

Does Austerity Pay Off?

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Austerity imposed by markets' assessment

Since 2010 sharp shift to austerity in most advanced economies, notably in euro area “periphery” despite ongoing recession

- Pro-cyclical fiscal stance
- Arguably without alternative, because of markets' concern regarding sustainability of debt, reflected in rising yield spreads

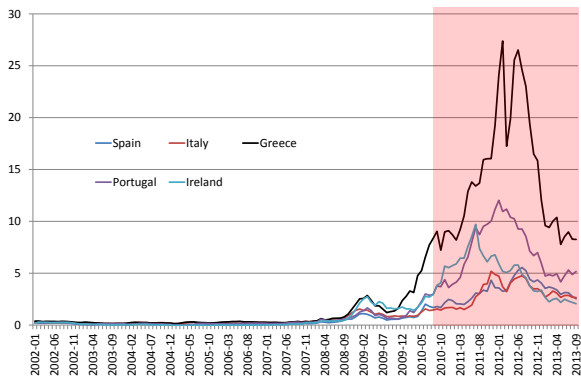
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and yet...

Yield spreads vis-à-vis Germany kept rising



- “Financial investors are schizophrenic about fiscal consolidation and growth. They react positively to news of fiscal consolidation, but then react negatively later, when consolidation leads to lower growth—which it often does.” (Blanchard, 2011)

This paper

Does austerity pay off?

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- That is, does it lower sovereign default premia?

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Identify shocks to exhaustive government consumption (one important element of austerity packages)

- Direct effect on government budget may be offset by indirect effect on growth
- Output-Debt interaction critical for willingness and/or ability to service debt

Our contribution

New panel data set for (currently) 38 emerging and advanced economies

- Data for sovereign default premia as a direct measure for markets' perception of debt sustainability
- Data for exhaustive government spending building on Ilzetzki, Mendoza, and Végh (2013) [▶ Details](#)
- Unbalanced panel from 1991Q1 to 2014Q2

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Estimate dynamic effect of government consumption on spreads

- Local projection approach (Jordá, 2005) applied in smooth transition autoregressive framework
- Condition on state of the economy (fiscal stress)
- Long-run VAR

Default premia data

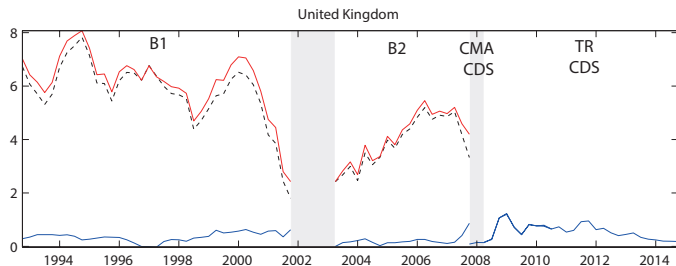
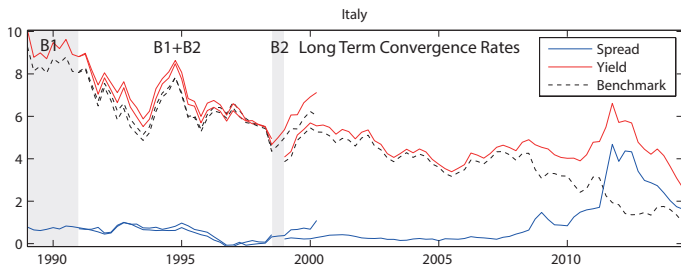
Measure how markets' assessment of government solvency affects real financing costs of countries

- 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

Default premia data: four 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: “**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
4. Use **CDS spreads** available at end of sample for some countries and to transform relative into absolute default premia

Default premia compilation: two examples



Econometric framework: local projection

Direct estimate of impulse response functions (Jordá, 2005)

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

Econometric framework: local projection

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Advantages compared to VAR

- robust to misspecification of the underlying DGP
- inference straightforward
- adaptable to nonlinear setting

