Thinking ahead for Europe

Revisions of cyclically adjusted budget balances

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FIRSTRUN workshop

Structural budget balances

- SGP: Headline figures of 3% deficit and 60% debt
- Post-crisis reform: Emphasis on structural balance
  - Six Pact
  - Treaty on Stability Coordination and Governance

Ambition:

- Avoid pro-cyclical fiscal policy stance
- Create buffer for ‘bad times’
- Debt sustainability

Unobservable target

1. Output gap not observable
   - Estimates depend on model choice
   - Difference across institutions

   →Estimated gap heavily revised

2. Headline deficit forecast errors

3. Revisions of (potential) GDP figures

Potential repercussions for SGP

Structural balance ex ante and ex post differ greatly

1. Unwarranted sanctions (& vice versa)
2. Debt sustainability
3. Ex post ill-suited policy advice (tightening/loosening)

Growing literature in the field

1. **Magnitude of revisions**
2. Difference across models and institutions
3. Ex ante fiscal stance counter-cyclical
4. De-composition of revisions (→ drivers)
5. Political cycle matters
6. **Policy implications for the SGP**

Aim of the study

- How large are the revisions of Commission estimates (ex-ante, real-time, ex-post)
- Are revisions of the CAB larger at the turn of the cycle?
  - Systematic revision or clustered?
  - Imprecise when most needed?

  → different policy implications
- What factors may mitigate the impact of revisions on the SGP?
- What safeguards have been put in place?

Dataset

- European Commission's Spring and Autumn forecasts
- Country coverage: EA12+Denmark, Sweden and UK
- Period: 2003-2016
- Not SB but CAB
- Data is freely available at http://www.firstrun.eu/

- $CAB_{revision} = CAB_t^T - CAB_t^{t-x}$

Magnitude of revisions: OG

	Output gap					
	t-1 Spr	t-1 Aut	t Spr	t Aut	t+1 Spr	t+1 Aut
Mean	0.7	0.8	1.0	1.0	0.8	0.6
Stdev	2.5	2.1	1.7	1.5	1.4	1.1
Min	-6.4	-4.8	-3.8	-3.4	-3.2	-2.4
Max	7.7	6.6	5.6	5.4	4.9	3.7
Median	1.1	0.9	0.9	0.6	0.6	0.5
Mean Abs	2.1	1.8	1.6	1.3	1.2	1.0

Magnitude of revisions: CAB

	Cyclically adjusted balance					
	t-1 Spr	t-1 Aut	t Spr	t Aut	t+1 Spr	t+1 Aut
Mean	-0.7	-0.8	-0.7	-0.5	-0.6	-0.5
Stdev	2.7	2.4	2.1	1.6	1.3	1.0
Min	-13.0	-12.8	-10.4	-8.9	-6.0	-4.9
Max	4.9	4.1	3.4	3.6	2.5	1.6
Median	-0.4	-0.4	-0.4	-0.4	-0.4	-0.3
Mean Abs	1.8	1.7	1.4	1.2	1.0	0.8

Country properties

- Large difference between countries:
  → Largest revisions for EL and IE, lowest DE and IT
- Always downward correction?
  → BE, (-1) EL, FR, IT and PT vs. (-1) Lux and DE

Methodology: turn of the cycle

Identifying the turns

- Large cycles vs. small cycles
  - Size of the output gap
  - Dummy
- Dummy specification:
  - Switch in sign of the OG growth rate
  - Threshold: minimum growth rate (1% GDP, t-1→t+2)
    →Alternative approaches (av., peak2peak etc.)

