
The eurozone under stretch? Analysing regional divergences
in EMU: facts, dangers and cures

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**Fiscal Policies and Business Cycles
in an Expanded Euro Area**

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Personal viewpoints!

1. The issues

2. Empirical methodology

3. Fiscal policies since the mid-1990s

4. Determinants of fiscal policy

5. Effect of fiscal policy on output variability

6. Eastern Europe in the EMU

Overview

1. The issues
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3. Fiscal policies since the mid-1990s
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Earlier versions of paper:

- Bank of Estonia Working Paper, no. 3/2007
- CESifo Working Paper, no. 1933

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1. The issues

‘The Eurozone under stretch? Analysing regional divergences in EMU: Facts, Dangers and Cures’

Here → compare fiscal policy in eurozone 12 and CEE accession 10

Fiscal policy → differences across ‘old’ and new EMU-members?

- Determinants of fiscal policy
- Effect of fiscal policies
- ‘Convergence’?

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Why important to compare fiscal policy in eurozone 12 and CEE accession 10?

Accession countries → join eurozone

Economic reasons

Reduced or non-existent independent monetary policy

→ excessive fluctuations from asymmetric shocks?

- Optimal Currency Area
- ☺ if flexible labour markets
- ☺ if fiscal policy is counter-cyclical and effective

European Commission (2006): “[T]he loss of the exchange rate instrument in EMU impl[ies] a greater role for automatic fiscal stabilisers at national level to help economies adjust to asymmetric shocks”

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Institutional reasons

Maastricht Treaty Convergence criteria (pre-entry) & Stability and Growth Pact

- 3% deficit and 60% debt (or a bit more...)
- Will criteria restrain fiscal policy and reduce its stabilisation scope?

But

Little formal research explicitly comparing fiscal policies in old EMU countries and new/future CEE members

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(In parenthesis)

- Overheating e.g. in the Baltics → too fast growth
- ‘Everybody’ → high growth should be dampened using tight fiscal policy

- Is current fiscal stance slack, ‘neutral’, tight?
 - How is fiscal policy actually formed?
 - Counter-cyclical → tighter during booms?
 - Pro-cyclical → looser during booms?
- Does fiscal policy actually affect the business cycle?

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2. Empirical methodology

‘Traditional approach’ to analysis of fiscal policy

- Fixed exogenously by government
- Almost always with effect on output (Keynesian, Ricardian equivalence)
- ‘Theoretical’ (Keynesian cross, IS-LM) ...
- ... except empirical ‘case stories’

Recently → focus on stringent empirical testing

Difficult ‘identification problem’ as two-way causality:

- Determination (output → fiscal policy variable)
- Effect (fiscal policy variable → output)

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3 methods

i) Case studies

- Mainly effect of fiscal policy on output
- ‘Natural experiment’ (war, government colour) → autonomous fiscal shock
- Positive or no effect of autonomous fiscal shock on output

ii) VAR-models

- System with *inter alia* output and fiscal policy variable(s)
- Identification via restrictions on error terms
- Varying results
- Large data requirement

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iii) 'Direct estimation'

Y → F

- Effect of output on fiscal policy ('reaction function')
- Identification via instrumentation of output (using variables not affected by fiscal policy)

F → Y

- Explain output variability with fiscal policy variables

Both

- Can use panel data estimation
- Homogeneity across time (and countries)?

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Related literature

Western Europe

- Very many!

Eastern Europe

- Afonso *et al.* (2005) → case studies of fiscal contractions → factors leading to permanent strengthening of fiscal position in CEE countries
- Berger *et al.* (2007) → direct estimations shows that differences in headline budget balances in CEE countries cannot be explained by cyclical position etc. → bargaining position as function of size
- Kattai & Lewis (*BJE*, 2005) → direct estimations of fiscal policy reactions for individual CEE countries
- No previous studies compare East and West!