Allowing for state dependence

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

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

- $F(z_{i,t})$ captures the degree to which the economy is in one of two “regimes”
- Response changes with state of economy: indicator $z_{i,t}$
- Intermediate observations are instrumental in identifying “regimes”
- Use $z_{i,t} = s_{i,t-1}$ (predetermined w.r.t. to shocks)

Identification: general idea

- Assumption: within a given quarter, government consumption is predetermined (Blanchard and Perotti, 2002)
- Plausible, because exhaustive government consumption is unlikely
 1. to respond automatically to cycle
 2. to be adjusted instantaneously in a discretionary manner by policy makers
- Government spending is gov. consumption, not transfers
- Discretionary spending subject to decision lags
- Lags are even observed as crisis imminent (US stimulus package, austerity measures in European “periphery”)

Identification: implementation

- Formally, we assume that government spending is determined by the process

$$g_{i,t} = \Gamma_*(L)X_{i,t-1} + \varepsilon_{i,t}^g, \quad (1)$$

where $\varepsilon_{i,t}^g$ is an orthogonal innovation to government consumption

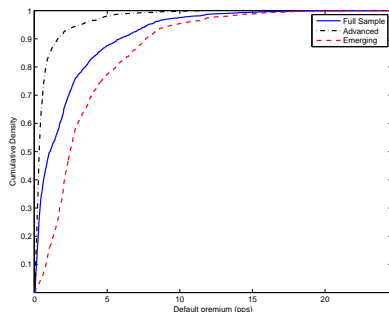
- We are interested in response of variable $x_{i,t+h}$ to shock, allowing for state dependence:

$$x_{i,t+h} = F(z_{i,t})\psi_{A,h}\varepsilon_{i,t}^g + [1 - F(z_{i,t})]\psi_{B,h}\varepsilon_{i,t}^g + u_{i,t}$$

- Using (1) to substitute for $\varepsilon_{i,t}^g$ yields the initial local projection and allows estimating the $\psi_{*,h}$

► IRF Construction

Indicator function for fiscal stress



- Non-parametric version: country-group specific empirical CDF

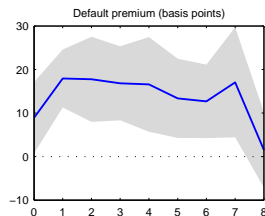
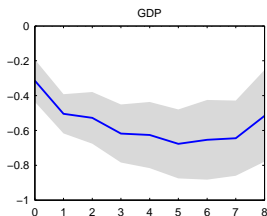
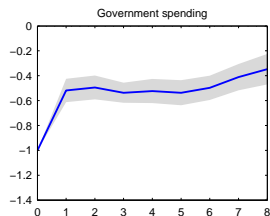
$$F(z_{i,t}) = \frac{1}{N} \sum_{j=1}^N \mathbb{1}_{z_j < z_{i,t}}$$

- Regimes characterized by states that materialized in sample

Estimates of the effects of spending cuts

- Spending cut normalized to one percent of GDP
- Local projections: estimate panel model for horizon of up to 8 quarters
 - Unbalanced panel for 38 countries (\approx 2300 observations)
 - Include time fixed effects and country-specific constant/trend
 - Driscoll and Kraay (1998) standard errors: robust to heteroskedasticity, serial and cross-sectional correlation
- Time fixed effect, among other things, captures time-varying risk aversion

Cut of government consumption: unconditional response

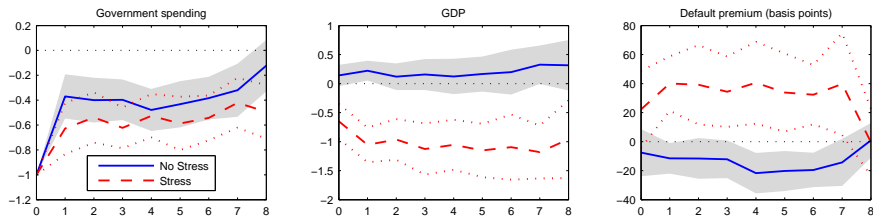


- Output falls by -0.3% on impact, declines further to -0.6%
- Spreads increase by 20bps during first couple quarters
 - spreads countercyclical
 - austerity does not pay off

