Does Austerity Pay Off?

Benjamin Born (Bonn, CEPR)

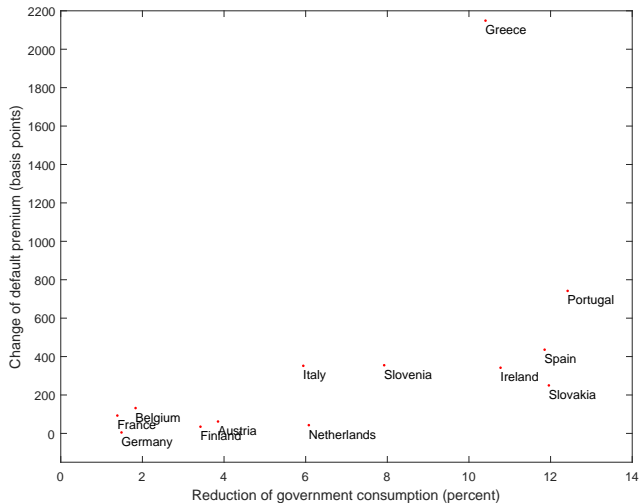Gernot J. Müller (Tübingen, CEPR)

Johannes Pfeifer (Mannheim)

Fiscal Sustainability, XXI Century

Madrid, June 6, 2016

Spending cuts and sovereign default premia

Euro area: 2010Q1–2012Q2

Does austerity pay off?

Does austerity *cause* the sovereign default premium to decline?

- And, if so, when and under which circumstances?

Default premium: market-based assessment of debt sustainability, reflecting both

- Fiscal fundamentals, often not directly observed (Arellano 2008; Bi 2012)
- Market sentiment (Calvo 1983; Cole and Kehoe 2000; Roch and Uhlig 2015)

This paper

New panel data set for 38 emerging and developed economies

1. Data for sovereign default premium as a direct measure for markets' perception of debt sustainability
2. Data for government consumption building on Ilzetzki, Mendoza, and Végh (2013)

Investigate impact of government consumption on default premia, while conditioning on

1. Time horizon: short vs. long run
2. State of public finances: fiscal stress vs. benign times
3. Size and sign of fiscal measure: in particular spending cut vs. increase

Main results

Pursuing alternative econometrics strategies, we find that cutting government consumption

- *Reduces* the default premium in the long run
- *Raises* the default premium (a) in the short run, (b) if there is fiscal stress, and (c) provided the cut is large

Rationalize findings for the short run within structural model of sovereign default

- Introduce government consumption in model of Arellano (2008)

Literature

Recent work on spreads

- ▶ Longstaff et al. (2011), Borri and Verdelhan (2011), Broner, Lorenzoni, and Schmukler (2013), Bernoth, von 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), Beetsma, Furtuna, and Giuliodori (2016) . . .

State dependence

- ▶ Perotti (1999), Christiano, Eichenbaum, and Rebelo (2011), Auerbach and Gorodnichenko (2012), Corsetti et al. (2013), Ilzetzki, Mendoza, and Végh (2013), Ramey and Zubairy (2014) . . .

Outline

- Data

- VAR model

- Local projections

- Robustness checks

- Theory

New data set

Quarterly data for 38 emerging and developed economies on

- ▶ Government consumption

- ▶ GDP

- ▶ Sovereign default premia

Unbalanced panel from 1991Q1 to 2014Q2

Fiscal data

Focus on *exhaustive government consumption* rather than taxes
(because of identification and data availability issues) ▸ details

- ▶ Identification requires non-interpolated fiscal data based on direct sources
- ▶ Ilzetzki, Mendoza, and Végh (2013) collect data for 44 countries ending in 2008
- ▶ Most of the data taken from national sources
- ▶ Relates to general or central government

For subset of countries, debt and deficits are available

- ▶ Include as controls

Sovereign default premium

Measures markets' assessment of government solvency

- ▶ Affects real financing costs of countries

Difference in sovereign yield vis-à-vis riskless country on bonds issued on common currency

- ▶ Eliminate effect of inflation and depreciation expectations

Data on default premium: 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"
   - "Yields to maturity" from bonds with residual maturity close to 10 years
   - German government bond yield as risk-free benchmark

3. European countries issued foreign-currency government bonds

4. CDS spreads available at end of sample for some countries and to transform relative into absolute default premia

▸ Example Figure

Default premium: quarterly data for 38 countries

Country	Group	min	max	mean	std	$\rho(\Delta y_t, s_t)$	$\rho(\Delta g_t, s_t)$
Argentina	E	2.12	19.50	7.78	3.65	-0.55	-0.06
Australia	D	0.03	1.30	0.31	0.31	-0.38	-0.39
Austria	D	0.03	1.98	0.40	0.41	-0.47	-0.31
Belgium	D	0.03	2.94	0.59	0.59	-0.42	-0.20
Brazil	E	1.64	24.20	5.70	4.17	-0.05	-0.07
Bulgaria	E	0.73	9.18	3.24	2.53	-0.11	-0.04
Chile	E	0.62	4.04	1.60	0.63	-0.46	0.10
Colombia	E	1.26	10.73	3.56	2.07	-0.40	-0.17
Croatia	E	0.15	5.47	2.07	1.61	-0.66	-0.47
Czech Republic	E	0.05	2.08	0.62	0.54	-0.83	-0.05
Denmark	D	0.02	2.18	0.53	0.46	-0.20	-0.05
Ecuador	E	5.09	21.20	9.86	4.07	-0.44	-0.36
El Salvador	E	1.34	9.15	3.56	1.45	-0.75	0.04
Finland	D	-0.02	1.27	0.39	0.29	-0.50	-0.15
France	D	0.03	2.03	0.44	0.46	-0.41	0.01
Germany	D	0.02	0.73	0.20	0.18	-0.34	0.07
Greece	D	0.18	10.02	1.49	2.58	-0.61	-0.21
Hungary	E	0.17	6.37	2.00	1.75	-0.60	-0.05
Ireland	D	-0.02	9.09	1.41	2.15	-0.19	-0.39