Revisions of the CAB and OG

$$(CAB_t^T - CAB_t^{t-x}) = \alpha + \beta OG_t^T$$

	t-1_spring b/se	t-1 autumn b/se	t_spring b/se	t_autumn b/se	t+1_spring b/se	t+1 autumn b/se
OG_f	-0.179**	-0.153**	-0.239***	-0.264***	-0.262***	-0.185***
	(0.06)	(0.05)	(0.04)	(0.03)	(0.02)	(0.02)
constant	-0.855**	-0.966**	-0.984**	-0.874***	-0.913***	-0.768***
	(0.31)	(0.32)	(0.31)	(0.23)	(0.17)	(0.13)
r2_w	0.078	0.077	0.233	0.412	0.496	0.383
r2_b	0.239	0.354	0.391	0.321	0.132	0.163
r2_o	0.029	0.015	0.065	0.164	0.305	0.226

* p<0.05, ** p<0.01, *** p<0.001

Directional relationship: OG larger, CAB downwards (worsening)

Introducing the dummy

$$(CAB_t^T - CAB_t^t)) \;=\; \alpha + \beta_1 OG_t^T + \beta_2 OG_t^T * Dummy_t^{turn} + Dummy_t^{turn}$$

```
Random-effects GLS regression                   Number of obs      =       176
Group variable: id                              Number of groups   =        15

R-sq:  within  = 0.3954                         Obs per group: min =         9
       between = 0.2682                                        avg =      11.7
       overall = 0.1814                                        max =        12

                                                Wald chi2(3)       =     80.05
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

cab_e_t_a	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
og_f	-.2117846	.0348088	-6.08	0.000	-.2800087	-.1435606
int_og_turn1	-.131167	.0626913	-2.09	0.036	-.2540397	-.0082942
turn1	-.3658655	.1855456	-1.97	0.049	-.7295281	-.0022028
_cons	-.691631	.1897327	-3.65	0.000	-1.0635	-.3197617
sigma_u	.54717216					
sigma_e	1.0377213					
rho	.21754375	(fraction of variance due to u_i)				

Revisions by estimation date

	t-1_spring b/se	t-1 autumn b/se	t_spring b/se	t_autumn b/se	t+1 spring b/se	t+1 autumn b/se
peak	0.492	-0.225	-0.248	-0.524	-0.467*	-0.274
	(0.61)	(0.53)	(0.49)	(0.27)	(0.23)	(0.20)
