RECENT ESTIMATES OF SOVEREIGN RISK PREMIA FOR EURO-AREA COUNTRIES

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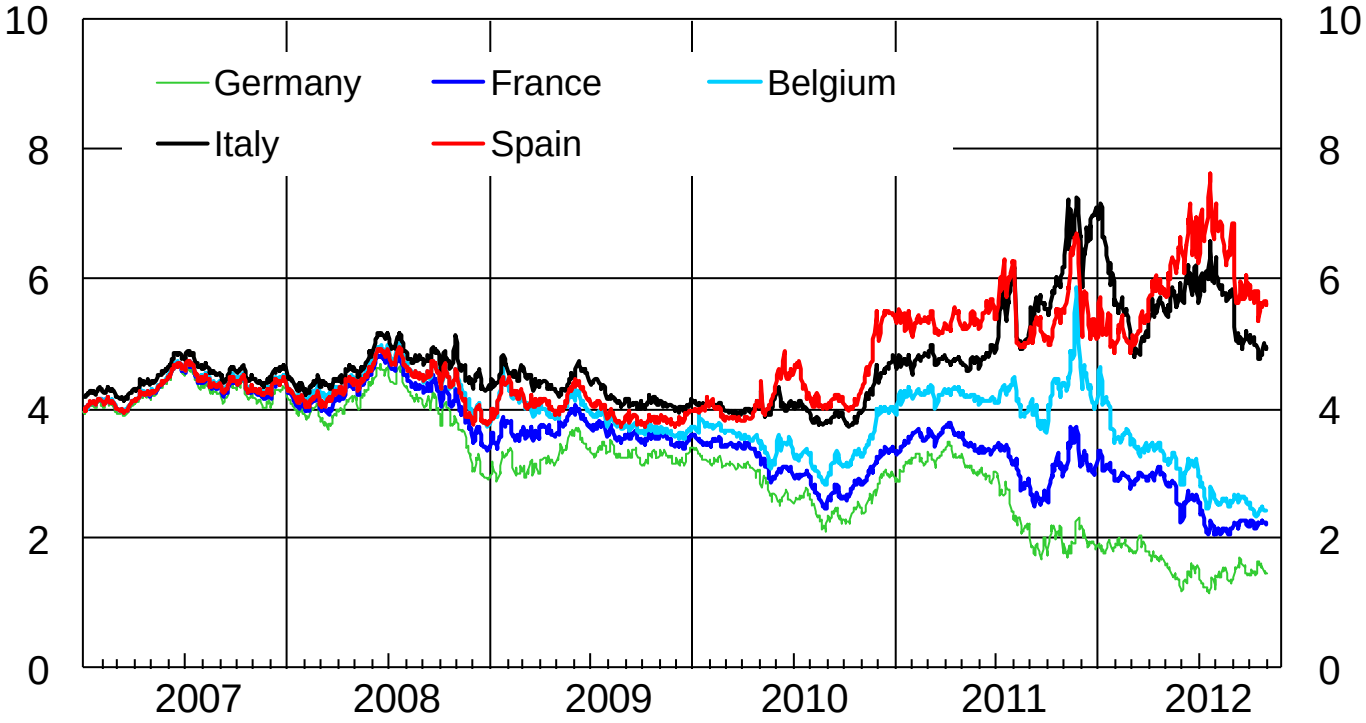
Objective and Motivation

Ten-year interest rates
(*daily data; per cent*)



Objective and Motivation (cont.)

Two questions:

1. To what extent are the current levels of yields justified by fundamentals?
2. What accounts for the unexplained portion of sovereign yields?

Outline

1. Recent literature on euro-area sovereign spreads
2. To what extent are the current levels of yields justified by fundamentals?
    i. Overview of methodology and results
    ii. Financial factors
    iii. Financial factors and other fundamentals
    iv. Robustness
3. What accounts for such a huge dispersion of yields beyond fundamentals?
    i. Euro break-up risk: Qualitative evidence
    ii. Euro break-up risk: Market-based indicators
    iii. Euro break-up risk: Model-based indicators

Recent literature on the euro-area sovereign debt crisis

1. Fiscal fundamentals would explain premia (up to mid-2011)
   - Borgy, Laubach, Mésonnier, Renne (2011)
     - No-arbitrage term struct. model of defaultable bonds with macro factors
     - Panel of 8 euro-area government bond yield curves

2. Fundamentals would not explain a large portion of the premia
   - Aizenman, Hutchison, Jinjarak (2011)
     - Panel of the sovereign CDS premia for 60 countries over the period 2005-2010
   - Ardagna, Burgi, Cole, Garzarelli (2012)
     - Panel of 10-year spreads of FR, IT, ES since early 1990s
     - Expected fundamental + time dummies
   - IMF (2012)
     - Panel of 10-year yields of 21 adv. economies (1980-2010)

Recent literature on the euro-area sovereign debt crisis (cont.)

