



EU Commission Methodology for Estimating Potential Output

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(AIECE Working Group on Longer
Term Issues & Structural Change)

Outline of Presentation



1, Introductory Remarks

2, Overview of the EU's Common Methodology

- Graphical & technical description of PF methodology
- Recent changes : NAWRU
- Trend TFP calculations

3, What information is given to Policy Makers

- Main tabular & graphical "outputs" of PF method

4, How reliable is this information

- Comparison of Real time performance (OECD / IMF)

5, Conclusions (Future Changes)

1, Introductory Remarks



- How has the method developed over time ?
 - 1999 mandate from ECOFIN Council to EPC
 - 2001 OGWG report advocated use of PF method
 - EPC / ECOFIN Council Endorsement of method (July 2002 + May 2004)
 - Hours worked (Autumn 2005) + Kalman Filter TFP methodology (Autumn 2010) + NAWRU modification(Spring 2014)
- What is the method used for ?
 - Fiscal surveillance (LR Debt sustainability + SR/MT Structural Balances)
 - Impact of financial crisis (Impact of crisis on long run growth potential)
 - EU's « 2020 » Strategy
 - Annual Growth Survey / « European Semester »
- What is the institutional setup – who are the key actors ?
 - DG ECFIN (Day-to-day operation of method)
 - OGWG (Technical discussions)
 - EPC / Euro Group / ECOFIN Council (Political Endorsement)
- What are the key principles driving the method ?
 - Simplicity
 - Transparency / Equal Treatment
 - Prudent / unbiased estimates



2, Overview of the EU's Common Methodology

Graphical Presentation of PF Method



MEASURING POTENTIAL OUTPUT USING A PRODUCTION FUNCTION APPROACH

COBB-DOUGLAS PRODUCTION FUNCTION

Labour Supply
(Employment * Hours Worked)

Total Factor
Productivity (TFP)

