The international dimension of a fragile EMU

Demosthenes Ioannou
European Central Bank

Maria Sole Pagliari
Banque de France

Livio Stracca
European Central Bank

ESCB Research Cluster 2 conference
18 November 2021

Disclaimer: The views expressed in this paper are solely of the authors and do not reflect the views of either the ECB, the Banque de France or the ESCB.

g n§_®9§_n j

- Over the last twenty years, global and euro area economies have dramatically changed
- European political integration has become more and more _j§O}§°_jOL with global financial integration
- Rich and controversial debate on EMU deepening has to take into account the _j§O}j9§_njªe _hq9H§ nT N g ª Hn\O _nj
- ^LOj§_T´_jX §\O L_}OH§_nj nT H9« 9e_§´ between EMU stress and international developments is however difficult

Gnj§}_@«§_nj nT §_ q9q0}

Main contributions

- w«9j§_»H9§_nj nT §}0 }0e9§0L §n N g ª Hn\0 _nj
  - → N8~¦| h09 «}0
- Identification of N g ª §}0 vs global stress shocks
  - → Daily SVAR with _XjJ h9Xj_§«L0 9jL j9}}9§_®0 }0 §}_H§_nj
- Assessment of h9H}n0Hnjnh_H _hqe_H9§_nj for non-EA economies
  - → Panel local projections

¦9c09°9´

Findings

- w«9j§_»H9§_nj nT §}O }Oe9§OL §n Ng ª Hn\O _nj
  - → N8~¦| h09 «}O well captures variations in EMU cohesion
- Identification of Ng ª §}O vs global stress shocks
  - → Daily SVAR with _XjJ h9Xj_§«LO 9jL j9}}9§_®O }O §}_H§_nj manages to disentangle between EMU and global stress shocks
- Assessment of h9H}nOHnjnh_H _hqe_H9§_nj for non-EA economies
  - → Panel local projections show that a LOH}09 O _j Ng ª Hn\O _nj (increase in stress) has a negative impact on global economic and trade activities.

| 0e9§0L §}9jL nT e_§0}9§«}0

- Policy debate on N g ª Hn h qe0§_n j (4PR (2012) & 5PR (2015), Corsetti (2015), Pisani-Ferry & Zettelmeyer (2019))
- Quantification of euro area stress (via @n j L q}09L : Attinasi et al (2009), De Santis (2012), Di Cesare et al. (2012), Afonso et al. (2014, 2015); via GK~ q}0 h_9 and ¦ 8 | WN ¦ © balances: De Bruyckere et al. (2013), Acharya et al. (2014))
- The role of LOT9«e§ ® }nee]n®0} }_ c (Krishnamurthy et al. (2018), Bocola & Dovis (2019))
- ~q_een®0} nT 0«}n 9}09 §}0 onto RoW financial markets (Aizenman et al (2012), Ahmad et al. (2013), Stracca (2015))
- G}n]@n}L0} §}9j h_ _n j of macroeconomic and monetary policy shocks (Dungey et al. (2011), Forbes (2012), Forbes et al. (2017), Chen et al. (2017))
- Domestic vs global «j H0}§9_j§´ (Castelnuovo (2019), Ahir et al. (2019))

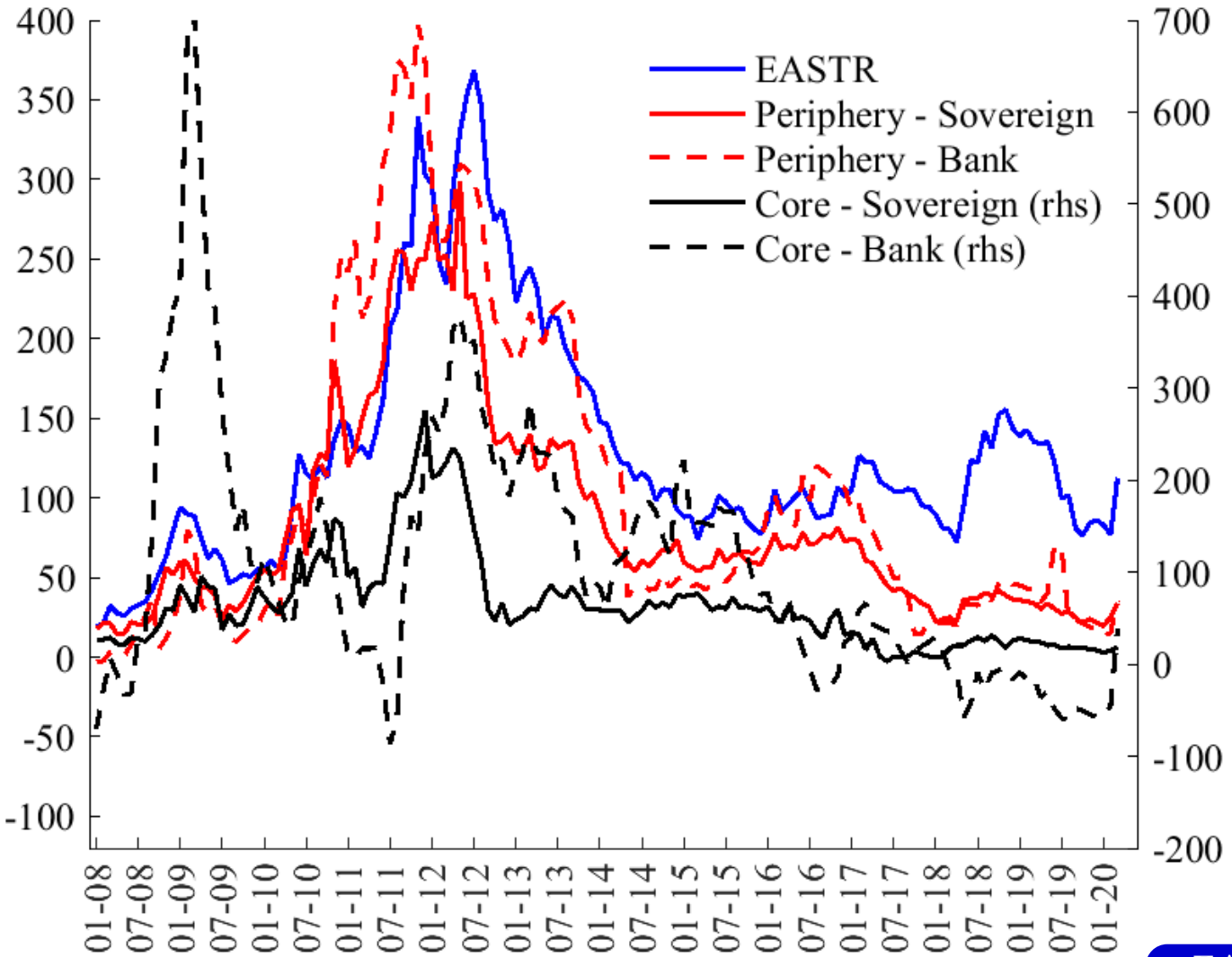
g 09 «}0 nT N g ª §}0

EMU stress (EASTR) = average 10Y sovereign spread IT&ES vs DE

| 9§_n j 9e0:

- large and abrupt fluctuations in spreads related to }_ c q}0 h_9
- risk premia in EA jn§ j0H0 9}_e´ driven by macroeconomic and fiscal fundamentals
- sovereign bond market stress also linked to «jH0}§9_j§´ around EMU completion

N8~¦| ® GK~ q}0h_9



in§0 I EASTR and CDS premia (2010=100)

◂ EASTR vs T2B
◂ EASTR vs EURII

?9 0e_j0 _L0j§_»H9§_nj §}9§0X´

^j§«_§_nj

Changes in some financial variables used to tease out:

- Wen@9e §}0 \nHc (+)
  VIX ↑, cov($\Delta EASTR, \Delta EMBI+$) ≥ 0, US10Y ↓

- N g ª §}0 \nHc (+)
  EASTR ↑, $|\Delta EASTR| > |\Delta EMBI+|$, eNEER ↓

S_} § §0q] N®0j§ §«L´

Significance assessment of changes in variables around relevant events

$$\Delta x_t = \alpha_x + \beta_x \text{Event}_t + \gamma_x D_t + \varepsilon_{x,t} \quad (1)$$

with

- Δx_t = $\{\text{EASTR}_t, \text{VIX}_t, \text{ROWeq}_t, \text{EAeq}_t, \text{eNEER}_t, \text{US10y}_t, \text{EMBI+}_t\}$
- Event_t: dummy vector selecting dates of events
- D_t: dummy vectors controlling for dates of macroeconomic releases in US and EA
- β_x: estimate of difference between change in x on event days and average daily change of x on other dates (excluding other EA and US macroeconomic releases)

→ |0 «e§ «qqn}§ n«} _j§«_§_nj

◂ Table

~OHnjL §Oq] K9_e´ ~-8 |

K9_e´ Structural Vector Autoregression Model:

$$A_0 Y_t = H + A_1 \, ^3 \, _{t-1} + \cdots + A_p \, ^3 \, _{t-p} + \varepsilon_t, \tag{2}$$

with

$Y_t \equiv [\text{EASTR}_t, \text{VIX}_t, \text{ROWeq}_t, \text{EAeq}_t, \text{eNEER}_t, \text{US10y}_t, \text{EMBI+}_t]$

$\varepsilon_t | Y^0 \quad N(0, I_N)$

→ ~_Xj 9jL h9Xj_§«LO }O §}_H§_nj _jTn}hOL @´ O®Ojs §«L´

~OHnjL §Oq] ?9 Oe_jO }O §}_H§_nj

Variables \ Shocks	EMU	Global
EASTR	> 0	≥ 0
eNEER	≤ 0	< EA shock
VIX		> 0
EMBI+ spread	< EASTR	≥ EASTR
EA equity	≤ 0	
RoW equity	< EA Equity	≤ 0
US10Y		< 0

¦_}L §0q] i9}}9§_®O }O §}_H§_nj

i9}}9§_®O }O §}_H§_nj imposed on structural shock series around well-known events along two dimensions:

1. §´qO nT \nHc → sign

Case I positive
Case II negative

2. }OeO®9jHO nT \nHc → contribution to historical decomposition

Case I least important contributor
Case II most important contributor

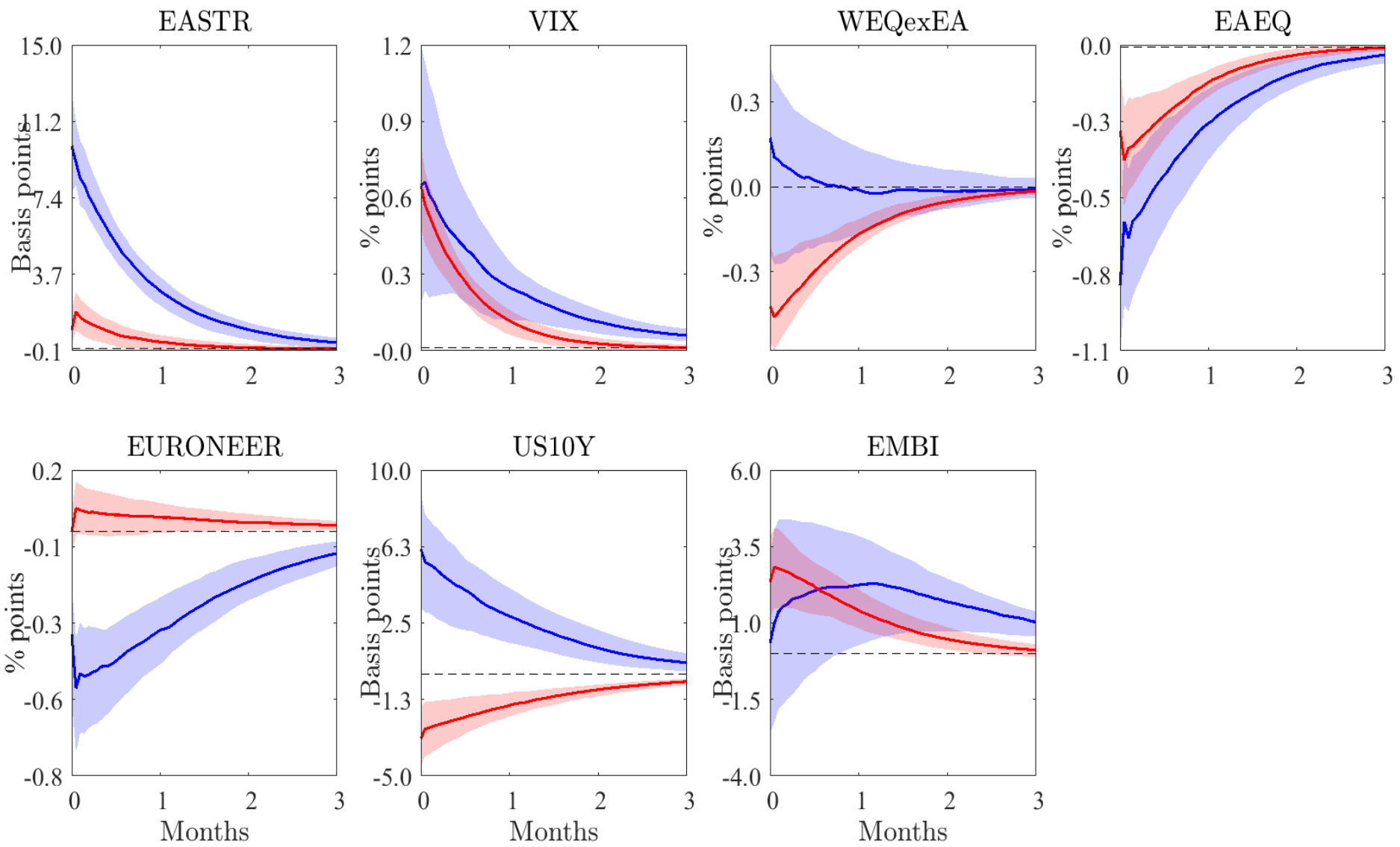
◂ Formulas

¦_}L §0q] i 9}}9§_®O }O §}_H§_nj

Date	Event	Shock	
		Type	Contribution
15-Sep-08	Lehman Brothers bankruptcy	Global+	$\overset{+}{\rightarrow} VIX$
22-May-13	FED "Taper tantrum"	Global+	
27-Jun-12	Spain and Cyprus request for programme	EMU+	
26-Jul-12	London speech	EMU-	$\overset{+}{\rightarrow} EASTR$
09-Jul-15	Eurogroup agrees on Greek 3^{rd} programme	EMU-	

i n§0 : EA = EMU cohesion shock; Global = global risk aversion shock; $\overset{+}{\rightarrow} x$ = most important contributor for HD of variable x.

