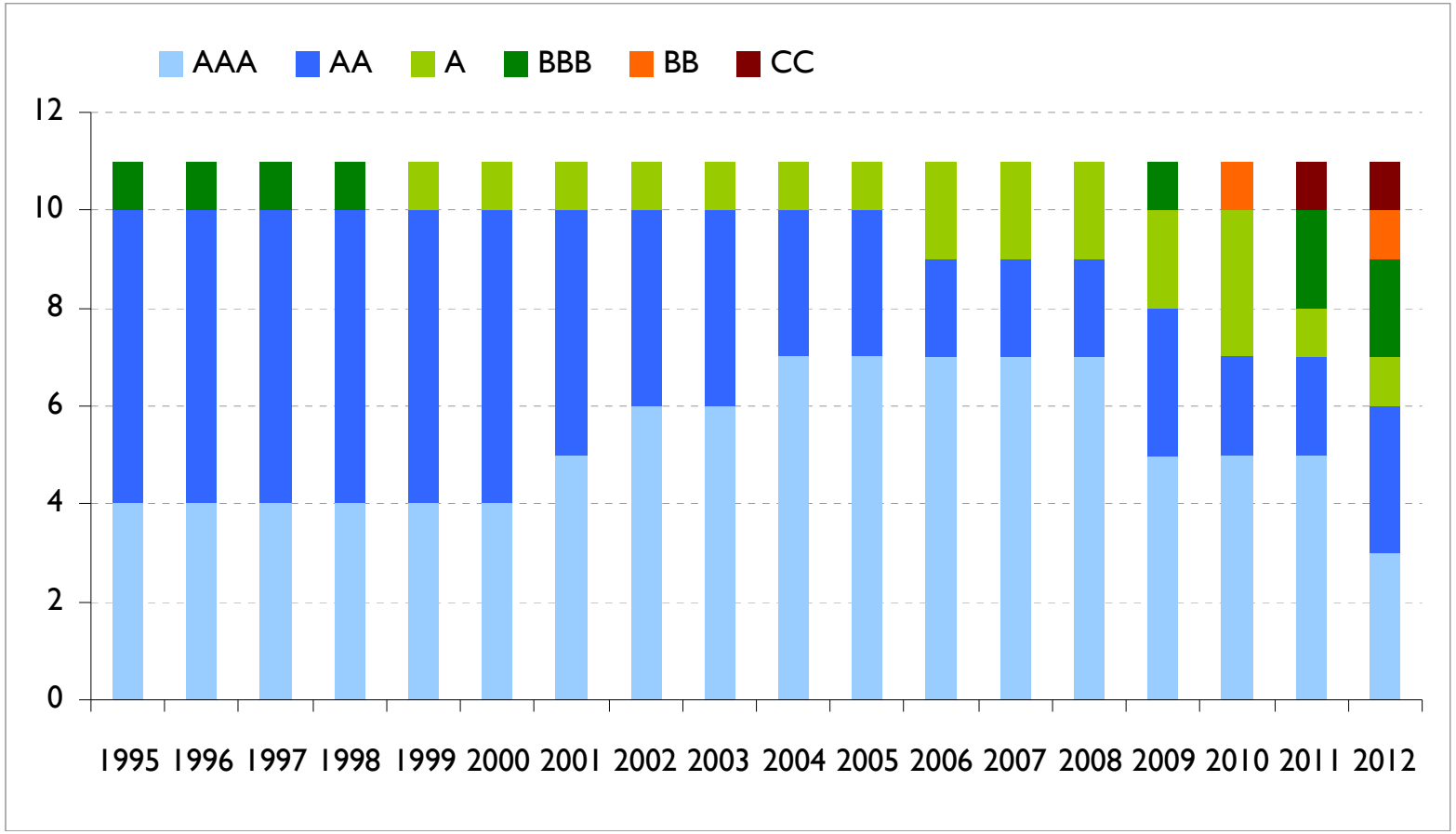
- In addition, ESMA also carries out policy work to prepare future legislation, such as regulatory technical standards, and guidelines. This work is undertaken through the CRA technical committee, which has representatives from all the national competent authorities.

