

Numerical Expenditure Rules: Design and Effects

Wolf Heinrich Reuter¹

¹Vienna University of Economics and Business, Department of Economics

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"Expenditure-based consolidation: experiences and outcomes"

DG ECFIN, European Commission, Brussels

Motivation

Countries are introducing more and more expenditure rules (ER)

- ER used to control government spending and consolidate public budgets (especially in EU)
- ER especially used to cover general or central government

Mixed evidence in literature about effectiveness and implications

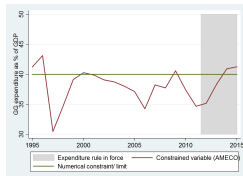
- Empirical studies: no significant effect of ER on public finances, as opposed to balanced budget or debt rules
e.g. Debrun et al. (2008) or Nerlich & Reuter (2013)
- Theoretical literature: ER more targeted, better suited to tackle the deficit bias and not as pro-cyclical as other rules
e.g. Wierts (2008), Holm-Hadulla et al. (2010), Ayuso-i-Casals (2012)

Examples of numerical expenditure rules

Bulgaria, Since 2012

"The maximum amount of the expenditures in the consolidated fiscal programme may not exceed 40% of forecast GDP."

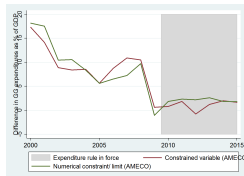
Law on the State Budget/chapter 1, art. 12A. (new, SG No. 54 of 2011 enforced on 01.01.2012.)



Romania, Since 2010

"... the annual total expenditure growth rate [...] should be maintained below the annual growth rate of nominal GDP [...] until the preliminary general consolidated budget balance has registered an increase..."

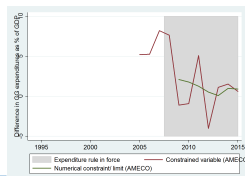
The Law of financial and budget responsibility, Law No. 69 from 2010



Lithuania, Since 2008

"... where the average of the budget balance[...] for the past five [...] years [...] is a deficit [...], the annual growth rate in % of [expenditures] [...] for the corresponding year [...] may not exceed one half of the average annual growth rate in % of [...] revenues [...] for the past five [...] years."

Article 3, Law on Fiscal Discipline, Nov. 2007



Contribution

So far no studies on compliance with national fiscal rules

- So far only studies on effect of existence of (different types of) national fiscal rules
 - Frankel and Schreger (2013) - analyse (forecast) compliance with supranational rules of Stability and Growth Pact
- Studies usually find positive effect of other fiscal rules on public finances (primary balance, debt levels, etc.) using dummy var's or composite indices

Key Contributions

- Analysing the reaction of policy makers to (non-)compliance with expenditure rules
- Taking into account the current economic situation of country
- Using difference between constrained variable and numerical limit set by national expenditure rules

Data

Definitions of Expenditure Rules

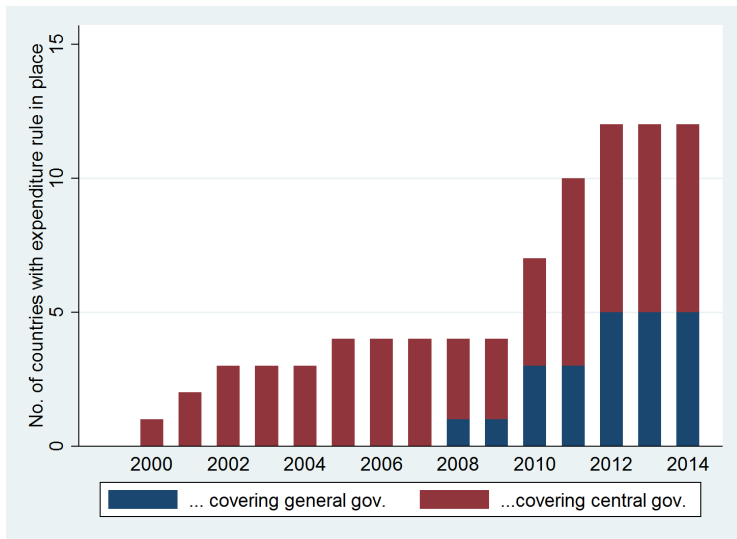
- Collected legal documents (with help of native speakers, translators and lawyers)
- 8 national numerical expenditure rules
 - Were or are in force in one of the EU28
 - Enlisted in European Commission (2010) and/ or IMF (2012)
 - Covering general/central gov. & enshrined in national legislation

