

# The design of national fiscal frameworks and their budgetary impact

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*The views expressed in this presentation are exclusively those of the authors and do not necessarily reflect those of the European Central Bank.*

# Motivation

- The sovereign debt crisis has exposed **fundamental weaknesses** in the EU fiscal governance framework.
- The **lack of national ownership** to comply with EU rules => fostered the deficit bias and contributed to the building-up of large fiscal imbalances.
- Recent **initiatives to enhance the governance framework** in the EU aim to strengthen national fiscal frameworks.
- A key focus in the public debate is on **strict and effective numerical fiscal rules**, targeting the medium term, and with a strong monitoring role for fiscal councils.
  - How should **national fiscal frameworks** be **designed** to help providing fiscal discipline? OR
  - Will the recent initiatives be **effective** to help avoiding large fiscal imbalances in the future?

# Contribution of our paper

- **New dataset**

We constructed a **time-varying dataset** for national fiscal frameworks based on several already existing datasets. Our dataset covers a **larger country sample** for a **longer time period**.

- **Quantifiable effects**

By **using dummies** instead of a composite index we can quantify (in % of GDP) and compare the fiscal impact of specific fiscal framework features.

- **Disaggregated fiscal variables**

Besides on headline fiscal variables, we estimate the impact of fiscal rules on **different expenditure and revenue components** as well as on different **expenditure areas**.

- **Fiscal councils and medium-term budgeting frameworks**

To our knowledge the first empirical study which extends the analysis on fiscal rules by **including fiscal councils** and **medium-term budgeting frameworks**.

# Outline

- Stylized facts
- Data
- Empirical framework
- Results
- Conclusions and outlook

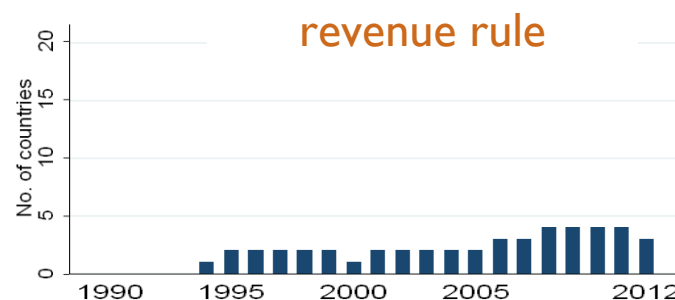
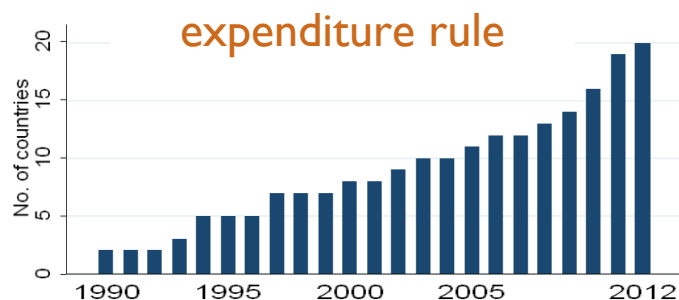
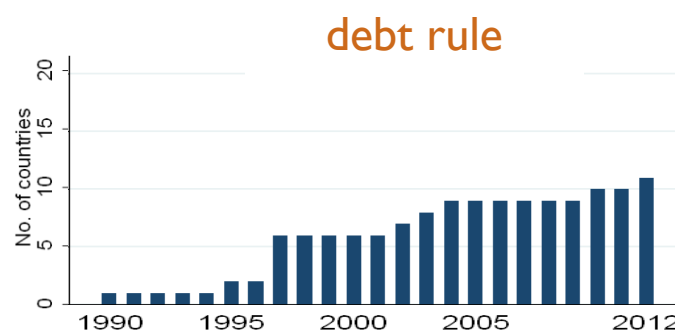
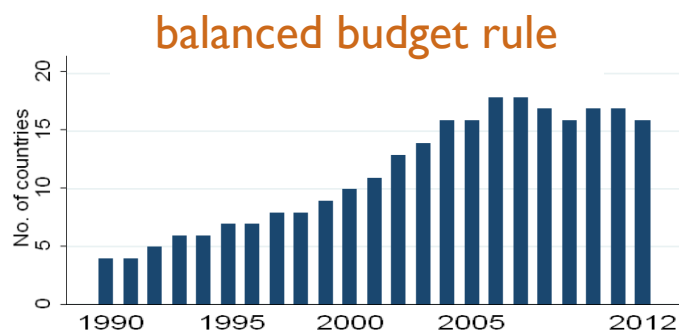
# Characteristics of numerical fiscal rules

