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Lecture notes

Alternative Approaches to Fiscal Rules and Fiscal Stances in Europe

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THE QUESTION

From Maastricht on, how did fiscal authorities (FAs) deal with the two objectives of **output stabilization** and **debt consolidation**?

To answer this question, we need a measure of the fiscal stance, in order to single out discretionary fiscal policy.

Fiscal stance = variation of the primary budget (fiscal impulse), to accomplish the target for total budget.

1) "Neutral measure": CAPB → Fiscal stance
2) "Theory-based" measure: Fiscal rules → Fiscal stance

Intertemporal Public Budget constraint

Fiscal Sustainability (public debt stock equalized by the future stream of net surpluses)

$$b_t = (1+r)b_{t-1} - (\tau_t - \gamma_t)$$

Solving for b_{t-1} , and iterating for the subsequent periods, after k iterations we get :

$$b_t = \sum_{i=0}^{k} (1+r)^{-i} (v_{t+i}) + (1+r)^{-k} b_{t+k}$$

- The “transversality condition” is met when the second term converges to zero as time approaches to infinite ($k \rightarrow \infty$):

$$\lim_{k \to \infty} (1 + r)^{-k} b_{t+k} = 0$$

- The present value of future surpluses must equalize, in each period t, the stock of public debt (b_t):

$$b_t \sum_{i=0}^{k} (1 + r)^{-i} (v_{t+i})$$

$$\sum_{i=0}^{k} (1+r)^{-} (v_{t+i}) + (1+r)^{-k} b_{t+k}$$

- The fulfilment of the Transversality condition (TC) is a dynamic optimization problem.
- The second term becomes nil for k $\rightarrow\infty$, which guarantees that **public debt will not accumulate**. Formally, by taking a t+k horizon version of the problem of maximizing the present value, we obtain the F-O condition for t+k, and then the limit of this condition is taken as k goes to infinity (Bohn, 1998).

$$\Delta b = \gamma - \tau + (i - g)b$$

- **Still the first term of TC could be < b_t due to (i - g)<0**. Yet, even a diminishing width of future surpluses (v) warrants FS, as the IPBC would not be fulfilled only in the non-realistic case in which the output level falls below the formation of fiscal revenues, which is preposterous.

Macroeconomic governance in the EMU

(1) AD: $$\boldsymbol{Y} = \left[\zeta_1 \boldsymbol{d} - \zeta_2 (\boldsymbol{i} - \pi^{\boldsymbol{e}}) + \varepsilon \right]$$

(2) AS: $$\pi = \pi^{\boldsymbol{e}} + \omega \boldsymbol{Y} + \boldsymbol{\nu}$$

(3) CB's loss function: $$\boldsymbol{L_{CB}} = \pi^2 + \beta_1 (\boldsymbol{Y})^2$$

(4) P. Budget: $$\boldsymbol{d} = \boldsymbol{d_s} - \psi \hat{\boldsymbol{s}}(\boldsymbol{y})$$

where ψ between 0 (medium-term target: d_s) and 1 (a.s.); ŝ (the budget's elasticity after a output deviation from pot.) measures the capacity of a.s. to absorb O.G.: (y). All variables are deviations from the baseline.

(5) FAs' loss function $$\boldsymbol{L_{FP}} = [(\boldsymbol{d_s} - \psi \hat{\boldsymbol{s}}(\boldsymbol{y})]^2 + \beta_2 (\boldsymbol{y}^*)^2$$

where β_2 is the weight for stabilization beyond pot. output (y* > 0). To avoid a "deficit bias", similar to the "inflation bias", the design of the SGP points to β_2 = 0 (NO "discretionary" f.p.). During the cycles ($\boldsymbol{y} \neq 0$), $\psi = 1$ allows for the operation of automatic stabilizers (a.s.) during output fluctuations. SGP: d_s=0 in the medium-term is the condition for a.s. to fully operate when $\boldsymbol{y} \neq 0$, and FAs comply with: $\boldsymbol{d} \leq \hat{\boldsymbol{d}} - \boldsymbol{d}(\varepsilon)$

(6)

d^ = 3% limit and ε = neg.shock: 0 = -3 - (- 3)

The d_s/GDP ratio depends on g and Δ i

(10) CB's loss function

$$L_{CB} = \pi^2 + \beta_1 (i - i_{LP})^2$$

where i_{LP} is the long-run interest rate and the value of β_1 reflects the "smoothing" interest rate in the monetary and fiscal policy interactions meant to pursuing the desired inflation-output trade-off.