I O «e§



i n§0 I IRFs - global stress; EMU stress.

N²q9jL_jX §n §\0 Gm-^Kok q0}_nL

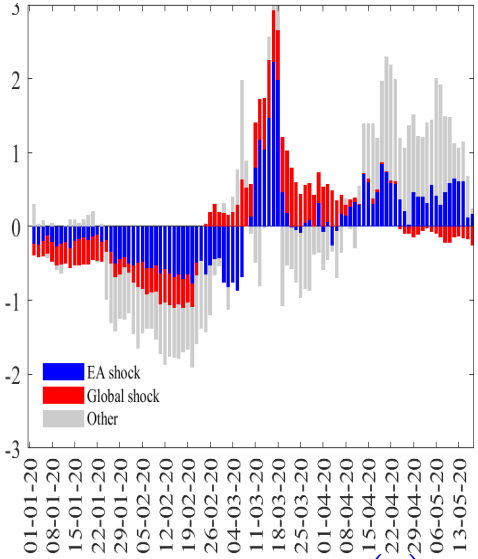
8LL_§_nj9e j9}}9§_®O }O §}_H§_nj

Date	Event	Shock	
		Type	Contribution
11-Mar-20	WHO declares Covid 19 as world pandemic	Global+	
13-Mar-20	US declares state of emergency for Covid19	Global+	
12-Mar-20	ECB press conference	EMU+	
26-Mar-20	EuCo fails to find an agreement on Covid19 emergency	EMU+	

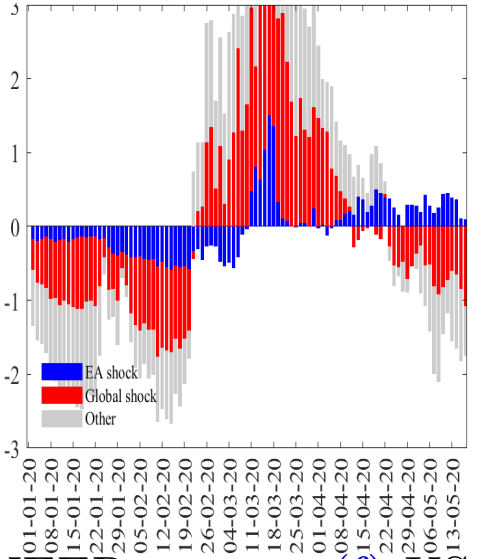
i n§0 : EA = EMU cohesion shock; Global = global risk aversion shock; $\overset{+}{-\!\!\rightarrow}$ x = most important contributor for HD of variable x.

[_ §n}_H9e LOHnhqn _§_nj

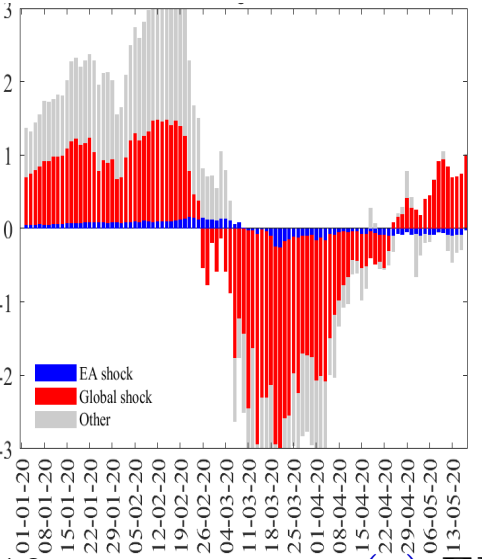
(a) EASTR



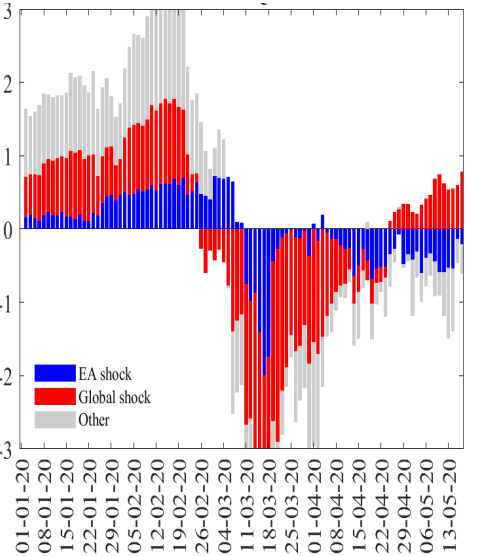
(b) VIX



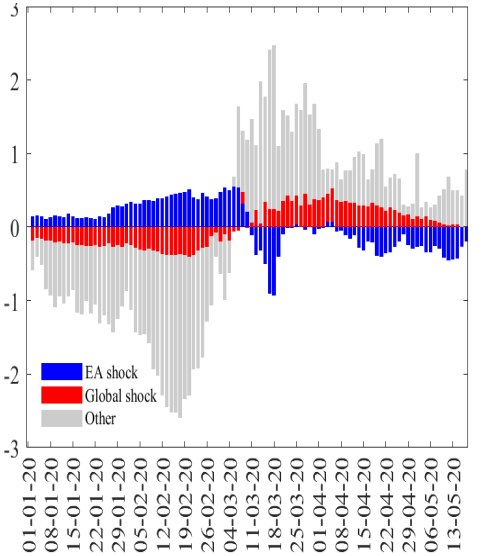
(c) RoW Equity



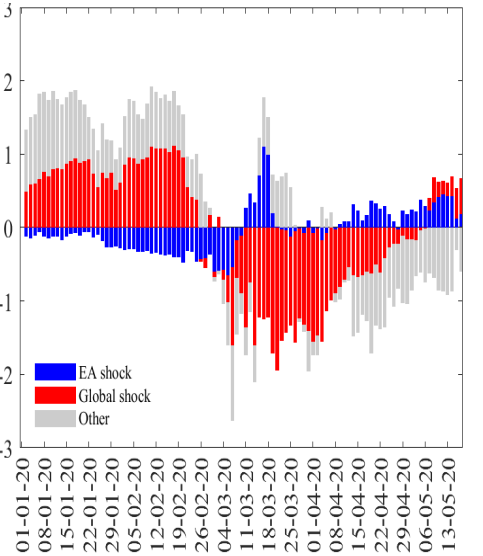
(d) European equity



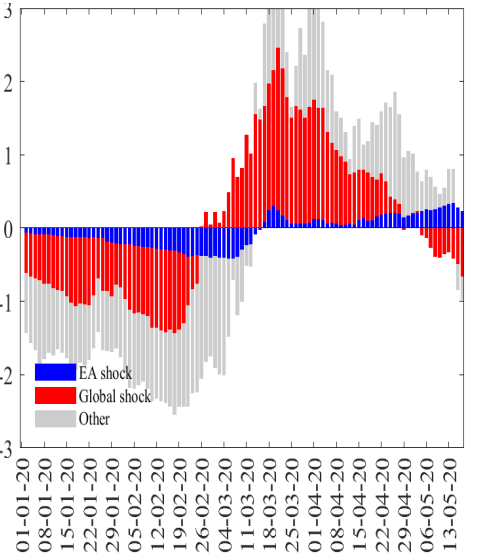
(e) eNEER



(f) US 10-year



(g) EMBI+



N²§O}j9e L_hOj _nj nT Ng ª §}O

- Does financial stress originating in EMU _h q9H§ the rest of the world (RoW)?