trough	-0.007	0.025	0.926*	0.701**	0.657**	0.263
	(0.63)	(0.48)	(0.44)	(0.25)	(0.21)	(0.18)
constant	-0.895*	-0.879*	-0.989**	-0.640*	-0.664***	-0.559***
	(0.37)	(0.38)	(0.37)	(0.25)	(0.17)	(0.14)
r2_w	0.004	0.002	0.030	0.085	0.095	0.031
r2_b	0.096	0.099	0.143	0.126	0.155	0.142
r2_o	0.005	0.001	0.030	0.067	0.085	0.029

* p<0.05, ** p<0.01, *** p<0.001

Magnitudes: absolute value revision

	t-1_spring b/se	t-1 autumn b/se	t_spring b/se	t_autumn b/se	t+1_spring b/se	t+1 autumn b/se
peak	-0.313	-0.209	-0.078	0.336	0.339	0.238
	(0.47)	(0.42)	(0.42)	(0.22)	(0.19)	(0.16)
trough	0.526	0.040	-0.320	0.115	-0.000	-0.056
	(0.48)	(0.38)	(0.38)	(0.20)	(0.17)	(0.15)
constant	1.934***	1.817***	1.661***	1.106***	0.948***	0.779***
	(0.34)	(0.33)	(0.32)	(0.18)	(0.13)	(0.10)
r2_w	0.013	0.002	0.004	0.018	0.023	0.018
r2_b	0.047	0.110	0.092	0.177	0.145	0.075
r2_o	0.013	0.002	0.005	0.007	0.014	0.012

* p<0.05, ** p<0.01, *** p<0.001

Overview of models (in-year)

		OG_f	D_turn	D_peak	D_trough
	M1 (t)	-0.24***			
	M1 (t)	-0.24***	-0.11		
	M1 (t)	-0.24***		-0.49	0 .55
ABS	M2 (t abs)	0.08			
ABS	M2 (t abs)		0.48*		
ABS	M2 (t abs)	-0.08	0.46*		
ABS	M2 (t abs)	-0.07		0.63*	0.28

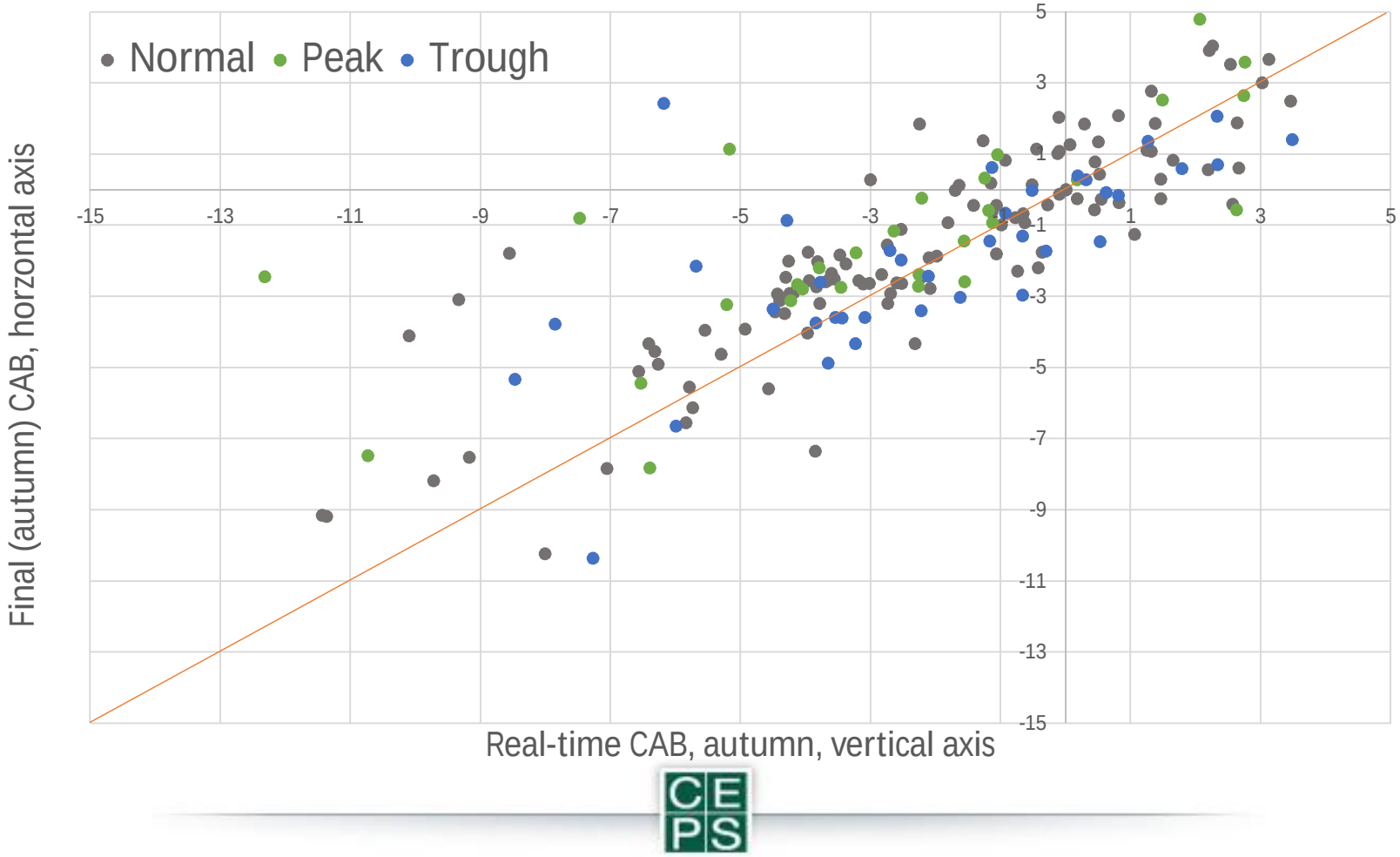
Overview of models (t+1)

		OG_f	D_turn	D_peak	D_trough
	M3 (t+1)	-0.26***			
	M3 (t+1)	-0.26***	-0.09		
	M3 (t+1)	-0.26***		0.38*	-0.40*
ABS	M4 (t+1 abs)	0.00			
ABS	M4 (t+1 abs)		0.06		
ABS	M4 (t+1 abs)	0.03	0.17		
ABS	M4 (t+1 abs)	0.04		-0.86	0.51*

Overview of models (forecast, t-1)

		OG_f	D_turn	D_peak	D_trough
	M1 (t-1)	-0.17**			
	M1 (t-1)	-0.18**	0.08		
	M1 (t-1)	-0.17**		-0.33	0.33
ABS	M2 (t-1 abs)	0.16*			
ABS	M2 (t-1 abs)		0.01		
ABS	M2 (t-1 abs)	0.16*	0.06		
ABS	M2 (t-1 abs)	0.16*		0.25	-0.05

Visualization



Impact Fiscal Framework

- Sizable systematic revisions, not just at the turn
