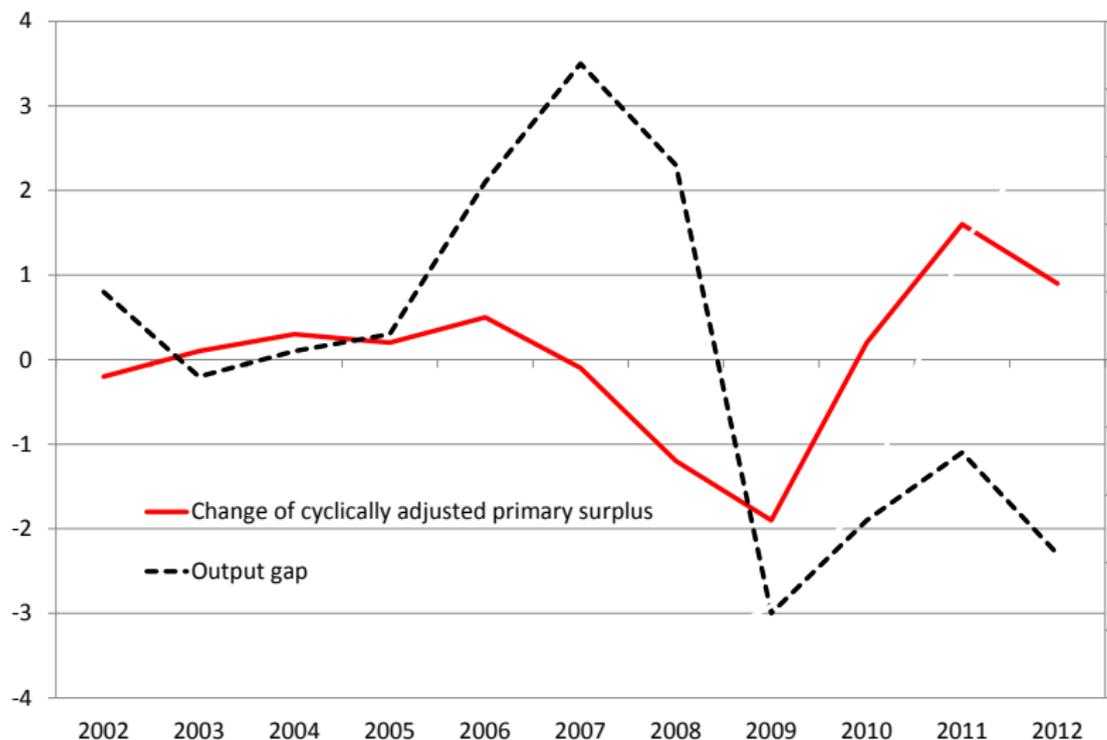


Does Austerity Pay Off?

Benjamin Born (Mannheim) Gernot Müller (Bonn & CEPR)
Johannes Pfeifer (Mannheim)

December 2014

The shift to austerity in the euro area



Source: OECD Economic Outlook (2014)

The question

Shift to austerity in 2010 despite ongoing recession, notably in euro area periphery

- Concerns regarding sustainability of debt, reflected in rising sovereign yield spreads

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- But yield spreads kept rising until mid 2012 [▶ Figure](#)

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Shift to austerity in 2010 despite ongoing recession, notably in euro area periphery

- Concerns regarding sustainability of debt, reflected in rising sovereign yield spreads
- But yield spreads kept rising until mid 2012 [▶ Figure](#)

Does austerity pay off?

- Does austerity *per se* lower sovereign yield spreads and, hence, the financing costs of governments?

The contribution

New panel data set for 31 emerging and advanced economies from 1990Q1 to 2014Q2 (unbalanced)

- Data for sovereign yield spreads, as a direct measure for markets' perception of debt sustainability
- Data for exhaustive government consumption

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New panel data set for 31 emerging and advanced economies from 1990Q1 to 2014Q2 (unbalanced)

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- Data for exhaustive government consumption

Estimate dynamic effect of government consumption on spreads

- Identification within vector autoregressions and local projections
- Condition the effects of austerity on fiscal stress, as state of the economy is likely to matter

Literature

Recent work on spreads

- Longstaff et al. (2011) Borri and Verdelhan (2011), Broner, Lorenzoni, and Schmukler (2013), Bernoth, Hagen, and Schuknecht (2012)

Classic studies of consolidation episodes and narrative approaches

- Giavazzi and Pagano (1990), Alesina and Perotti (1995), Ramey and Shapiro (1998), Devries et al. (2011), Jordá and Taylor (2013)

Austerity in the euro area

- Alesina et al. (2014), Callegari, Drudi, and Kuester (2014)

Identification in VAR models

- Blanchard and Perotti (2002), Mountford and Uhlig (2009), Ramey (2011)

State dependence

- Christiano, Eichenbaum, and Rebelo (2011), Auerbach and Gorodnichenko (2012, 2013), Corsetti, Meier, and Müller (2012), Ilzetki, Mendoza, and Végh (2013), Ramey and Zubairy (2014)

Fiscal policy transmission under fiscal stress

- Bertola and Drazen (1993), Perotti (1999), Corsetti et al. (2013)

Outline

1. Intro w/o preview of results
2. Data
3. Framework
4. Results
5. Interpretation
6. Conclusion

2. Data

Exhaustive government consumption

- goods purchased/produced by the government for final consumption
- Non-interpolated from direct sources at quarterly frequency (general or central government, depending on country)
- Ilzetzki, Mendoza, and Végh (2013) collect data up to 2008
→ update (new base year) and extend their data set [▶ Table](#)

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→ update (new base year) and extend their data set [▶ Table](#)

Actual austerity often tax-based (Alesina et al., 2014)

- More difficult to handle in terms of identification

Spread data

Measure of market's assessment of government solvency/real financing costs of countries

- Compute difference in sovereign yields vis-à-vis a “riskless” reference country
- Only consider yields on government securities issued in a common currency: eliminate effects of inflation and depreciation expectations

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Measure of market's assessment of government solvency/real financing costs of countries

- Compute difference in sovereign yields vis-à-vis a “riskless” reference country
- Only consider yields on government securities issued in a common currency: eliminate effects of inflation and depreciation expectations