Accounting for heterogeneity

- So far: results for the entire sample
 - might mask important heterogeneity
 - conditioning on fiscal stress vs. benign times

Austerity does not pay off in times of fiscal stress

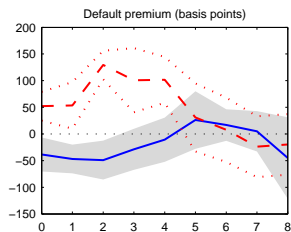
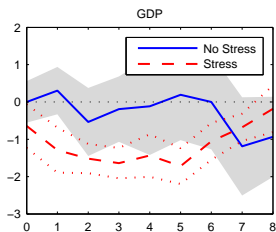


- Results during fiscal stress are even starker!
- Positive effect only during benign times
- Output and default premia responses significantly different
- Government consumption response not significantly different

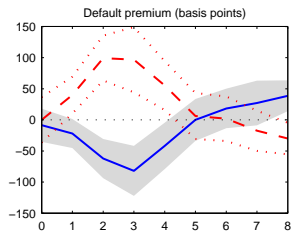
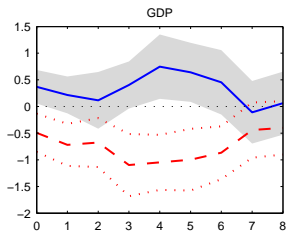
What about fiscal foresight?

- Ramey (2011) and Leeper, Walker, and Yang (2012): fiscal policy innovations might be anticipated
- Information sets of econometrician and agents different
 - unobserved state
- Structural shocks not recoverable from observables
 - “nonfundamentalness” (Lippi and Reichlin, 1994)
- Local projection: replace government consumption with forecast error, available for subsample of OECD countries

Fiscal foresight not an issue



(a) Identification using G forecast error



(b) Identification using actual G

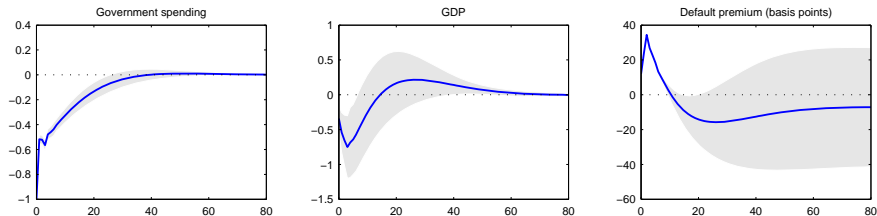
Results are robust with respect to . . .

- Excluding Great Recession [▶ Figure](#)
- Number of sample splits (e.g. advanced vs. emerging) [▶ Figure](#)
- Conservative data quality sample [▶ Figure](#)
- Excluding benefits in kind [▶ Figure](#)
- Consumption and investment [▶ Figure](#)
- Boom vs. Recession [▶ Figure](#)
- Monetary Union vs. Own Legal Tender [▶ Figure](#)
- Mean-group estimator [▶ Figure](#)

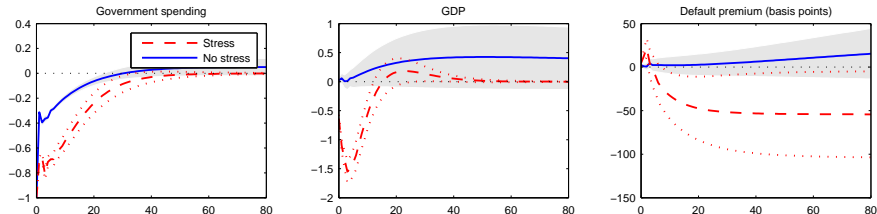
Long-run response

- Number of coefficients to estimate increases in IRF horizon for local projections
- exhausts degrees of freedom in time dimension
- Solution: use VAR instead
- IRFs are computed recursively
- Enter default premia in first differences to allow for long-run response of temporary shock
- Estimation allows for smooth transition in slope parameters and covariances