- Three steps:
  1. derivation of _ §n}_H9e O}_O for EMU stress and global stress structural shocks from SVAR ◂ Charts
  2. aggregation of shock series from daily to h n j § \e´ frequency
  3. assessment of impact on macroeconomic and trade activity of advanced (AEs) and emerging economies (EMs) via q9 j Oe enH9e q}naOH§_n j

p9jOe enH9e q}naOH§_nj

Local projection approach à la Jordà (2005):

$$x_{i,t:t+h} = \alpha_i + \xi_h \varepsilon_t^z + \sum_{k=1}^{p} \beta_{h,k} x_{i,t-k} + \nu_{i,h,t} \tag{3}$$

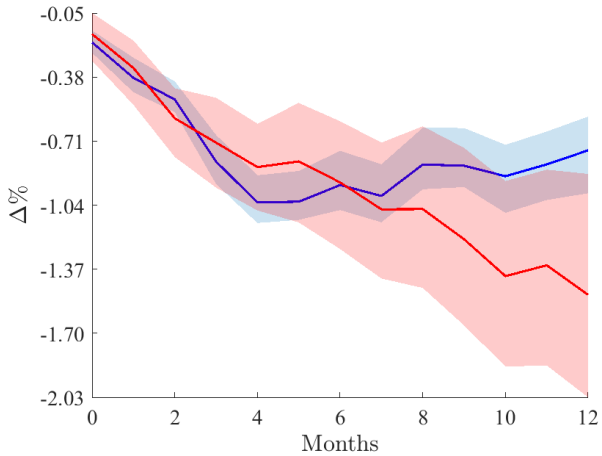
with

- $x_{i,t:t+h}$: ®9}_9@eO nT _j§O}O § between t and $t+h$ for country i
- ε_t^z: O²nXOjn« \nHc (EMU or global stress)
- $\{\xi_h\}_{0 \le h \le H}$: enH9e q}naOH§_nj ^| S of $x_{i,t}$ to ε_t^z

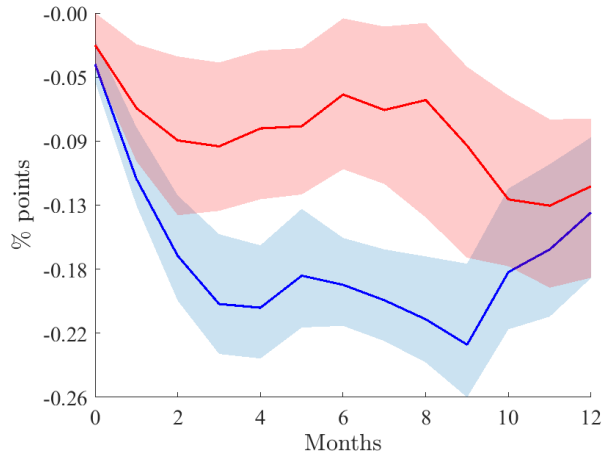
In our setup: $x_{i,t} \equiv \{ip_{i,t}, \pi_{i,t}, imp_{i,t}^{ea}, exp_{i,t}^{ea}, imp_{i,t}^{row}, exp_{i,t}^{row}\}$

|O «e§] 8L®9jHOL NHnjnh_O

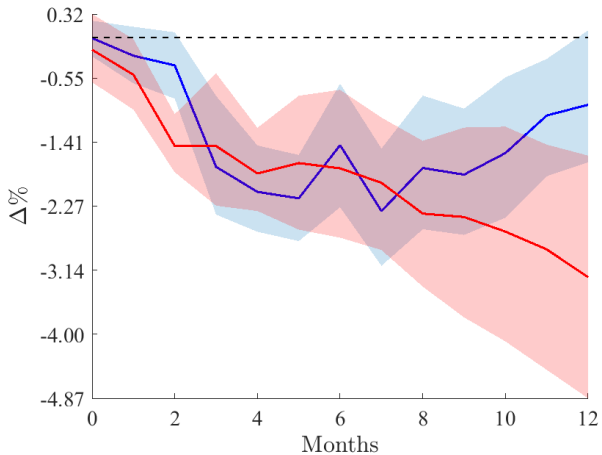
(a) Industrial production



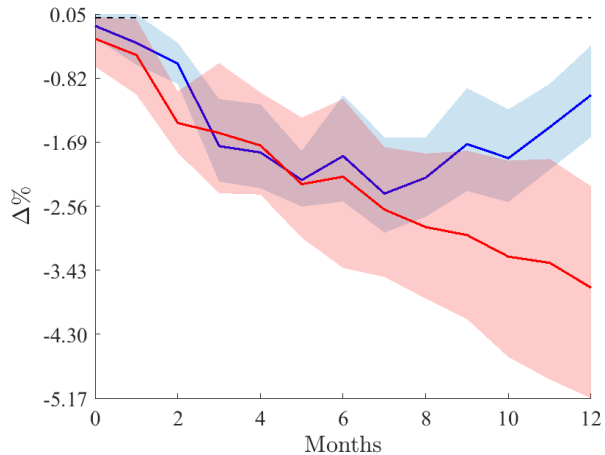
(b) Inflation



(c) Exports to RoW



(d) Imports from RoW

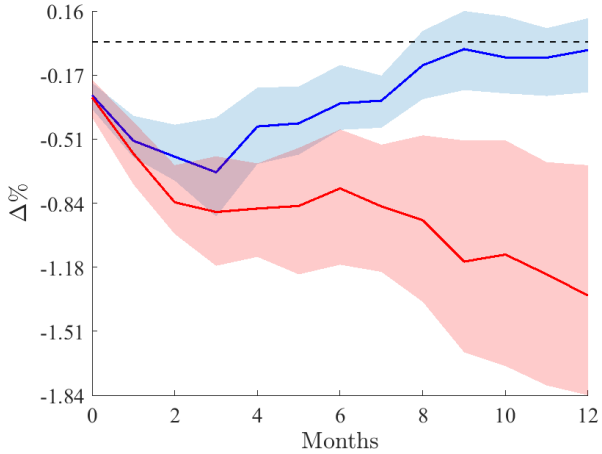


dOXOjLI global stress; EMU stress.