Alternative credit default swap (CDS) spread looks similar, but available for only for subset of countries/time periods [▶ Figure](#)

Spread data: three strategies

1. Emerging markets: J.P. Morgan EMBI spreads
→ difference in yields of dollar-denominated government (-guaranteed) bonds relative to U.S. government bonds
2. Euro area (ECB): “long-term interest rate for convergence purposes”
→ computed as “yields to maturity” from bonds with residual maturity close to 10 years
→ use German government bond yield as risk-free benchmark
3. Make use of issuance of foreign currency government bonds in many economies

▶ Table

Spreads: quarterly observations for 31 countries

Country	first obs	last obs	min	max	mean	std	$\rho(\Delta y_t, s_t)$	$\rho(\Delta g_t, s_t)$
Argentina	1993.75	2014.50	2.10	66.16	15.35	17.68	0.00	-0.20
Austria	1993.75	2014.50	0.00	1.21	0.28	0.26	-0.44	-0.32
Belgium	1991.75	2014.50	0.03	2.52	0.46	0.44	-0.38	-0.17
Brazil	1994.25	2014.50	1.48	18.95	5.64	3.93	-0.03	-0.08
Bulgaria	1994.50	2013.75	0.55	20.37	5.18	4.86	-0.09	-0.04
Chile	1999.25	2014.50	0.57	3.57	1.46	0.58	-0.48	0.19
Colombia	1997.00	2014.50	1.16	8.48	3.50	2.06	-0.40	-0.22
Denmark	1988.50	2002.50	0.02	1.93	0.57	0.42	-0.17	-0.01
Ecuador	1995.00	2014.50	3.97	39.38	12.11	8.33	-0.28	-0.02
El Salvador	2002.25	2014.50	1.32	7.52	3.34	1.23	-0.75	0.01
Finland	1992.25	2014.50	-0.04	0.80	0.27	0.18	-0.44	-0.23
France	1999.00	2014.50	0.02	1.36	0.29	0.31	-0.35	0.03
Greece	1992.25	2014.50	0.16	24.25	3.01	5.23	-0.60	-0.22
Hungary	1999.00	2014.50	0.20	5.90	1.81	1.55	-0.58	-0.07
Ireland	1991.75	2014.50	-0.04	7.93	1.07	1.75	-0.18	-0.39
Italy	1989.00	2014.50	-0.07	4.68	0.84	1.00	-0.41	-0.40

Spreads: quarterly observations for 31 countries cont'd

Country	first obs	last obs	min	max	mean	std	$\rho(\Delta y_t, s_t)$	$\rho(\Delta g_t, s_t)$
Lithuania	2009.75	2014.50	1.26	4.23	2.55	0.86	-0.14	-0.41
Malaysia	1996.75	2014.50	0.55	7.84	1.76	1.23	-0.61	-0.01
Mexico	1993.75	2014.50	1.02	14.02	3.47	2.54	-0.28	-0.05
Netherlands	1999.00	2014.50	-0.00	0.67	0.20	0.17	-0.65	-0.28
Peru	1997.00	2014.50	1.10	7.79	3.46	1.96	-0.33	-0.08
Poland	1994.75	2014.50	0.48	8.26	1.93	1.39	-0.02	-0.09
Portugal	1993.25	2014.50	0.00	11.39	1.40	2.61	-0.44	-0.40
Slovakia	2008.50	2014.50	0.73	3.40	1.67	0.79	-0.10	-0.16
Slovenia	2006.50	2014.50	0.04	5.11	1.92	1.62	-0.29	-0.40
South Africa	1994.75	2014.50	0.68	6.16	2.26	1.17	-0.50	-0.18
Spain	1992.50	2014.50	0.01	5.09	0.79	1.16	-0.61	-0.45
Sweden	1986.00	2009.50	-0.95	2.95	0.90	0.94	0.34	-0.07
Thailand	1997.25	2006.00	0.48	5.87	1.56	1.16	-0.47	0.19
Turkey	1996.25	2014.50	1.72	10.10	3.97	2.18	-0.34	-0.14
Uruguay	2001.25	2014.50	1.29	13.94	3.86	2.99	-0.25	-0.35

3. Econometric framework

Vector autoregressive model

$$X_{i,t} = \mu_i + \alpha_i t + A(L)X_{i,t-1} + \nu_{i,t}$$

with endogenous variables

$$X_{i,t} = [\log(g_{i,t}), \log(y_{i,t}), s_{i,t}]'$$

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Identification: $g_{i,t}$ predetermined (Blanchard and Perotti, 2002)

- Government spending is gov. consumption, not transfers
- Discretionary spending subject to decision lags
- Such lags even observed as crisis imminent (US stimulus package, austerity measures in European periphery)

Local projection provides direct estimate of impulse response functions (Jordá, 2005), same identification assumption

$$x_{i,t+h} = \psi_h g_{i,t} + \Pi_h(L) X_{i,t-1} + u_{it}$$

- Straightforward to condition impulse response on current regime: fiscal stress vs benign times

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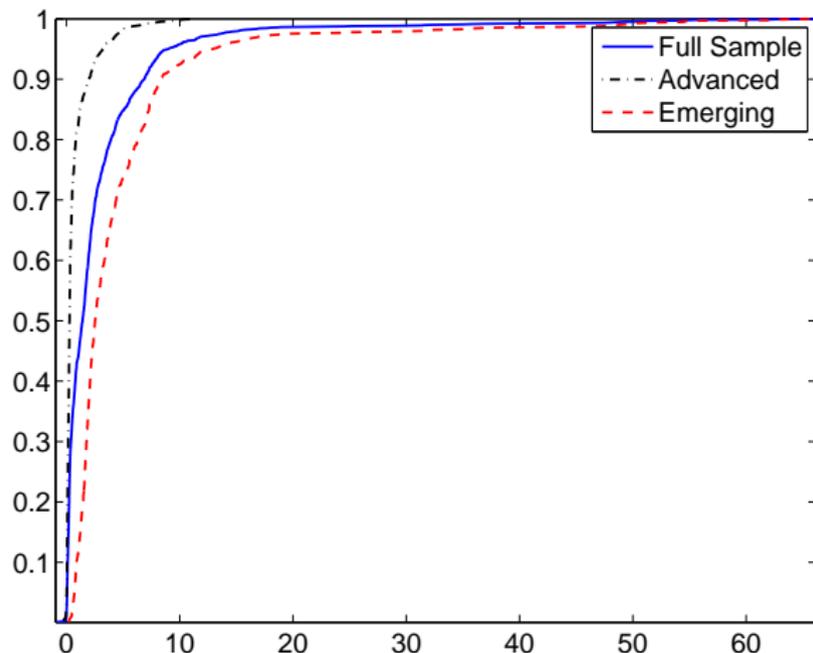
Smooth transition regression (Granger and Teräsvirta, 1993; Auerbach and Gorodnichenko, 2012)

