European Commission
Directorate-General for Economic and Financial Affairs

Workshop on

Achieving and Safeguarding Sound Fiscal Positions

Brussels, 17 January 2008

Comments on
R. **Golinelli** and S. **Momigliano:**

The Cyclical Response of Fiscal Policies in the Euro Area. Why Do Results of Empirical Research Differ so Strongly?

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The goal of the paper

After recognising that the empirical literature is not conclusive as regards the cyclical behaviour of fiscal policy and whether it is symmetric or asymmetric over the cycle

The paper tries to identify the factors explaining the large differences across empirical analyses as regards the cyclical behaviour of fiscal policies

Assessing cyclicality

Cyclicality is measured through the estimate of the coefficient of the output gap in a fiscal reaction function or a fiscal rule (coming back later) of the form:

$$Y = \alpha + \beta X + F(Z) + \varepsilon$$

where **Y is the fiscal policy indicator and X is the indicator of the cyclical position of the economy**. F(Z) represents other variables and ε is a random shock.

Usually, **Y and X are measured in such a way that $\beta>0$ means counter-cyclical fiscal policies, $\beta=0$ a-cyclical and $\beta<0$ pro-cyclical**

Conclusions (7?)

1. Models for PB tend to show more counter-cyclical behaviour, while models for CAPB exhibit a-cyclical behaviour in most cases and pro-cyclical only in a few of them;
2. AMECO data more ‘counter’ than OECD;
3. Real-time OG more ‘counter’ than OECD, HP or AMECO;
4. Some tendency to ‘pro’ in the latest 15-year windows;
5. If symmetry: Different reaction functions/rules in good an bad times (all the parameters change);
6. Tendency to ‘counter’ in good times and ‘pro’ in bad (more ‘evident’ with AMECO and RT, while OECD & HP might indicate more ‘pro’ in bad times); and
7. These results do not seem to change if the electoral cycle, ‘Maastricht’, monetary conditions and fiscal institutions are added to the fiscal reaction/rule: AMECO and RT more ‘counter’ in both good and bad times, OECD & HP ‘pro’ in bad times.

Well-founded conclusions

- Exhaustive revision of the empirical literature
- Detailed comparison of relevant specifications
- Use of main/standard data banks
- Sound econometric techniques
- Continuous robustness checks

Four suggested issues for further discussion

1. Fiscal rules vs. reaction functions;
2. Panel vs. intra-country analyses (incl. the importance of the country sample);
3. Assessing cyclical behaviour in extended models, and
4. Is there and overall conclusion?

1. FR vs. RF

Fiscal rules would mirror monetary rules à la Taylor

$R^*_t = \alpha + \beta(\pi_{t-1} - \pi^*) + \chi\, E(\text{og}_t/\Omega_t)$

They refer to a discretionary fiscal target; usually the CAPB. Fiscal rules assume that fiscal policy aims at stabilising both debt (sustainability; debt target=d) and the economy (stabilisation)*

$S^*_t = \alpha + \delta(d_{t-1}-d^*) + \gamma\, E(\text{og}_t/\Omega_t) \qquad \delta, \gamma > 0$

Attaining S^*_t *in all t may be difficult due to inertia in the budgetary process (problems to fully adjust expenditures and/or taxes over the budgetary year) and unexpected events (viz. wrong assessment of budgetary impacts). This can be expressed as*

$S_t = (1-\rho)\, S^*_t + \rho\, S_{t-1} + \nu_t \qquad 0 < \rho < 1 \qquad \nu_t$ ----- iid $(0, \sigma^2)$

Which allows to express the fiscal rule in observable terms, introduces some dynamics and determines its stochastic properties,

$S_t = (1-\rho)\,(\alpha - \delta d^*) + (1-\rho)\delta d_{t-1} + (1-\rho)\,\gamma\,\text{og}_t + \rho\, S_{t-1} + \varepsilon_t$

$\varepsilon_t = -(1-\rho)\,\gamma(\text{og}_t - E(\text{og}_t/\Omega_t)) + \nu_t$

(α and d* are not identified)

1. FR vs. RF (cont. 1)

This approach might be useful in section 2 of the paper (CAPB vs. PB and g_t *vs* g_{t-1}):