# Sovereign ratings (4/11)

| Characterization of debt and issuer (source: Moody's) | | Rating | | | |
|---|---|---|---|---|---|
| | | S&P | Moody's | Fitch | Scale |
| **Highest quality** | Investment grade | **AAA** | **Aaa** | **AAA** | **17** |
| **High quality** | | **AA+** | **Aa1** | **AA+** | **16** |
| | | **AA** | **Aa2** | **AA** | **15** |
| | | **AA-** | **Aa3** | **AA-** | **14** |
| **Strong payment capacity** | | **A+** | **A1** | **A+** | **13** |
| | | **A** | **A2** | **A** | **12** |
| | | **A-** | **A3** | **A-** | **11** |
| Adequate payment capacity | | BBB+ | Baa1 | BBB+ | 10 |
| | | BBB | Baa2 | BBB | 9 |
| | | BBB- | Baa3 | BBB- | 8 |
| Likely to fulfil obligations, ongoing uncertainty | Speculative grade | BB+ | Ba1 | BB+ | 7 |
| | | BB | Ba2 | BB | 6 |
| | | BB- | Ba3 | BB- | 5 |
| High credit risk | | B+ | B1 | B+ | 4 |
| | | B | B2 | B | 3 |
| | | B- | B3 | B- | 2 |
| Very high credit risk | | CCC+ | Caa1 | CCC+ | 1 |
| | | CCC | Caa2 | CCC | |
| | | CCC- | Caa3 | CCC- | |
| Near default with possibility of recovery | | CC | Ca | CC | |
| | | | | C | |
| Default | | SD | C | DDD | |
| | | D | | DD | |
| | | | | D | |

Sovereign ratings (5/11)

## Sovereign ratings of the euro area countries by S&P
(1995 – 2012)




Source: Thomson Reuters.

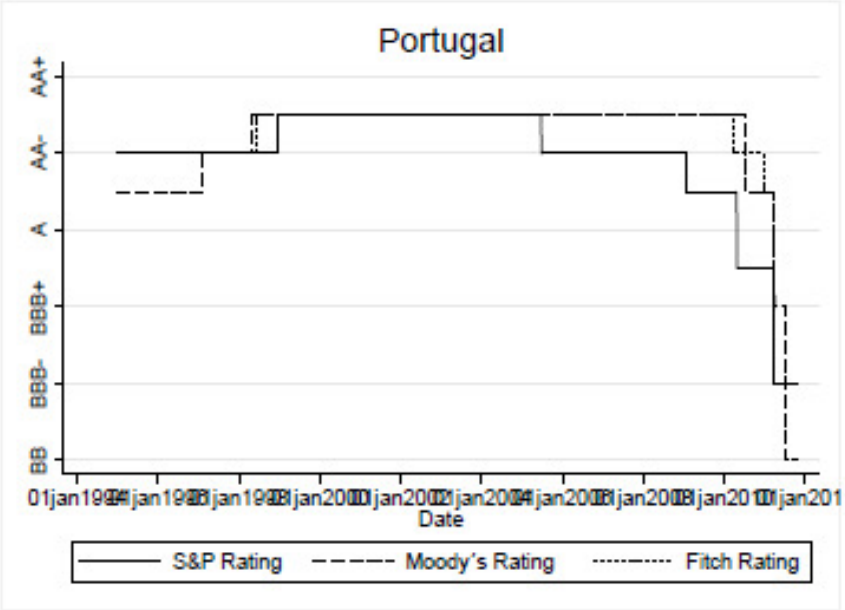
Notes: The euro area countries consist of the EA12 member states excluding Luxembourg. The ratings are end-year observations except for 2012 in the case of which the ratings are equal to these observed on January 16, 2012.

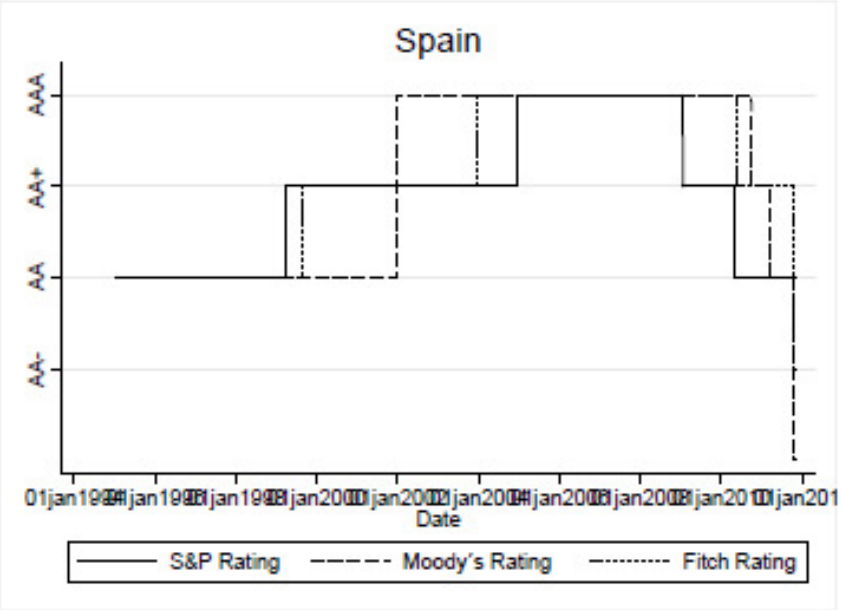
- Bond spreads, CDS rates and sovereign ratings convey information about the sustainability of fiscal policies.