$$x_{i,t+h} = F(z_{i,t}) \psi_{A,h} g_{i,t} + [1 - F(z_{i,t})] \psi_{B,h} g_{i,t} \\ + F(z_{i,t}) \Pi_{A,h}(L) X_{i,t-1} + [1 - F(z_{i,t})] \Pi_{B,h}(L) X_{i,t-1} + u_{i,t}$$

- Indicator function $F(z_{i,t})$ weights the two regimes

Indicator function: empirical CDF for spreads

$$F(s_{i,t-1}) = \frac{1}{N} \sum_{j=1}^N \mathbb{1}_{s_j < s_{i,t-1}}$$



4. Results

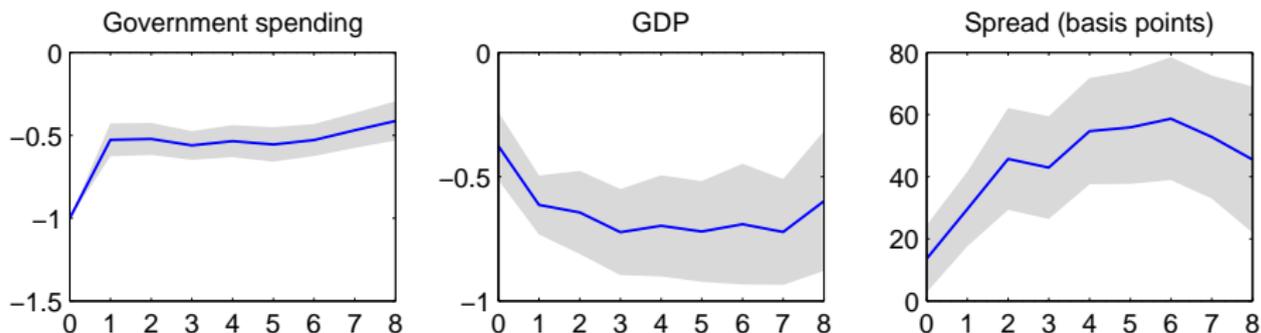
Local projections

- Unbalanced panel for 31 countries, 1990q1–2014q1 (\approx 1850 observations)
- Include time-fixed effects and country-specific constant/trend, group-specific indicator function
- Driscoll and Kraay (1998) standard errors: robust to heteroskedasticity, serial and cross-sectional correlation

Estimate impulse response functions for 8 quarters

- VAR estimates very similar and available for longer horizons

Austerity: cut government consumption by 1 pp of GDP

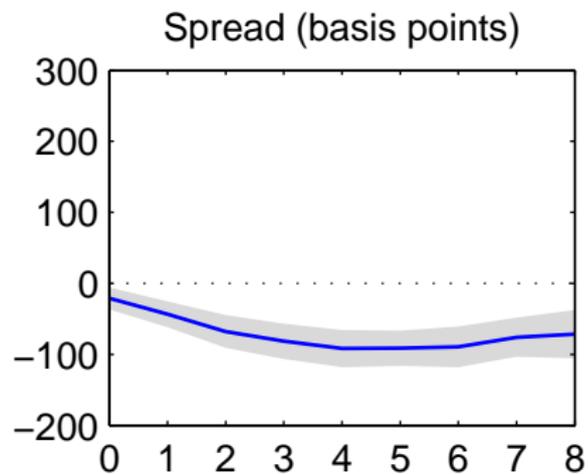
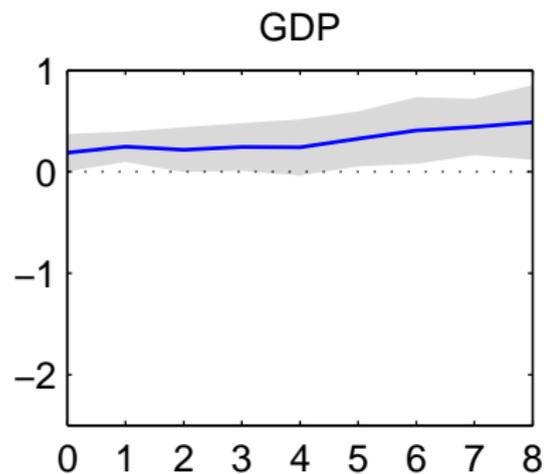


- Output falls by -0.4% on impact, declines further to -0.8%
- Spreads increase by 20-60 bps during first couple quarters
 - spreads still countercyclical
 - austerity does not pay off

► Comparison to SVAR

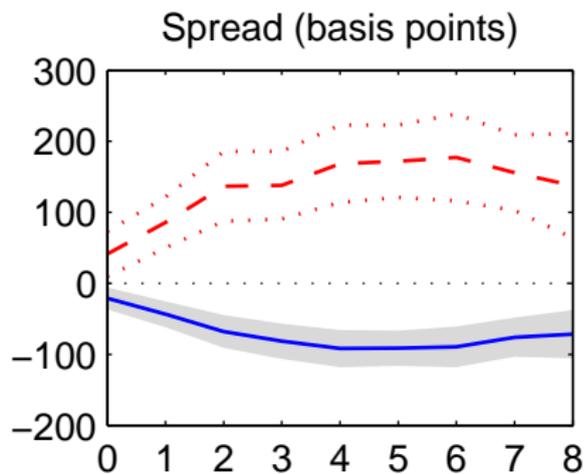
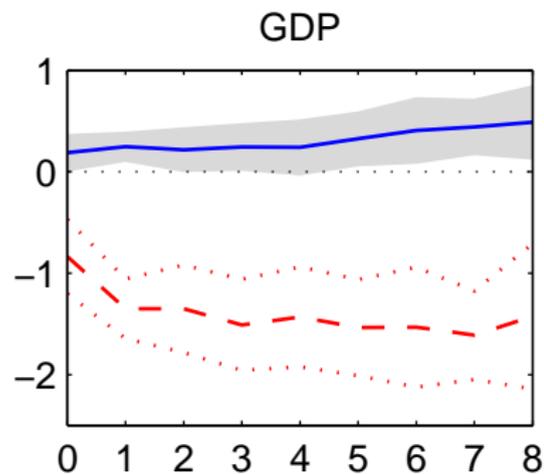
Austerity: cut government consumption by 1 pp of GDP