▶ Full list of included rules

Statistical data

- Actual values and past forecasts from EC - AMECO
 - Constrained variable (\mathcal{F})
 - Numerical constraint / limit imposed (on constrained variable) by fiscal rule (\mathcal{F}^R)
- All in % of GDP and homogenous meaning w.r.t. fiscal rule

EU28 countries with expenditure rule



Compliance with numerical expenditure rules I

overall compliance in actual values ($\mathcal{N}_{i,t,0} = 0$):	61%					
	$t - 1$	$t - 2$	$t - 3$			
compl. in t , changed from non-compl. in...	19%	21%	32%			
non-compl. in t , changed from compl. in...	31%	33%	18%			
overall compliance in forecasts ($\mathcal{N}_{i,t,\tau} = 0$):	62%					
	$\tau =$	-1	-2	-3	-4	-5
compl. in $\tau = 0$, changed from non-compl. in...	18%	10%	29%	33%	33%	
non-compl. in $\tau = 0$, changed from compl. in...	18%	19%	14%	25%	21%	

Notes: Percentage of years (upper panel) or forecasts (lower panel) in which countries complied (or did not comply) with their expenditure rules while they were in force between 2000-2014.

Compliance with numerical expenditure rules II

Compliance in...	Actual ($\tau = 0$)	Forecast $t - 2$ ($\tau = -5$)
General	61%	48%
General Gov.	58%	46%
Central Gov.	67%	50%
Coverage of GG: < 50%	63%	80%
Coverage of GG: > 50%	58%	18%
Sanctions or automatic corr. mechanisms.	67%	94%
None	58%	35%
<i>Combination with other fiscal rules covering general or central government</i>		
Any fiscal rule	60%	50%
Balanced Budget Rule	63%	71%
Debt Rule	59%	42%
No fiscal rule	57%	25%

Notes: Percentage of years (column 2) or forecasts (column 3) in which countries complied with their expenditure rules while they were in force between 2000-2014, split by characteristics shown in column 1. GG= General government expenditures, BBR = Balanced Budget Rules, DR = Debt Rules.

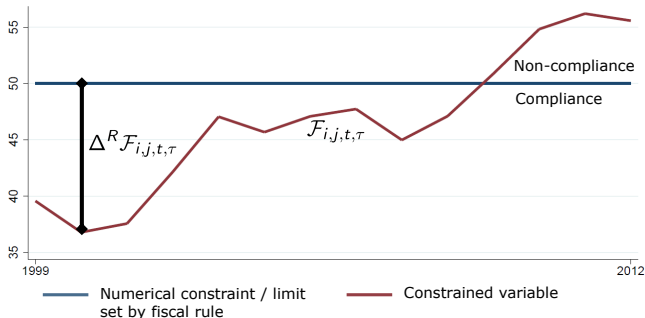
Variable definitions

$\mathcal{R}_{i,t} \dots$ Dummy if expenditure rule of country i is in force in year t

$\Delta^\tau \dots$ Difference between consecutive forecasts in same year

$\Delta^t \dots$ Difference between actual values of consecutive years

$\mathcal{N}_{i,t,\tau} \dots$ Dummy if fiscal rule i is not complied with



Empirical framework

$$\Delta^t(\Delta^R \mathcal{F}_{i,t,0}) = \beta_0 + \beta_1 \mathcal{R} \times \mathcal{N}_{i,t-1} + \beta_2 \mathcal{R}_{i,t} + \beta_3 \mathcal{N}_{i,t-1} + \mu_i + \nu_t + \epsilon_{i,t,0}$$

- Rule (μ_j) and time (ν_t) fixed effects
- Robustness checks:
 - Including control variables,
 - ① economic variables (lagged debt levels, lagged output gap, dependency ratio, population and openness),
 - ② political variables (ideology of government, ideological distance of parties in government, fragmentation of parliament and district magnitude), and
 - ③ institutional variables (delegation or contract approach to governance, and stability and growth pact
 - Different fixed effects,
 - Different sample periods.