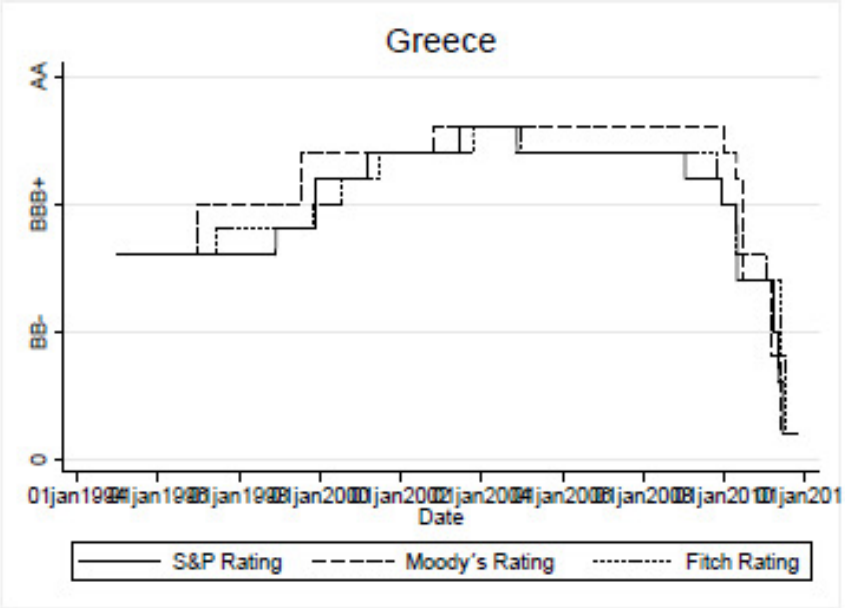
- But exclusive reliance on market signals can be problematic:
  - markets overreact; risks of complacency/panic;
  - market participants have different objectives (e.g. projection horizon);
  - importance of global risk factors – difficult to explain;
  - distorted signals: lack of market liquidity for small countries (including lack of markets for other risks);
  - government reaction to market signals uncertain.

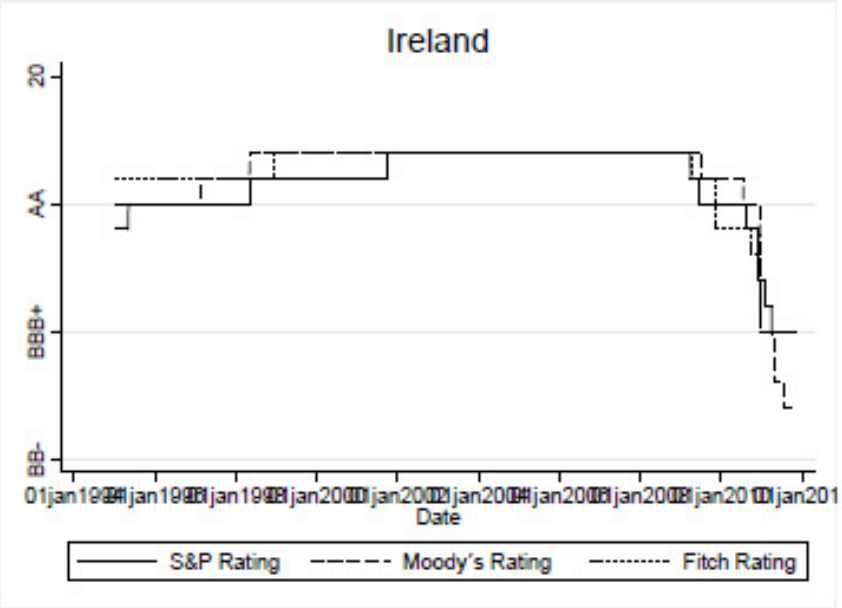
- Market discipline depends on fiscal framework (market access; no-bail out; transparency).
- Negative events more relevant and two-way causality between ratings and sovereign spreads (Afonso et al, 2012).