We distinguish **numerical fiscal rules** according to the following characteristics:

<b>Type</b>	Balanced budget rule ( <i>BBR</i> ) Debt rule ( <i>DR</i> ) Expenditure rule ( <i>ER</i> ) Revenue rule ( <i>RR</i> )
<b>Status</b>	Statutory or constitutional ( <i>LC</i> ) Political or coalitional agreement ( <i>PC</i> )
<b>Coverage</b>	Central or general government ( <i>CGGG</i> ) Local or regional government ( <i>LRG</i> )
<b>Enforcement</b>	Sanctions or automatic correction mechanism ( <i>SCM</i> ) No sanctions or automatic correction mechanism ( <i>NSCM</i> )

# Fiscal rules in EU countries

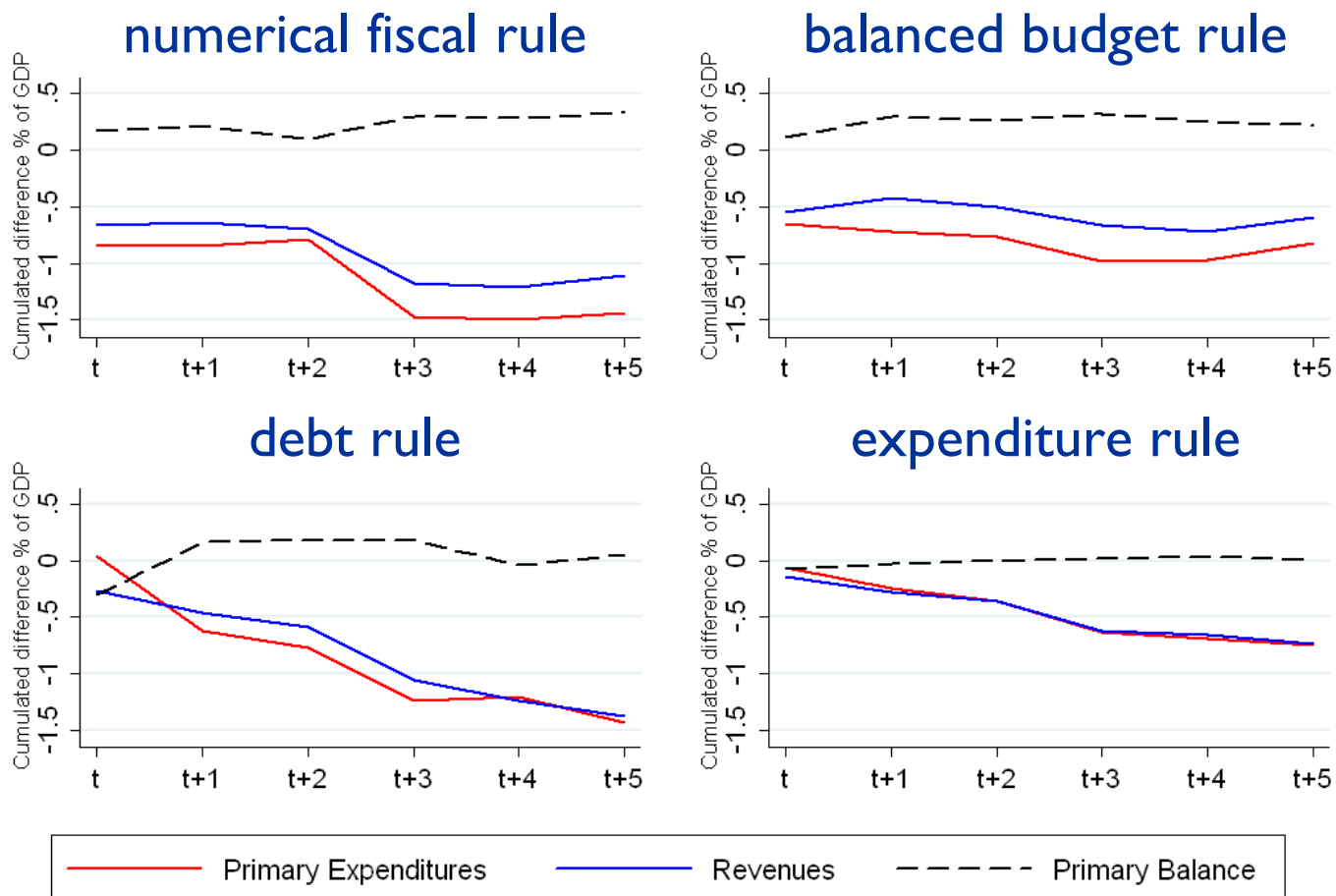
- Number of EU countries which have at least some kind of...