Long-run impulse response



(c) Unconditional VAR



(d) Conditional: fiscal stress vs. benign times

Inspecting the mechanism

- Consider modified “willingness-to-pay” model of sovereign default à la Arellano (2008)
- Small open economy whose government engages in intertemporal trade to maximize household utility
- Output y_t is given by

$$y_t = \bar{y} e^{\epsilon \hat{g}_t},$$

where

- \bar{y} is a positive constant
- \hat{g}_t is percentage deviation of government consumption from its long-run value \bar{g}
- ϵ is a reduced-form measure of the multiplier

Default decision of the government

- Government cannot commit to repaying its debt
- Resource constraint in case of repayment:

$$y_t + q_t d_{t+1} - d_t = c_t + \bar{g} e^{\hat{g}_t} ,$$

where q_t is price of debt determined in world capital markets

$$q_t = \frac{1 - \delta_t}{1 + r}$$

- Default: exclusion from world markets with re-access probability θ
- During autarky, there is an asymmetric output cost:

$$y_t^{\text{def}} = \min(y_t, \bar{y}^{\text{def}}) ,$$

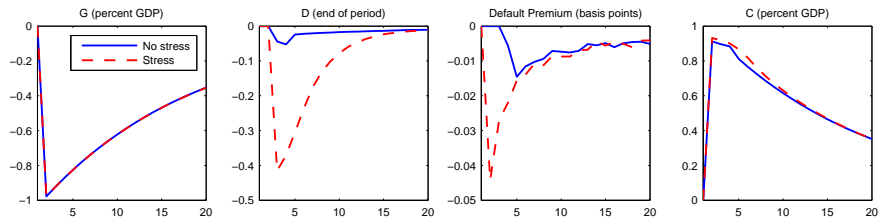
with consumption given by

$$c_t^{\text{def}} = y_t^{\text{def}} - \bar{g} e^{\hat{g}_t} .$$

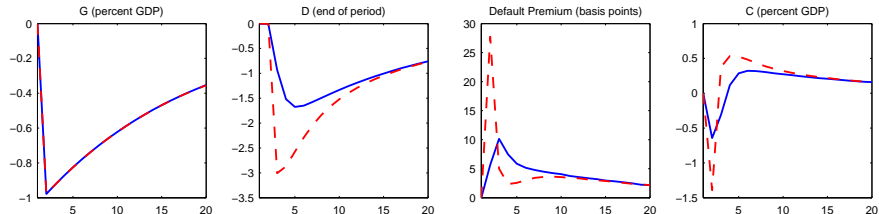
Calibration and policy experiments

- Parametrization follows Arellano (2008) for Argentina
- Exception: \bar{g} set to 20% of steady state output
- Consider two states of fiscal finances: zero debt (no stress) and debt at the boundary of the default set (stress)
- Consider two multipliers ε : zero as found for benign times and “consensus estimate” of 0.7