Benign times

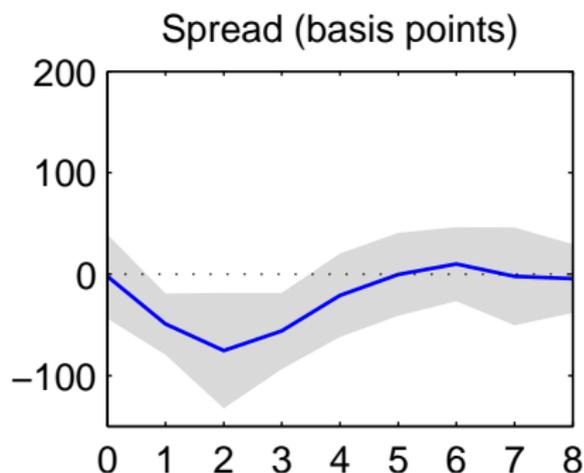
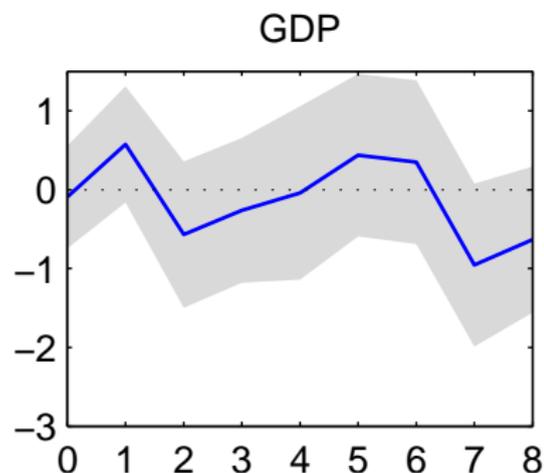


Austerity: cut government consumption by 1 pp of GDP

Benign times vs. times of fiscal stress

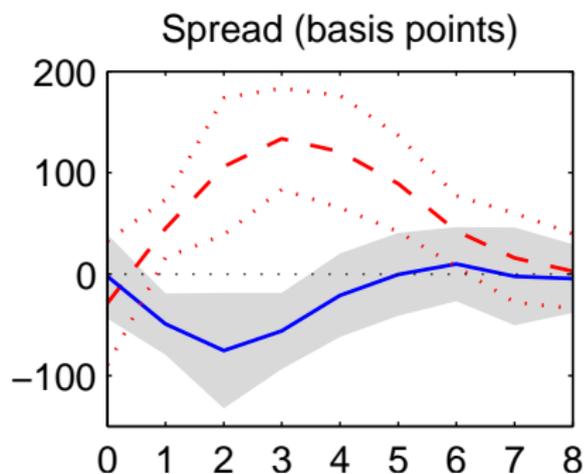
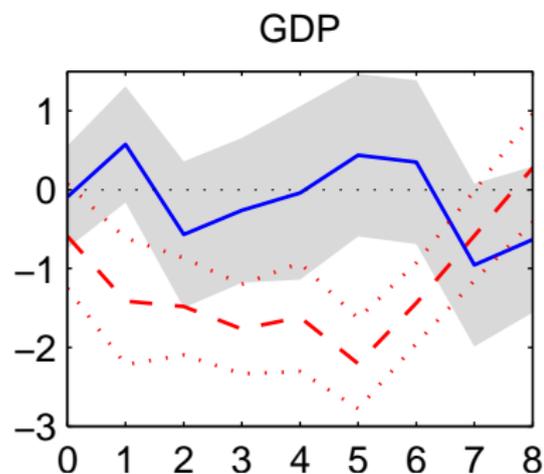


Same results based on forecast error identification



Government consumption in local projection replaced by forecast error, available for subsample of OECD countries at biannual frequency

Same results based on forecast error identification

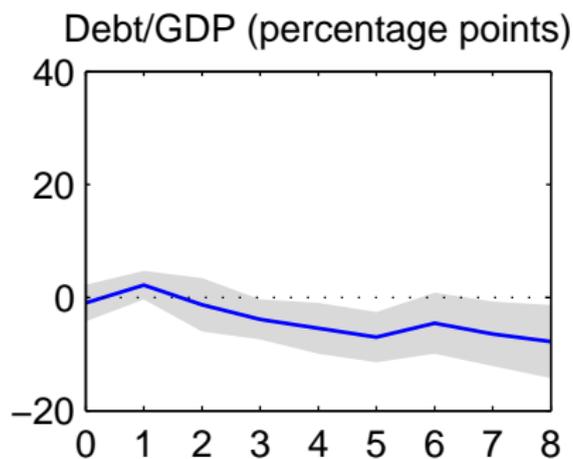


Government consumption in local projection replaced by forecast error, available for subsample of OECD countries at biannual frequency

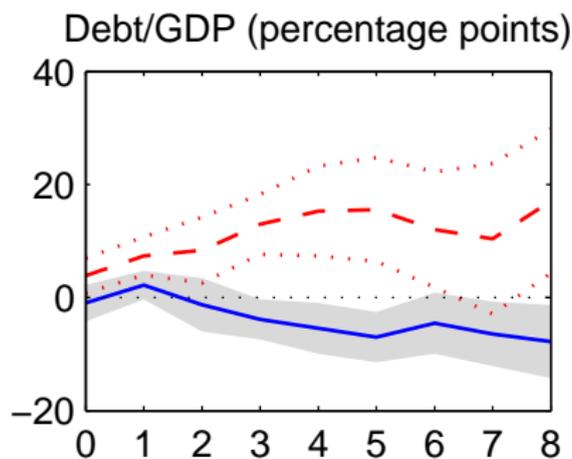
Results are robust with respect to. . .