3. Deviations of spreads from fundamentals are partly due to contagion effects …
   - Metiu (2011)
     - Statistical model run from Janury 2008 and February 2012
     - IT hit by contagion from ES and PT, while the latter in turn hit by GR
4. … and safe haven (or flight-to-liquidity) effects
   - De Santis (2012)
     - There are both contagion and safe haven phenomena
5. Policy perspective: Contagion might come from self-fulfilling liquidity crises
   - De Grauwe and Ji (2012)

Question #1:
How far do fundamentals explain sovereign premia?
Methodology

1. Draw on a variety of methodologies and look at the range of results across methodologies
2. We move from simple to more general models
3. Run regressions up to June 2011 and then compute out-of-sample forecasts (in order not to allow the last wave of exceptional instability to affect the coefficients)

- Estimates available for:
  - 10-year maturity: BE, FR, IE, IT, PT, ES
  - 2- and 5-year maturities: IT

Fitted Spreads for IT: Range of Results

Main determinants of the spread	Frequency of the data	Time horizon		
		2 years	5 years	10 years
Debt-to-GDP ratio	Daily	91	109	122
Debt-to-GDP ratio (nonlinear)	Quarterly	164	203	212
Fiscal/macro indicators (CDS model)	Daily	124	143	155
Fiscal/macro consensus expectations	Monthly	116	215	260
Fiscal/macro indicators ("wake-up call" model)	Monthly	–	–	80-270
Financial indicators (average value)	Daily	168	193	215
Fiscal/macro consensus expectations and financial indicators	Monthly	182	272	272
Fiscal/macro indicators and financial accounts	Yearly	–	–	112-301
Memo:				
Actual BTP-Bund spread (21 August 2012)	Daily	300	413	410
Actual BTP-Bund spread (June 2012)	Monthly	414	493	449
Actual BTP-Bund spread (2012 Q1)	Quarterly	289	371	382