## Sovereign ratings (7/11)

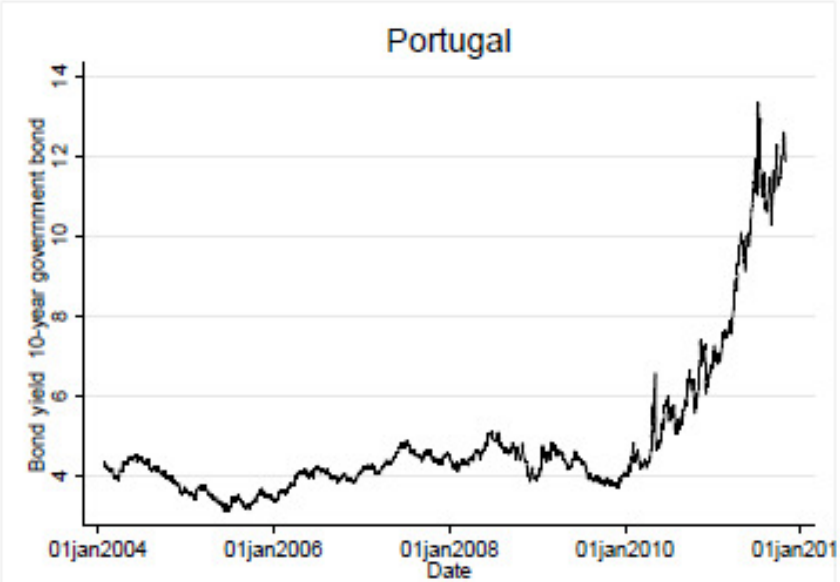


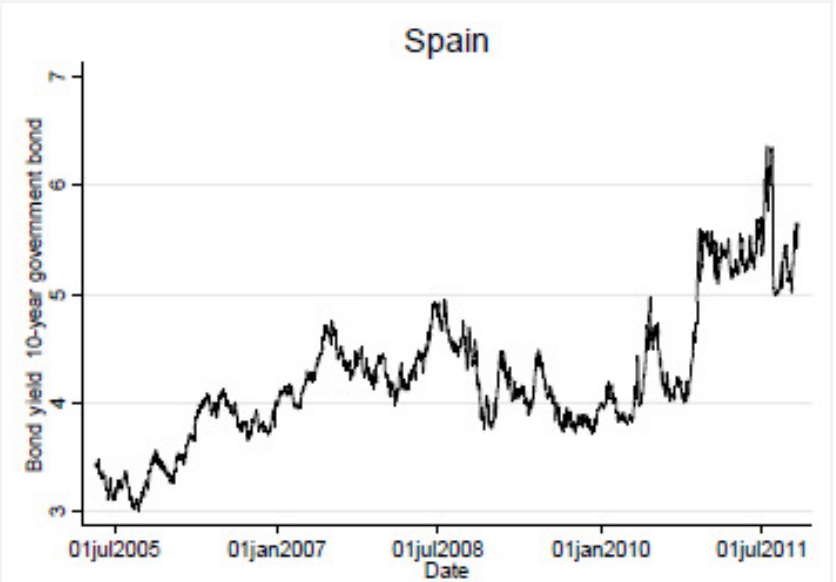



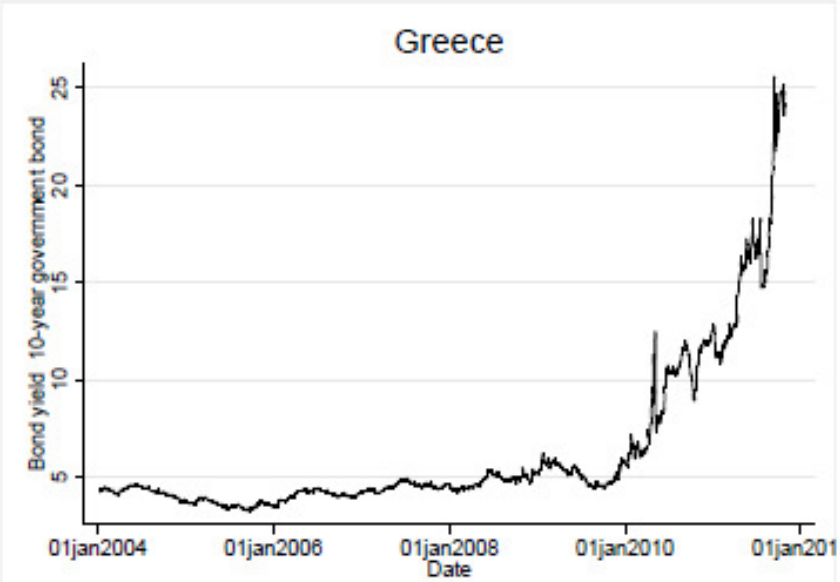



# Sovereign ratings (8/11)



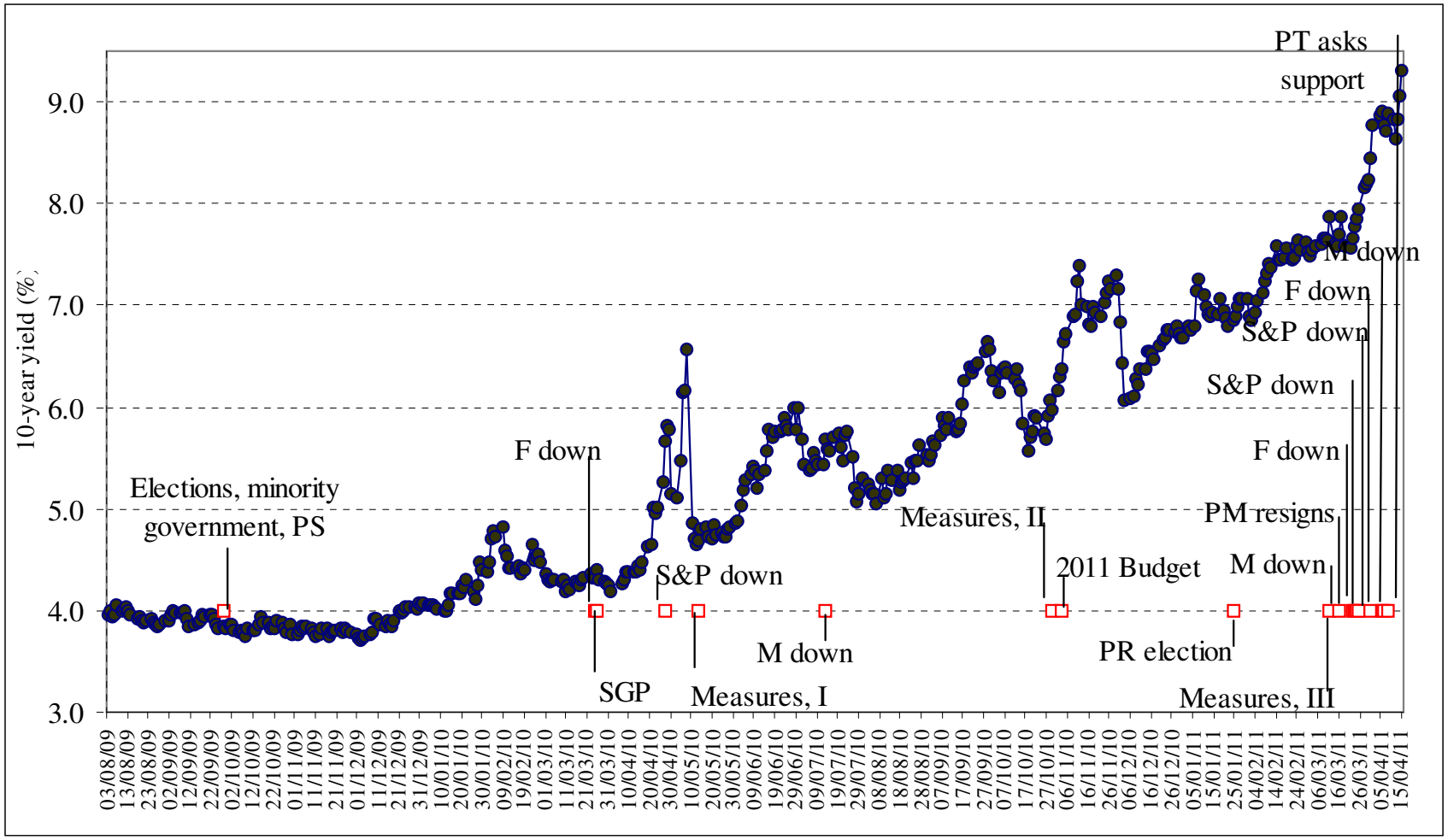

Sovereign ratings (9/11)

# Sovereign credit rating in the euro area countries (17 May 2012)

| Characterization of debt and issuer | Ratings | | | | | |
|---|---|---|---|---|---|---|
| | S&P | Countries | Moody's | Countries | Fitch | Countries |
| Highest quality | AAA | DE, FI, LU, NL | Aaa | AT, DE, FI, FR, LU, NL | AAA | AT, DE, FI, FR, LU, NL |
| High quality | AA+ | AT, BE, FR | Aa1 | | AA+ | ES |
| | AA | BE | Aa2 | | AA | BE, SI |
| | AA- | EE | Aa3 | BE | AA- | |
| Strong payment capacity | A + | SI | A1 | EE | A+ | EE, MT, SK |
| | A | CY, SK | A2 | CY, SI, SK | A | ES, SI |
| | A- | MT | A3 | ES, IT, MT | A- | IT |
| Adequate payment capacity | BBB+ | ES, IE, IT | Baa1 | | BBB+ | IE |
| | BBB | | Baa2 | | BBB | |
| | BBB- | | Baa3 | | BBB- | CY |
| Likely to fulfil obligations | BB+ | CY | Ba1 | CY, IE | BB+ | PT |
| | BB | PT | Ba2 | | BB | |
| | BB- | | Ba3 | PT | BB- | |
| High credit risk | B+ | | B1 | | B+ | |
| | B | | B2 | | B | |
| | B- | | B3 | | B- | GR |
| Very high credit risk | CCC | GR | Caa1 | | CCC | |
| Default | | | C | GR | C | |