- Excluding Great Recession
- Number of sample splits (e.g. advanced vs. emerging)
- Variations of fiscal stress indicator
- Construction of Spreads
- Whether a country has its own legal tender

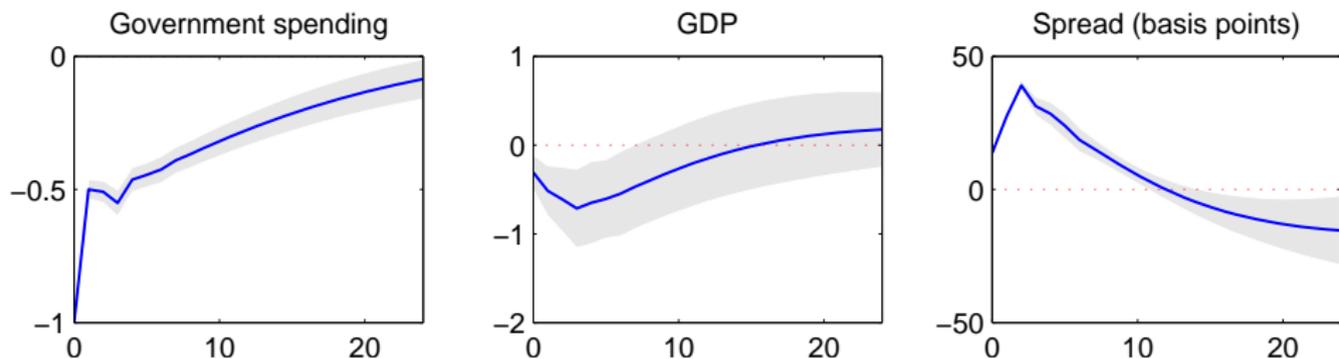
Austerity has differential impact on debt-to-GDP ratio, depending on the state of the economy (subsample)



Austerity has differential impact on debt-to-GDP ratio, depending on the state of the economy (subsample)



Spreads decline in the long-run



Estimate VAR with spreads in first differences to allow for long-run effect on spreads

4. Interpretation

Are financial markets schizophrenic about austerity? (Blanchard)

- High spreads appear as a call for austerity
- Spreads rise further in response to austerity

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Are financial markets schizophrenic about austerity? (Blanchard)

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Quantitative model of optimal sovereign default (Arellano, 2008)

- Explore financial market response to exogenous variation in government spending
- Allow for multiplier effect on output (otherwise exogenous)

Policy maker's objective

$$\max_{c_t} E_0 \sum_{t=0}^{\infty} \beta^t [u(c_t) + v(g_t)]$$

subject to budget constraint

$$c_t + g_t = y_t + q_t d_{t+1} - d_t$$

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Assume for output ($\epsilon \geq 0$)

$$y_t = x_t + \epsilon g_t$$

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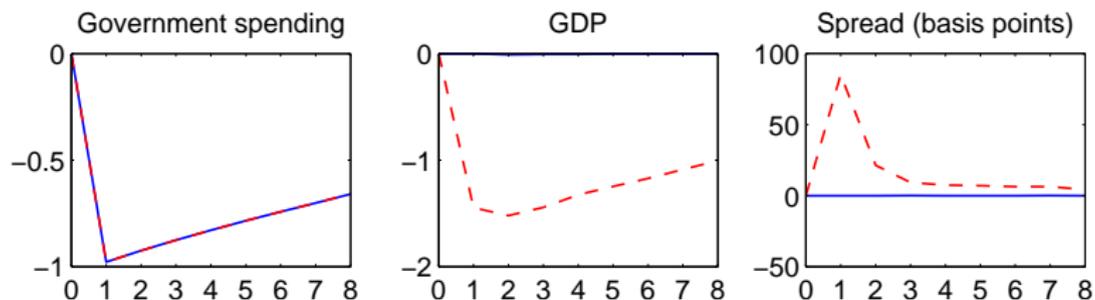
$$y_t = x_t + \epsilon g_t$$

No arbitrage condition links bond price to probability of default

$$q_t = \frac{1 - \delta(d_t, x_t, g_t)}{1 + r}$$

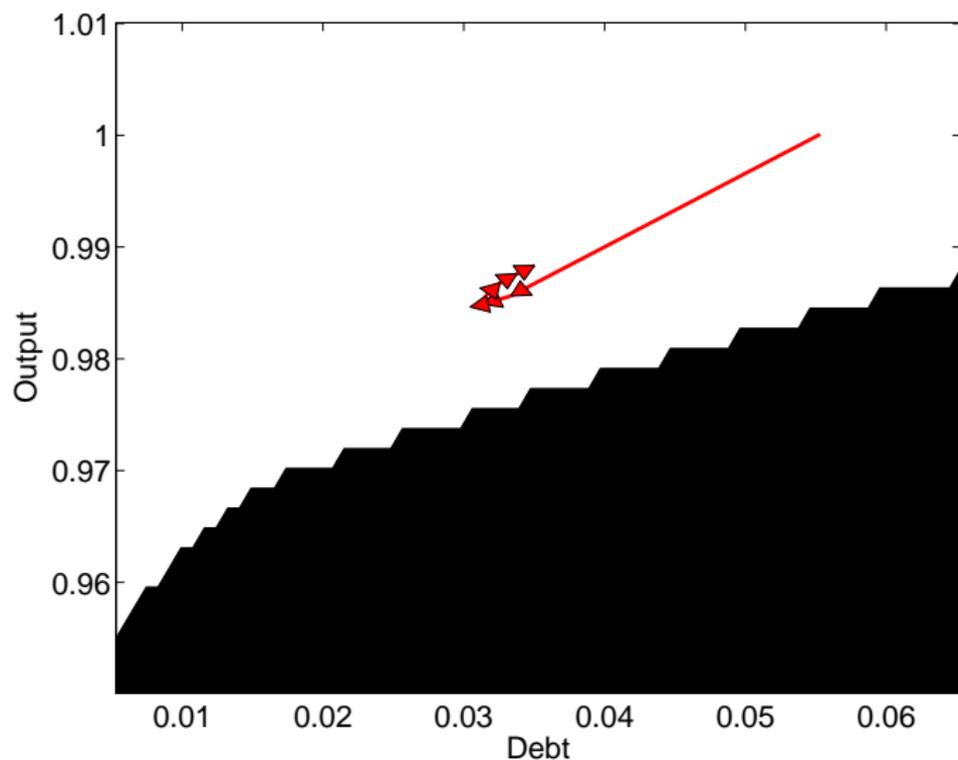
Austerity: cut government consumption by 1 pp of GDP