Spreads as a function of financial indicators of country risk

$$s_t = \beta_1 + \beta_2 \, financial\_indicator_t + \varepsilon_t$$

s_t: spread at time t of the country considered

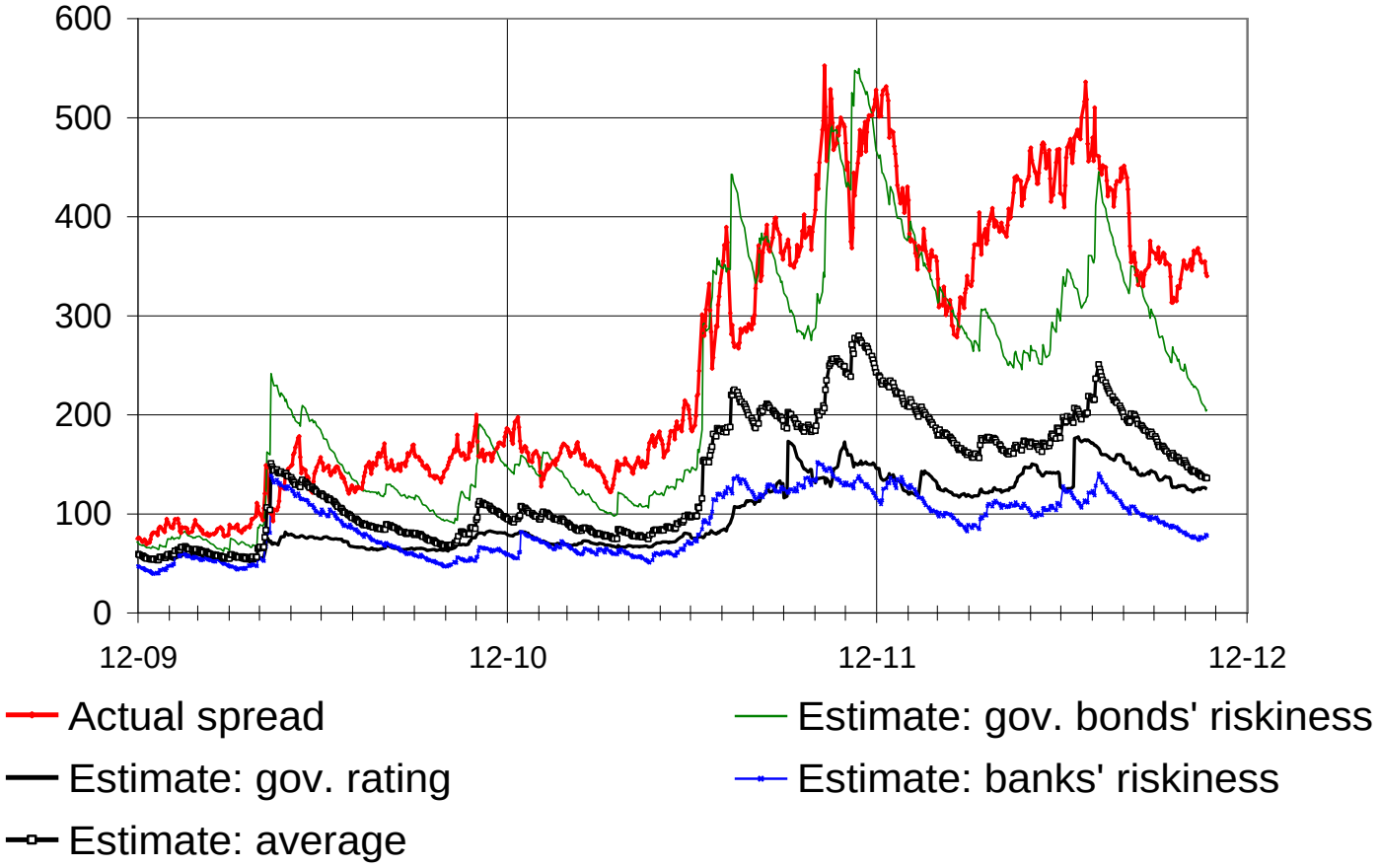
Three financial indicators of country risk:

1. *Volatility of the sovereign spread*: Exponentially weighted moving average (EWMA) of squared day-on-day changes in the 10-year gover.t bond spread
2. *Volatility of bank share prices*: Exponent. weighted mov. average (EWMA) of squared day-on-day changes in the country indeces of bank share prices
3. *Spread on corporate bonds having the same rating*: average spread on the Merrill Lynch index of the corporate bonds having the same rating as the sovereign's government bonds.

Run on daily data from January 1999 to June 2011.

Spreads as a function of financial indicators of country risk (cont.)

Ten-year sovereign spreads with respect to Germany:
(*daily data, up to November 2012; basis points*)



Spreads as a function of fundamentals and financial factors

$$r_t = \alpha + \beta' \overline{EXPFUND}_t + \gamma' \overline{FINFACT}_t + \varepsilon_t$$

r_t : yield at time *t* of the country considered

$\overline{EXPFUND}_t$: vector of 12-month-ahead forecasts of fundamentals

$\overline{FINFACT}_t$: vector including the three financial indicators of country risk

The expected fundamentals are the 12-month-ahead forecasts of :

- budget balance-to-GDP ratio ← *fiscal fundamental*
- three month interest rates
- GDP growth rate
- consumer price inflation
- unemployment rate
- current account-to-GDP ratio

→ *other macroeconomic fundamentals*

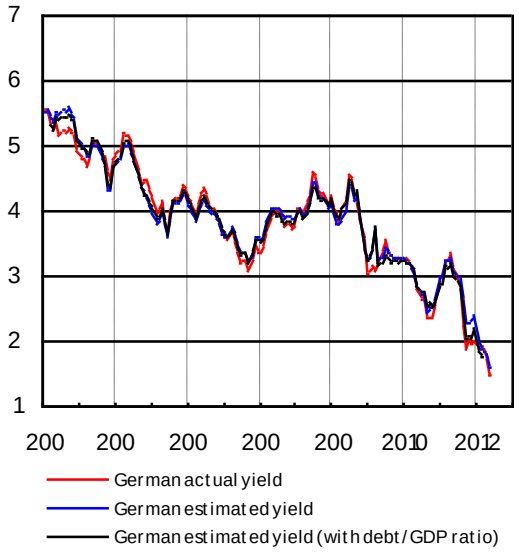
Extended version: public debt-to-GDP ratio ← *fiscal fundamental*

Run on monthly data over the period January 2000-June 2011.