Results: Generalized IRFs



(e) $\epsilon = 0$



(f) $\epsilon = 0.7$

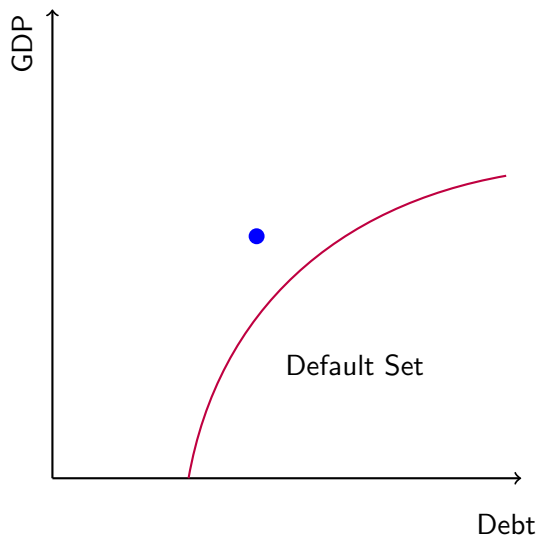
Default set and austerity

- Spreads rise with default probability δ

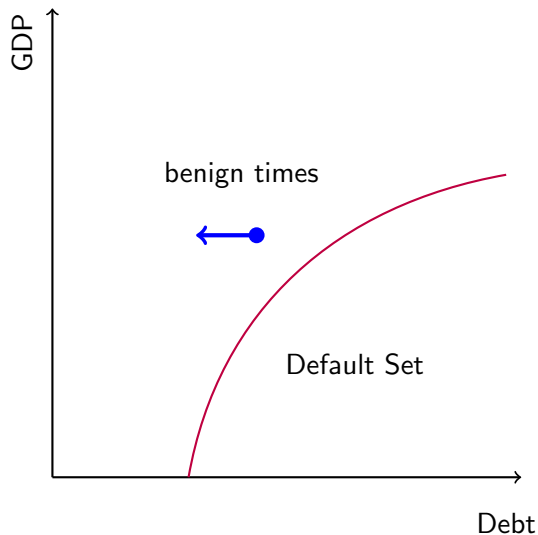
$$1 + r = \frac{1 + \bar{r}}{1 - \delta(d', y)}$$

- Default more likely if borrowing high and/or output low
 - At low levels of output, servicing high debt hurts more
 - With high multiplier in times of stress, austerity deprives economy of much needed resources
- higher temptation to default

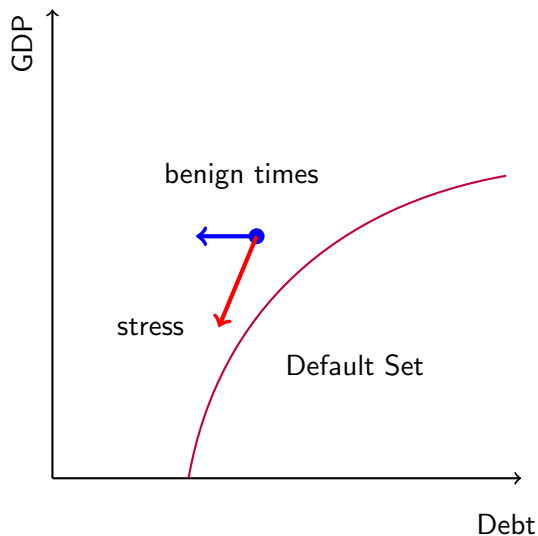
Default set and austerity



Default set and austerity



Default set and austerity



Why does default risk rise?

- Investors are not irrational or schizophrenic about consolidation
- Rather, they correctly anticipate temporarily higher temptation of government to default when negative shocks occur in the future
- Defaulting in these bad states would free up scarce resources
- Naive observer might interpret movement close to default set as “austerity is not working”

Some thoughts on policy implications

- Spend your way out of the crisis?
 - ⇒ unlikely to be successful in the long run
- There is no free lunch! Austerity involves tradeoffs
 - ⇒ No pain, no gain! No expansionary austerity
- Consolidate while not yet in fiscal stress

Conclusion — Does austerity pay off?