Default premium: quarterly data for 38 countries cont'd

Country	Group	min	max	mean	std	$\rho(\Delta y_t, s_t)$	$\rho(\Delta g_t, s_t)$
Italy	D	-0.03	5.86	0.98	1.18	-0.42	-0.39
Latvia	E	0.05	10.01	2.75	2.30	-0.72	-0.74
Lithuania	E	0.06	7.25	2.32	1.83	-0.65	-0.23
Malaysia	E	0.74	4.31	1.70	0.71	-0.65	-0.05
Mexico	E	1.18	15.96	3.65	2.58	-0.28	-0.04
Netherlands	D	-0.01	1.18	0.34	0.32	-0.63	-0.28
Peru	E	1.24	9.18	3.52	1.93	-0.26	0.02
Poland	E	0.49	8.78	2.02	1.33	-0.05	-0.12
Portugal	D	0.03	12.28	1.63	2.84	-0.45	-0.42
Slovakia	D	0.04	4.10	1.22	1.21	-0.39	-0.23
Slovenia	D	-0.15	5.42	1.58	1.78	-0.47	-0.44
South Africa	E	0.77	6.59	2.42	1.25	-0.54	-0.18
Spain	D	-0.03	5.40	0.95	1.35	-0.65	-0.45
Sweden	D	0.01	1.20	0.39	0.24	-0.33	-0.07
Thailand	E	0.27	5.62	1.38	0.92	-0.38	0.13
Turkey	E	1.89	10.73	4.48	2.40	-0.33	-0.16
United Kingdom	D	0.05	1.20	0.45	0.24	-0.43	-0.06
United States	D	0.07	0.61	0.27	0.12	-0.48	0.12
Uruguay	E	1.51	16.50	4.02	3.13	-0.42	-0.38

Properties of the data and way forward

Unconditional, within countries

- ▶ Sovereign default premium countercyclical
- ▶ No systematic relationship between premium and government consumption growth

Does austerity *cause* the sovereign default premium to decline?

- ▶ Identify exogenous variation of government consumption
- ▶ Condition on various dimensions: time horizon, initial conditions (fiscal stress) and size of variation
- ▶ Use vector autoregression and local projections (robust results of long run vs flexibility)

Identify fiscal shocks in smooth-transition VAR

Auerbach and Gorodnichenko (2012)

Vector of endogenous variables

$$X_{i,t} = \begin{bmatrix} \log(g_{i,t}), & \log(y_{i,t}), & \Delta s_{i,t} \end{bmatrix}'$$

Smooth-transition VAR

$$X_{i,t} = F(z_{i,t})\Lambda_A(L)X_{i,t-1} + [1 - F(z_{i,t})]\Lambda_B(L)X_{i,t-1} + \nu_{i,t}$$

$$\nu_{i,t} \sim \mathcal{N}(0, \Omega_t), \quad \Omega_t = \Omega_A F(z_{i,t}) + [1 - F(z_{i,t})]\Omega_B$$

Smooth transition in parameters: $F(z_{i,t})$ measures degree to which economy experiences fiscal stress

Default premium: comprehensive measure for fiscal stress
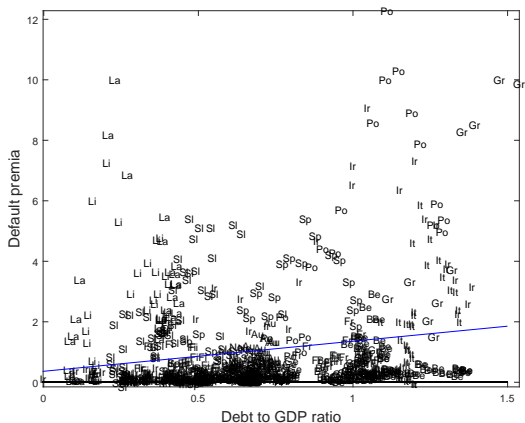
Fiscal stress depends on (unobserved) variables: fiscal capacity,
potential output, . . .

Weighting function capturing fiscal stress: cumulative distribution function of default premium

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

Lagged spread as indicator variable $z_{i,t} = s_{i,t-1}$ (predetermined w.r.t. to shocks) and empirical CDF as measure of stress

- Non-parametric, possibly country-group specific
- Regimes characterized by states that materialized in sample

Cumulative distribution function of default premium
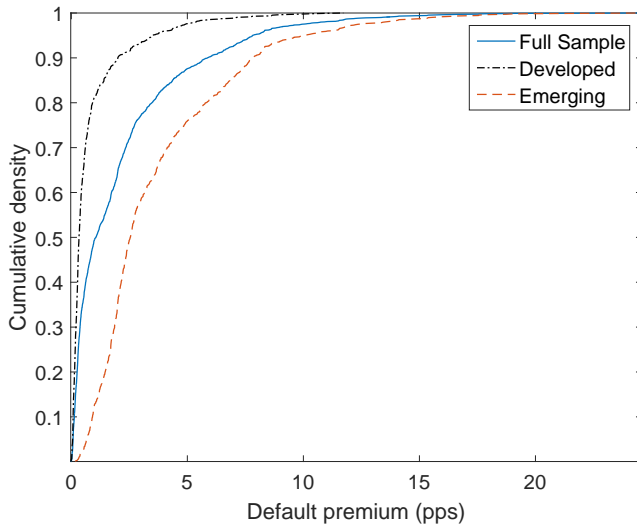
Example: weighting functions for Italy

Note: fiscal stress ≠ recessions
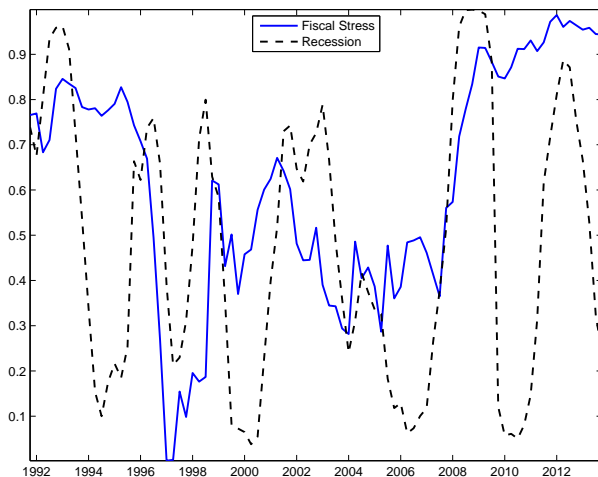
Identification

Assumption: within quarter, government consumption predetermined (Blanchard and Perotti 2002)