▶ Results for robustness checks

Empirical framework

$$\Delta^t(\Delta^R \mathcal{F}_{i,t,0}) = \beta_0 + \beta_1 \mathcal{R}_{i,t} \times \Delta^R \mathcal{F}_{i,t-1,0} + \beta_2 \mathcal{R}_{i,t} \\ + \beta_3 \Delta^R \mathcal{F}_{i,t-1,0} + \mu_i + \nu_t + \epsilon_{i,t,0}$$

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▶ Results for robustness checks

Empirical framework

$$\Delta^t(\Delta^{\mathcal{R}} \mathcal{F}_{i,t,0}) = \beta_0 + \beta_1 \mathcal{R}_{i,t} \times \Delta^{\mathcal{R}^+} \mathcal{F}_{i,t-1,0} + \beta_2 \mathcal{R}_{i,t} \times \Delta^{\mathcal{R}^-} \mathcal{F}_{i,t-1,0} + \beta_3 \mathcal{R}_{i,t} + \beta_4 \Delta^{\mathcal{R}^+} \mathcal{F}_{i,t-1,0} + \beta_5 \Delta^{\mathcal{R}^-} \mathcal{F}_{i,t-1,0} + x'_{i,t} + \mu_i + \nu_t + \epsilon_{i,t,0}$$

- Rule (μ_j) and time (ν_t) fixed effects
- Robustness checks:
 - Including control variables,
 - ① economic variables (lagged debt levels, lagged output gap, dependency ratio, population and openness),
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 - ③ institutional variables (delegation or contract approach to governance, and stability and growth pact)
 - Different fixed effects,
 - Different sample periods.

▶ Results for robustness checks

Empirical framework

$$\Delta^\tau(\Delta^R \mathcal{F}_{i,t,\tau}) = \beta_0 + \beta_1 \mathcal{R}_{i,t} \times \Delta^{\mathcal{R}^+} \mathcal{F}_{i,t,\tau-1} + \beta_2 \mathcal{R}_{i,t} \times \Delta^{\mathcal{R}^-} \mathcal{F}_{i,t,\tau-1} + \beta_3 \mathcal{R}_{i,t} + \beta_4 \Delta^{\mathcal{R}^+} \mathcal{F}_{i,t,\tau-1} + \beta_5 \Delta^{\mathcal{R}^-} \mathcal{F}_{i,t,\tau-1} + x'_{i,t} + \mu_i + \nu_t + \epsilon_{i,t,\tau}$$

- Rule (μ_j) and time (ν_t) fixed effects
- Robustness checks:
 - Including control variables,
 - ① economic variables (lagged debt levels, lagged output gap, dependency ratio, population and openness),
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 - Different fixed effects,
 - Different sample periods.

▶ Results for robustness checks

Annual change of diff. to limit, Dep. Var: $\Delta^t(\Delta^R \mathcal{F}_{i,t,0})$

	(1)	(2)		(3)	(4)
\mathcal{R}_t	0.63 (0.99)	-0.14 (0.55)	\mathcal{R}_t	0.54 (1.11)	1.03 (1.46)
\mathcal{N}_{t-1}	-2.64*** (0.81)		$\Delta^{R+} \mathcal{F}_{t-1,0}$	-1.08*** (0.07)	-1.20*** (0.24)
$\mathcal{R} \times \mathcal{N}_{t-1}$	-5.37*** (1.65)		$\Delta^{R-} \mathcal{F}_{t-1,0}$	-0.36* (0.21)	-0.61** (0.26)
$\Delta^R \mathcal{F}_{t-1,0}$		-0.83*** (0.13)	$\mathcal{R}_t \times \Delta^{R+} \mathcal{F}_{t-1,0}$	-1.09** (0.51)	-1.03** (0.52)
$\mathcal{R}_t \times \Delta^R \mathcal{F}_{t-1,0}$		-0.50*** (0.18)	$\mathcal{R}_t \times \Delta^{R-} \mathcal{F}_{t-1,0}$	-0.30 (0.37)	-0.16 (0.34)
Controls	No	No	Controls	No	Yes
N	105	91	N	91	85
R ² (within)	0.40	0.66	R ² (within)	0.70	0.79