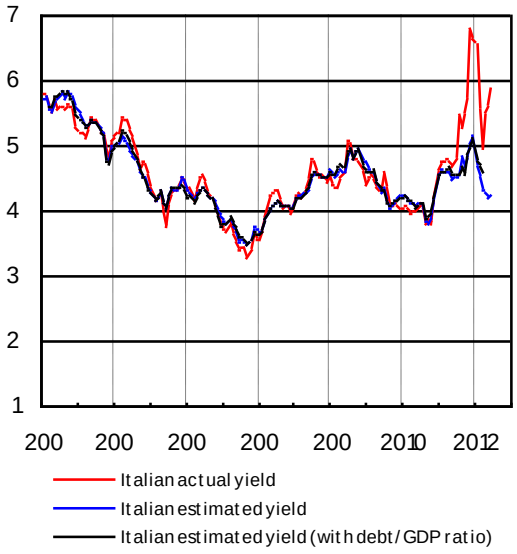
Spreads as a function of fundamentals and financial factors (cont.)

Consensus expectations of fundamentals and financial factors (10-year maturity)

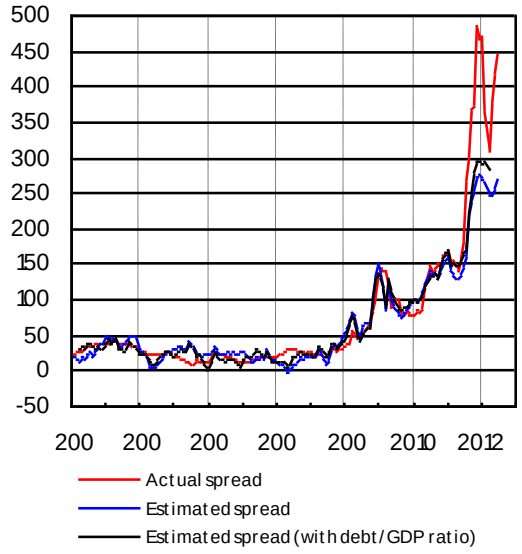
German yields
(monthly data; percentages)



Italian yields
(monthly data; percentages)



Spreads
(monthly data; basis points)



Spreads as a function of fundamentals and financial factors (cont.)

Fundamentals and net asset holdings of the main sectors
(Grande, Masciantonio, Tiseno, 2012)

- Main providers or users of savings: households, non-financial corporations, the public sector and the foreign sector
- Fundamentals include real short term rates, inflation, the debt-to-GDP ratio, the average residual maturity of the public debt and rating dummies
- Panel of the 10-year interest rates of 18 advanced countries.
- Three scenarios about net asset holdings in 2012: (1) recovery; (2) stabilization; (3) deterioration
- In the worst-case scenario, the fitted value of the spread of Italy relative to Germany is equal to 300 basis points

Robustness

"Wake-up call" hypothesis (Giordano, Pericoli and Tommasino, 2012):

- It is well possible that sovereign risk premia have become much more sensitive to fundamentals
- Panel of 9 euro-area countries. Sample period: Jan. 2000-Dec. 2011
- Post-Greek-crisis predicted level of the Italian 10-year spread: 270 bp

Changing risk aversion (for models with financial factors)

- Rolling regressions over 2-year windows: estimates virtually unchanged
- Inclusion of the VIX index as an indicator of risk aversion: estimates virtually unchanged

Question #2:
What accounts for the unexplained portion of spreads?
A model of generalized euro-area risk

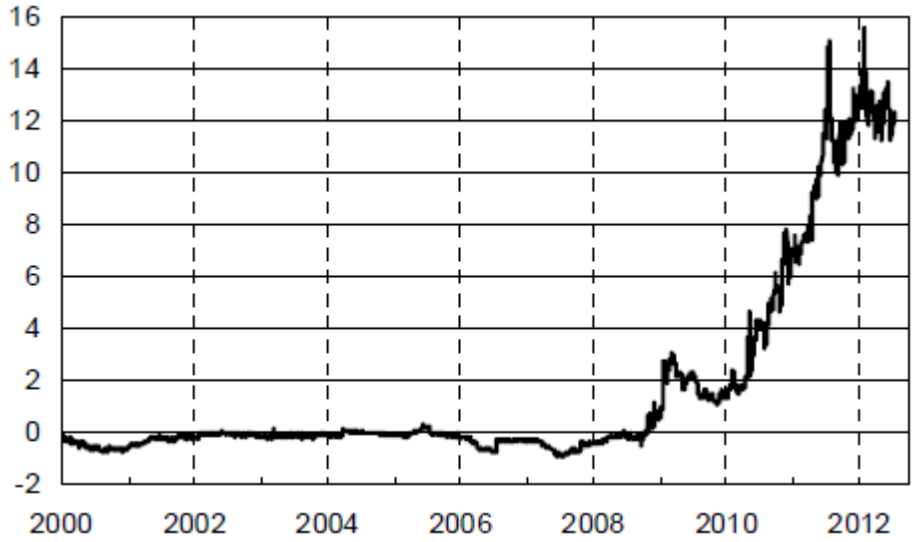
Following Bufano-Manna (2012):