Government consumption unlikely

- ▶ to respond automatically to cycle (does not include transfers)
- ▶ to be adjusted instantaneously in a discretionary manner by policy makers (decision lags)

Lags also observed as crisis imminent (US stimulus package, austerity measures in European "periphery")

- ▶ Present supportive evidence below

Results for VAR

Estimate effect of a cut of government consumption

- ▶ Unbalanced panel for 38 countries ($\approx$ 2300 observations)
- ▶ Include country-specific constant/trend and time-fixed effects
- ▶ Weighting function country-group specific

Impulse responses to cut of government consumption by 1 percent

- ▶ Cumulative response of default premium $\Delta s_{i,t}$, as well as response of government consumption and output
- ▶ Bootstrapped 90%-confidence bounds

Response to fiscal shock depends on fiscal stress
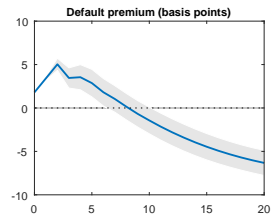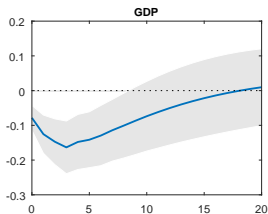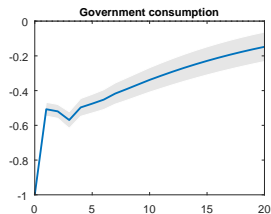
(a) Unconditional VAR
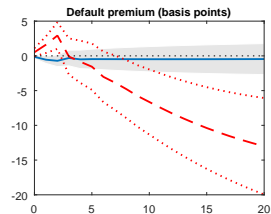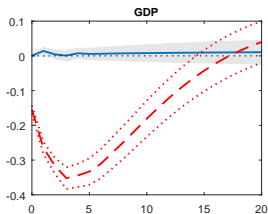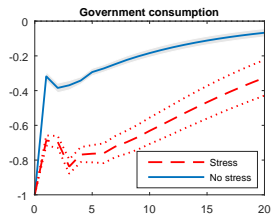
(b) Conditional: fiscal stress vs. no stress

Long-run: permanent drop of spread—provided there is fiscal stress...
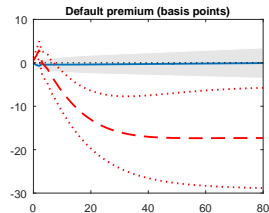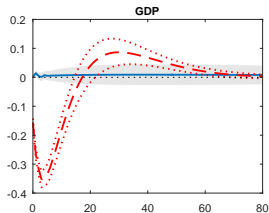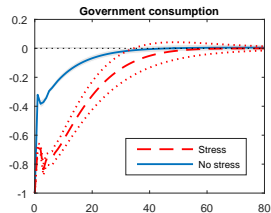
Panel VAR model: does austerity pay off?

Under fiscal stress, cutting government consumption induces default premium to

- ▶ decline in the long run (after about 1 year), but to
- ▶ increase in the short run

Limitations of VAR model

- ▶ Impulse response based on constant-regime assumption
- ▶ Response linear in the size/sign of the shock

Local projections

Jordá (2005), Granger and Teräsvirta (1993), Auerbach and Gorodnichenko (2013)

Impulse response to government-consumption shock

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

Consider first equation of VAR model (under Blanchard-Perotti)

$$g_{i,t} = F(z_{i,t}) \Gamma_A(L) X_{i,t-1} + [1 - F(z_{i,t})] \Gamma_B(L) X_{i,t-1} + \varepsilon_{i,t}^g$$

Combining (and adding deterministics) yields local projection

$$
\begin{aligned}
x_{i,t+h} = {}& \alpha_{i,h} + \beta_{i,h} t + \eta_{t,h} \\
& + F(z_{i,t}) \psi_{A,h}\, g_{i,t} + [1 - F(z_{i,t})] \psi_{B,h}\, g_{i,t} \\
& + \textit{squares and cross terms of lags} \\
& + u_{i,t+h}
\end{aligned}
$$

Impulse response functions

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

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

- ▶ Measures average response of economy in state $z_{i,t}$ going forward

- ▶ Conditional linearity allows using Wald-type test for assessing significance of different responses

Local projections results: technical details

Estimate effect of a cut of government consumption

- Unbalanced panel for 38 countries ($\approx$ 2300 observations)
- Include country-specific constant/trend and time-fixed effects
- Weighting function country-group specific

Impulse responses to cut of government consumption by 1 percent

- Estimate panel model for horizon of up to 8 quarters; less reliable for longer horizons (Ramey 2012)
- Confidence bounds based on Driscoll and Kraay (1998) standard errors: robust to heteroskedasticity, serial, and cross-sectional correlation

Response to fiscal shock depends on fiscal stress
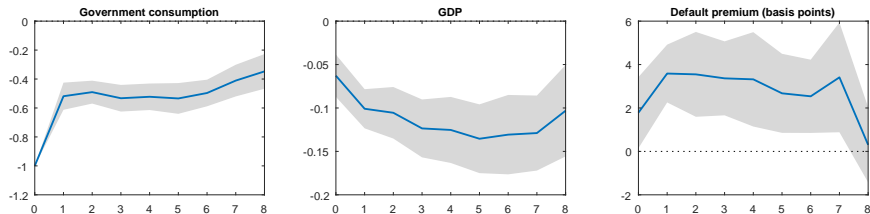
(a) Unconditional LP
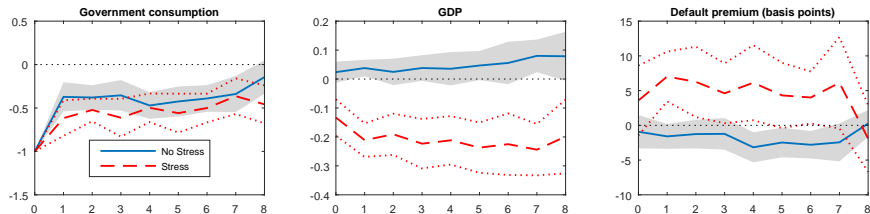
(b) Conditional: fiscal stress vs. no stress times

Concern 1: Reverse causality

In the presence of fiscal stress

- ▶ Find that reducing government consumption raises spreads
- ▶ Perhaps the other way around: higher spreads induce immediate cuts of government consumption (ruled out under our identification scheme)