Notes: Estimation results for Equations 1 to 4; time and country fixed effects are included in all regressions but not reported; dependent variable is the change of the difference of the constrained variable to its numerical constraint from year to year $\Delta^t(\Delta^R \mathcal{F}_{i,t,0})$, explanatory variables are the difference between constrained variable and numerical limit ($\Delta^R \mathcal{F}_{t-1,0}$) for the previous year, also split into positive ($\Delta^{R+} \mathcal{F}_{t-1,0}$) and negative ($\Delta^{R-} \mathcal{F}_{t-1,0}$) values, a dummy variable being one if this difference is positive (\mathcal{N}_{t-1}), i.e. the rule is not complied with, and a dummy variable being one if the fiscal rule is in force in the respective years \mathcal{R}_t . Heteroscedasticity robust standard errors are in parentheses. * indicate significance at 10% level, ** at 5% level and *** at 1% level.

Forecast change of diff. to limit, Dep. Var: $\Delta^\tau(\Delta^R \mathcal{F}_{i,t,\tau})$

	(1)	(2)		(3)	(4)
\mathcal{R}_t	-1.04* (0.63)	-1.70*** (0.74)	\mathcal{R}_t	-2.20*** (0.76)	-1.72** (0.72)
$\mathcal{N}_{t,\tau-1}$	-2.94*** (1.11)		$\Delta^{R+} \mathcal{F}_{t,\tau-1}$	-0.66** (0.28)	-0.91*** (0.34)
$\mathcal{R} \times \mathcal{N}_{t,\tau-1}$	-2.82*** (1.00)		$\Delta^{R-} \mathcal{F}_{t,\tau-1}$	-0.94*** (0.09)	-1.03*** (0.11)
$\Delta^R \mathcal{F}_{t,\tau-1}$		-0.94*** (0.11)	$\mathcal{R}_t \times \Delta^{R+} \mathcal{F}_{t,\tau-1}$	-0.59*** (0.22)	-0.62** (0.27)
$\mathcal{R}_t \times \Delta^R \mathcal{F}_{t,\tau-1}$		-0.16* (0.10)	$\mathcal{R}_t \times \Delta^{R-} \mathcal{F}_{t,\tau-1}$	-0.03 (0.09)	0.07 (0.12)
Controls	No	No	Controls	No	Yes
N	333	333	N	333	317
R ² (within)	0.08	0.54	R ² (within)	0.54	0.55

Notes: Estimation results for Equations 1 to 4 with forecast differences instead of annual differences; time and country fixed effects are included in all regressions but not reported; dependent variable is the change of the difference of the constrained variable to its numerical constraint from forecast to forecast $\Delta^t(\Delta^R \mathcal{F}_{i,t,\tau})$, explanatory variables are the difference between constrained variable and numerical limit ($\Delta^R \mathcal{F}_{t,\tau-1}$) for the previous forecast, also split into positive ($\Delta^{R+} \mathcal{F}_{t,\tau-1}$) and negative ($\Delta^{R-} \mathcal{F}_{t,\tau-1}$) values, a dummy variable being one if this difference is positive ($\mathcal{N}_{t,\tau-1}$), i.e. the rule is not complied with, and a dummy variable being one if the fiscal rule is in force in the respective years \mathcal{R}_t . Heteroscedasticity robust standard errors are in parentheses. * indicate significance at 10% level, ** at 5% level and *** at 1% level.

Conclusions

Countries comply with their expenditure rules in 60% of the years...

- Tendency to change non-compliance into compliance over medium-term, non-compliance after compliance only in short-term
- Compliance higher for rules covering CG, only smaller fractions of GG finances, and enforced with sanctions or automatic corr. mech.

... but introducing rules enforces adjustment towards the limit.