# Portugal

3 Aug 2009 – 15 Apr 2011

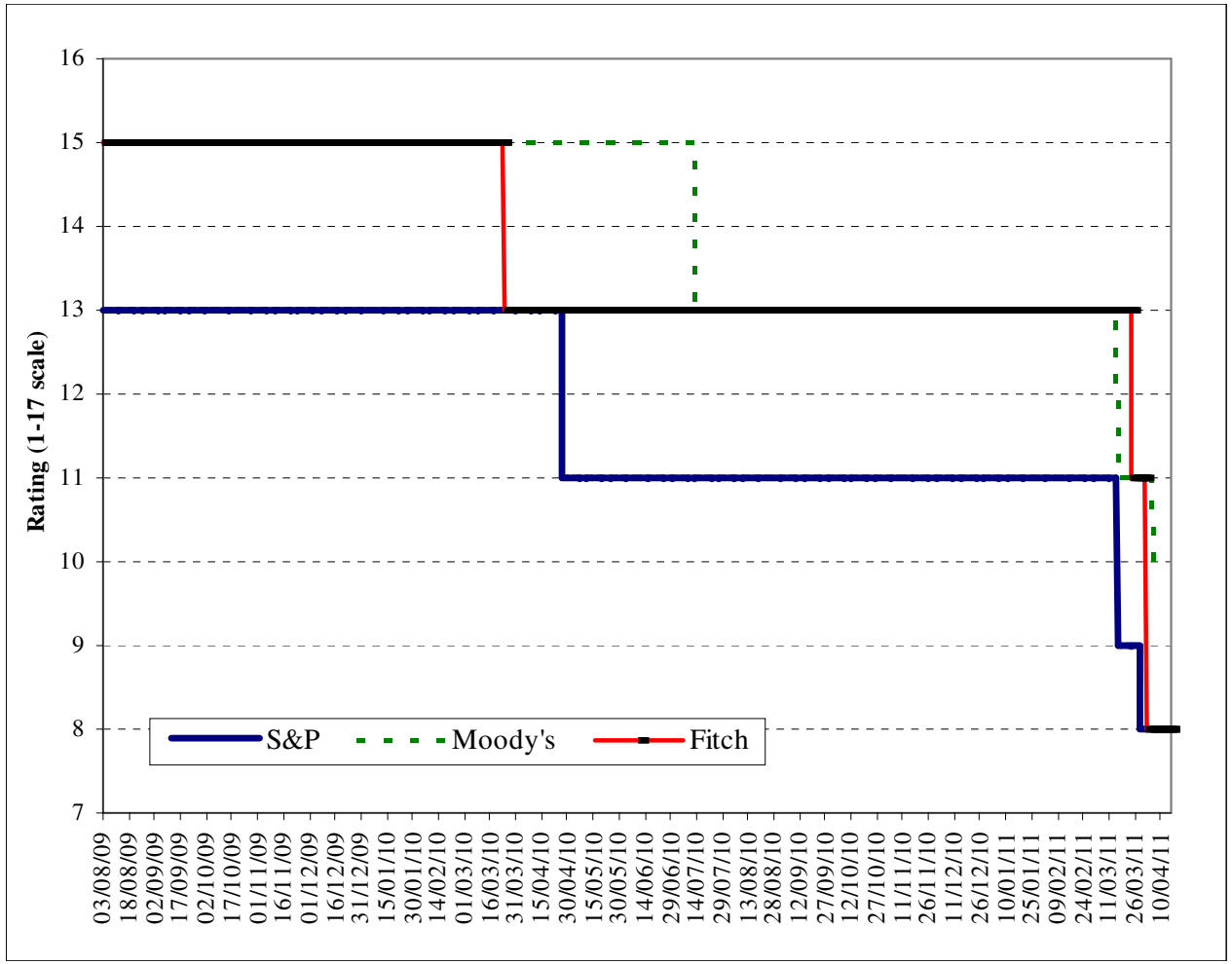



Note: daily yields from Reuters.