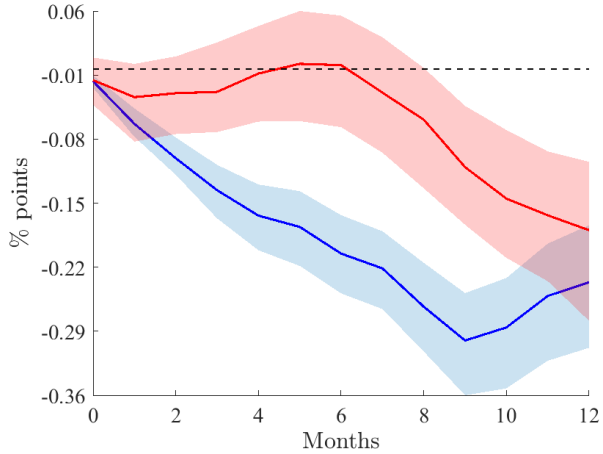
◂ Table

|O «e§]NhO}X_jX NHnjnh_O

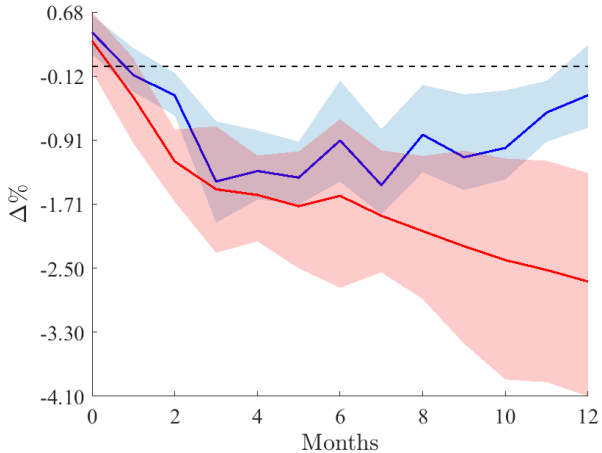
(a) Industrial production



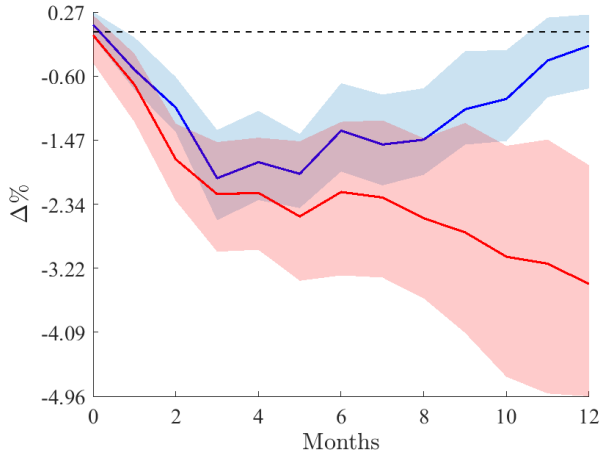
(b) Inflation



(c) Exports to RoW



(d) Imports from RoW

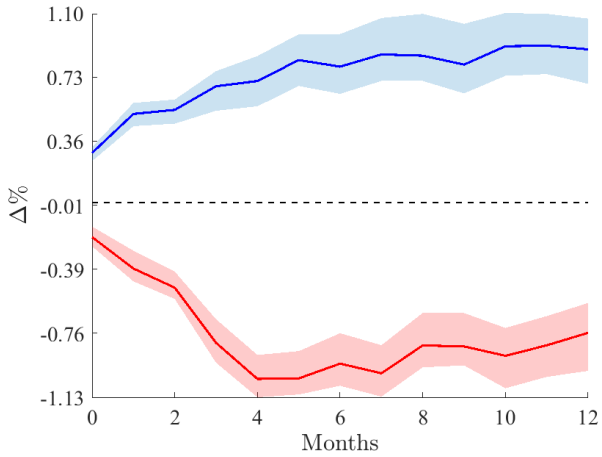


dOXOjLI global stress; EMU stress.