$$s_{i,t} = \beta_0 + \beta_{1,i} C1_t + \beta_2 \left(\frac{debt}{GDP} \right)_{i,t} + \beta_3 \left(\frac{deficit}{GDP} \right)_{i,t} + \beta_4 E_{t,t+5} \left(\frac{\Delta GDP}{GDP} \right)_{i,t} + \varepsilon_{i,t}$$

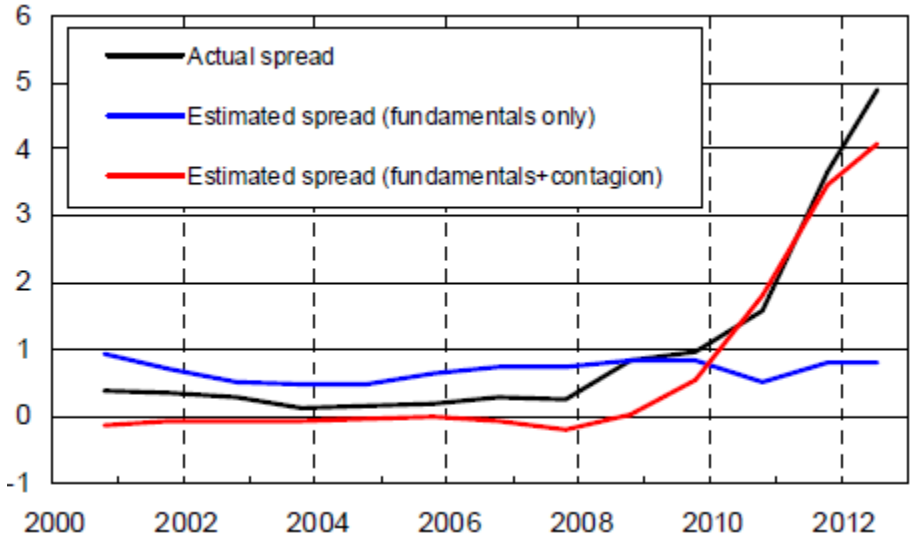
C1 : first principal component (it explains 94% of the overall variance)

Panel of 10 euro-area countries, estimated on annual data from 2000 to 2011.

First principal component



10-year spread of Italy relative to Germany



Fears of euro reversibility

- Since the summer of 2011 euro-area government bond markets have been increasingly affected by stories of a break-up of the euro area

- Doubts about the irreversibility of the euro lead market participants to start guessing about the likelihood and consequences of a euro break-up and about investors' willingness to bear that risk

Fears of euro reversibility: Qualitative evidence

- Surveys of financial market participants
  - A survey of central banks' managers of official reserves, conducted in June 2012 by a private bank, found that the greatest perceived risk for the world economy consisted in the break-up of the euro area.
- Media reports on banks' contingency plans to mitigate the possible effects of a country's exiting the Monetary Union
  - Appearance of "euro redenomination risk" clauses in financial contracts
  - Rebalancing of infra-group financial flows along national lines
  - Stress test exercises
- Sharp increase in Internet searches using keywords relating to the end of the euro 

Fears of euro reversibility: Market-based evidence

- Since March 2012 convergence of Belgian government bond yields to French and German levels
- Differential between government securities yields and sovereign CDS spreads (which should mainly reflect factors other than credit risk): since March 2012 the differential for Italy has diverged from that for Germany, stabilizing at significantly higher values

Fears of euro reversibility: Model-based evidence

- The deviation of sovereign yields from their estimated values has recently tended to be negative for Germany and positive for “non-core” countries.

- Since the second half of 2011 positive correlation between the euro break-up indicator and the portions of the Italian and German 10-year interest rates not justified by fundamentals.