- In 1990s fiscal rules were mainly based on political commitments, while in 2012 most EU27 countries have fiscal rules in law or constitution.
- Expenditure rules mostly cover central/general government, while balance budget rules mostly cover the regional/local government (2012).

# Stylized impact of fiscal rules

Impact on fiscal variables after introducing some kind of ...



Note: Average cumulated difference to year mean of all countries; t is the year when rule is in place for first time, t+1 the following year, etc.; NFR are constitutional or statutory (CL); fiscal variables are cyclically adjusted; countries with rule already in place before 1991 or introduced after 2006 are ignored.

# Data: numerical fiscal rules

- Time-varying dataset for 27 EU countries; period 1990-2012
- Based on existing datasets:
  - *European Commission (2010, 2012)*
  - *OECD (2003, 2008)*
  - *IMF (2012)*
  - *ESCB-internal dataset on NFF (2011, 2012)*
- Differences in datasets mainly due to different approaches and time horizons.
- Dummy variable for each specification of a fiscal rule; the dummy variable is “one” for a country in the years it has a fiscal rule in place with the corresponding specification.



# Data: fiscal councils

- Dataset for 27 EU countries; 1990-2012
- Based on existing datasets:
  - *European Commission (2010, 2012)*
  - *Calmfors and Wren-Lewis (2011)*
  - *ESCB-internal dataset on NFF (2011, 2012)*
- We looked at key **features of fiscal councils**:
  - *in charge of preparing macroeconomic/budgetary forecasts;*
  - *issuing normative statements and/or assessing government programs;*
  - *government should be obliged to “comply or explain” with council’s recommendations;*
  - *no political interference;*
  - *independent resources and nomination of staff*
- EU countries: **number of fiscal councils** more than **doubled** since 2007 to currently 14. Features differ across countries.
- Dummy variable for each feature of a fiscal council; the dummy variable is “one” for the years a country has a fiscal council with the respective feature.

# Data: medium-term budgeting frameworks

- No time-varying database available
- Necessary **key elements** for effective medium-term budgeting frameworks:
  - a. planning horizon of at least 3 years,*
  - b. provision of medium-term fiscal developments and multi-annual character of budgetary planning,*
  - c. impose a binding character, and*
  - d. medium-term fiscal plans should be published annually.*
- We constructed a time-varying **proxy variable** for medium-term budgeting frameworks.
- Assumptions:
  - annually published stability/convergence programmes (elements *a.* and *d.*).
  - accurate estimation of primary expenditures (elements *b.* and *c.*).
  - calculate annual **estimation error** of **primary expenditure-to-GDP** ratio (adjusted for GDP forecast errors).

# Empirical framework: the model

Basic **fiscal reaction function** (similar to Debrun et al., 2008; Hallerberg et al., 2009; De Haan et al., 2012):

$$\mathcal{F}_{i,t}^* = \beta_0 + \beta_1 \mathcal{F}_{i,t-1}^* + \beta_2 \mathcal{R}_{i,t,\omega}^\tau + x'_{i,t} \gamma + \eta_i + \epsilon_{i,t}$$

Fiscal policy variables  $\mathcal{F}_{i,t}^*$  are cyclically adjusted (EC potential GDP method) and expressed in % of GDP.

**Control variables**  $x_{i,t}$  consist of:

- i. economic (e.g. debt level, output gap, inflation, dependency ratio)
- ii. political (e.g. parliamentary election, ideology range), and
- iii. institutional (e.g. budgetary decision organisation) variables.

# Results: coefficients for aggregated variables

	primary balance	primary expenditures	revenues
fiscal rules (all)	0.62* (0.35)	-1.43*** (0.34)	-0.82** (0.34)
fiscal rules (in law or constitution)	0.65* (0.36)	-1.49*** (0.50)	-0.85** (0.40)

- On average, the **primary balance** is by **0.62 pp of GDP higher** (improvement) in countries introducing a fiscal rules (compared to countries without such a rule).
- This effect is even **stronger** if fiscal rules are **enshrined in law or constitution**.
- When comparing different types of rules:
  - **strongest effect with balanced budget rules** at constitution level,
  - **debt rules** show **partly** significant results,
  - **expenditure rules** show **no significant effect** on aggregated fiscal variables.