By substituting (4) in (1) and solving for y:

(11)

$$y = \frac{1}{1+\psi\zeta_1}\left[\zeta_1 d_s - \zeta_2 (i - \pi^e) + \mu_1\right]$$

<u>Hypotheses</u>: in the absence of inflation expectations (π^e=0) the CB pursues "zero inflation" under REH (π = π^e=0); with no AD shocks: μ_1=0 , so that y=0, the actual output = potential output ,and the structural deficit / GDP ratio = 0 in the medium-term:

(12)

$$0 = \frac{1}{1+\psi\zeta_1}\left[\zeta_1 d_s - \zeta_2 i\right]$$

Hence, in equilibrium the structural deficit is:

(13)

$$d_s = (\zeta_1 / \zeta_2) i$$

A direct relation holds between the i rate and the structural balance / GDP

1) CAPB

The variation of the fiscal stance **is measured through the so-called** "structural" primary balance**:**

the cyclically-adjusted public budget (the value that the public budget would have assumed "<u>if the output level would have not changed</u>")

minus

the exogenously determined amount of interest payments (the stock of public debt, times the interest rate determined by financial markets and monetary policy).

1) CAPB measure of discretionary fiscal policy

Fiscal impulse: the value of the primary budget minus the estimate of the cyclically-originated variation of primary budget. In other words, the variation of the fiscal stance by FAs is computed as a residual.

No role for the effective "room for manouvre" of FAs: the impact of the cycle (ΔY) is cancelled out, and no reverse causation of public budget on Y is envisaged.

The CAPB is unable to offer a clear evaluation of the FAs' behaviour, as it does not express the accountability of FAs.

2) Fiscal stance simulation

By using the "Growth Accounting" (the contribution of growth to the total balance / GDP ratio; von Hagen and Bruckner, 2002), I assess discretional fiscal policy as depending on the FISCAL RULE adopted by FAs. To the year-by-year flow of fiscal revenues, the fiscal reaction implied by two different fiscal rules are subtracted, and then set as the dependent variables in regressions in which output stabilization and debt decumulation play the role of independent variables.

“Simulated” fiscal impulses, computed according to the requirements of a certain fiscal rule: ∆ Fiscal Stance : + means that not all revenues are spent (restriction**), - means a larger amount of expenses w.r. to revenues (**expansion**)**

This approach permits to cast light on a variety of possible causes for an “excessive” fiscal expansion:

1) **lack of “fiscal discipline”, but also:**
2) **unforeseen negative g**
3) **a rise in the interest rate**
4) **a fall of the fiscal multiplier**
5) **a medium-term slow-down in potential output.**

- **Tax Smoothing (TS)**

  Fiscal policy can smooth the business cycle but cannot influence the GDP trend. The structural total public budget must be kept at its medium-term balanced position, with a fiscal expansion in bad times and a fiscal retrenchment in good times. However, to maintain the zero budget balance over the cycle at a constant τ is taken by the SGP as the FAs commitment to cope with the total (not only the primary) budget, which amounts to take responsability for any positive (i – g) difference.

EMU: the SGP and Tax Smoothing

- **Tax Smoothing requires a constant τ be preserved over the cycle. Governments should abstain from discretionary fiscal policy and just "let automatic stabilizers work" over the cycle**
- **Similarly, the SGP dictating a zero structural deficit / GDP ratio in the medium-term is meant for preserving a constant τ**

- **The Tax Smoothing and the SGP do not consider that *g* and iB are decisive for the transversality condition of fiscal sustainability to be fulfilled.**
- **Due to exposure of the total balance/GDP to Δg and Δi, in the EMU fiscal sustainability is not credibly enforced, as it relies on the evaluation of the public budget's eligibility of each country to the pecuniary penalty for "excessive deficit".**

- **<u>Expenditure smoothing</u> (ES)**

  Though the NKE is skeptical about the relevance of the fiscal multiplier for macroeconomic equilibrium,

  to prevent hysteresis after a negative shock, that is a pro-cyclical fiscal stance to worsen a sluggish growth, the public budget should maintain constancy with potential growth;

  in addition, pro-ciclicity during upswing should not be banned, as excess fiscal revenues could be intertemporally redistributed in order to raise potential output (Y*>Ypot.).

Fiscal rules

- $\Delta v^{TS} = \Delta v_t - [\lambda_1 \tau_{t-1}(g - g^*) + \lambda_2 \gamma_{t-1}(g - g^*)] - iB/Y$

(during a downswing, $\lambda_1 = 0$; $\lambda_2 = 1$)

- $\Delta v^{ES} = \Delta v_t' - [\lambda_3 \gamma_{t-1}(g - g^*)] - iB/Y$

(during a downswing, $\lambda_3 = 1$)

- where $$\Delta v_t = \frac{\Delta T_t - \Delta G_t}{Y_{t-1}} = g(\tau_t - \gamma_t)$$

and $$\Delta v_t' = \tau_{t-1} g - \gamma_{t-1} g^*$$

“Counterfactual” regressions

- **TS = C + α_1 output gap$_{i,t}$ + α_2 debt$_{i,t-1}$ + α_3 (i-i*)$_{i,t}$ + α_4 Z$_{i,t}$ + $\varepsilon_{i,t}$**
- **ES = C + β_1 output gap$_{i,t}$ + β_2 debt$_{i,t-1}$ + β_3 (i-i*)$_{i,t}$ + β_4 Z$_{i,t}$ + $\varepsilon_{i,t}$**