Other explanations of the gaps between the market and model-based values of sovereign spreads

- Poor measurement of expected fundamentals

  Explanatory variables may not measure expected fundamentals well enough

- Biased perception of sovereign risks

  Perception of sovereign risks is biased, maybe because the difficulty of measuring these risks lead investors to make over-simplifying assumptions (e.g. rule-of-thumb assessments) and take into consideration only very pessimistic or worst-case scenarios

- Major repricing of sovereign risk on the part of investors

Conclusions

- The huge increase in the dispersion of interest rates in the euro area since the summer of 2011 can be only partly explained by country-specific economic fundamentals and financial factors
- Market yields are excessively high for the weaker countries of the euro area and excessively low for the sounder ones
- This indicates that some common risk factor is at play in the euro area which has opposite effects on the two groups of countries

Conclusions

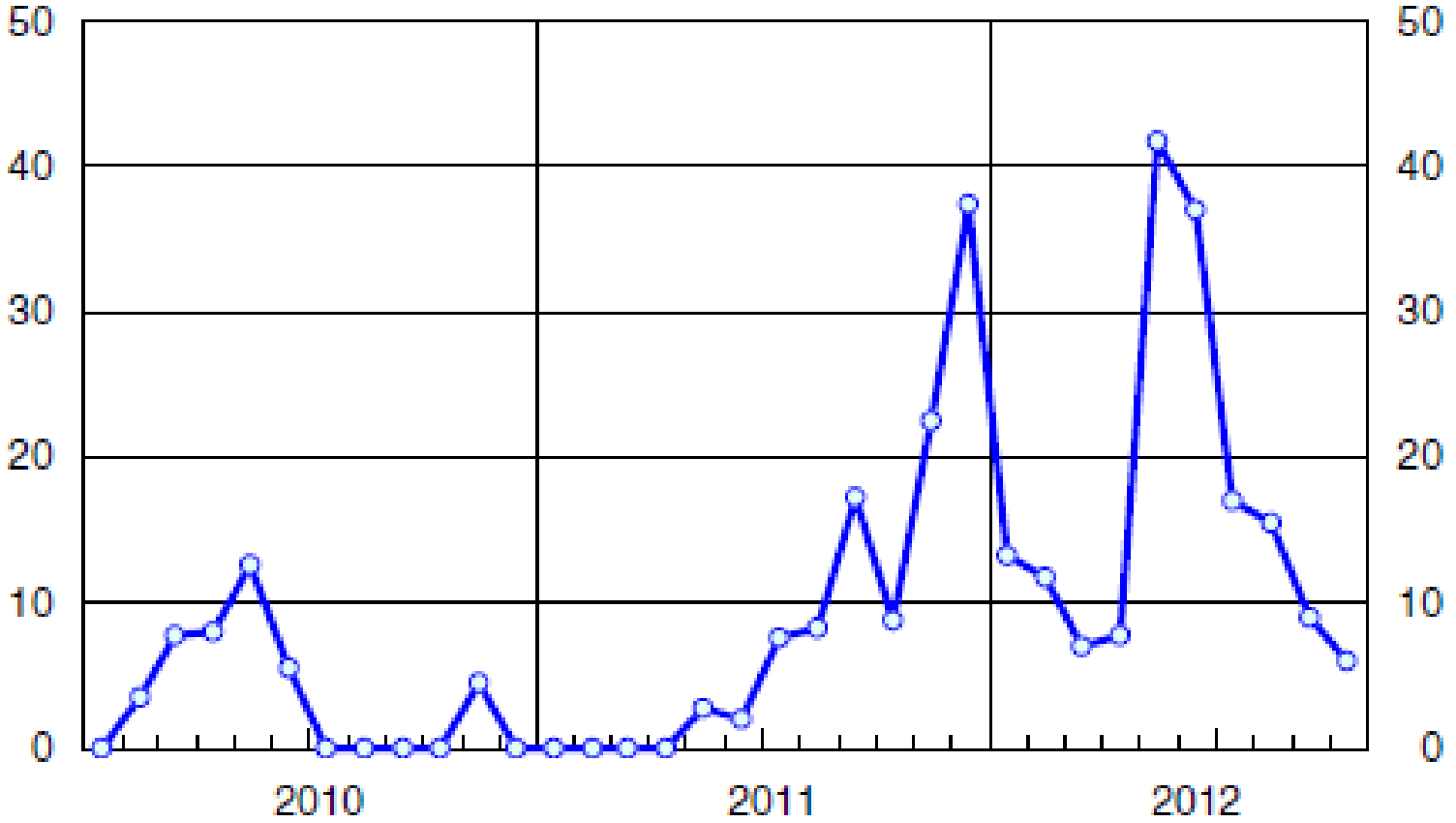
- One factor driving these gaps may be the risk of a break-up of the euro area
- Concerns about the fragility of the euro have apparently caught the attention of market observers and the public at large.
- This hypothesis is corroborated by some new findings presented in this paper. For some “core” and “non-core” countries, the gaps between actual and fitted values of the spreads are in opposite directions and turn out to be correlated with an indicator or euro break-up risks.