Zero multiplier **vs. multiplier of 1.5**

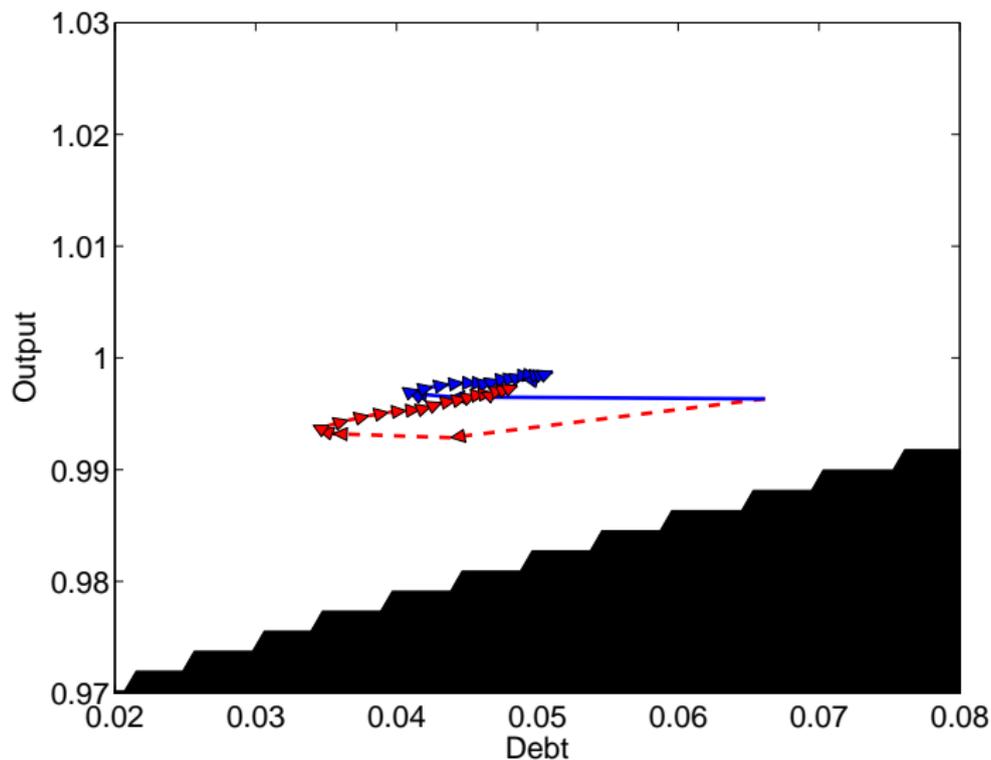


Generalized IRF, starting at ergodic mean, Arellano calibration

Dynamics in Debt/Output Space: austerity pushes economy closer to default set if multiplier high



Movement in Debt/Output Space: starting in stress state, with austerity and w/o



Does austerity pay off?

No.

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No.

Austerity

- Depresses economic activity and raises spreads in the short run

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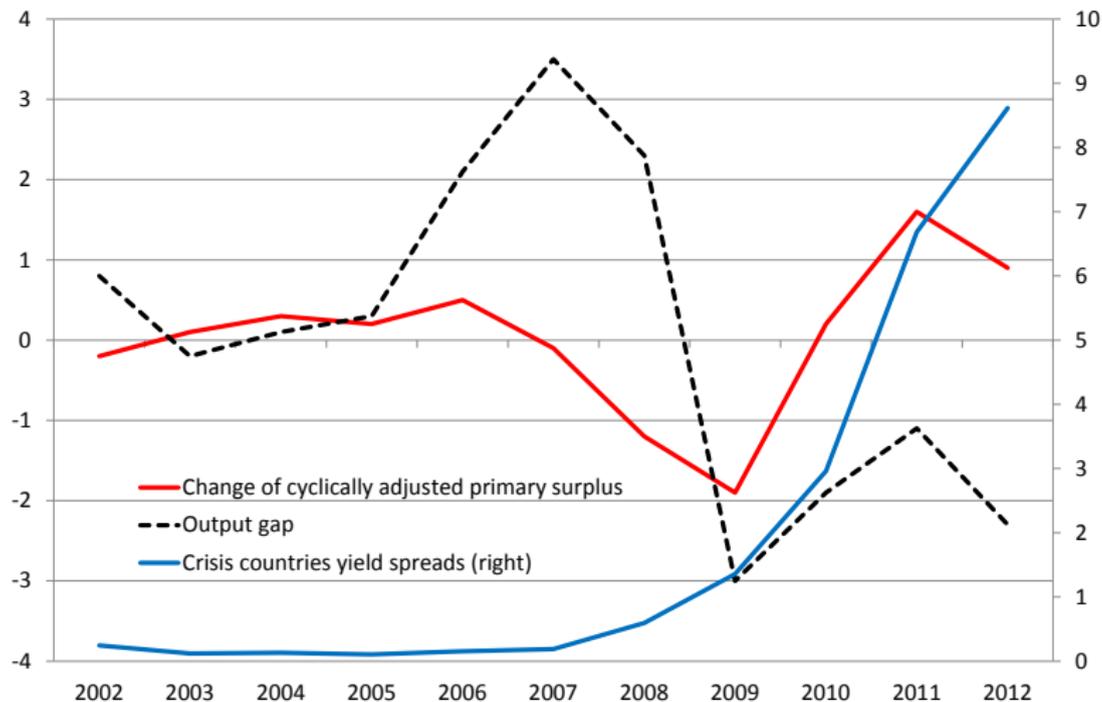
Austerity

- Depresses economic activity and raises spreads in the short run
- Unless economy enjoys benign times

Policy implications

- Keep public debt in check before its too late
- Avoid excessive frontloading of austerity during times of fiscal stress

Sovereign yield spreads vis-à-vis Germany



[▶ back](#)