# Results: coefficients for disaggregated variables

	BBR	debt rule		BBR	debt rule
indirect taxes	-0.36** (0.18)	-0.27 (0.19)	social benefits	-0.42** (0.17)	-0.56*** (0.17)
direct taxes	-0.25 (0.17)	-0.38** (0.17)	intermediate consumption	-0.29*** (0.11)	-0.29*** (0.11)
social contributions	-0.36*** (0.13)	-0.25* (0.13)	subsidies	-0.07** (0.04)	-0.04 (0.04)
			compensation of employees	-0.39*** (0.13)	-0.30** (0.13)
			government investment	-0.20** (0.10)	-0.12 (0.11)

- Fiscal rules show a **significant dampening impact** on various expenditure and revenue items.
- On the expenditure side, in particular **social benefits**, **intermediate consumption** and **public wages** are strongly affected; on the revenue side the impact varies depending on the specific rule in place.

# Results: coefficients for expenditure areas

	defence	economic affairs	education	general public services	health	housing	public safety	social protection
<b>BBR</b>	<b>-0.19***</b> (0.04)	<b>0.19</b> (0.25)	<b>-0.14**</b> (0.06)	<b>-0.19*</b> (0.10)	<b>-0.12*</b> (0.07)	<b>-0.09**</b> (0.04)	<b>-0.06**</b> (0.03)	<b>-0.39***</b> (0.17)
<b>debt rule</b>	<b>-0.13***</b> (0.05)	<b>-0.39</b> (0.27)	<b>0.02</b> (0.07)	<b>-0.31**</b> (0.12)	<b>-0.10</b> (0.08)	<b>-0.04</b> (0.04)	<b>-0.05*</b> (0.03)	<b>-0.64***</b> (0.19)

- Fiscal rules show a dampening impact on defence, general public services and social protection.
- The dampening impact on expenditure areas is generally higher for budget balanced rules than for debt rules.

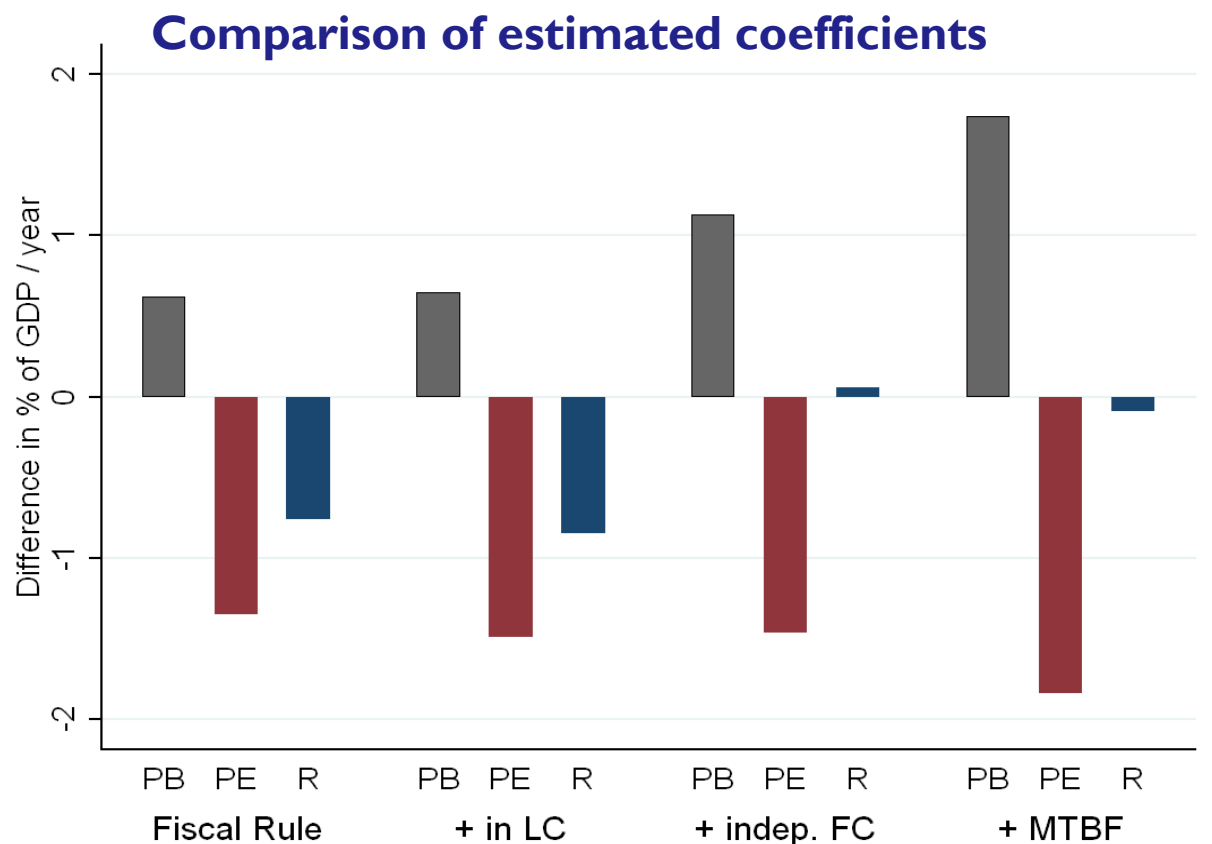
# Results: coefficients for different combinations