- ① General tendency of constrained variables towards numerical limit from above and from below
 - With actual values stronger from above, with forecasts from below
- ② After introducing rule into legislation the adjustment in years of non-compliance is twice as strong as without
- ③ Only in forecasts also a level effect of improved fiscal institutions

Appendix

Numerical expenditure rules included in this paper

Cty ¹	Time	EC ²	IMF ³	Simplified Rule
BG	12-	x	x	$E_t^Y(GG) \leq 40\%$
ES	11-	x	x	$\delta(PE_t(CG) - UnempB_t(CG)) \leq \varnothing_\theta \delta Y_t$
FR	11-	x	x	$Max(\delta RE_t(CG), \delta PE_t(CG)) \leq 0$
HR	12-	x	x	$\Delta E_t^Y(GG) \leq -1\%$
HU	09	-	-	$PE_t \leq PE_{t-1}$
HU	10-11	- ⁴	x	$\delta RPE_t(GG) < 0.5\delta RY_t$
LT	08-	x	x	if $\varnothing_5 BB_t(GG) < 0$: $\delta E_t(GG) \leq 0.5\varnothing_5 \delta R_t(GG)$
PL	11-	x	x	$\delta RPE_t(CG) \leq 1\%$
RO	10-	-	x	if $BB_t(GG) < 0$: $\delta E_t(GG) < \delta Y_t$

Notes: ¹ Country name; ² "x" if rule is included in [?], deviations from [?] in notes; ³ "x" if rule is included in [?], deviations from [?] in notes; ⁴ in [?] included as Debt Rule; δ growth rate from $t-1$ to t , \varnothing_θ θ -year average, with ^Y always ratio of GDP, E total expenditures, PE Primary expenditures, RE real expenditures, RPE real primary expenditures, $UnempB$ expenditures for unemployment benefits, Y gross domestic product, RY Real gross domestic product; CG central government, GG general government.

Choice of expenditure rules

Statutory expenditure rules covering central or general government:

- fiscal rules enshrined in statutory law cannot easily be changed every year and are said to be more credible than mere political commitments or coalitional agreements,
- statutory rules are set out in legal documents which are publicly available,
- economic data on the general and central government are more reliable and more significant for the consolidation of public finances than those for the regional or local governments, and
- the compliance of local or regional governments with their expenditure rules would not be possible to determine on an aggregate level

Data & Control Variables

Variable	Source
<i>Economic variables</i>	
(lagged) Debt level	AMECO, European Commission
(lagged) Output gap	AMECO, European Commission
Dependency ratio	Population structure and ageing, EC
Population	Population structure and ageing, EC
Openness	(Imports + Exports) / GDP, AMECO, European Commission
<i>Political variables</i>	
Ideology of government	World Bank Political Database
Ideol. dist. of parties in government	World Bank Political Database
Fragmentation of parliament	World Bank Political Database
District magnitude	World Bank Political Database
<i>Institutional variables</i>	
Contract or delegation approach	Hallerberg et al. (2009), Ylaoutlinen (2004)
Stability and growth pact	authors input

EC data instead of national data

Statutory expenditure rules covering central or general government:

- Countries might still (not) comply with their expenditure rule in national data, but (do) not in the EU data, which would result in biased estimates of the reaction of governments to (non-) compliance. But if one assumes that national and EU data are fairly close and governments are not able to exactly steer the economic variables towards (non-) compliance with their rules, then this should only be a minor concern.
- The forecasts of the European Commission (opposed to the own forecasts of the governments, as e.g. used in Frankel and Schreger (2013) might be more resilient to the political influence of governments and national interest groups.

Robustness regarding the use of fixed effects

	(1)	(2)	(3)	(4)
\mathcal{R}_t	0.541 (1.113)	0.098 (0.863)	0.537 (1.346)	0.239 (1.012)
$\Delta^{R^+} \mathcal{F}_{t-1,0}$	-1.079*** (0.070)	-1.199*** (0.133)	-0.983*** (0.114)	-1.096*** (0.137)
$\Delta^{R^-} \mathcal{F}_{t-1,0}$	-0.360* (0.206)	-0.407*** (0.121)	-0.019 (0.106)	-0.083 (0.088)
$\mathcal{R}_t \times \Delta^{R^+} \mathcal{F}_{t-1,0}$	-1.085** (0.512)	-1.017*** (0.344)	-1.092** (0.502)	-1.043*** (0.355)
$\mathcal{R}_t \times \Delta^{R^-} \mathcal{F}_{t-1,0}$	-0.298 (0.369)	-0.232 (0.302)	-0.480 (0.374)	-0.389 (0.333)
Country fixed effects	Yes	Yes	No	No
Time fixed effects	Yes	No	Yes	No
N	91	91	91	91
R^2 (within)	0.699	0.631	0.688	0.622