- **where output gap is ΔY/Y*, debt$_{t-1}$ is (B/Y)$_{,t-1}$, (i-i*) is the difference between each country long term interest rate minus the German one, and Z is a vector of dummy variables**

Table 5 – Tax Smoothing

	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV
Constant	-1.066**	-1.377*	1.880**	1.727*	0.144*	-2.651**
	(0.489)	(0.652)	(0.883)	(0.959)	(0.095)	(1.449)
output gap	-15.786***	-12.940***	-11.376*	-7.111*	-13.088***	-7.299***
	(4.711)	(3.018)	(6.291)	(3.736)	(3.878)	(1.034)
Debt t-1	8.353***	9.903***	4.163***	4.378***	7.029***	7.611***
	(0.803)	(1.901)	(1.686)	(1.699)	(1.686)	(2.465)
i-i*	0.987***	1.126***	0.571***	0.647***	0.811***	1.360***
	(0.139)	(0.176)	(0.064)	(0.264)	(0.110)	(0.202)
High debt	1.515***	1.127***	2.891***	2.179**	2.019***	2.866***
	(0.064)	(0.069)	(0.655)	(0.816)	(0.565)	(0.510)
N	287	269	123	105	203	185
Time	1980-04	1980-04	1980-92	1980-92	1980/98	1980/98
Adj-R^2	0.894		0.949		0.921	
p-value over id. χ^2		0.521		0.266		0.637

Numbers in parentheses are robust standard errors. *, **, and *** denote significance at 10%, 5%, and 1% levels, respectively.

Table 6 – Expenditure Smoothing

	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV
Constant	-1.840*	-1.110*	-2.369*	-2.153**	2.665**	3.615***
	(0.662)	(0.421)	(0.804)	(0.669)	(0.692)	(0.996)
Output gap	-6.314***	-6.300***	-13.021***	-11.245***	-8.769***	-8.435***
	(1.214)	(1.189)	(4.310)	(3.117)	(2.877)	(42.84)
Debt t-1	-9.339***	-9.587***	-11.259***	-12.569***	-15.624***	-13.633***
	(2.850)	(2.411)	(2.172)	(2.461)	(4.899)	(3.147)
i-i*	-1.059***	-0.899***	-1.893***	-1.794***	-1.256***	-2.056**
	(0.154)	(0.113)	(0.469)	(0.419)	(0.262)	(0.577)
High debt	0.473*	0.622**	-6.228	-5.142	5.962	4.108
	(0.238)	(0.117)	(5.106)	(4.881)	(4.148)	(7.125)
N	287	269	123	105	203	185
Time	1980-04	1980-04	1980-92	1980-92	1980/98	1980/98
Adj-R^2	0.762		0.772		0.733	
p-value over id. χ^2		0.761		0.367		0.557

Numbers in parentheses are robust standard errors. *, **, and *** denote significance at 10%, 5%, and 1% levels, respectively.

Regression results: 1980-92;93-98;99-04

- IV to cope with endogeneity problem (reverse causation) → two lags of output gap and (i-i*) as instruments. P-value: non-rejection area.OLS coefficients : upward bias.
- O.G.: the negative sign = "pro-cyclicity". "Deviation" from the TS rule (there was NO revenues' accumulation in upswings to comply with τ constant); "loyalty" to the ES rule (fiscal expansion in upswings, keeping the primary balance / trend GDP constant). Declining coefficients from EMS (1980-92) to the pre-EMU (1980-98), to the EMU (1980-04)→ decreasing "pro-cyclicity"
- Lagged Debt and i differential: opposite signs for the two Fiscal Rules

Concluding remarks

The CAPB cannot be taken as a synonimous of "discretionary fiscal policy". FAs' fiscal impulses can be "biased" by a positive (i - g) difference and/or by a fall in potential output. From econometric estimates conducted on post-Maastricht Europe, where the two objectives are regressed on the fiscal stance variation computed by the TS and the ES fiscal rule some important conclusions follow.

1) In the EMU countries who stick to the TS Fiscal Rule declining coefficients in the negative correlation between OG and the fiscal impulse do not mean that a "less pro-cyclical" (Gali-Perotti, 2004) fiscal stance in bad times has been pursued after Maastricht, but just lower discretion in upswings, due to the need to comply with the debt/GDP < 60% objective. Hence, debt decumulation was substituted to output stabilization.

2) In the "high debt" EMU countries who stick to the ES Fiscal Rule, the objective of debt decumulation cannot be pursued.