- *Equivalence of CAPB and PB models is straightforward plugging [4] of page 7*

  $PB^* = CAPB^* + \omega\, E(g_t/\Omega_t) \quad (\omega > 0)$ in

  $CAPB^*_t = \alpha + \delta(d_{t-1} - d^*) + \gamma\, E(g_t/\Omega_t)$

  $PB^*_t = \alpha + \delta(d_{t-1} - d^*) + (\gamma+\omega)\, E(g_t/\Omega_t)$

  (equivalent to $\gamma^{disc} = \gamma - \omega$ of [5] in page 7: PB models include automatic stabilisation, which is counter-cyclical, $\omega > 0$)
- *The inertia variable (from $S_t = (1-\rho)\, S^*_t + \rho\, S_{t-1} + \nu_t$) would coincide with the policy target* ***(CAPB/PB ruled out?)***
- *If significant, time/country effects in the panel might point to across-time/country differences in the debt target, (intercept = $(1-\rho)(\alpha - \delta d^*)$)* ***(worth further exploiting country/time effects in panels?)***
- *Estimation methods depend on the hypotheses about* $E(g_t/\Omega_t)$. For instance:

  If $g_t = g_{t-1}$ $\varepsilon_t = \nu_t$ ν_t ---- iid $(0, \sigma^2)$ **(no need of GMM?)**
- *Would this also apply to real-time models? [$g_t - E(g_t/\Omega_t) = 0$?]*

1. FR vs. RF (cont. 2)

However, some commentators (viz. Roeger, 2003) might argue that, unlikely monetary rules, ***fiscal rules are not well established empirically****, while it is* ***difficult to interpret*** *the estimated coefficients of econometric specifications* ***as reflecting the intentional behaviour of governments****.*

(Roeger, W., 2003, Comment on Ballabriga and Martinez-Mongay, in M. Buti (ed): *Monetary and Fiscal Policies in EMU. Interactions and Coordination*, Cambridge UP)

1. FR vs. RF (cont. 3)

The alternative is to specify a purely empirical relationship (as in, for instance, Ballabriga and Martinez-Mongay, 2008) for the primary balance (or the CAPB) with respect to debt levels and cyclical conditions (output gap):

$$S_t = \alpha + \delta d_{t-1} + \gamma \text{og}_{(\cdot)} + \varepsilon_t$$

In this case, **specification tests of the baseline model should provide guidance for the analyst** to determine the extent to which the model requires an inertia term, (ρS_{t-1}), and which one should be **(probably CAPB/PB also ruled out?)**, or what output gap (contemporaneous, og_t , or lagged, og_{t-1}) fits better with the data. The same applies to, for instance, the stochastic properties of ε_t.

(Ballabriga, F. and C. Martinez-Mongay, 2008, A further inquire about the sustainability of fiscal policy in the EU, forthcoming in an ECFIN Economic Paper edited by M. Larch and J. Nogueira)

2. Panel vs country-specific

Panel data assume the same coefficients (excl. intercepts) in all the countries in the sample, but:

If based on fiscal rules: There is the untested hypothesis that all countries apply the **same rule** (same intentional behaviour), except, *possibly,* for the debt target and face the **same budgetary inertia and shocks**.

In any case: Empirical evidence shows **significant differences across countries** in fiscal reaction functions (see 3 slides below from Ballabriga and Martinez-Mongay, 2002 and 2008)

(Implication: The country sample would also matter)

(Ballabriga, F. and C. Martinez-Mongay, 2002, Has EMU shifted policy? ECFIN Economic Papers, No 166)

Table 1: Fiscal policy rules, 1979-1998 [(a)]

	ρ_F [(b)]	$\tilde{\alpha}_{F(c)}$	$\delta_{F(d)}$	$\gamma_{F(e)}$	$\sigma^2_{(f)}$	J [(g)]
Belgium	0.47	-12.8	0.14	0.34	1.04	3.68
	(0.13)*	(1.66)*	(0.02)*	(0.12)*		[0.24]
Denmark	0.49	-0.75	0.10	1.14	1.32	6.03
	(0.10)*	(0.99)	(0.02)*	(0.15)*		[0.11]
Germany	0.54	-2.01	0.08	-0.09	0.90	6.32
	(0.16)*	(1.34)	(0.04)*	(0.12)		[0.10]
Spain	0.50	-4.90	0.09	0.33	0.91	3.69
	(0.14)*	(0.95)*	(0.02)*	(0.10)*		[0.30]
France		-0.17	0.02	0.26	0.52	4.53
		(0.32)	(0.01)*	(0.04)*		[0.34]
Ireland[(h)]	0.87	-31.0	0.38	0.20	1.17	2.70
	(0.08)*	(17.0)	(0.20)	(0.55)		[0.44]
Italy	0.58	-14.5	0.16	0.06	1.13	1.08
	(0.10)*	(1.85)*	(0.02)*	(0.13)		[0.78]
The Netherlands		-3.69	0.08	0.24	1.00	1.43
		(0.58)*	(0.01)*	(0.09)*		[0.84]
Austria		-1.29	0.04	0.24	0.78	2.44
		(0.67)*	(0.01)*	(0.04)*		[0.66]
Portugal		-20.0	0.35	0.05	1.40	3.81
		(2.40)*	(0.04)*	(0.02)*		[0.43]
Finland	0.47	2.19	0.04	0.92	1.04	1.99
	(0.06)*	(0.42)*	(0.02)*	(0.08)*		[0.58]
Sweden	0.62	-0.86	0.08	1.46	1.67	6.05
	(0.06)*	(4.02)*	(0.07)	(0.21)*		[0.11]
United Kingdom	0.84	-49.6	1.04	1.05	1.04	6.49
	(0.05)*	(18.8)*	(0.39)*	(0.63)		[0.09]