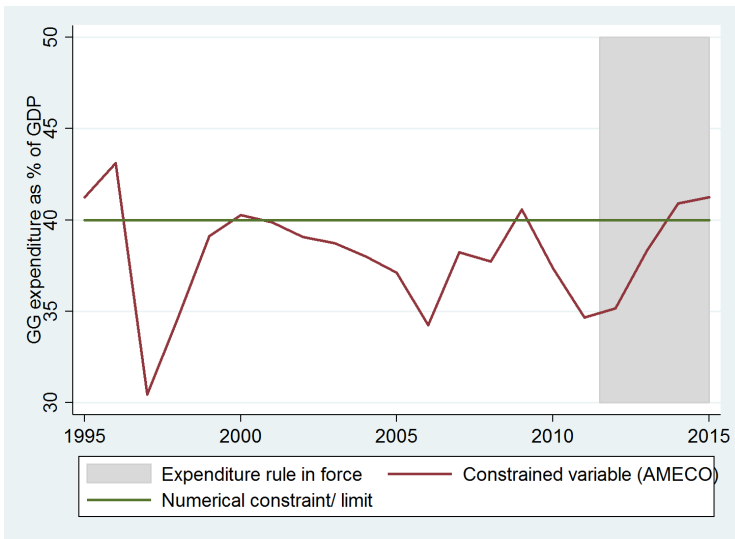
Notes: Estimation results for Equation 3; fixed effects are included in according to middle panel; dependent variable is the change of the difference of the constrained variable to its numerical limit from year to year $\Delta^t(\Delta^R \mathcal{F}_{i,t,0})$, explanatory variables are the difference between constrained variable and numerical limit ($\Delta^R \mathcal{F}_{t-1,0}$) for the previous year, also split into positive ($\Delta^{R^+} \mathcal{F}_{t-1,0}$) and negative ($\Delta^{R^-} \mathcal{F}_{t-1,0}$) values, and a dummy variable being one if the fiscal rule is in force in the respective years \mathcal{R}_t . Heteroscedasticity robust standard errors are in parentheses. * indicate significance at 10% level, ** at 5% level and *** at 1% level.

Robustness regarding the time period

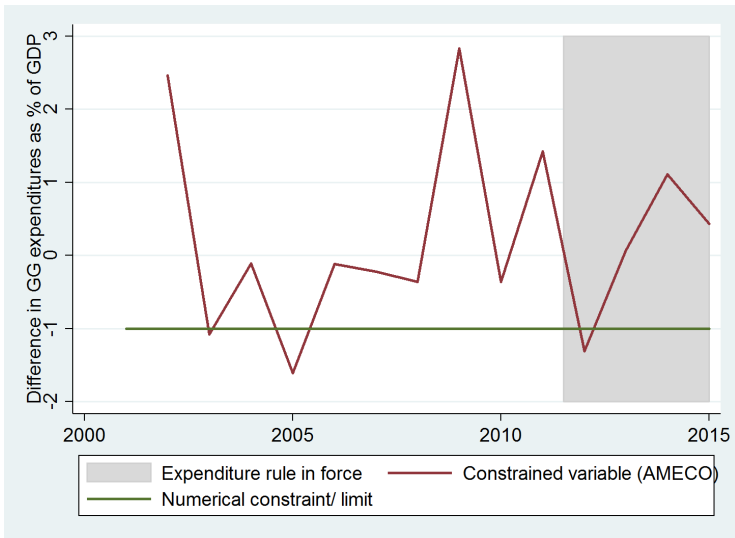
	(1) 2000-2014	(2) 2000-2009	(3) 2008-2014	(4) 2005-2011
\mathcal{R}_t	-2.201*** (0.763)	-4.175*** (1.544)	-0.954** (0.417)	-1.950*** (0.761)
$\Delta^{R+} \mathcal{F}_{t,\tau-1}$	-0.664** (0.278)	-1.078*** (0.397)	-0.286*** (0.077)	-0.716** (0.297)
$\Delta^{R-} \mathcal{F}_{t,\tau-1}$	-0.939*** (0.091)	-0.988*** (0.086)	-0.724*** (0.123)	-0.867*** (0.143)
$\mathcal{R}_t \times \Delta^{R+} \mathcal{F}_{t,\tau-1}$	-0.585*** (0.219)	-1.489*** (0.519)	-0.420** (0.193)	-0.571** (0.286)
$\mathcal{R}_t \times \Delta^{R-} \mathcal{F}_{t,\tau-1}$	-0.030 (0.094)	0.500 (0.307)	-0.044 (0.126)	-0.013 (0.123)
N	333	221	179	217
R ² (within)	0.540	0.583	0.365	0.515