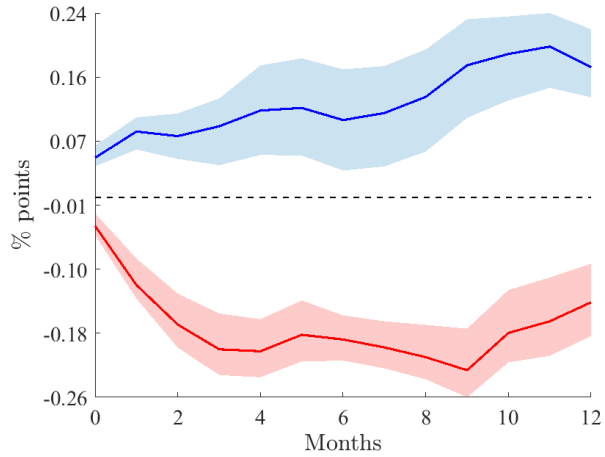
◂ Table

r8s ´h h0§}´ nT \nHc] 8L®9jH0L NHnjnh_0

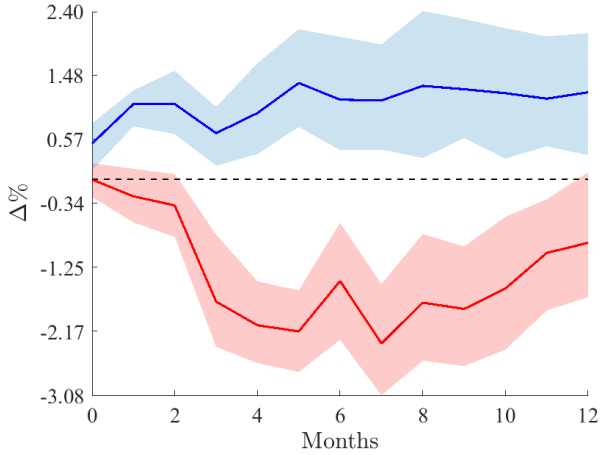
(a) Industrial production



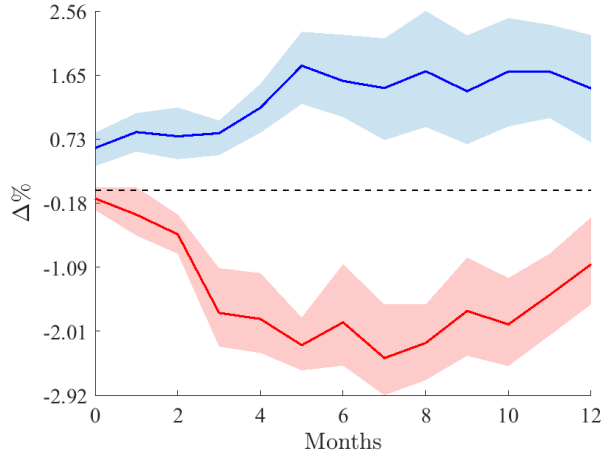
(b) Inflation



(c) Exports to RoW



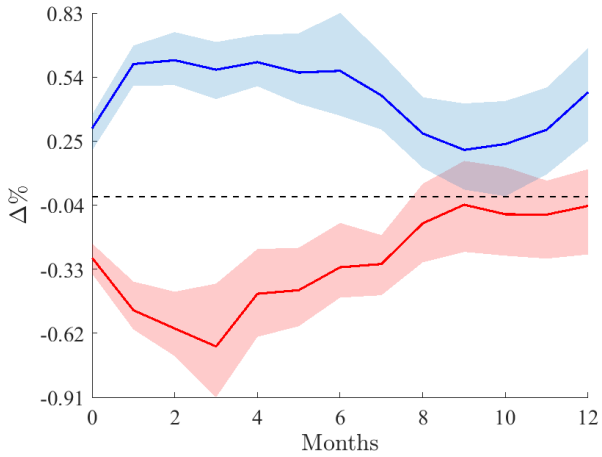
(d) Imports from RoW



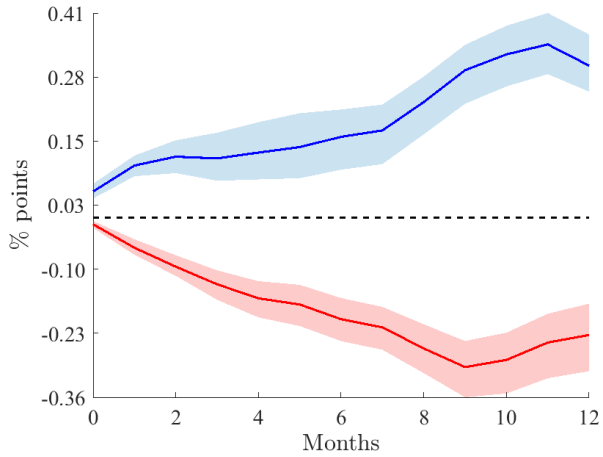
dOXOjLI positive EMU stress shock; negative EMU stress shock.

r8s ´h h0§}´ nT \nHc]Nh0}X_jX NHnjnh_0

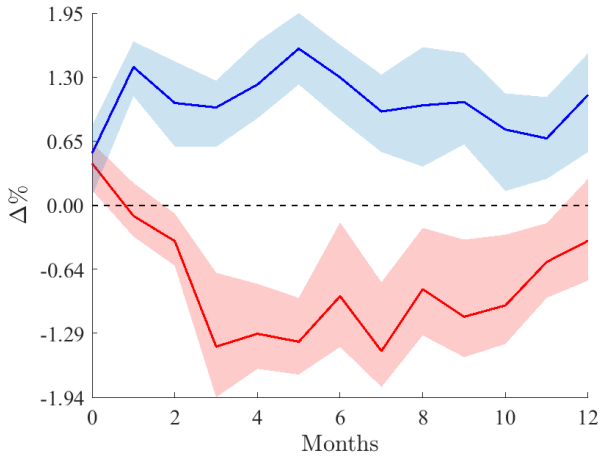
(a) Industrial production



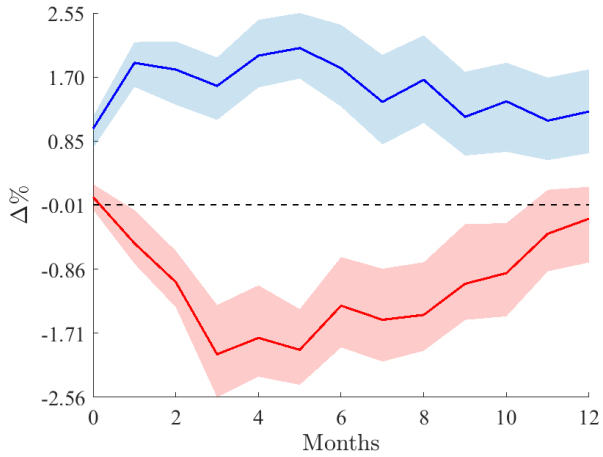
(b) Inflation



(c) Exports to RoW



(d) Imports from RoW



dOXOjLI positive EMU stress shock; negative EMU stress shock.

8®0}9X0 0¸0H§

in§0 I Yearly average impact of EMU stress shocks - positive vs negative

Variable / Shock	IP	Inflation	Exports to		Imports from	
			EA	RoW	EA	RoW
8L®9jH0L NHnjnh_0						
EMU+	-0.8%	-0.17pps	-1.78%	-1.34%	-1.11%	-1.3%
EMU-	0.73%	0.12pps	1.7%	1%	0.9%	1.3%
Nh0}X_jX g9}c0§						
EMU+	-0.3%	-0.18pps	-0.88%	-0.8%	-1.51%	-1%
EMU-	0.45%	0.19pps	1.88%	1%	0.9%	1.5%

in§0 I Yearly impact computed as average IRF over a 12-month horizon. As the shocks series are standardized, coefficients refer to a unit increment in the relevant shocks, which corresponds to an increase by one standard deviation.