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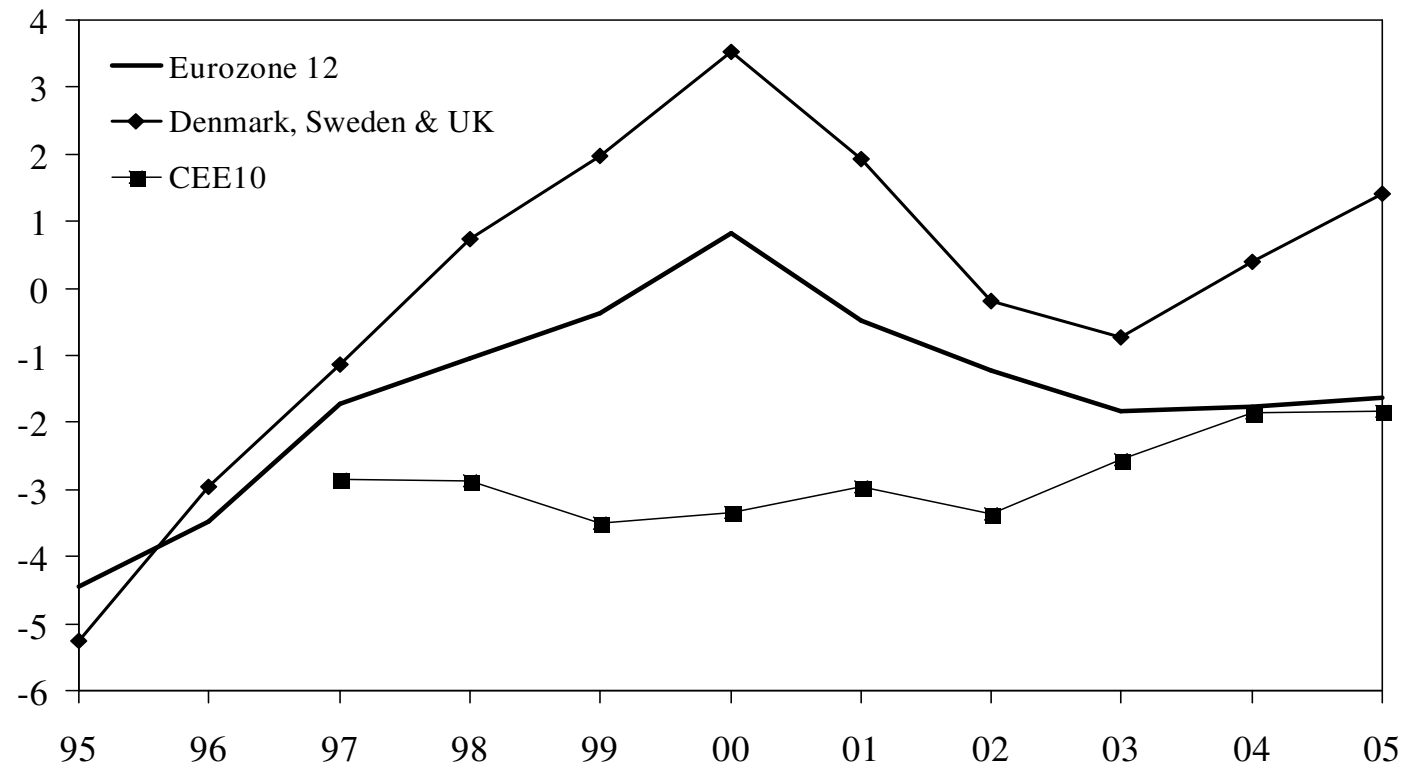
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3. Fiscal policies since the mid-1990s

Figure 1. General government balance as a percentage of GDP, unweighted averages for country groups, 1995-2005



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Headline fiscal balance (BAL)

- Larger deficits in CEE ... but ‘headline convergence’

Headline fiscal balance says little about ...

- ... whether fiscal policy is sensible in light of business cycle / growth (GY)
 - Headline balance = 0 and still expansive policy
 - Headline deficit and still quite tight policy
- ... whether fiscal policy works as intended

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Table 1. Annual GDP growth as a percent (GY), unweighted averages for country groups, 1995-2005

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Eurozone 12	5.5	2.7	4.2	4.1	4.4	4.8	2.4	1.9	1.6	2.7	2.1
Denmark, Sweden & UK	3.3	2.3	2.9	3.0	3.4	3.9	1.3	1.5	1.6	2.9	2.5
CEE10^{a)}	3.0	2.8	4.6	4.1	2.1	4.6	4.5	4.5	5.2	6.2	6.3

^{a)} No data available for the Czech Republic and Bulgaria for 1995 and for Romania for 1995-98.