- New panel data set for 38 emerging and advanced economies
 - Data for government consumption from direct/non-interpolated sources
 - Data for sovereign default premia
- Austerity (cuts of government consumption)
 - Depresses economic activity and raises default premia in the short-run
 - Unless economy enjoys benign times
 - Decreases default premia in the long-run
- Rational expectations model of sovereign default explains results
 - Output drop due to austerity increases incentives to default in bad states

Exhaustive government consumption

- Refers to a national accounting concept: goods purchased/produced by the government for final consumption → mostly wages, goods and services purchases, and benefits in kind while excluding monetary transfers
- By definition includes “social transfers in kind related to expenditure on products supplied to households via market producers” (different from US)
- Different than “government expenditure” which often denotes all cash outlays by the government
- Should be accrual-based, not cash-based
- Excludes government investment
- Still based on SNA95 (next revision will use SNA2010 where available)
- Relates to general or central government depending on the country

Impulse response functions

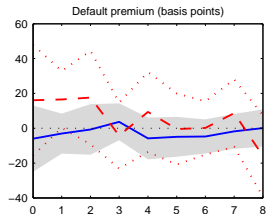
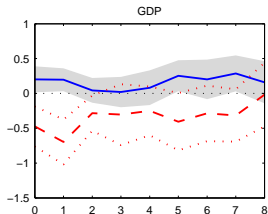
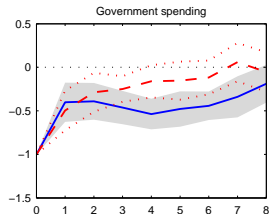
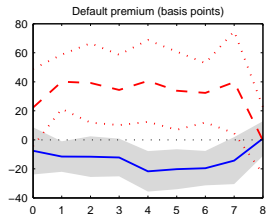
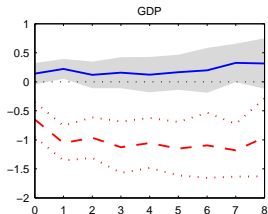
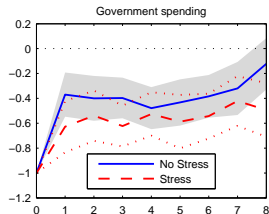
- Response in period $t + h$, conditional on experiencing state indexed by $z_{i,t}$:

$$\left. \frac{\partial x_{t+h}}{\partial \varepsilon_{i,t}^g} \right|_{z_{i,t}} = F(z_{i,t}) \psi_{A,h} + [1 - F(z_{i,t})] \psi_{B,h} \quad (2)$$

- Directly provides average response of an economy in state $z_{i,t}$ going forward
- Conditional linearity allows using Wald-type test for assessing significance of different responses

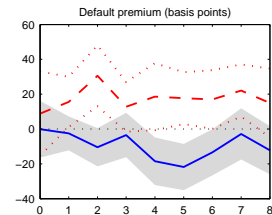
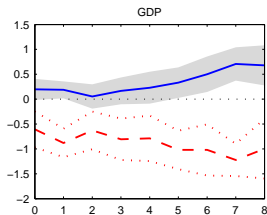
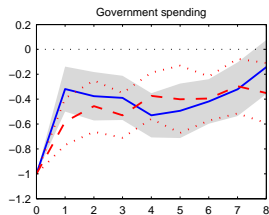
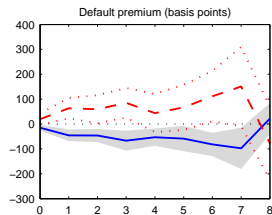
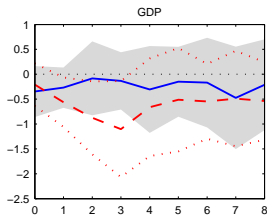
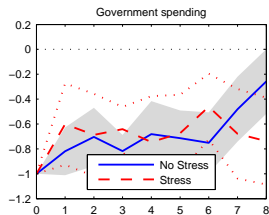
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Austerity does not pay off in times of fiscal stress (top), pre financial crisis sample (bottom)