Standard errors in parentheses; '*' significant at 5%.
[(a)] Except for Portugal, where the sample period is 1982-1998.
[(b)] Coefficient of (fiscal) policy inertia; see equation (4).
[(c)] Intercept of the fiscal rule; see equations (3) and (8).
[(d)] Fiscal response to the stock of debt at the beginning of the period; see equation (3).
[(e)] Fiscal response to the contemporaneous output gap; see equation (3).
[(f)] Standard error of the regression.
[(g)] Test for over-identifying restrictions (Chi-square with 3 degrees of freedom); p-values in brackets.
[(h)] The p-values associated to α_F and δ_F are 0.07.

Table 1: Discretionary fiscal policy, 1979-1998 [(a)]

	ρ_{F} [(b)]	$\tilde{\alpha}_{F(c)}$	δ_{F} [(d)]	γ_{F} [(e)]	σ [(f)]	J [(g)]
Belgium	0.63	-16.6	0.17	-0.05	1.64	3.48
	(0.13)*	(4.34)*	(0.04)*	(0.29)		[0.32]
Denmark	0.47	-0.25	0.10	0.70	1.62	2.15
	(0.16)*	(2.28)	(0.04)*	(0.21)*		[0.54]
Germany	0.61	-0.62	0.06	-0.58	0.99	5.56
	(0.06)*	(1.12)	(0.03)	(0.17)*		[0.13]
Spain	0.40	-4.14	0.08	0.08	0.90	2.87
	(0.20)*	(0.73)*	(0.02)*	(0.13)		[0.41]
France	0.23	-0.84	0.04	-0.07	0.58	4.12
	(0.10)*	(0.56)	(0.01)*	(0.07)		[0.25]
Ireland	0.90	-42.8	0.53	-0.29	1.42	2.92
	(0.08)*	(27.3)	(0.34)	(0.40)		[0.40]
Italy	0.63	-15.2	0.17	-0.14	1.20	1.92
	(0.09)*	(2.47)*	(0.03)*	(0.15)		[0.59]
The Netherlands	0.63	-3.54	0.08	-0.32	1.28	1.54
	(0.13)*	(2.18)	(0.04)*	(0.31)		[0.67]
Austria		-2.72	0.06	0.22	0.95	2.05
		(0.092)*	(0.02)*	(0.06)*		[0.73]
Portugal		-17.8	0.33	0.02	1.12	6.23
		(1.32)*	(0.02)*	(0.02)		[0.18]
Finland	0.52	1.85	0.04	0.08	1.30	3.95
	(0.13)*	(1.09)	(0.02)	(0.10)		[0.27]
Sweden	0.60	-0.86	0.08	0.97	1.69	7.45
	(0.06)*	(4.02)	(0.07)	(0.19)*		[0.06]
United Kingdom	0.81	-26.5	0.57	0.58	1.31	6.67
	(0.09)*	(16.4)	(0.34)	(0.65)		[0.08]

Standard errors in parentheses; '*' significant at 5%.
[(a)] Except for Portugal, where the sample period is 1982-1998.
[(b)] Coefficient of (fiscal) policy inertia; see equation (4).
[(c)] Intercept of the fiscal rule; see equations (3) and (8).
[(d)] Fiscal response to the stock of debt at the beginning of the period; see equation (3).
[(e)] Fiscal response to the contemporaneous output gap; see equation (3).
[(f)] Standard error of the regression.