Gnj He« _nj

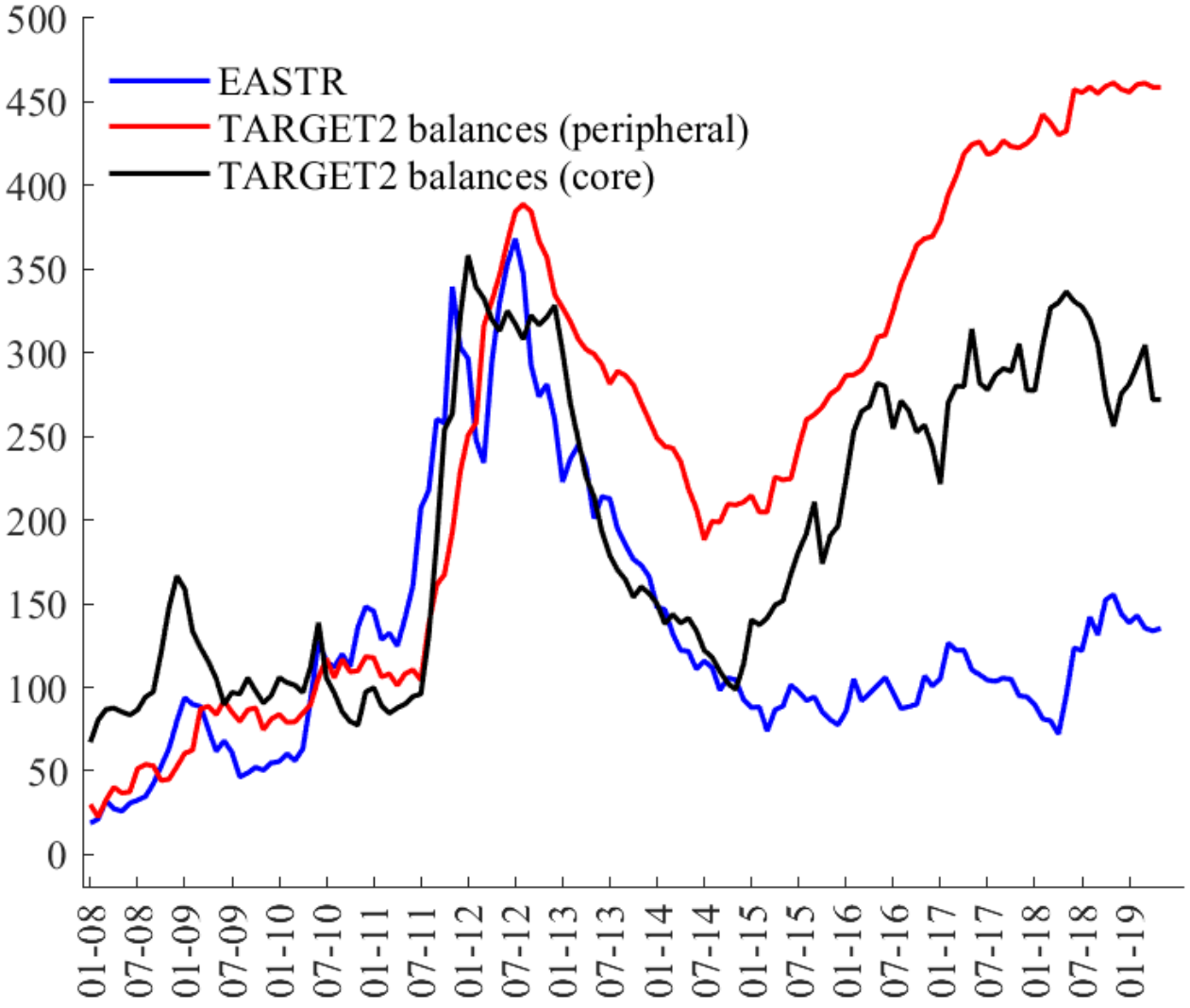
Findings

- w«9j§_»H9§_nj nT §}O }Oe9§OL §n N g ª Hn\O _nj
  - → N8~¦| h09 «}0 well captures variations in EMU cohesion
- Identification of N g ª §}O vs global stress shocks
  - → Daily SVAR with _XjJ h9Xj_§«LO 9jL j9}}9§_®O }O §}_H§_nj manages to disentangle between EMU and global stress shocks
- Assessment of h9H}nOHnjnh_H _hqe_H9§_nj for non-EA economies
  - → Panel local projections show that a LOH}09 0 _j Ng ª »j9jH_9e Hn\O _nj (increase in stress) has a negative impact on global economic and trade activities. An _jH}09 0 _j Ng ª »j9jH_9e Hn\O _nj (decrease in stress) has broadly symmetric beneficial effects, although slightly more persisting over time.

Thank you!
Questions?

Background slides

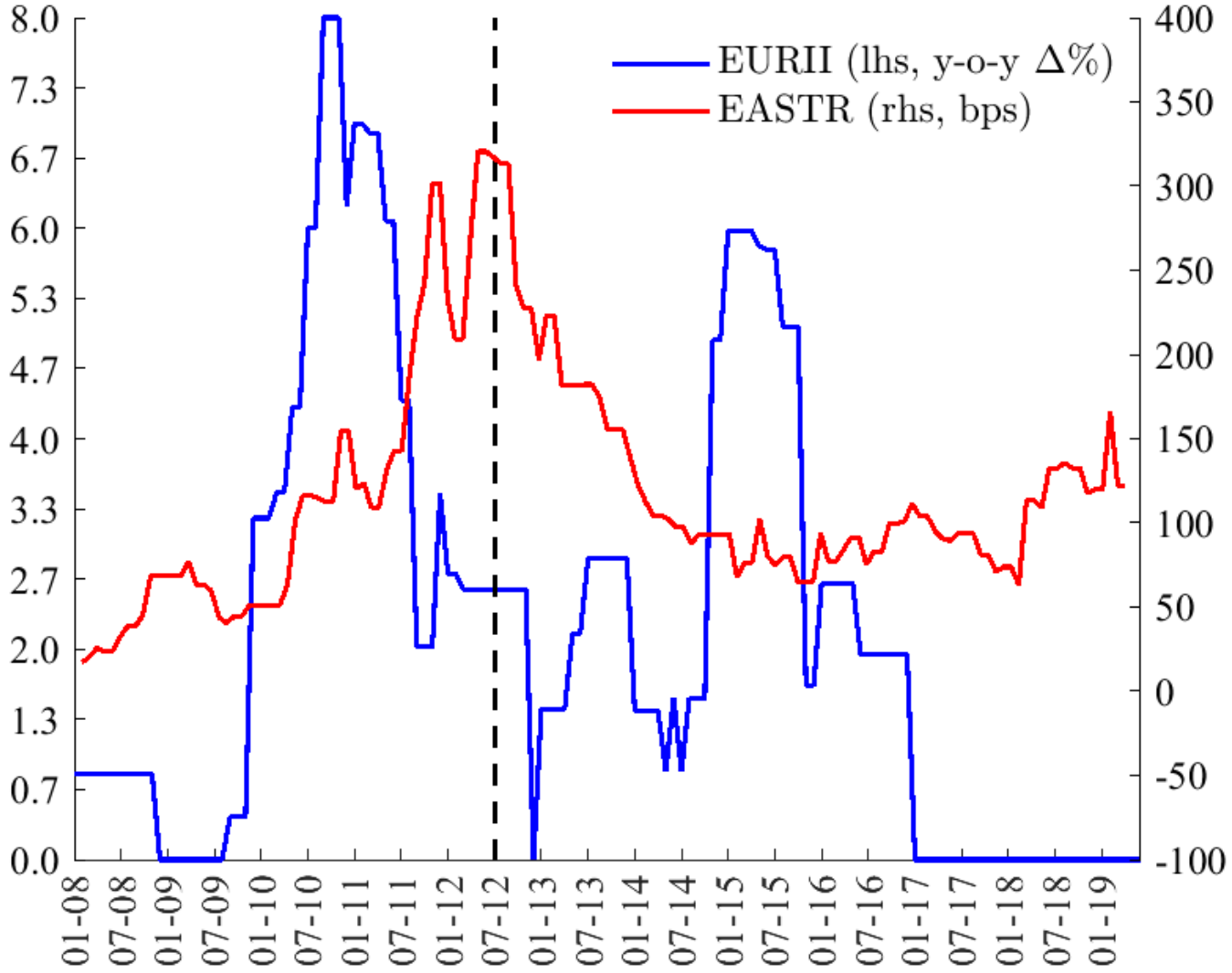
N8~¦ | ® ¦8 |WN¦© r©·o·Qo··s



in§0 I EASTR and TARGET2 balances

Back

N8~¦ | ® Nª |^^



in§0 I EASTR (2010=100) and EURII (y-o-y Δ%)