Source: Eurostat (2006), own calculations.

Table 3. Government consolidated gross debt as a percentage of GDP (DEBT), unweighted averages for country groups, 1995-2005

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005 ^{a)}
Eurozone 12	74.8	74.4	71.6	68.5	67.0	64.8	63.7	61.9	61.7	61.5	61.6
Denmark, Sweden & UK	73.1	72.6	69.7	66.6	64.6	61.6	60.4	58.6	58.4	58.2	57.9
CEE10^{b)}	..	..	29.2	25.4	28.6	28.6	29.4	29.7	30.5	30.0	28.8

^{a)} Estimates by Eurostat.

^{b)} No data available for Latvia and Slovenia for 1995-98 and for Bulgaria and Romania for 2005.

Source: Eurostat (2006), own calculations.

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4. Determinants of fiscal policy

Fiscal policy reaction function

$$\text{BAL} = \alpha + \beta \cdot \text{BAL}(-1) + \gamma \cdot \text{GY} + \delta \cdot \text{DEBT}(-1) + \varepsilon$$

BAL → budget balance as % of GDP (> 0 if surplus)

GY → Growth in output, %

DEBT → government debt as % of GDP

β → inertia

γ → cyclical dependence

δ → effect of debt

Links deficit, debt and business cycle!

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Data

- Annual data from Eurostat, 1995-2005
- 12 EMU 'old' countries (+ 3 EU15, Malta, Cyprus)
- 10 CEE countries (incl. Romania, Bulgaria)

Infeasible to estimate regressions for individual countries

Assume same structure within 12 old eurozone members (W) and within new CEE 10 (E)



- Many similar experiences within the two groups
- Similar situation now (out / in)
- Tests show assumption is reasonable

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Panel estimations with individual coefficients to variables for W and E

$$\begin{aligned} \text{BAL} = & \beta^W \cdot \text{BAL}(-1) \cdot W + \beta^E \cdot \text{BAL}(-1) \cdot E \\ & + \gamma^W \cdot \text{GY} \cdot W + \gamma^E \cdot \text{GY} \cdot E \\ & + \delta^W \cdot \text{DEBT}(-1) \cdot W + \delta^E \cdot \text{DEBT}(-1) \cdot E \\ & + \text{country dummies} + \text{time dummies} + \varepsilon \end{aligned}$$

$W \rightarrow 1$ if West, otherwise 0

$E \rightarrow 1$ if East, otherwise 0

Arellano Bond \rightarrow time difference regression

- Instrumentation (BAL(-1), GY) \rightarrow lagged values, US GDP, Russian GDP, oil prices, US interest rate

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Table 4. Budget balance reaction functions

	(4.1)	(4.2)	(4.3)	(4.4)	(4.5)
	BAL	BAL	BAL	BAL	BAL
BAL(-1)·W	0.606*** (0.141)	0.725*** (0.052)	0.621*** (0.080)	0.586*** (0.136)	0.596*** (0.145)
BAL(-1)·E	0.099 (0.131)	0.084* (0.092)	0.177** (0.072)	0.099 (0.116)	0.244* (0.137)
GY·W	0.218** (0.093)	0.189* (0.104)	0.193*** (0.059)	0.268** (0.123)	..
GY·E	0.622*** (0.146)	0.593*** (0.135)	0.457*** (0.103)	0.496*** (0.149)	..
GYP·W	..	..	..	..	0.231** (0.090)
GYP·E	..	..	..	..	0.363*** (0.059)
DEBT(-1)·W	-0.013 (0.022)	0.0090 (0.028)	-0.011 (0.0089)	0.027 (0.032)	0.056 (0.024)
DEBT(-1)·E	0.014 (0.030)	0.034 (0.027)	-0.0073 (0.023)	0.025 (0.031)	0.110** (0.052)
Country dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	No	Yes	Yes	Yes
Method	GMM-AB ^{a)}	GMM-AB ^{a)}	OLS/FE	GMM-AB ^{a)}	GMM-AB ^{b)}
Time sample	95-05	95-05	95-05	95-05	95-05
No. of countries	22	22	22	27	22
No. of obs.	194	194	205	239	188