Some evidence against this conjecture

- ▶ Isolate common factor of default premium in cross section of panel (principal component analysis)
- ▶ Project country-specific variables on common factor

Response to common factor of sovereign default premium

Government consumption reacts with delay only
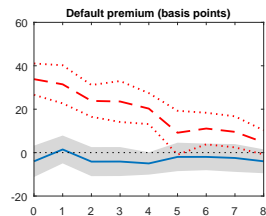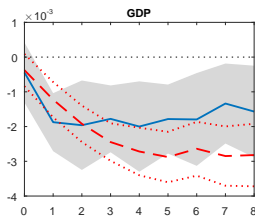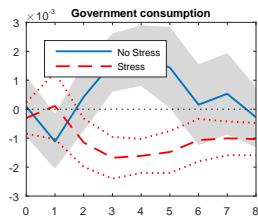
Concern 2: Fiscal foresight

Fiscal policy innovations possibly anticipated (Leeper, Walker, and Yang 2012; Ramey 2011)

- ▶ Information sets of econometrician and agents different
- ▶ Structural shocks not recoverable from observables: "nonfundamentalness" (Lippi and Reichlin 1994)

Local projection

- ▶ Replace government consumption with forecast error compiled by OECD
- ▶ Available for subsample of OECD countries (semi-annual observations)

Response of premium to government consumption

Anticipation effects—if anything—seem to dampen spread response
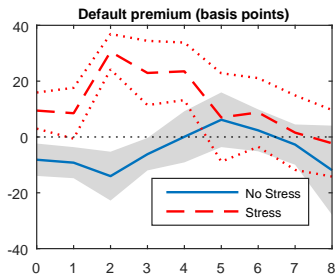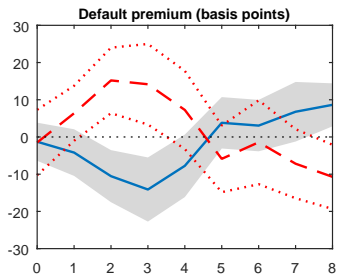
(a) Forecast error   (b) Actual consumption

Spending cuts vs. increases and small vs. large

Include positive and negative structural shocks separately

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

Allow for different effect of large shocks (cuts and hikes)

$$x_{i,t+h} = F(z_{i,t}) \psi_{A,h} \hat{\varepsilon}_{i,t}^{g} + [1 - F(z_{i,t})] \psi_{B,h} \hat{\varepsilon}_{i,t}^{g}$$
$$+ F(z_{i,t}) \psi_{A,h}^{big} \hat{\varepsilon}_{i,t}^{g} \mathbb{1}_{>2SE} + [1 - F(z_{i,t})] \psi_{B,h}^{big} \hat{\varepsilon}_{i,t}^{g} \mathbb{1}_{>2SE}$$
$$+ \ldots + u_{i,t}$$

Response of premium: size of shock matters too

Large shock is > 2SE
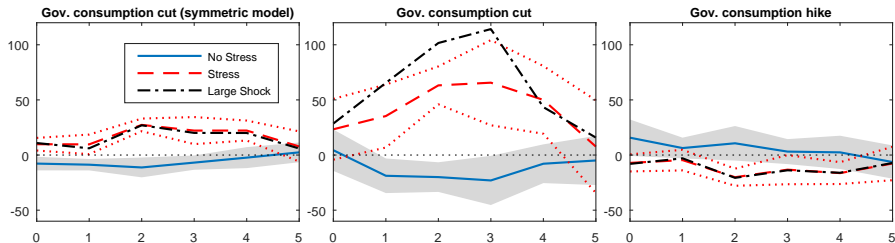
Results are robust...

Additional controls: gross public debt
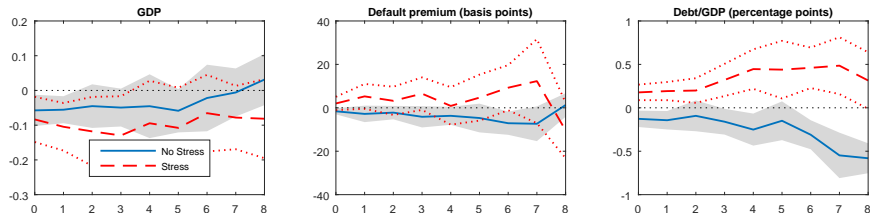
- ▶ Debt only available for smaller sample
- ▶ Debt-to-GDP ratio rises during stress

▸ Deficit ▸ Consumption/Investment

Results are also robust with respect to. . .

- ▶ Excluding Great Recession   ▶ Figure

- ▶ Number of sample splits (e.g. advanced vs. emerging)   ▶ Figure

- ▶ Conservative data quality sample   ▶ Figure

- ▶ Including stock market indices   ▶ Figure

- ▶ Confidence   ▶ Figure

- ▶ Cross-sectional heterogeneity: mean-group estimator   ▶ Figure

- ▶ Monetary union/dollarization vs. own legal tender   ▶ Figure

- ▶ Excluding IMF program countries   ▶ Figure

- ▶ Boom vs. recession   ▶ Figure

Interpretation of results

Robust—and (perhaps) surprising—feature of the data

- ▶ Default premium increases if government consumption is cut in the short run and provided there is fiscal stress

Structural model sovereign default

- ▶ Minimal departure from workhorse model of Arellano (2008)
- ▶ Exogenous variation of government consumption and multiplier effect

Model Setup

Small open economy; government engages in intertemporal trade to maximize household utility

$$E_0 \sum_{t=0}^{\infty} \beta^t U(c_t)$$

subject to resource constraint in case of repayment

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

- ▶ Output $y_t = \bar{y} e^{\mu \hat{g}_t}$
- ▶ $\hat{g}_t$ is percentage deviation of government consumption from its long-run value $\bar{g}$
- ▶ $\mu = (\bar{g}/\bar{y})\epsilon$, where ϵ reduced-form measure of the multiplier
- ▶ $r_t - r$ is the default premium

No commitment

Default whenever benefits from default exceed costs

Default entails

- ► Exclusion from world market, re-access probability θ
- ► During autarky, there is an asymmetric output cost:

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

- ► Household consumption

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

Functional forms and calibration to quarterly observations

- CRRA utility

$$U(c_t) = \frac{c_t^{1-\sigma}}{1-\sigma}$$

- Government consumption follows

$$\hat{g}_t = \rho^g \hat{g}_{t-1} + \varepsilon_t^g, \ \varepsilon_t^g \sim \mathcal{N}(0, \sigma_g^2)$$