- Revisions for forecasts often as large as the CAB itself
- Revisions remain significant for in-year and t+1

→ Does this render the SGP assessment unjustifiably unreliable?

Which data matters when?

- t+1, in spring (also autumn), others complementary
- Revisions in t+1 much lower: 0.5pp
- Once under the EDP/SDP:

  → Improvement in the structural balance

Magnitude of revisions: delta CAB

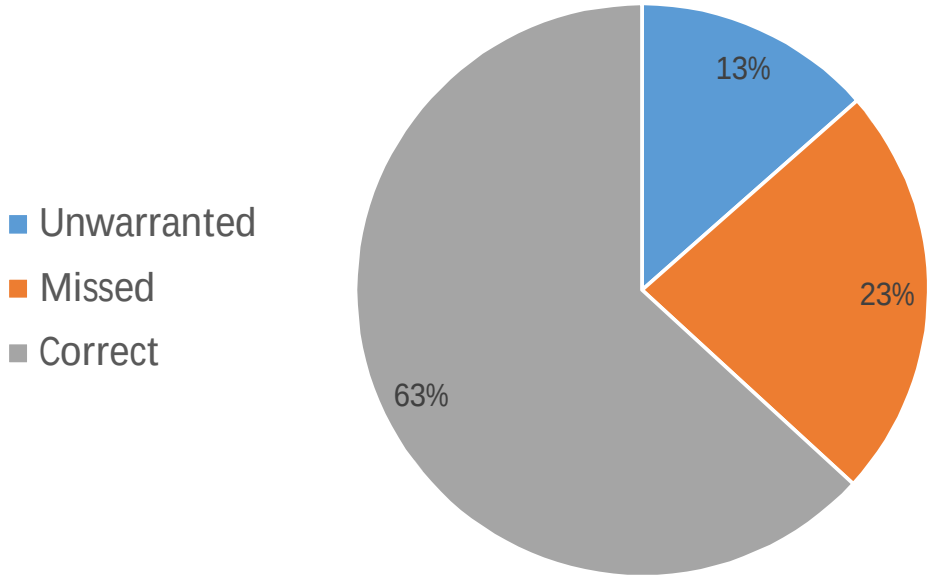
	Delta Cyclically adjusted balance					
	t-1 Spr	t-1 Aut	t Spr	t Aut	t+1 Spr	t+1 Aut
Mean	0.1	-0.2	0.0	-0.2	0.0	-0.1
Stdev	1.8	1.6	1.7	1.8	1.0	0.8
Min	-5.3	-5.7	-10.4	-11.4	-3.0	-3.2
Max	7.6	4.4	3.5	3.7	4.4	4.2
Median	0.1	0.0	0.2	-0.1	-0.1	0.0
Mean abs	1.3	1.1	1.1	1.2	0.6	0.5

Unwarranted and missed sanctions/EDP stepped up

Assuming a minimum structural improvement of 0.5%:

→How often could sanctions have been ill-fitting?

(Improvement assess for previous period)



Mitigating factors

1. Structural balance slightly less revised
2. Assessing compliance over several years
   - Preventive arm: average past two years
   - Corrective arm: Debt reduction 3 years (forward and backward)

- Revisions of two consecutive years more likely to be offsetting than amplifying
- Offsetting revisions more ‘powerful’

Safeguards

3. Revisions to some extent taken into account
4. Deviation from target up to 0.25% allowed
5. Exemption clauses
6. Flexibility
   - EC communication
   - Spain and Portugal

What about debt sustainability? (downwards bias)

Moving in Second-bests

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Magnitude of revisions: NL

	Net Lending					
	t-1 Spr	t-1 Aut	t Spr	t Aut	t+1 Spr	t+1 Aut
Mean	-0.3	-0.4	-0.1	0.0	-0.1	-0.1
Stdev	3.1	2.6	2.0	1.5	1.1	1.0
Min	-13.1	-13.0	-10.0	-7.6	-5.1	-3.8
Max	5.6	4.6	4.5	5.5	6.1	6.6
Median	0.4	0.1	0.1	0.1	0.0	0.0
Mean Abs	2.1	1.8	1.4	1.0	0.6	0.5

Model 2: Separating peak and trough