Table 6. Refined estimates

	Intercept	DEBT	GAP	$PSUR_{-1}$	Maastricht	Launching of the euro	EMU	Adj. R^2	DW/ h-Durbin
Belgium (1a)	-3.73 1.06***	0.04 0.01***	0.13 0.12	0.57 0.14***		0.01 0.004***		0.93	-1.74
Germany (1b)	-2.25 1.00**	0.07 0.03**	-0.10 0.08	0.34 0.09***			-0.04 0.01***	0.55	-0.66
Greece	-2.85 1.23**	0.02 0.01	0.18 0.17	0.44 0.15***	0.03 0.01***	(2)		0.77	-1.38
Spain	-1.20 0.34***	0.02 0.01*	0.32 0.09***	0.26 0.14*		0.03 0.01***		0.87	0.69
France (1a)	-2.44 0.89***	0.11 0.03***	0.26 0.12**	0.18 0.15	-0.06 -0.02***		-0.02 0.01***	0.70	1.96
Italy (1a)	-4.69 1.57***	0.06 0.02***	0.01 0.10	0.67 0.11***			-0.01 0.003***	0.93	-1.16
Ireland	-2.63 1.17**	0.03 0.01**	-0.06 0.10	0.82 0.06***		0.03 0.01***		0.88	1.04
Nether-lands	-1.96 0.98**	0.05 0.02***	0.30 0.19	0.22 0.19		0.02 0.006***		0.64	1.49
Austria	-0.32 0.57	0.01 0.01	0.17 0.09*	0.32 0.15**		0.01 0.006*		0.57	-0.70
Portugal (1c)	-13.0 2.52***	0.23 0.04***	0.20 0.08**	0.22 0.15				0.72	1.45
Finland (1d)	2.17 052***	0.00 0.01	0.45 0.09***	0.52 0.07***				0.82	-1.20
Denmark	-0.15 0.62	0.04 0.02***	0.51 0.16***	0.62 0.10***				0.82	2.93
Sweden (1d)	-0.94 1.52	0.07 0.02***	0.95 0.29***	0.54 0.14***				0.85	1.52
UK (1c)	-4.03 1.74**	0.10 0.03***	0.23 0.09***	0.78 0.09***				0.83	-0.84
US (1c)	-3.37 0.98***	0.05 0.01***	0.40 0.08***	0.72 0.09***				0.83	1.25
Japan	-2.87 0.52***	0.05 0.01***	0.16 0.09*	0.60 0.05***	-0.04 0.004***			0.95	-0.09

(1a) The model includes an intervention in 1993 to correct for the effect of large statistical revisions of debt levels that took place in such a year;
(1b) The model includes an intervention in 1995 when the debt rose by almost 8 percentage points ¾ of which was explained by a stock-flow adjustment;
(1c) The model includes a non-linear term, positive in the cases of Portugal and the US and negative in the UK;
(1d) The model includes a dummy taking value 1 between 1990 and 1992, the coefficient of which is negative and significant at 1% (-0.15) in Finland and at 5% (-0.05) in Sweden;
(2) The dummy takes value 1 between 1993 and 2000;
Standard errors are shown below the parameter estimate: '***' significant at 1%, '**' significant at 5%, '*' significant at 10%.

3. Extended models

The same framework might shed some light on the adequacy of models including institutional, political and other variables (electoral cycle, 'Maastricht', monetary conditions and fiscal institutions), but

In rules: Additional variables only have an impact on α and/or d*, but **do not change the (intended) cyclical behaviour** (/reaction to debt/inertia) of fiscal policy;

In reaction functions: The initial specification would be free, but **should be tested** against other specifications.

4. Is there a (conclusive) conclusion?

Taking at face value the quantitative results of the paper (significance about 5%):

Table 2a (six initial alternatives) a-cyclical (5 cases), counter-cyclical (1 case -PB)

Table 2b (six initial alternatives) a-cyclical (2 cases), pro-cyclical (3 cases), counter-cyclical (1 case -PB)

Table 3 (sources –CAPB) a-cyclical (all)

Table 4 ('times' and sources –CAPB) a-cyclical (all)

Table 5 (extended, 'times' and sources –CAPB) a-cyclical (6) counter-cyclical (2)

My tentative (un)conclusive conclusion (with confidence of about 95%): Average discretionary fiscal policy across euro area countries has been A-CYCLICAL between 1978 and 2006. Automatic stabilisers have operated in the expected direction. Little evidence of discretionary pro-cyclical fiscal policies.

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