Sovereign ratings (11/11)

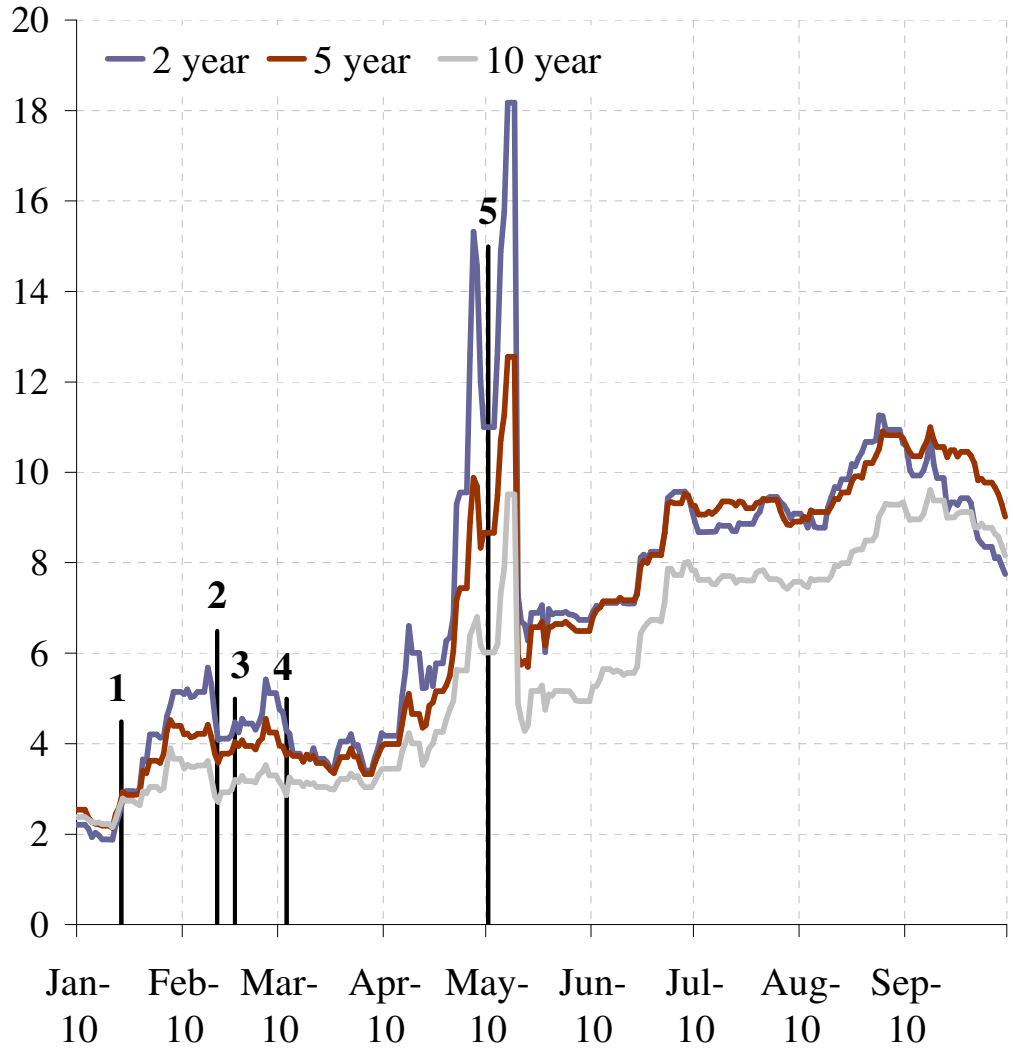
# Portugal, sovereign ratings

3 Aug 2009 – 15 Apr 2011




| | S&P | Moody's | Fitch |
|---|---|---|---|
| 15 | AA | Aa2 | AA |
| 14 | AA- | Aa3 | AA- |
| 13 | A+ | A1 | A+ |
| 12 | A | A2 | A |
| 11 | A- | A3 | A- |
| 10 | BBB+ | Baa1 | BBB+ |
| 9 | BBB | Baa2 | BBB |
| 8 | BBB- | Ba3 | BBB- |

## Greek government bond yield spreads over German government bond yield (%)




1: Greek government presents its stability program.

2: 11 February EU summit.