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Table 4: Baseline results

- More inertia/persistence in fiscal policy in eurozone 12 than in CEE 10
- Less counter-cyclicality in eurozone than in CEE
 - GDP
 - Private GDP
- Debt without discernable effect
- Robust to changes in estimation method, instrumentation, inclusion of 5 remaining EU countries

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Table 5. Budget balance reaction functions – debt and interest payments

	(5.1)	(5.2)	(5.3)	(5.4)
	BAL	BAL	PrBAL	PrBAL
BAL(-1)·W	0.606*** (0.141)	0.588*** (0.156)	..	..
BAL(-1)·E	0.099 (0.131)	0.023 (0.101)	..	..
PrBAL(-1)·W	..	..	0.503*** (0.146)	0.547*** (0.127)
PrBAL(-1)·E	..	..	0.129 (0.122)	0.120 (0.121)
GY·W	0.218** (0.093)	0.156* (0.086)	0.085 (0.105)	0.125 (0.076)
GY·E	0.622*** (0.146)	0.532*** (0.142)	0.655*** (0.120)	0.525*** (0.106)
DEBT(-1)·W	-0.013 (0.022)	-0.012 (0.020)	0.041 (0.040)	-0.0065 (0.017)
DEBT(-1)·E	0.014 (0.030)	0.058 (0.051)	0.041 (0.047)	0.053 (0.038)
INTR·W	..	-0.028 (0.142)	..	0.393** (0.197)
INTR·E	..	-0.213 (0.371)	..	0.287 (0.404)
Country dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Method	GMM-AB ^{a)}	GMM-AB ^{b)}	GMM-AB ^{c)}	GMM-AB ^{d)}
Time sample	95-05	95-05	95-05	95-05
No. of countries	22	22	22	22
No. of obs.	194	189	186	186

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Additional results: Table 5

- No effect on budget balance of debt and interest payments in W and E
- NB: Already control for BAL(-1)
- Effect on primary budget balance (balance without interest payments) of *interest payments* in W , but not in E
- No effect on primary budget balance of *debt stock* in W and E
- Argument for cap on debt?

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Table 6. Budget balance reaction functions – sample split and structural change

	(6.1)	(6.2)	(6.3)	(6.4)	(6.5)	(6.6)
	BAL	BAL	BAL	BAL	BAL	BAL
BAL(-1)·West	0.606*** (0.141)	0.609*** (0.148)	0.539*** (0.117)	0.571*** (0.135)	0.705*** (0.211)	0.645*** (0.215)
BAL(-1)·East	0.099 (0.131)	0.103 (0.128)	0.071 (0.305)	0.022 (0.268)	-0.012 (0.159)	0.031 (0.154)
GY·West	0.218** (0.093)	0.206** (0.087)	0.025 (0.068)	0.026 (0.068)	0.771*** (0.276)	0.692*** (0.239)
GY·East	0.622*** (0.146)	0.620*** (0.130)	0.204 (0.265)	0.229 (0.254)	0.751** (0.334)	0.728** (0.290)
DEBT(-1)·West	-0.013 (0.022)	..	-0.013 (0.022)	..	-0.013 (0.022)	..
DEBT(-1)·East	0.014 (0.030)	..	0.014 (0.030)	..	0.014 (0.030)	..
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Method	GMM-AB ^{a)}	GMM-AB ^{a)}	GMM-AB ^{a)}	GMM-AB ^{a)}	GMM-AB ^{a)}	GMM-AB ^{a)}
Time sample	95-05	95-05	95-00	95-00	01-05	00-05
No. of countries	22	22	22	22	22	22
No. of obs.	194	194	86	86	108	108

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Additional results: Table 6

- Compare 1995-2000 and 2001-05
- Too few observations for reliable inference
- Difference in persistence across W and E persists
- Fiscal policy more counter-cyclical in 2001-05, especially in eurozone 12 countries
- Convergence?