Government consumption-to-output 1/2

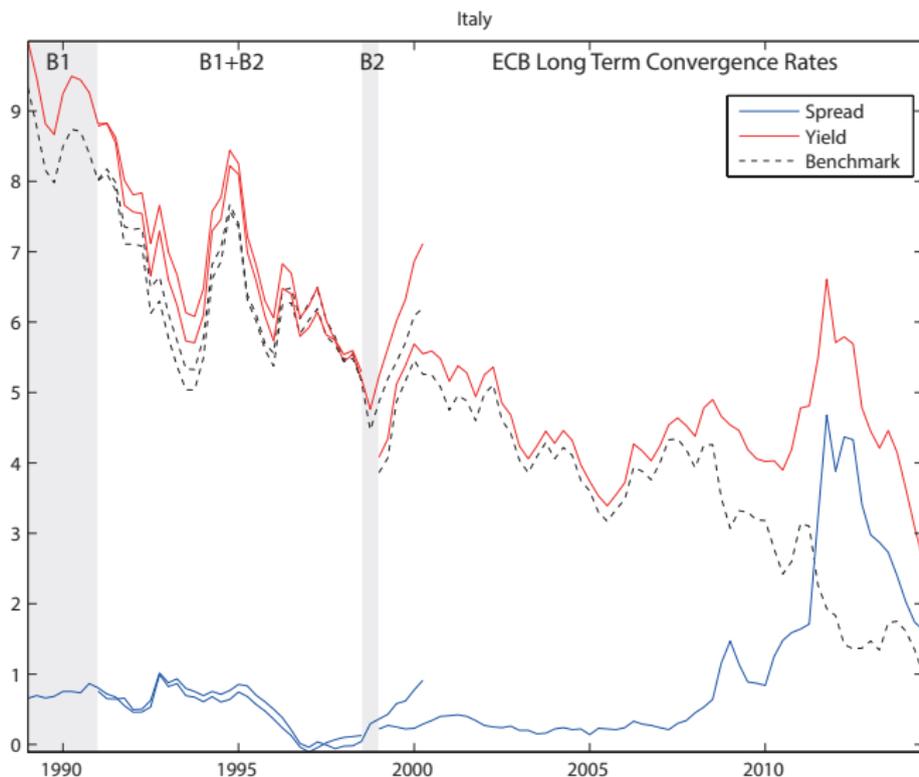
Country	first obs	last obs	min	max	mean	std
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Chile	1996.00	2014.25	0.05	0.06	0.06	0.00
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Greece	2000.00	2011.00	0.17	0.22	0.18	0.01
Hungary	1995.00	2014.00	0.20	0.25	0.22	0.01
Ireland	1997.00	2013.50	0.14	0.21	0.17	0.02
Italy	1990.00	2014.00	0.17	0.22	0.19	0.01

Government consumption-to-output 2/2

Country	first obs	last obs	min	max	mean	std
Lithuania	1995.00	2014.00	0.17	0.28	0.21	0.03
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Portugal	1995.00	2013.50	0.17	0.22	0.19	0.01
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South Africa	1980.00	2014.00	0.13	0.23	0.19	0.02
Spain	1980.00	2014.00	0.13	0.22	0.18	0.02
Sweden	1993.00	2014.25	0.07	0.10	0.08	0.01
Thailand	1993.00	2014.25	0.09	0.14	0.12	0.01
Turkey	1998.00	2014.00	0.10	0.16	0.13	0.01
Uruguay	1988.00	2014.00	0.10	0.15	0.12	0.01

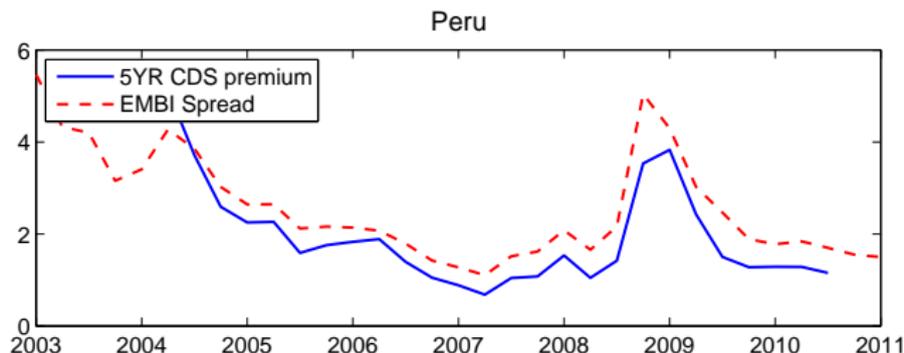
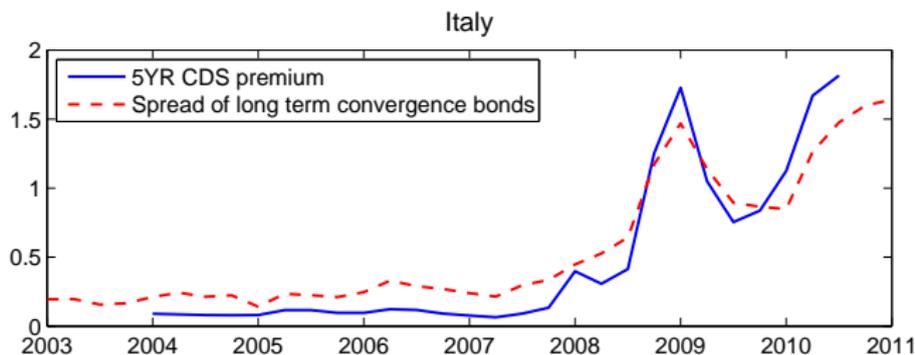
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Spread compilation: an example