	primary balance	primary expenditures	revenues
fiscal rule (in law or constitution)	0.65** (0.36)	-1.49*** (0.50)	-0.85** (0.40)
+ independent fiscal council	1.13** (0.48)	-1.46** (0.66)	0.06 (0.54)
+ effective medium-term budgeting framework	1.74*** (0.46)	-1.84*** (0.61)	-0.09 (0.51)

The impact of fiscal rules can be **strengthened** when national fiscal framework are complemented by:

- independent **fiscal councils** (impact on primary balance almost doubles), and
- in addition, effective **medium-term budgeting frameworks** (impact is almost three times higher).

# Results: coefficients for different combinations *(cont.'d)*



- Differences in the coefficients for countries with/with-out a **fiscal council** relate mainly to **lower cuts in revenues**.
- This supports the view that fiscal councils **increase transparency** (as governments might be less able to compensate expenditure cuts with tax expenditures).



# Conclusions and outlook

- The paper shows that **fiscal rules** have a **disciplinary impact**, in particular when combined with fiscal councils and effective medium-term budgeting frameworks.
- Thus, recent **fiscal governance reforms** are a **step in the right direction** to foster fiscal discipline.
  
- Outlook for further research:
  - Effects on cyclical components of fiscal policy,
  - Look at additional elements of fiscal frameworks (e.g. independent forecasts, budget coordination between government levels),
  - Investigate effects on economic variables (e.g. GDP growth, inflation, interest rates on government bonds).

Thank you for your attention!

# Appendix

## A. Historic Evolution of NFRs

# No. of Countries Having NFRs in Place

	1990	1993	1996	2000	2002	2004	2006	2008	2010	2012
$\mathcal{R}$	6	8	10	16	18	21	22	22	23	24
$\mathcal{R}^{BBR}$	4	6	7	10	13	16	18	17	17	16
$\mathcal{R}^{DR}$	1	1	2	6	7	9	9	9	10	11
$\mathcal{R}^{ER}$	2	3	5	8	9	10	12	13	16	20
$\mathcal{R}^{RR}$	0	0	2	1	2	2	3	4	4	3
$\mathcal{R}_{LC}$	5	5	6	13	15	18	19	19	20	21
$\mathcal{R}_{LC}^{BBR}$	4	4	5	8	11	13	13	13	13	13
$\mathcal{R}_{LC}^{DR}$	1	1	1	5	6	7	7	8	9	10
$\mathcal{R}_{LC}^{ER}$	0	0	0	2	3	3	5	6	10	15
$\mathcal{R}_{LC}^{RR}$	0	0	0	0	0	0	1	2	2	2
$\mathcal{R}_{CGGG}$	2	5	7	14	17	20	20	19	20	22
$\mathcal{R}_{CGGG}^{BBR}$	1	3	3	7	8	10	12	11	11	10
$\mathcal{R}_{CGGG}^{DR}$	0	0	1	5	5	7	6	5	6	8
$\mathcal{R}_{CGGG}^{ER}$	2	3	5	7	9	10	12	12	15	19
$\mathcal{R}_{CGGG}^{RR}$	0	0	2	1	2	2	3	4	4	3