Thanks

Range of models

Model	Determinants		Frequency of the data
	economic	financial	
Debt-to-GDP ratio	X		Daily
Debt-to-GDP ratio (nonlinear)	X		Quarterly
Fiscal/macro indicators (CDS model)	X		Daily
Fiscal/macro consensus expectations	X		Monthly
Fiscal/macro indicators (“wake-up call” model)	X		Monthly
Financial indicators (average value)		X	Daily
Fiscal/macro consensus expectations and financial indicators	X	X	Monthly
Fiscal/macro indicators and financial accounts	X	X	Yearly

Internet search frequency of keywords relating to the break-up of the euro area

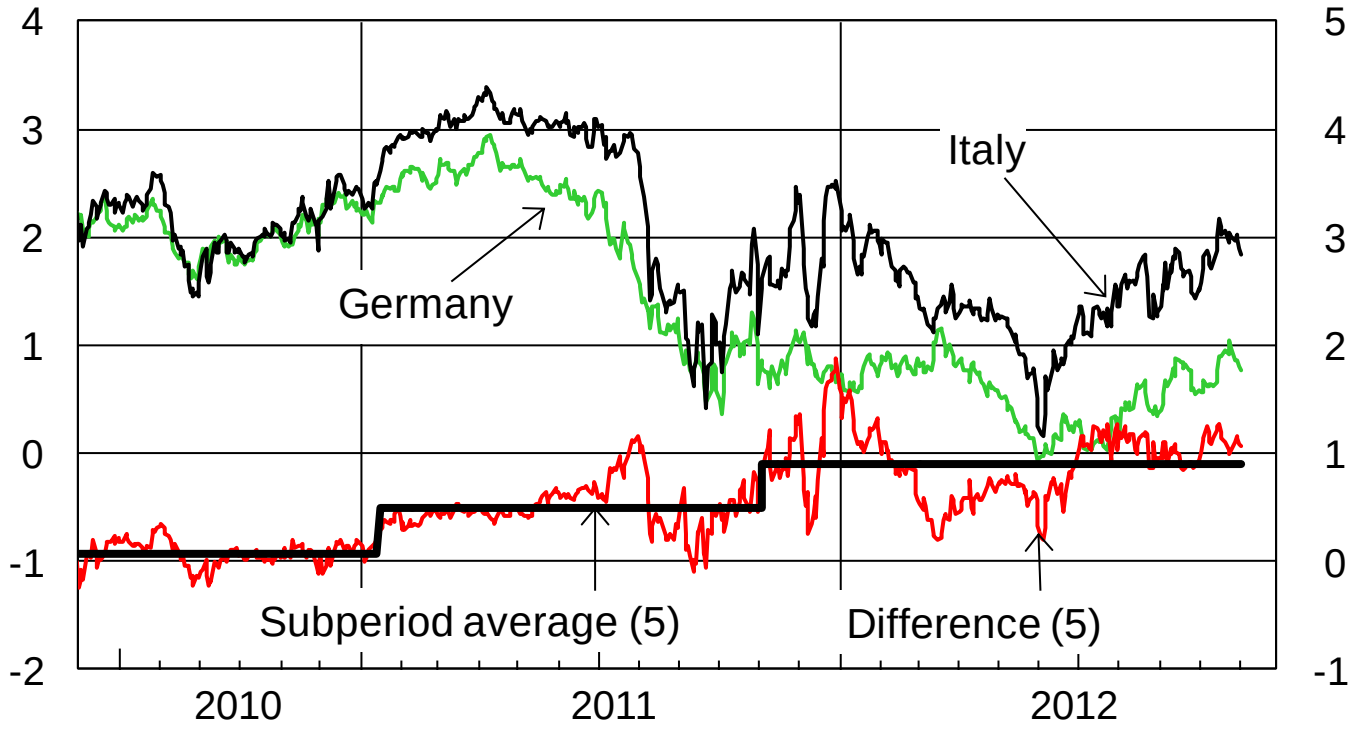


Keywords: “end of euro”, “end of the euro”, “euro break-up”, “euro break up”, “euro breakup” and “euro exit”.