- Parameterization

r	σ	β	θ	$\bar{y}$	$\bar{y}^{\text{def}}$	$\bar{g}$	ρ^g	σ_g	ϵ
1.70%	2	0.988	0.07	1	0.969	0.18	0.986	0.014	0.7

Generalized impulse response of premium to fiscal shock: model predictions in line with evidence
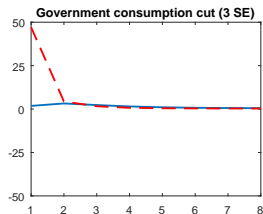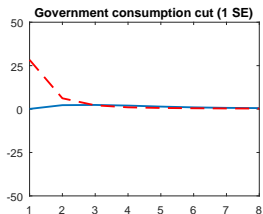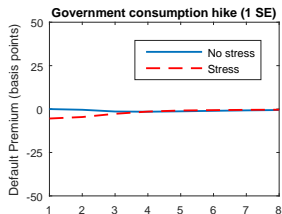
Pricing of default risk actuarially fair

International investors risk neutral, demand premium according to
(prob. of default: δ_t)

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

Rational expectations

- ▶ Lower government consumption reduces output
- ▶ Output net of government consumption increases (as multiplier below unity)
- ▶ Resource costs of default reduced (Arellano 2008)
- ▶ Incentives to default increase

Does austerity pay off? Conclusion

Cutting government consumption

- ▶ Depresses economic activity and *raises* default premium in the short-run—at least if there is fiscal stress
- ▶ Decreases default premium in the long-run

Markets not "schizophrenic" (Blanchard 2011) about consolidation

- ▶ Short run: output loss makes default more likely such that default premium rises
- ▶ Austerity pays off in the long run (if we get there)
- ▶ Naive observer may conclude that "austerity is not working"

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

▸ back

Construction of default premium: two examples

Italy

United Kingdom
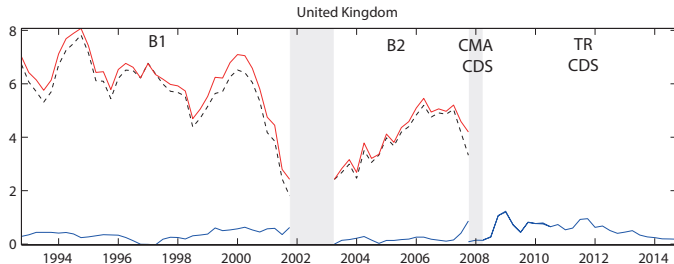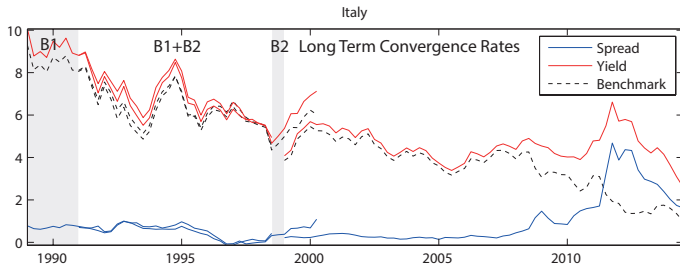
Gov. consumption: quarterly data for 38 countries

Country	first obs	last obs	min	max	mean	std
Argentina	1994Q1	2013Q3	0.12	0.18	0.14	0.02
Australia	2003Q2	2010Q3	0.17	0.18	0.17	0.00
Austria	1994Q1	2014Q1	0.18	0.21	0.19	0.01
Belgium	1995Q1	2014Q1	0.21	0.25	0.23	0.01
Brazil	1995Q1	2014Q1	0.19	0.23	0.20	0.01
Bulgaria	1999Q1	2014Q1	0.14	0.20	0.18	0.02
Chile	1999Q3	2014Q2	0.05	0.06	0.06	0.00
Colombia	2000Q1	2014Q1	0.15	0.17	0.16	0.01
Croatia	2004Q2	2014Q1	0.18	0.21	0.20	0.01
Czech Republic	2004Q2	2014Q1	0.19	0.22	0.21	0.01
Denmark	1991Q1	2014Q1	0.25	0.30	0.26	0.01
Ecuador	1995Q2	2014Q1	0.09	0.14	0.12	0.02
El Salvador	2002Q3	2014Q1	0.06	0.09	0.07	0.01
Finland	1992Q3	2014Q1	0.20	0.25	0.22	0.02
France	1999Q2	2014Q1	0.23	0.25	0.24	0.01
Germany	2004Q2	2014Q1	0.18	0.20	0.19	0.01
Greece	2000Q1	2011Q1	0.17	0.22	0.18	0.01
Hungary	1999Q2	2014Q1	0.20	0.25	0.22	0.01
Ireland	1997Q1	2014Q1	0.14	0.21	0.17	0.02

Gov. consumption: quarterly data for 38 countries cont'd

Country	first obs	last obs	min	max	mean	std
Italy	1991Q1	2014Q1	0.17	0.22	0.19	0.01
Latvia	2006Q2	2014Q1	0.15	0.22	0.18	0.02
Lithuania	2005Q3	2014Q1	0.17	0.22	0.19	0.02
Malaysia	2000Q1	2014Q1	0.07	0.12	0.10	0.01
Mexico	1994Q1	2014Q2	0.00	0.00	0.00	0.00
Netherlands	1999Q2	2014Q2	0.20	0.27	0.24	0.02
Peru	1997Q2	2014Q2	0.07	0.09	0.08	0.01
Poland	1995Q1	2014Q1	0.17	0.20	0.18	0.01
Portugal	1995Q1	2014Q1	0.17	0.22	0.19	0.01
Slovakia	2004Q2	2014Q1	0.17	0.20	0.18	0.01
Slovenia	2003Q2	2014Q1	0.17	0.21	0.19	0.01
South Africa	1995Q1	2014Q1	0.18	0.23	0.20	0.01
Spain	1995Q1	2014Q1	0.17	0.22	0.19	0.02
Sweden	1993Q2	2014Q2	0.07	0.10	0.08	0.01
Thailand	1997Q3	2014Q2	0.10	0.14	0.12	0.01
Turkey	1998Q1	2014Q1	0.10	0.16	0.13	0.01
United Kingdom	1993Q1	2013Q4	0.17	0.23	0.20	0.02
United States	2008Q1	2014Q1	0.15	0.17	0.16	0.01
Uruguay	2001Q3	2014Q1	0.10	0.14	0.11	0.01