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Table 7. Expenditure and revenue reaction functions

	(7.1)	(7.2)	(7.3)	(7.4)
	EXP	REV	REV	REV
EXP(-1)·W	0.500** (0.238)	..	..	..
EXP(-1)·E	0.459*** (0.083)	..	..	..
REV(-1)·W	..	0.742*** (0.124)	0.622*** (0.188)	0.965** (0.337)
REV(-1)·E	..	0.652*** (0.062)	-0.197 (0.235)	0.443*** (0.099)
GY·W	-0.290* (0.151)	-0.222** (0.104)	-0.299*** (0.077)	-0.185 (0.321)
GY·E	-0.422*** (0.095)	0.328 (0.223)	0.230 (0.184)	-0.202 (0.238)
DEBT(-1)·W	-0.0059 (0.042)	-0.0091 (0.027)	-0.040 (0.047)	0.016 (0.106)
DEBT(-1)·E	-0.278*** (0.094)	-0.253 (0.129)	-0.647*** (0.112)	-0.040 (0.146)
Country dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Method	GMM-AB ^{a)}	GMM-AB ^{b)}	GMM-AB ^{b)}	GMM-AB ^{b)}
Time sample	95-05	95-05	95-00	01-05
No. of countries	21	21	18	21
No. of obs.	183	183	82	101

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Additional results: Table 7

- Expenditures and revenues treated separately
- Expenditure reaction functions quite similar for eurozone 12 and CEE 10
- Revenue reaction functions different
 - Revenue as % of GDP exhibits more inertia in W than in E
 - Revenue as % of GDP is pro-cyclical in W and counter-cyclical in E

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5. Effect of fiscal policy on output variability

End result of fiscal policy → effect on business cycle

- Difficult → relevant measure, reverse causality, control variables, etc.

Method used

- Explain (private sector) output growth variability during 1995-2005 with ...
- ... variables capturing fiscal policies
- ... control variables

Effect of fiscal policy measures different across *W* and *E*?

NB: Cross-sectional analysis (22 + 5 countries)

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Variables (for each country)

- Output variability
SDGYP → standard deviation of private sector output growth 1995-2005
- 'Government size'
EREV → average government revenue 1995-2005
- Part of budget balance that is autonomous'
Autonomous Fiscal balance → budget balance 'shock' independent of the business cycle → residual from fiscal balance reaction function (4.4) / (4.1)
SDAF → standard deviation of budget balance 'shock', 1995-2005

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- Measure of Counter-Cyclical Fiscal policy

$$\text{BAL} = \beta_0 + \beta_1 \text{BAL}(-1) + \beta_2 \text{GY} + \varepsilon$$

Separate for *W* and *E*

Separate for each country

CCF → country-specific β_2 coefficient

- Control variables

Openness of economy

Size of economy

- Also variables indicating average deficit and primary deficit

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Table 8. Region-specific determinants of variability of private sector output growth

	(8.1)	(8.2)	(8.3)	(8.4)	(8.5)	(8.6)
	SDGYP	SDGYP	SDGYP	SDGYP	SDGYP	SDGYP
<i>EBAL·West</i>	-0.093 (0.066)	..	..		-0.040 (0.070)	..
<i>EBAL·East</i>	0.529*** (0.092)	..	..		-0.169 (0.098)	..
<i>SDAF·West</i>	..	0.488** (0.213)	..	..	0.406 (0.336)	0.467* (0.256)
<i>SDAF·East</i>	..	-0.142 (0.582)	..	..	1.030*** (0.168)	1.094*** (0.173)
<i>CCF·West</i>	..	..	0.116 (0.219)	..	0.205 (0.258)	0.187 (0.239)
<i>CCF·East</i>	..	..	-1.931*** (0.547)	..	-2.798*** (0.431)	-2.525*** (0.528)
<i>EREV·West</i>	..	..	..	-0.027 (0.024)	-0.032 (0.030)	-0.035 (0.028)
<i>EREV·East</i>	..	..	..	-0.310*** (0.059)	-0.323*** (0.025)	-0.286*** (0.025)
<i>Size·West</i>	-0.133*** (0.040)	-0.117** (0.046)	-0.143** (0.052)	-0.139*** (0.042)	-0.151* (0.079)	-0.147* (0.076)
<i>Size·East</i>	-0.514 (0.932)	-1.392 (0.837)	-1.722 (0.651)	0.480 (0.588)	-1.135*** (0.254)	-1.054** (0.356)
<i>Openness·West</i>	1.717*** (0.298)	1.302*** (0.248)	1.452*** (0.289)	1.344*** (0.350)	1.103** (0.492)	0.979** (0.440)
<i>Openness·East</i>	-1.616 (3.105)	-2.905 (5.797)	0.314 (4.637)	3.498** (1.810)	3.960*** (0.918)	2.978*** (0.475)
<i>Constant·West</i>	1.744*** (0.303)	1.209** (0.530)	1.985*** (0.285)	3.346** (1.310)	2.868 (1.667)	3.035* (1.625)
<i>Constant·East</i>	5.624*** (1.445)	5.212** (1.877)	5.120*** (1.877)	15.39*** (2.719)	15.95*** (0.878)	14.87*** (0.976)
Method	OLS	OLS	OLS	OLS	OLS	OLS
No. of countries	27	27	27	26	26	26
R²	0.63	0.51	0.65	0.80	0.93	0.93