◂ Back

| 0 «e§

	EA stress	eNEER	VIX	EMBI	EA eq.	RoW eq.	US10Y
Global events							
Lehman Brothers default	0.13	**-1.282*** **	**2.971*** **	**1.246*** **	**-1.470*** **	**-2.537*** **	**-0.273*** **
	(0.15)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Taper tantrum	**1.257*** **	**-0.057*** **	**0.162*** **	**1.336*** **	**-1.328*** **	**-1.764*** **	**-0.406*** **
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Chinese stock market bubble burst	**-0.460*** **	**0.692*** **	**-4.083*** **	**-2.684*** **	**1.492*** **	**0.743*** **	**1.871*** **
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
EA events							
Greece requests for programme	**1.480*** **	**-0.426*** **	**0.520*** **	**0.472*** **	**0.664*** **	**-0.061*** **	**-0.070*** **
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Ireland requests for programme	**1.900*** **	**-1.443*** **	**1.384*** **	**-0.200*** **	**-1.646*** **	**-0.496*** **	**0.805*** **
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Spain and Cyprus request for programme	**1.434*** **	**-0.707*** **	**0.215*** **	**0.072*** **	**-0.181*** **	**-0.702*** **	**0.462*** **
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
London speech	**-4.602*** **	**0.381*** **	**-0.511*** **	**1.223*** **	**1.150*** **	**1.877*** **	**-1.857*** **
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Greek bailout referendum	**0.457*** **	**-1.027*** **	**-0.439*** **	**2.126*** **	**-1.622*** **	**-0.458*** **	**0.500*** **
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
EG* agrees on Greek third programme	**-3.192*** **	**1.664*** **	**-2.160*** **	**-0.049*** **	**2.491*** **	**1.318*** **	**-1.287*** **
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Brexit referendum	**3.232*** **	**-1.637*** **	**5.829*** **	**-3.697*** **	**-5.986*** **	**-3.204*** **	**2.059*** **
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Sintra speech	**-0.311*** **	**1.927*** **	**-0.671*** **	**-0.049*** **	**-0.058*** **	**0.398*** **	**0.234*** **
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

i n§0 I ***p < 0.01, **p < 0.05, *p < 0.1, p-values in parentheses. t-statistics are computed using Newey-West standard errors. All figures are in standard deviation terms.

◂ Back

i 9}}9§_®O }O §}_H§_nj

~_Xj nT \nHc at s_j episodes at dates $t_1, \ldots, t_{s_j}$:

$$e_{j,n}\varepsilon_{t_v}(\Theta) \quad \begin{matrix} > 0 & \text{(Case I)} \\ < 0 & \text{(Case II)} \end{matrix}$$

Gnj§}_@«§_nj nT \nHc at s_j episodes at dates $t_1, \ldots, t_{s_j}$:

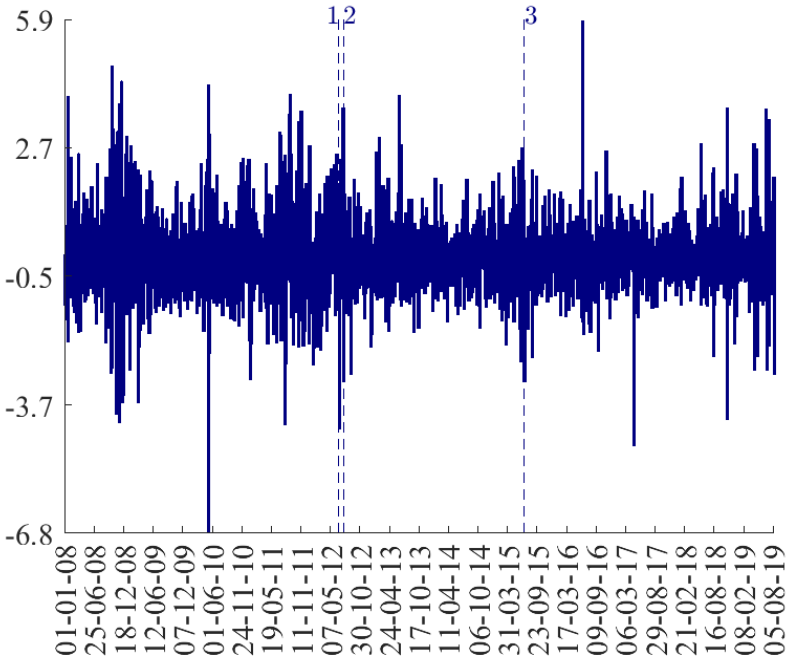
$$|H_{i_v,j,t_v,t_v+h_v}(\Theta, \varepsilon_{t_v}(\Theta), \ldots, \varepsilon_{t_v+h}(\Theta))|$$
$$- \max_{j' \neq j} |H_{i_v,j',t_v,t_v+h_v}(\Theta, \varepsilon_{t_v}(\Theta), \ldots, \varepsilon_{t_v+h}(\Theta))| \quad \begin{matrix} > 0 & \text{(Case I)} \\ < 0 & \text{(Case II)} \end{matrix}$$

for $1 \leq v \leq s_j$.

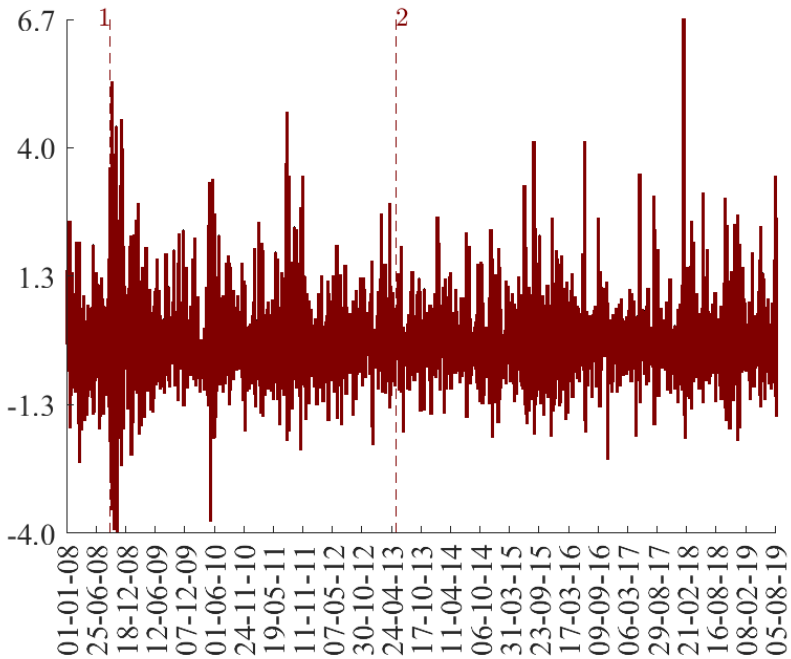
Back

K9_e´ \nHc 0}_0

(a) EMU stress



(b) Global stress



i n§0 I Panel a): 1.Spain & Cyprus programme, 2.London speech, 3.Greek 3^{rd} programme; Panel b): 1.Lehman Brothers default, 2.FED "Taper tantrum".

◂ Back

p9jOe enH9e q}naOH§_nj O §_h9§O

Table: Maximum impact of euro area stress and global risk aversion shocks

Shock \ Variable	IP	Inflation	Exports to EA	Exports to RoW	Imports from EA	Imports from RoW
Advanced Economies						
EA	-1.02% (4)*	-0.23pps (9)	-2.79% (10)	-2.34% (7)	-1.68% (3)	-2.39% (7)
Global	-1.50% (12)	-0.13pps (11)	-3.27% (12)	-3.23% (12)	-2.78% (12)	-3.67% (12)
Emerging Markets						
EA	-0.68% (3)	-0.30pps (9)	-2.36% (10)	-1.47% (7)	-1.55% (5)	-1.99% (3)
Global	-1.32% (12)	-0.18pps (12)	-2.97% (12)	-2.67% (12)	-2.72% (12)	-3.43% (12)

i n§0 I * Numbers in parentheses represent the amount of months after a shock has taken place. As the shocks series are standardized, coefficients refer to a unit increment in the relevant shocks, which corresponds to an increase by one standard deviation.

Back