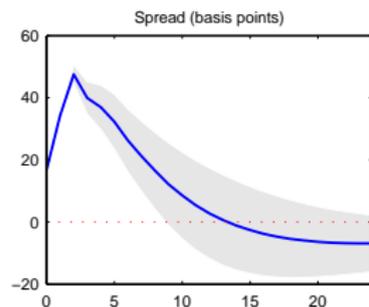
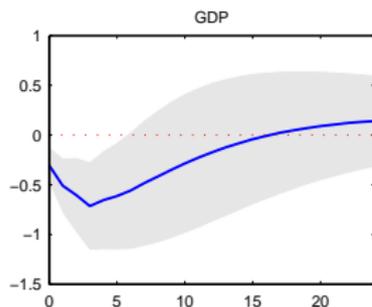
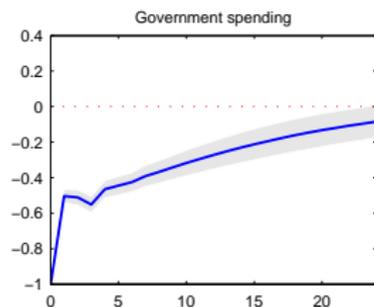


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Yield spreads and credit default swap (CDS) spreads

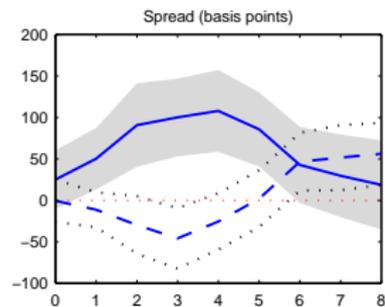
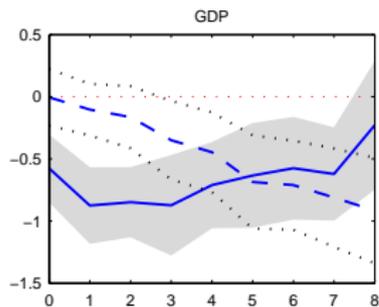
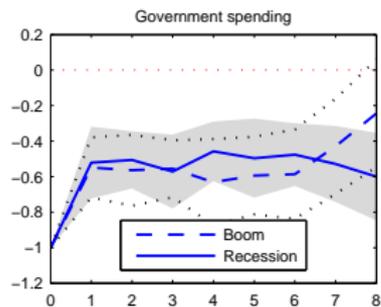


Cut of government consumption: unconditional (SVAR)



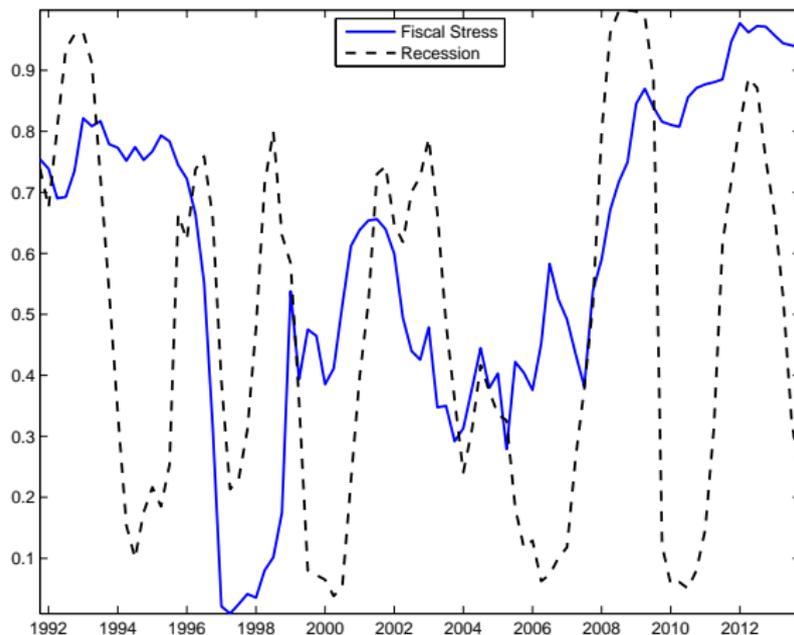
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Austerity does not pay off in recessions



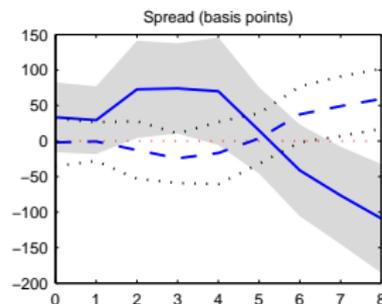
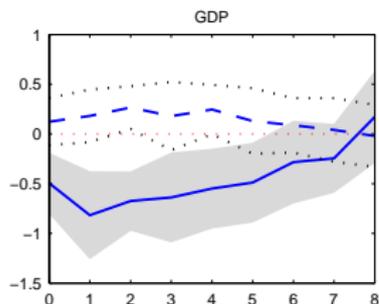
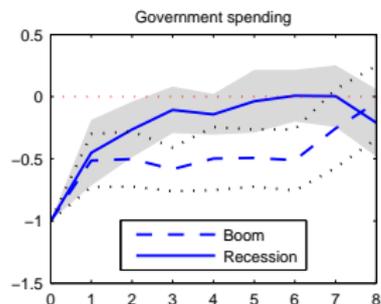
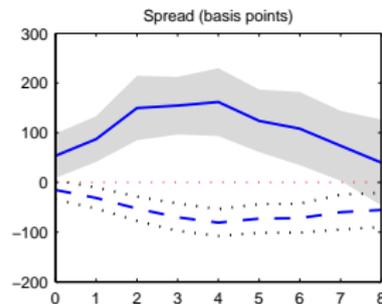
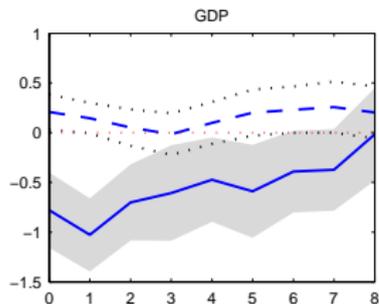
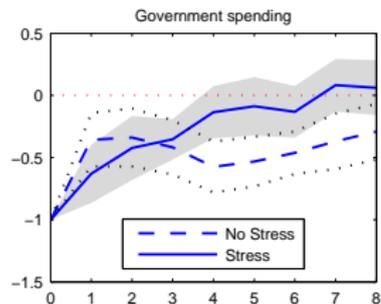
▶ back

Example: transition functions for Italy



- Fiscal stress: lagged spread
- Recession: filtered measure of output growth (Auerbach and Gorodnichenko, [2012](#))

Austerity does not pay off in times of fiscal stress (top) or recessions (bottom), pre financial crisis sample



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