Notes: Estimation results for Equations 4; Sample period used for calculations indicated in header; time and country fixed effects are included in all regressions but not reported; dependent variable is the change of the difference of the constrained variable to its numerical constraint from forecast to forecast $\Delta^t(\Delta^R \mathcal{F}_{i,t,\tau})$, explanatory variables are the difference between constrained variable and numerical limit ($\Delta^R \mathcal{F}_{t,\tau-1}$) for the previous forecast, also split into positive ($\Delta^{R+} \mathcal{F}_{t,\tau-1}$) and negative ($\Delta^{R-} \mathcal{F}_{t,\tau-1}$) values, a dummy variable being one if the fiscal rule is in force in the respective years \mathcal{R}_t . Heteroscedasticity robust standard errors are in parentheses. * indicate significance at 10% level, ** at 5% level and *** at 1% level.

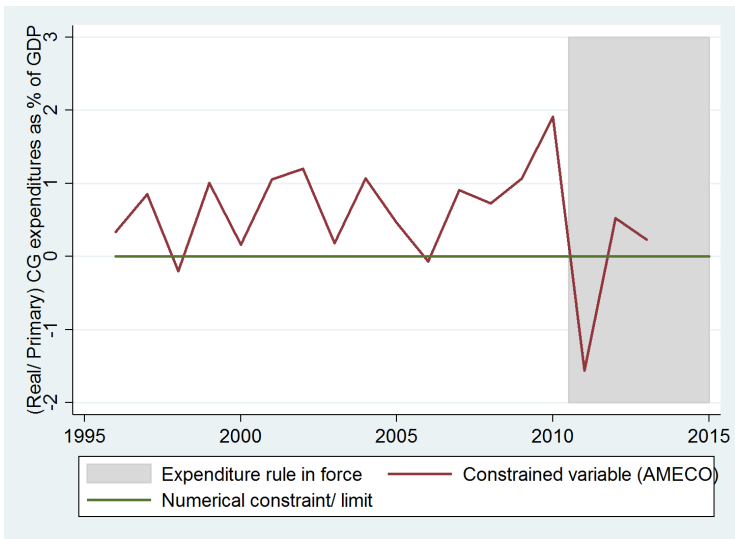
Bulgaria - General Government, Since 2012



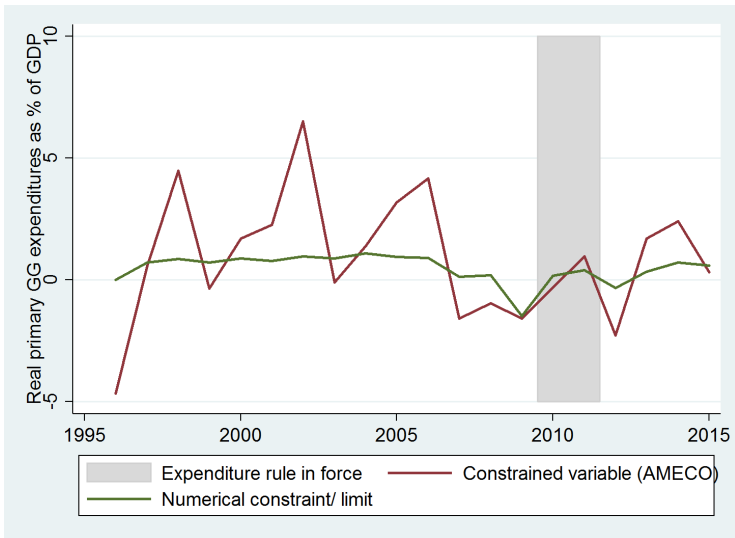
Croatia - General Government, Since 2012