```
Random-effects GLS regression                   Number of obs      =       165
Group variable: id                              Number of groups   =        14

R-sq:  within  = 0.5490                         Obs per group: min =         9
       between = 0.1694                                        avg =      11.8
       overall = 0.3317                                        max =        12

                                                Wald chi2(5)       =    160.09
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

cab_e_tplus1_s	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
og_f	-.2927319	.0258802	-11.31	0.000	-.3434562	-.2420077
peak1	.3821848	.1797398	2.13	0.033	.0299013	.7344682
trough1	-.3335766	.1831234	-1.82	0.069	-.6924918	.0253386
int_og_peak1	.0768515	.0750617	1.02	0.306	-.0702668	.2239699
int_og_trough1	.0427588	.0571798	0.75	0.455	-.0693115	.1548292
_cons	-.9224204	.170837	-5.40	0.000	-1.257255	-.5875861

IE, t+1

Model 1: peak and trough

```
R-sq:  within  = 0.1187                 Obs per group: min =         9
       between = 0.0054                               avg =      11.7
       overall = 0.0854                               max =        12

                                        Wald chi2(5)       =     19.75
corr(u_i, X)   = 0 (assumed)            Prob > chi2        =    0.0014
```

cab_e_t_s	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
og_f	-.0519673	.0760372	-0.68	0.494	-.2009975	.097063
peak1	-.6560879	.4847577	-1.35	0.176	-1.606196	.2940198
trough1	-.1240863	.4567917	-0.27	0.786	-1.019381	.7712089
int_og_trough	-.2026323	.1245358	-1.63	0.104	-.4467181	.0414534
int_og_peak1	-.480961	.2001154	-2.40	0.016	-.8731799	-.0887421
_cons	-.8619522	.3414484	-2.52	0.012	-1.531179	-.1927255

Separating Peak and Trough

```
Random-effects GLS regression                   Number of obs      =       175
Group variable: id                              Number of groups   =        15

R-sq:  within  = 0.0909                         Obs per group: min =         9
       between = 0.3396                                        avg =      11.7
       overall = 0.0332                                        max =        12

                                                Wald chi2(3)       =     11.76
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0083
```

cab_e_t_s	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
og_f	-.168487	.0605302	-2.78	0.005	-.287124	-.04985
peak1	-.778353	.4891114	-1.59	0.112	-1.736994	.1802876
trough1	-.4016037	.4392098	-0.91	0.361	-1.262439	.4592317
_cons	-.7891036	.3411101	-2.31	0.021	-1.457667	-.1205402

Repeat in absolute value

```
Random-effects GLS regression                   Number of obs      =       165
Group variable: id                              Number of groups   =        14

R-sq:  within  = 0.1089                         Obs per group: min =         9
       between = 0.1020                                        avg =      11.8
       overall = 0.0628                                        max =        12

                                                Wald chi2(5)       =     13.90
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0162
```

cab_e_tplus1_s_~s	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
og_f_abs	-.0042421	.0426651	-0.10	0.921	-.0878642	.0793801
peak1	-.8622638	.3508809	-2.46	0.014	-1.549978	-.1745498
trough1	.4036128	.2468132	1.64	0.102	-.0801322	.8873577
int_ogabs_peak1	.4454771	.1474331	3.02	0.003	.1565136	.7344406
int_ogabs_trough1	-.1197389	.0774065	-1.55	0.122	-.2714528	.031975
_cons	.9840831	.1534772	6.41	0.000	.6832733	1.284893