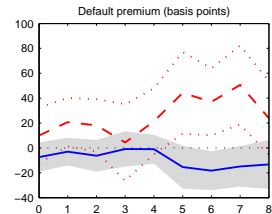
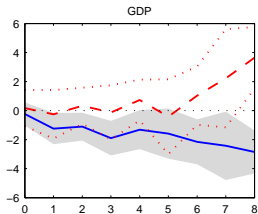
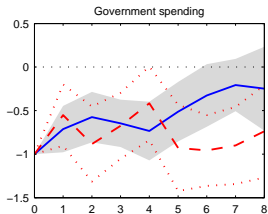
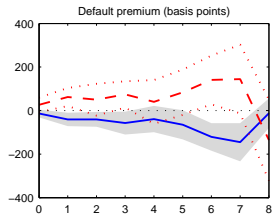
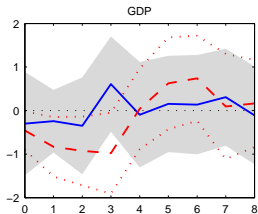
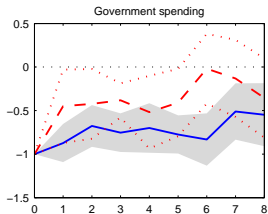
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Advanced (top) vs. emerging (bottom)



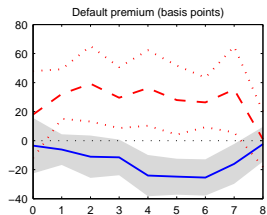
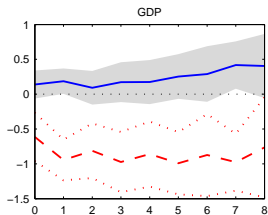
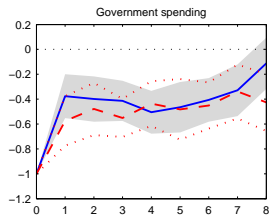
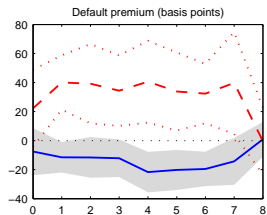
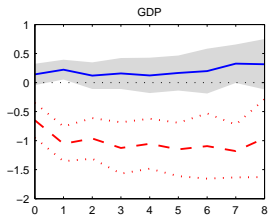
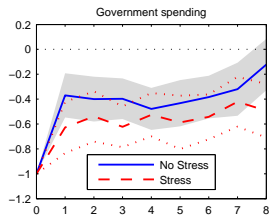
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Euro area: crisis (top) vs. non-crisis countries (bottom)



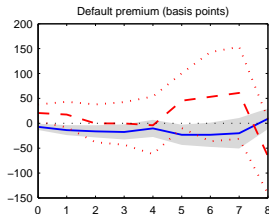
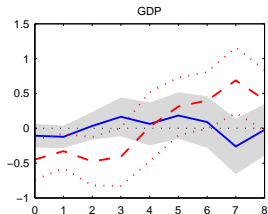
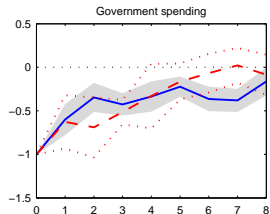
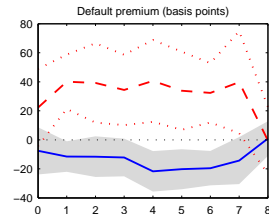
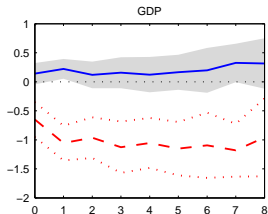
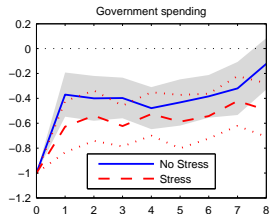
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Full sample (top) vs. conservative sample (bottom)