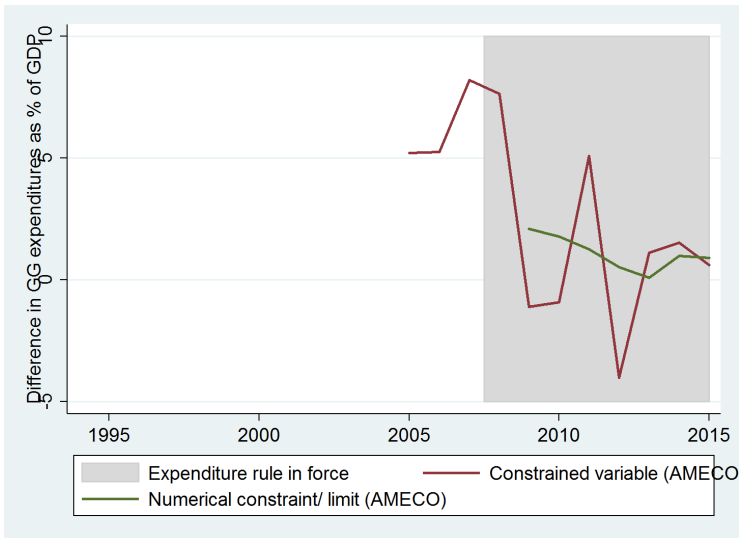
France - Central Government, Since 2011



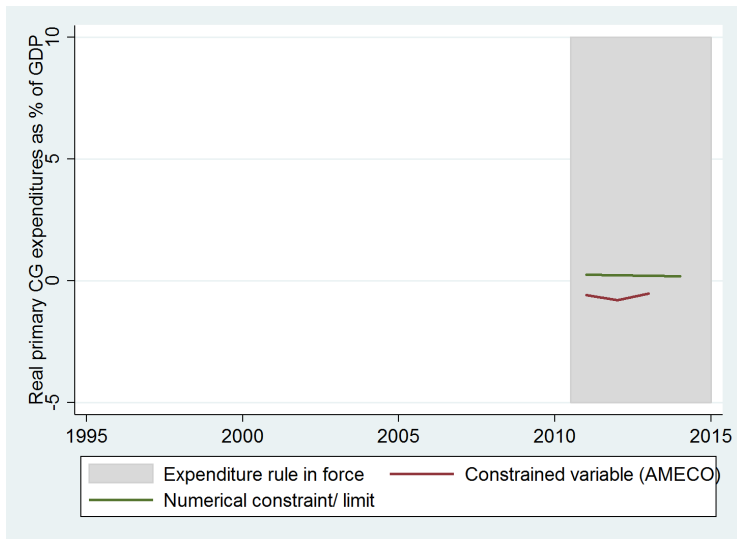
Hungary - General Government, 2010 - 2011



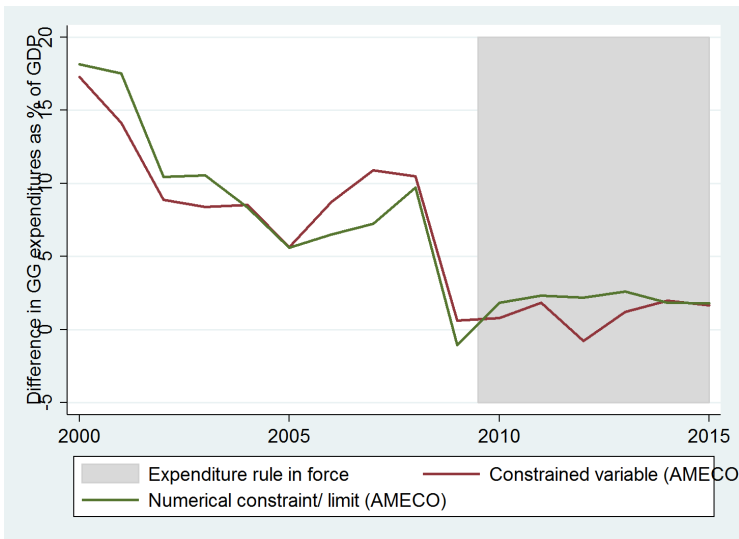
Lithuania - General Government, Since 2008



Poland - Central Government, Since 2011



Romania - General Government, Since 2010



Spain - Central Government, Since 2011