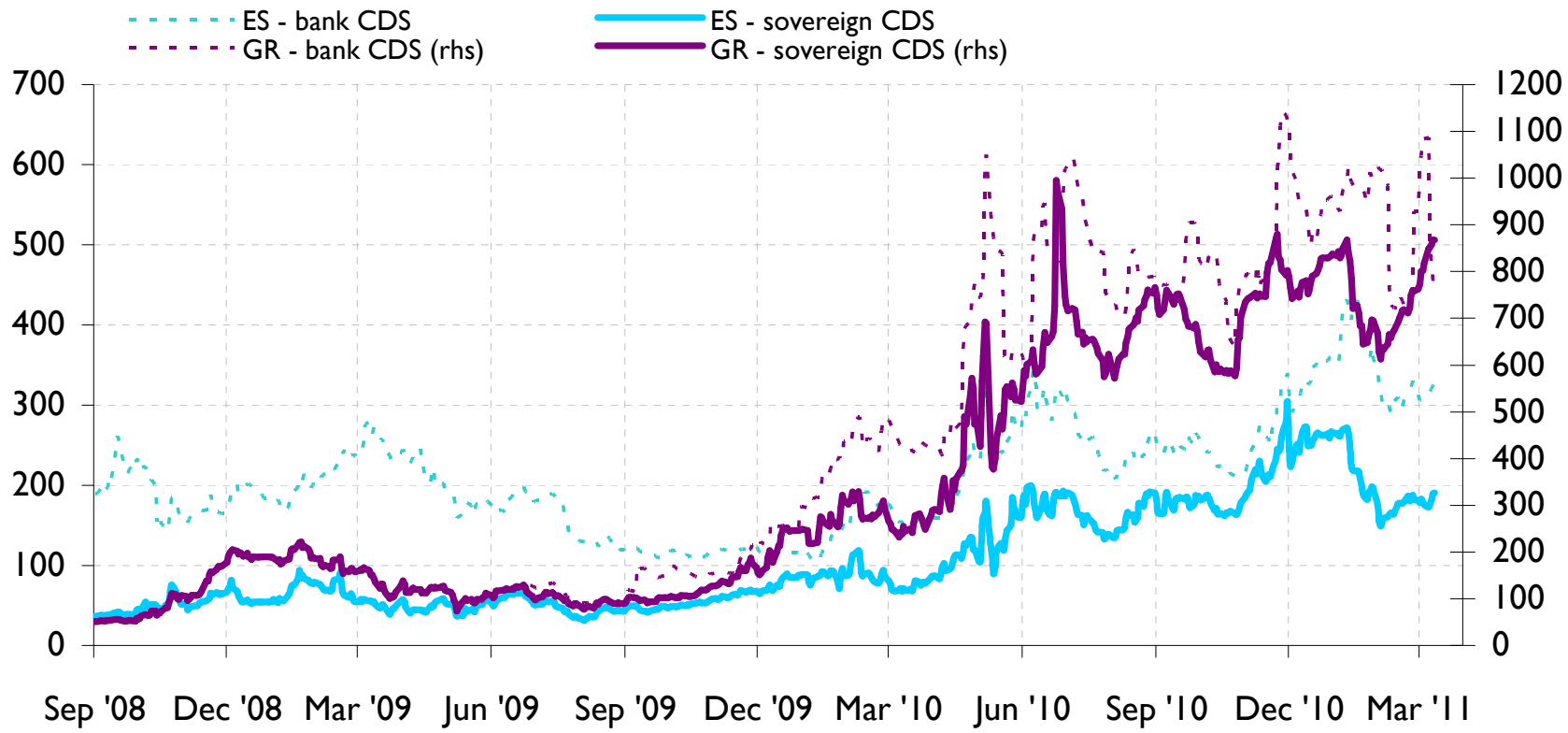
3: 16 February Ecofin meeting.

4: Greek government announces additional fiscal measures.

5: May 2010 EU/IMF financial support programme (€ 110 billion, conditional on strong corrective policy action).

Source: Datastream.

**Sovereign and bank CDS spreads** (1 Sep 2008 - 11 Mar 2011; basis points)




Sources: Thomson Reuters Datastream and ECB calculations.

Note: For each country, the CDS spreads of the largest banks for which CDS quotes were available were used to calculate the average CDS spread of banks in that country.

"Between 2004 and 2007, Moody's and S&P issued credit ratings for tens of thousands of U.S. residential mortgage backed securities (RMBS) and collateralized debt obligations (CDOs)."

"Moody's and S&P provided AAA ratings to tens of thousands of high risk RMBS and CDO securities and then, when those products began to incur losses, issued mass downgrades that shocked the financial markets, hammered the value of the mortgage related securities, and helped trigger the financial crisis."

in ***Wall Street and the Financial Crisis: Anatomy of a Financial Collapse***. Majority and minority staff report, Permanent Subcommittee on Investigations, US Senate, April 13, 2011.

During a briefing by academics at the London School of Economics on the turmoil on the international markets and the **credit crunch** the Queen asked: (Nov. 2008)

"Why did nobody notice it?"

## References


- Afonso, A., Arghyrou, M., Kontonikas, A. (2014). "Pricing sovereign bond risk in the EMU area: an empirical investigation", *International Journal of Finance and Economics*, 19 (1), 49-56.
- Afonso, A., Baxa, J., Slavik, M. (2016). "Fiscal developments and financial stress: a threshold VAR analysis", *Empirical Economics*, forthcoming.
- Afonso, A., Furceri, D., Gomes, P. (2012). "Sovereign credit ratings and financial markets linkages: application to European data", *Journal of International Money and Finance*, 31 (3), 606-638.
- Balakrishnan, R., Danninger, S., Elekdag, S., Tytell, I., (2009). "The Transmission of Financial Stress from Advanced to Emerging Economies, IMF WP 09/133.
- Cardarelli, R., Elekdag, S., Lall, S. (2009). "Financial Stress, Downturns, and Recoveries", IMF WP 09/100.