The response of confidence to a government spending shock
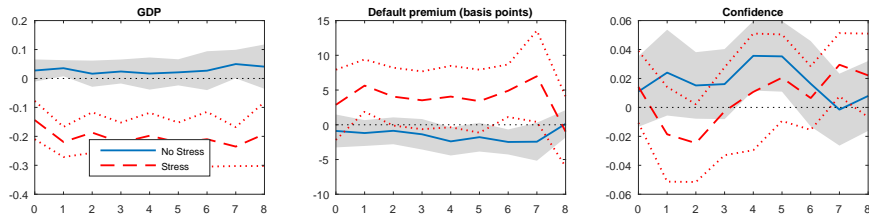
- ▶ Confidence (Ifo WES) pertains to expectations regarding economic conditions in the next 6 months.
- ▶ Fiscal stress: confidence is unresponsive to the spending cut
- ▶ No stress times: confidence tends to improve a year after spending cut
- → austerity less harmful whenever it improves confidence

▸ back

Including national stock market indices

GDP

Default premium (basis points)

Stock market index
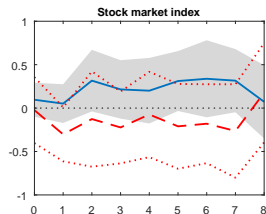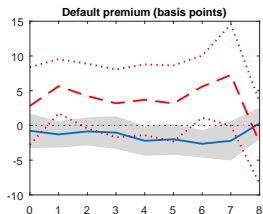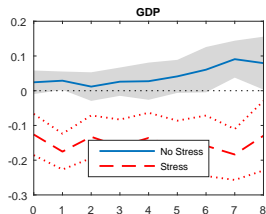
No Stress
Stress

▸ back

Boom vs. recession
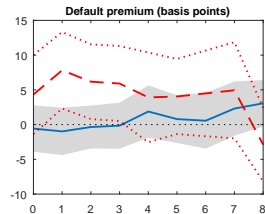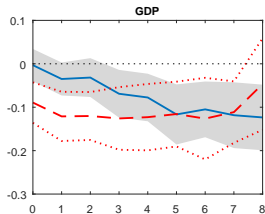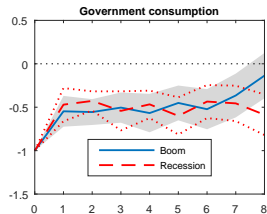
- ▶ Similar to fiscal stress vs. no stress times
- ▶ But: overlap between episodes is far from perfect

▸ back

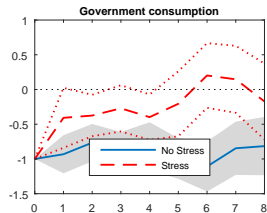# Austerity does not pay off in times of fiscal stress (top), pre financial crisis sample (bottom)
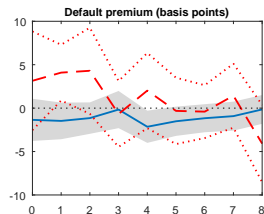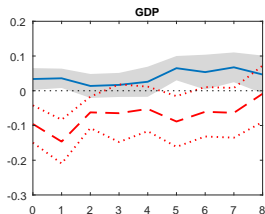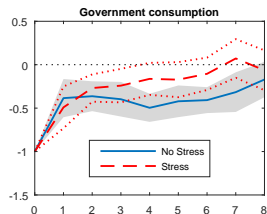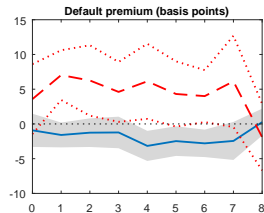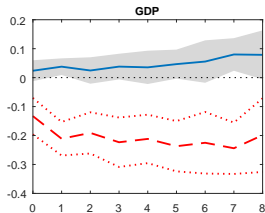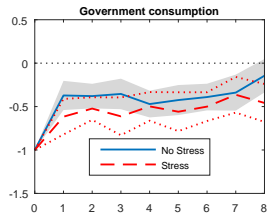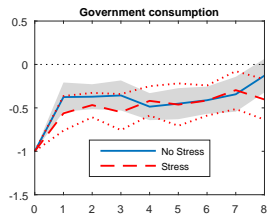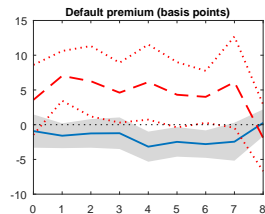
Advanced (top) vs. emerging (bottom)
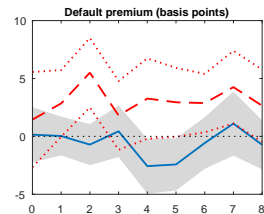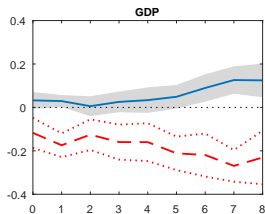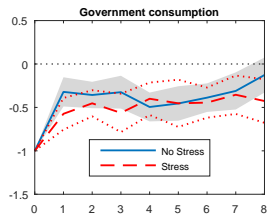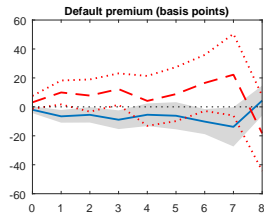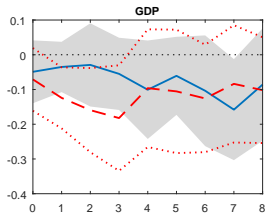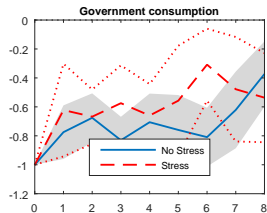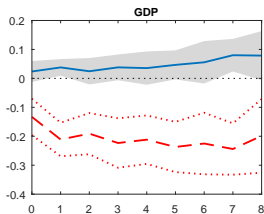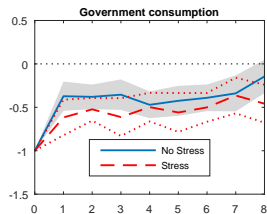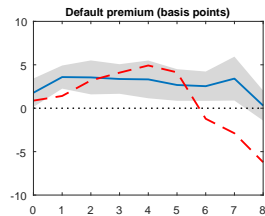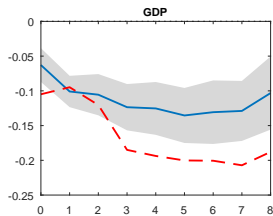
Euro area: crisis (top) vs. non-crisis countries (bottom)
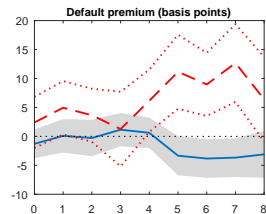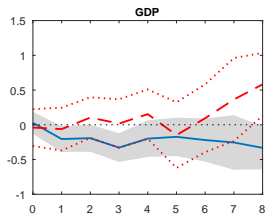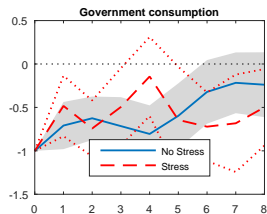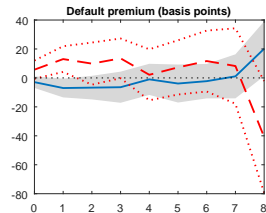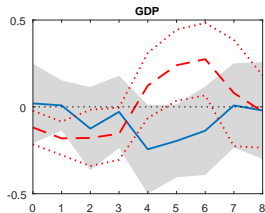
Full sample (top) vs. conservative sample (bottom)
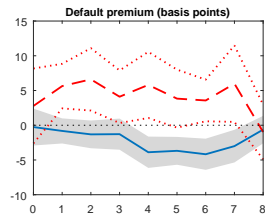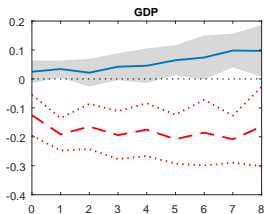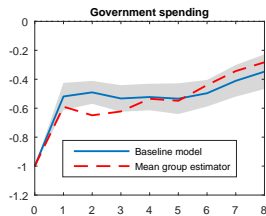
Cross-sectional heterogeneity: mean-group estimator