Data as of 5 November 2012.

Differentials between government bond yields and sovereign CDS spreads

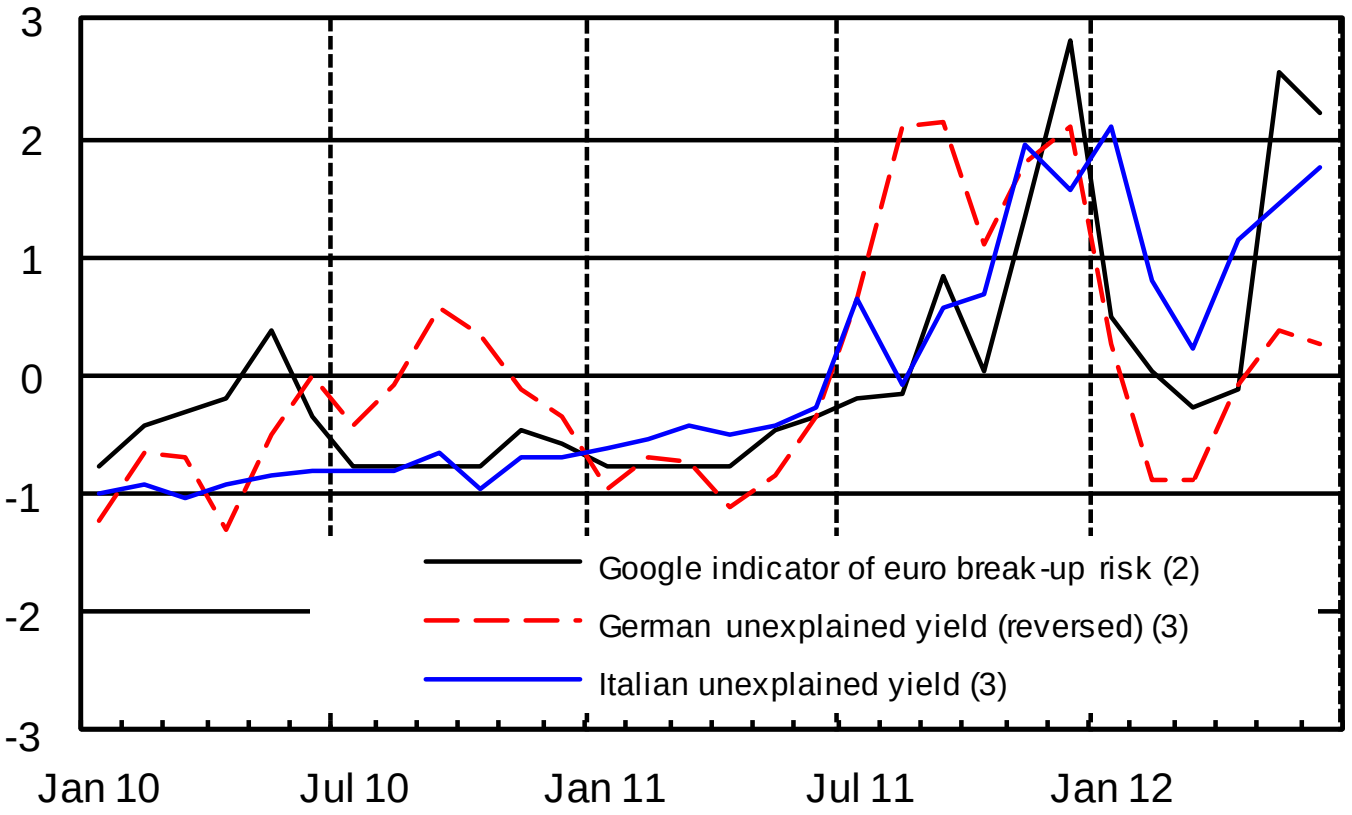
Differentials at the 10-year maturity
(daily data; per cent)



Source: Banca d'Italia (2012), Financial Stability Report, No. 4.

Euro break-up risk and the unexplained portions of German and Italian 10-year yields

(monthly data)



Residuals are standardized.
Since July 2011 fitted values are out-of-sample forecasts.