# Construction of MTBF proxy variable

- From "stability and convergence prog." (SCP) in year  $f$ :
  - Expected primary expenditures  $\hat{\mathcal{F}}_{i,f,t}^{PE}$  as share of
  - Expected nominal GDP  $\hat{Y}_{i,f,t}$  for the following three years  $t$ .
- Difference between the expected and actual primary expenditures as share of actual GDP:

$$d\hat{\mathcal{F}}_{i,f,t}^{PE} = \frac{\hat{\mathcal{F}}_{i,f,t}^{PE} \cdot \hat{Y}_{i,f,t} - \mathcal{F}_{i,t}^{PE} \cdot Y_{i,t}}{Y_{i,t}}$$

- Adjust for error in forecasts of nominal GDP (using OLS):

$$d\hat{\mathcal{F}}_{i,f,t}^{PE} = \beta \left( \hat{Y}_{i,f,t} - Y_{i,t} \right) + \epsilon_{i,f}$$

- Five-year average of the residual:

$$MTF_{i,f} = 0.2\epsilon_{i,t-2} + 0.2\epsilon_{i,t-1} + 0.2\epsilon_{i,t} + 0.2\epsilon_{i,t+1} + 0.2\epsilon_{i,t+2}$$

- Proxy for MTBF is 1 if  $|MTF_{i,f}| \leq 1$ , otherwise 0

# Cyclical Adjustment of Fiscal Policy Vars.

- Based on production function method used by the EC (see e.g. Denis et al., 2002, or EU Commission, 2012)
- EC also publishes potential output ( $Y^{Pot}$ )
- To get cyclically adjusted fiscal policy variable  $\mathcal{F}_{CA}^*$  calculate:

$$\mathcal{F}_{CA}^* = \mathcal{F}^* \left( \frac{Y^{Pot}}{Y} \right)^{\epsilon_{\mathcal{F}^*}}$$

$\mathcal{F}^*$  not-c.a. fiscal policy variable,  $Y$  actual output,  $\epsilon_{\mathcal{F}^*}$  elasticity of fiscal policy variable with respect to output gap

- Elasticity estimated for every country separately using OLS:

$$\log(\mathcal{F}^*) = \alpha + \epsilon_{\mathcal{F}^*} \log \left( \frac{Y}{Y^{Pot}} \right) + u$$

- Own cyclically adjusted PB, PE and R aggregates and counterparts published by EC have correlation of 0.999

# Sources of Control Variables

Variable	Source
Debt level (-I)	AMECO by EC (vintage spring 2012)
Output Gap (-I)	AMECO by EC (vintage spring 2012)
Inflation rate	AMECO by EC (vintage spring 2012)
Dependency Ratio	Population structure and ageing by EC
Population	Population structure and ageing by EC
Openness	(Imports + Exports) / GDP; AMECO
Ideology , Ideology Range	World Bank Political Database
Government Size	Economic Freedom Network
Government Fragmentation	World Bank Political Database
Majority Fragmentation	World Bank Political Database
Parliamentary Election	World Bank Political Database
District Magnitude	World Bank Political Database
Delegation , Contract	Hallerberg et al. (2009)
Institutional Quality	Economic Freedom Network
RunUp to EMU	% of GDP government deficit above 3% target in 5 years before joining Euro; AMECO

# Empirical framework: avoiding biased estimates

We addressed three potential sources for biased estimates as follows:

- **Reverse causality (fiscal variable => fiscal rule)**  
Bias likely to be negligible as the implementation time lag of fiscal rules is long, we use annual data and we only include rules that are already in force (no difference with IV estimation in Debrun et al. (2008)).
- **Omitted variable**  
To control for national preferences in fiscal institutions/policies, we included several control variables as well as country-fixed effects (Krogstrup and Wälti (2008): time-invariant unless electorate changes).
- **Small cross-section in dynamic panel**  
We use Kiviet (1995)'s bias corrected LSDV estimator for unbalanced dynamic panels, as in Bruno (2005).



## D. Robustness checks

- We used **different subsamples** (e.g. 1990-2008, EU15)
  - Results are broadly confirmed; yet, significance and size of coefficient partly even higher in sub-samples.
- We compared additive with **interacted characteristics**
  - Sum of coefficients and joint significance stay the same.
- We tested different **estimation methods** (fixed effects, pooled OLS, Arellano-Bover/Bundell-Bond)
  - Autocorrelation changes, but long-term effects stay the same.
- We looked at **variables in differences**
  - Qualitatively leads to same results.