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

▸ back

Monetary union/dollarization vs. own legal tender
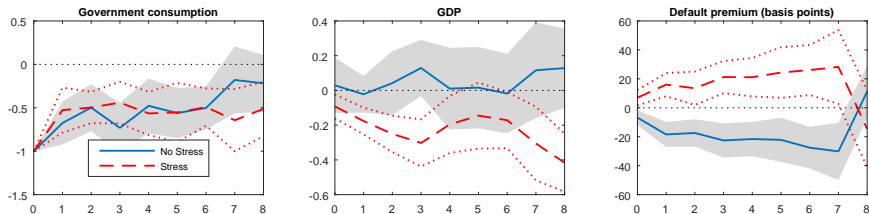
(a) Monetary union or dollarization
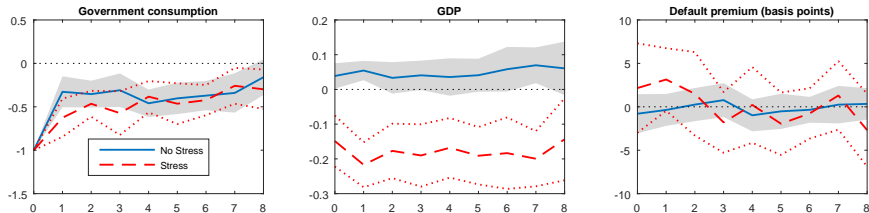
(b) Countries with their own legal tender

Transmission

(a) Including government net lending/GDP ratio

Transmission

(a) Including private consumption
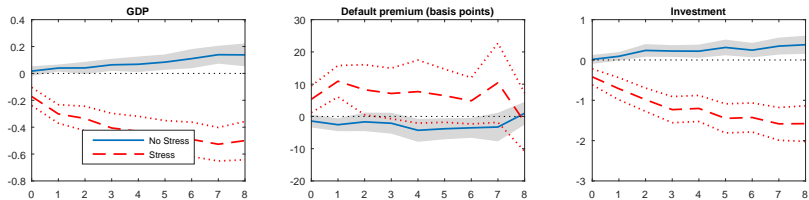
(b) Including private investment

Excluding IMF program countries
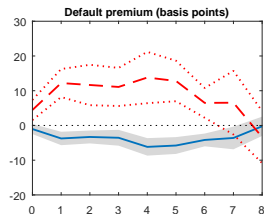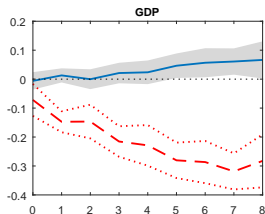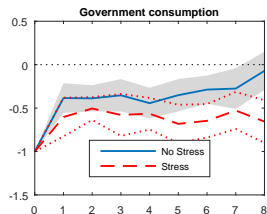
Bibliography I

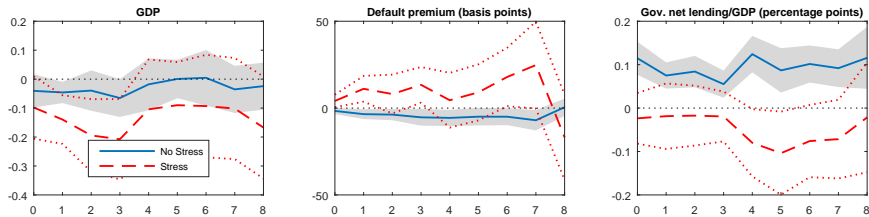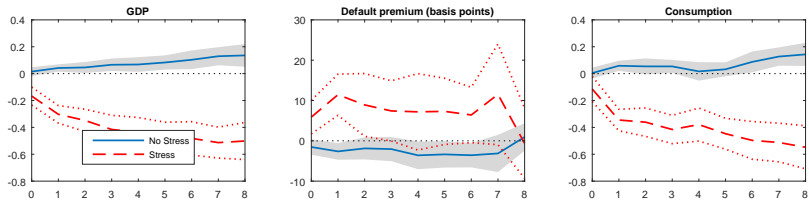📄 Alberto Alesina and Roberto Perotti. "Fiscal expansions and adjustments in OECD countries". In: *Economic Policy* 21.10 (1995), pp. 207–248.