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<i>SDAF·West</i>	..	0.488** (0.213)	0.406 (0.336)	0.467* (0.256)
<i>SDAF·East</i>	..	-0.142 (0.582)	1.030*** (0.168)	1.094*** (0.173)
<i>CCF·West</i>	0.116 (0.219)	..	0.205 (0.258)	0.187 (0.239)
<i>CCF·East</i>	-1.931*** (0.547)	..	-2.798*** (0.431)	-2.525*** (0.528)
<i>EREV·West</i>	-0.027 (0.024)	-0.032 (0.030)	-0.035 (0.028)
<i>EREV·East</i>	-0.310*** (0.059)	-0.323*** (0.025)	-0.286*** (0.025)

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Size·East	-0.514 (0.932)	-1.392 (0.837)	-1.722 (0.651)	0.480 (0.588)	-1.135*** (0.254)	-1.054** (0.356)
Openness·West	1.717*** (0.298)	1.302*** (0.248)	1.452*** (0.289)	1.344*** (0.350)	1.103** (0.492)	0.979** (0.440)
Openness·East	-1.616 (3.105)	-2.905 (5.797)	0.314 (4.637)	3.498** (1.810)	3.960*** (0.918)	2.978*** (0.475)
Constant·West	1.744*** (0.303)	1.209** (0.530)	1.985*** (0.285)	3.346** (1.310)	2.868 (1.667)	3.035* (1.625)
Constant·East	5.624*** (1.445)	5.212** (1.877)	5.120*** (1.877)	15.39*** (2.719)	15.95*** (0.878)	14.87*** (0.976)
Method	OLS	OLS	OLS	OLS	OLS	OLS
No. of countries	27	27	27	26	26	26
R²	0.63	0.51	0.65	0.80	0.93	0.93

1. The issues

2. Empirical methodology

3. Fiscal policies since the mid-1990s

4. Determinants of fiscal policy

5. Effect of fiscal policy on output variability

6. Eastern Europe in the EMU

Results: Table 9

- Average balance without effect
- Autonomous fiscal shocks probably increase variance for CEE, uncertain for Western EU
- Counter-cyclical policies reduce output variability in CEE, but not in Western EU
- Average government size important for CEE, maybe also for Western EU

- NB!
 - Counter-cyclical fiscal variable CCF correlated with government size, especially for CEE
 - Small sample, unstable results, instrumentation ...

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Findings

- Notable difference across two regions
- Fiscal balance exhibit most inertia in West
- Fiscal balance most counter-cyclical in East
- Overall fiscal balances do not react to debt or interest payments
- Fiscal policy formation convergence (?)
- Autonomous fiscal shocks increases variability
- Counter-cyclical policy may reduce variability in CEE countries, but not in the West
- Bigger government reduces variability, at least in CEE

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Policy implications

The unsurprising surprise! → CEE countries as ‘textbook economies’

- ☺ ‘Agile’ fiscal reaction in CEE → deficit persistence low
- ☺ Lack of monetary autonomy less of a problem for CEE as (?) fiscal policy is counter-cyclical and effective
- ☹ Highly counter-cyclical fiscal policy observed in CEE countries could conflict with deficit ceiling in SGP
- ☹ Little feedback from debt and debt servicing to overall deficit → argument for debt criterion?