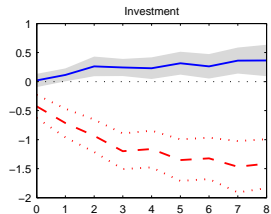
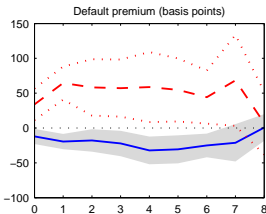
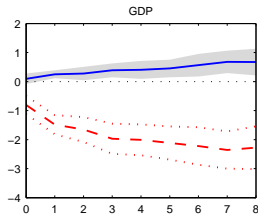
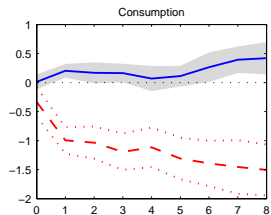
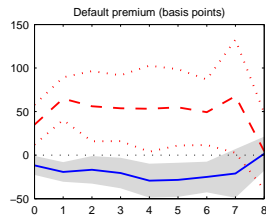
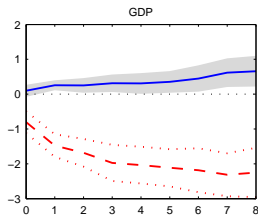
▶ back

Government consumption including benefits in kind (top) vs. excluding them (bottom)



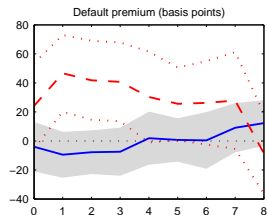
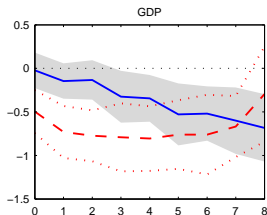
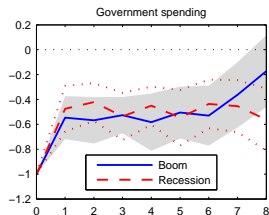
▶ back

Consumption and investment



▶ back

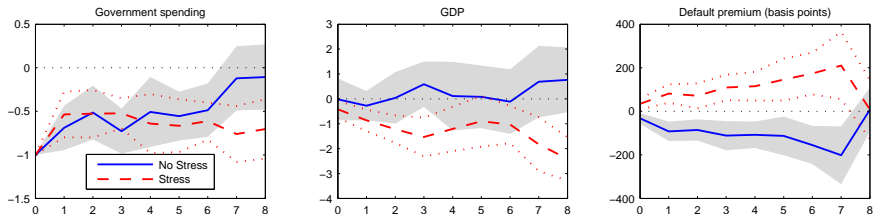
Boom vs. recession



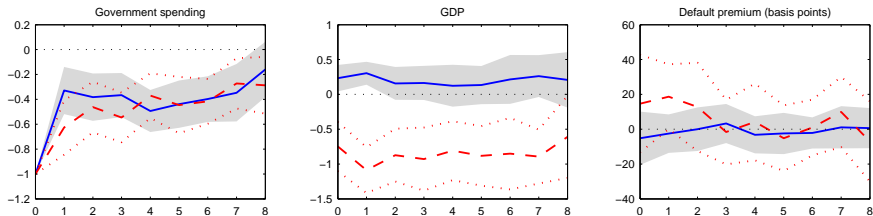
- Similar to fiscal stress vs. benign times
- But: overlap between episodes is far from perfect

▶ back

Monetary union/dollarization vs. own legal tender



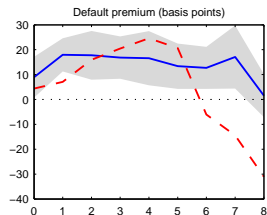
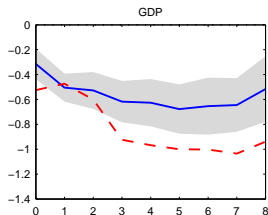
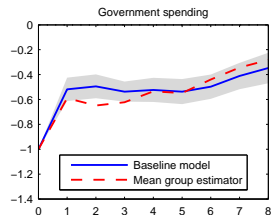
(g) Monetary union or dollarization



(h) Countries with their own legal tender

▶ back

Cross-sectional heterogeneity: mean-group estimator



- Take mean of coefficient of country-by-country regressions
- Only possible for unconditional model

▶ back

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