## Sub-Sample Robustness

	1990-2007			EUI5		
	$\mathcal{F}^{PB}$	$\mathcal{F}^{PE}$	$\mathcal{F}^R$	$\mathcal{F}^{PB}$	$\mathcal{F}^{PE}$	$\mathcal{F}^R$
$\mathcal{R}$	0.61** (0.28)	-1.48*** (0.39)	-0.95*** (0.32)	0.84** (0.35)	-1.70*** (0.41)	-0.95*** (0.32)
$\mathcal{R}_{LC}$	0.63** (0.26)	-1.53*** (0.37)	-0.95*** (0.30)	0.77* (0.41)	-1.86*** (0.47)	-1.12*** (0.36)
$\mathcal{R}_{LC}^{BBR}$	0.43 (0.28)	-1.08*** (0.40)	-0.83** (0.33)	0.70* (0.41)	-1.87*** (0.47)	-1.22*** (0.36)
$\mathcal{R}_{LC}^{DR}$	0.64 (0.44)	-1.81*** (0.67)	-1.11** (0.54)	0.81 (0.70)	-1.85** (0.86)	-1.26* (0.66)
$\mathcal{R}_{LC}^{ER}$	-0.32 (0.33)	-0.81* (0.46)	-1.35*** (0.36)	0.03 (0.46)	-0.91 (0.56)	-0.96** (0.42)

# Additive vs. Multiplicative Dummies

	$\mathcal{F}^{PB}$	$\mathcal{F}^{PB}$	$\mathcal{F}^{PE}$	$\mathcal{F}^{PE}$	$\mathcal{F}^R$	$\mathcal{F}^R$
$\mathcal{R}$	0.29 (0.56)		-0.20 (0.77)		-0.13 (0.62)	
$\mathcal{R}_{LC}$	0.38 (0.58)	0.65* (0.36)	-1.31 (0.80)	-1.49*** (0.50)	-0.73 (0.64)	-0.85** (0.40)
	$\mathcal{F}^{PB}$	$\mathcal{F}^{PB}$	$\mathcal{F}^{PE}$	$\mathcal{F}^{PE}$	$\mathcal{F}^R$	$\mathcal{F}^R$
$\mathcal{R}$	0.40 (0.59)		-0.29 (0.80)		-0.26 (0.64)	
$\mathcal{R}^{BBR}$	-0.39 (0.59)		0.08 (0.76)		0.35 (0.61)	
$\mathcal{R}_{LC}$	0.15 (0.71)		-0.95 (0.96)		-0.35 (0.77)	
$\mathcal{R}_{LC}^{BBR}$	0.62 (0.62)	0.68* (0.35)	-0.53 (0.78)	-1.46*** (0.50)	-0.81 (0.63)	-0.96** (0.39)

# Estimation Methods

	Fixed Effects	Pooled OLS	LSDVC	Arellano-Bond	Blundell-Bond
Lagged Dependent Variable	0.54*** (0.06)	0.65*** (0.04)	0.63*** (0.04)	0.39*** (0.08)	0.43*** (0.06)
$\mathcal{R}$	0.67** (0.27)	0.50*** (0.14)	0.62* (0.35)	1.26*** (0.49)	1.50*** (0.54)

# Fiscal Policy Variables in Differences

	$\Delta \mathcal{F}^{PB}$	$\Delta \mathcal{F}^{PE}$	$\Delta \mathcal{F}^R$
$\mathcal{R}$	<b>0.78**</b> (0.33)	<b>-1.01**</b> (0.44)	<b>-0.25</b> (0.36)
$\mathcal{R}_{LC}$	<b>0.78**</b> (0.34)	<b>-1.36***</b> (0.45)	<b>-0.56</b> (0.37)
$\mathcal{R}^{BBR}$	<b>0.68*</b> (0.36)	<b>-1.15**</b> (0.47)	<b>-0.40</b> (0.39)
$\mathcal{R}^{DR}$	<b>0.37</b> (0.38)	<b>-0.42</b> (0.51)	<b>-0.05</b> (0.42)
$\mathcal{R}^{ER}$	<b>0.14</b> (0.30)	<b>0.16</b> (0.41)	<b>0.34</b> (0.33)