📄 Cristina Arellano. "Default risk and income fluctuations in emerging economies". In: *American Economic Review* 98 (2008), pp. 690–712.

📄 Alan J. Auerbach and Yuriy Gorodnichenko. "Fiscal multipliers in recession and expansion". In: *Fiscal Policy after the Financial Crisis*. Ed. by Alberto Alesina and Francesco Giavazzi. Chicago: University of Chicago Press, 2013, pp. 63–98.

📄 Alan J. Auerbach and Yuriy Gorodnichenko. "Measuring the output responses to fiscal policy". In: *American Economic Journal: Economic Policy* 4.2 (May 2012), pp. 1–27.

Bibliography II

📄 Roel Beetsma, Oana Furtuna, and Massimo Giuliodori. *Does the Confidence Fairy Exist? Evidence from a New Narrative Dataset on Announcements of Fiscal Austerity Measures*. Tech. rep. 2016.

📄 Kerstin Bernoth, Jürgen von Hagen, and Ludger Schuknecht. "Sovereign risk premiums in the European government bond market". In: *Journal of International Money and Finance* 31.5 (2012), pp. 975–995.

📄 Huixin Bi. "Sovereign default risk premia, fiscal limits, and fiscal policy". In: *European Economic Review* 56 (2012), pp. 389–410.

Bibliography III

📄 Olivier J. Blanchard. "2011 In review: four hard truths". In: *iMFdirect Blog.* December 21, 2011, URL: http://blog-imfdirect.imf.org/2011/12/21/2011-in-review-four-hard-truths/.
2011.

📄 Olivier J. Blanchard and Roberto Perotti. "An empirical characterization of the dynamic effects of changes in government spending and taxes on output". In: *Quarterly Journal of Economics* 117.4 (2002), pp. 1329–1368.

📄 Nicola Borri and Adrien Verdelhan. *Sovereign risk premia.* Tech. rep. 2011.

📄 Fernando A. Broner, Guido Lorenzoni, and Sergio L. Schmukler. "Why do emerging economies borrow short term?" In: *Journal of the European Economic Association* 11.S1 (2013), pp. 67–100.

Bibliography IV

📄 Guillermo A. Calvo. "Staggered rices in a utility maximizing framework". In: *Journal of Monetary Economics* 12 (1983), pp. 383–398.

📄 Lawrence Christiano, Martin Eichenbaum, and Sergio Rebelo. "When Is the government spending multiplier large?" In: *Journal of Political Economy* 119.1 (2011), pp. 78 –121.

📄 Harold L. Cole and Timothy J. Kehoe. "Self-Fulfilling Debt Crises". In: *The Review of Economic Studies* 67.1 (2000), pp. 91–116.

📄 Giancarlo Corsetti, Keith Kuester, André Meier, and Gernot J. Müller. "Sovereign risk, fiscal policy, and macroeconomic stability". In: *Economic Journal* 123.566 (Feb. 2013), F99–F132.

Bibliography V

📑 Pete Devries, Jaime Guajardo, Daniel Leigh, and Andrea Pescatori. *A new action-based dataset of fiscal consolidation*. IMF Working Paper 11/128. 2011.

📑 John C. Driscoll and Aart C. Kraay. "Consistent covariance matrix estimation with spatially dependent panel data". In: *The Review of Economics and Statistics* 80.4 (Nov. 1998), pp. 549–560.

📑 Francesco Giavazzi and Marco Pagano. "Can severe fiscal contractions be expansionary? Tales of two small European countries". In: *NBER Macroeconomics Annual*. Ed. by Olivier J. Blanchard and Stanley Fischer. Vol. 5. Cambridge, MA: MIT Press, Aug. 1990, pp. 75–122.

📑 Clive W. J. Granger and Timo Teräsvirta. *Modelling nonlinear economic relationships*. Oxford University Press, 1993.

Bibliography VI

📄 Ethan Ilzetzki, Enrique G. Mendoza, and Carlos A. Végh. "How big (small?) are fiscal multipliers?" In: *Journal of Monetary Economics* 60.2 (2013), pp. 239–254.

📄 Òscar Jordá. "Estimation and inference of impulse responses by local projections". In: *American Economic Review* 95.1 (Mar. 2005), pp. 161–182.

📄 Òscar Jordá and Alan M. Taylor. *The time for austerity: estimating the average treatment effect of fiscal policy*. NBER Working Papers 19414. 2013.

📄 Eric M. Leeper, Todd B. Walker, and Shu-Chun Susan Yang. "Foresight and information flows". mimeo. 2012.

📄 Marco Lippi and Lucrezia Reichlin. "VAR analysis, non-fundamental representation, Blaschke matrices". In: *Journal of Econometrics* 63 (1994), pp. 307–325.

Bibliography VII

📄 Francis A. Longstaff, Jun Pan, Lasse H. Pedersen, and Kenneth J. Singleton. "How sovereign is sovereign credit risk?" In: *American Economic Journal: Macroeconomics* 3.2 (2011), pp. 75–103.

📄 Roberto Perotti. "Fiscal policy in good times and bad". In: *Quarterly Journal of Economics* 114.4 (Nov. 1999), pp. 1399–1436.

📄 Valerie Ramey. "Comment on "Roads to Prosperity or Bridges to Nowhere? Theory and Evidence on the Impact of Public Infrastructure Investment"". In: *NBER Macroeconomics Annual 2012, Volume 27*. NBER Chapters. National Bureau of Economic Research, Inc, Sept. 2012, pp. 147–153.

Bibliography VIII

📄 Valerie A. Ramey. "Identifying government spending shocks: It's all in the timing". In: *Quarterly Journal of Economics* 126.1 (2011), pp. 1–50.

📄 Valerie A. Ramey and Matthew D. Shapiro. "Costly capital reallocation and the effects of government spending". In: *Carnegie-Rochester Conference Series on Public Policy* 48 (1998), pp. 145–198.

📄 Valerie A. Ramey and Sarah Zubairy. *Government spending multipliers in good times and in bad: evidence from U.S. historical data*. NBER Working Paper 20719. Nov. 2014.

📄 Francesco Roch and Harald Uhlig. "The Dynamics of Sovereign Debt Crises and Bailouts". mimeo. 2015.