EXTRACTING THE STRUCTURAL COMPONENT

Labour Potential

Working Age Population

Trend
Participation
Rate

Labour Force

NAWRU

Potential Employment

Trend Hours

Potential Labour Supply

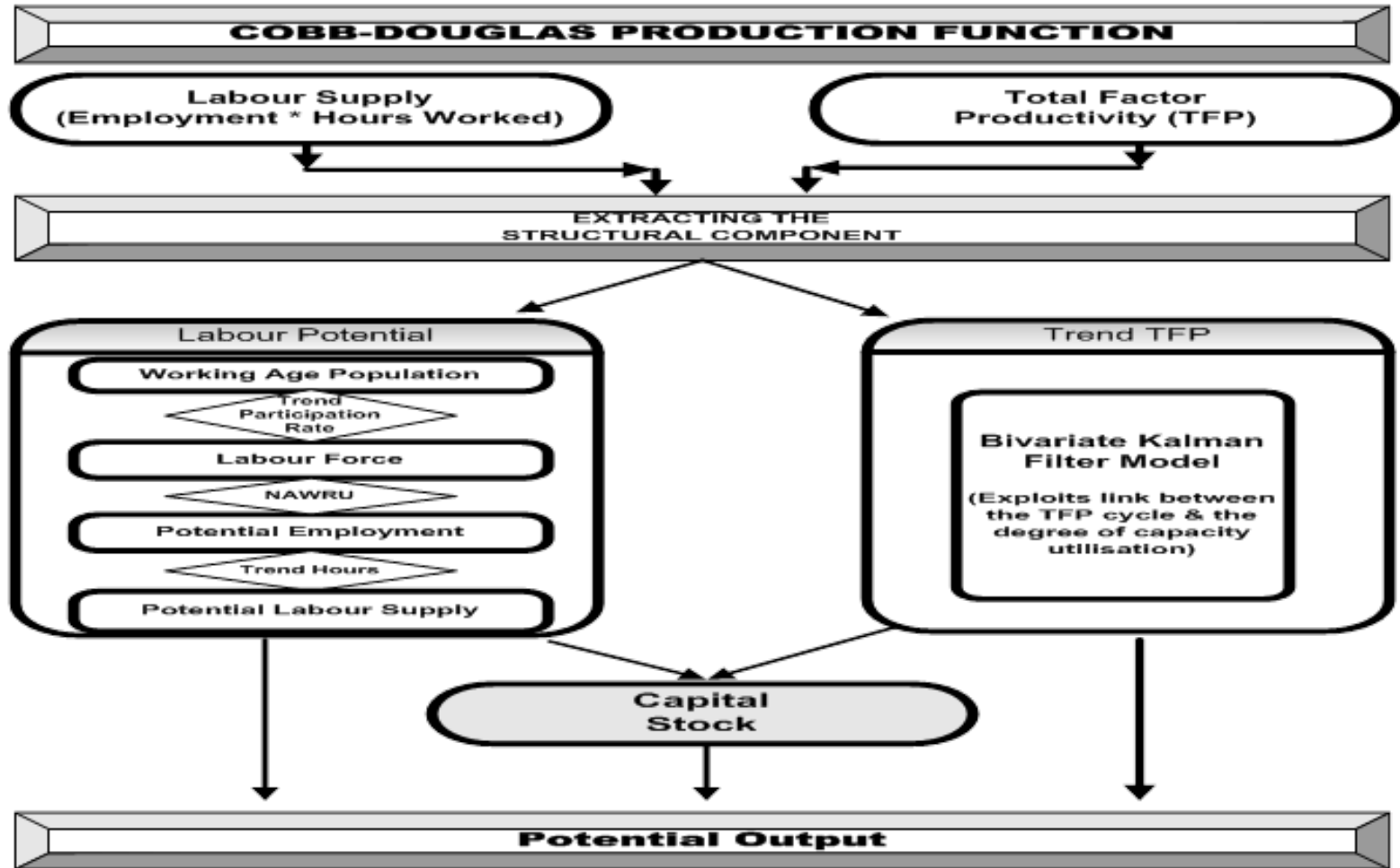
Trend TFP

Bivariate Kalman
Filter Model

(Exploits link between
the TFP cycle & the
degree of capacity
utilisation)

Capital
Stock

Potential Output



Technical Model Specification



EXOGENOUS VARIABLES

- *POPW* - (Population of Working Age)
- *PARTS* - (Smoothed Participation Rate)
- *NAWRU* - (Structural Unemployment)
- *IYPOT* - (Investment to Potential GDP Ratio)
- *SRK* - (Kalman Filtered Solow Residual)
- *HOURST* - (Trend, average hours worked)

ENDOGENOUS VARIABLES

- *LP* - (Potential Employment)
- *I* - (Investment)
- *K* - (Capital Stock)
- *YPOT* - (Potential Output)

1. POTENTIAL LABOUR INPUT

$$LP = (POPW * PARTS * (1 - NAWRU)) * HOURST$$

2. INVESTMENT AND CAPITAL

$$I = IYPOT * YPOT$$

$$K = I + (1 - dep)K(-1)$$

3. POTENTIAL OUTPUT

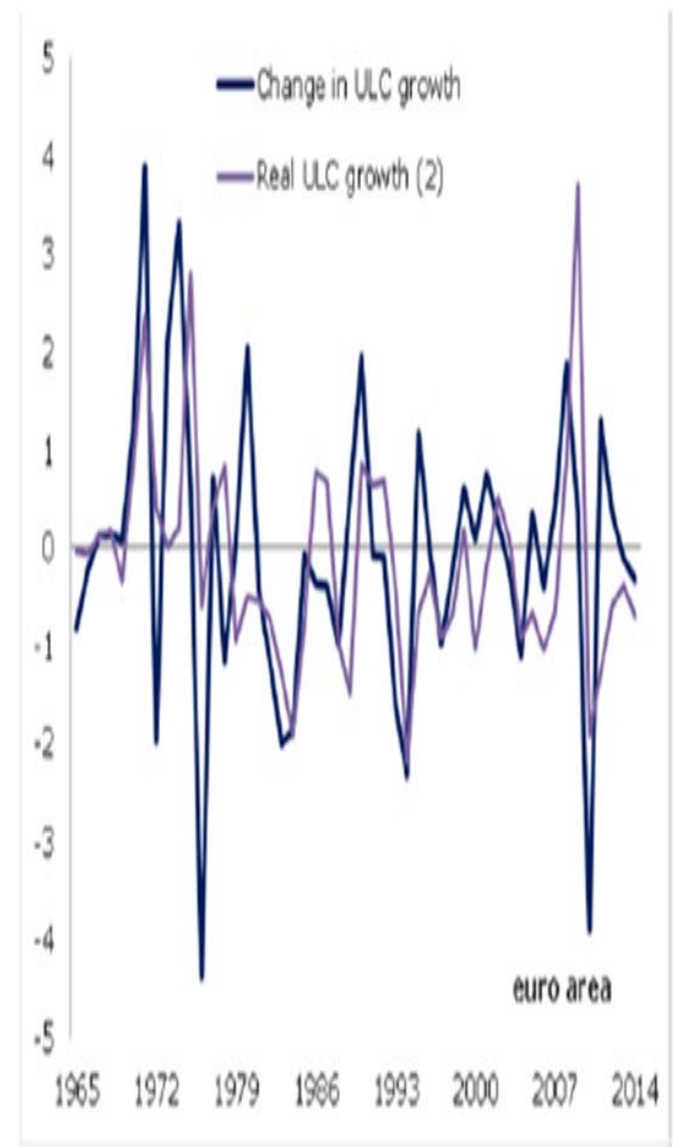
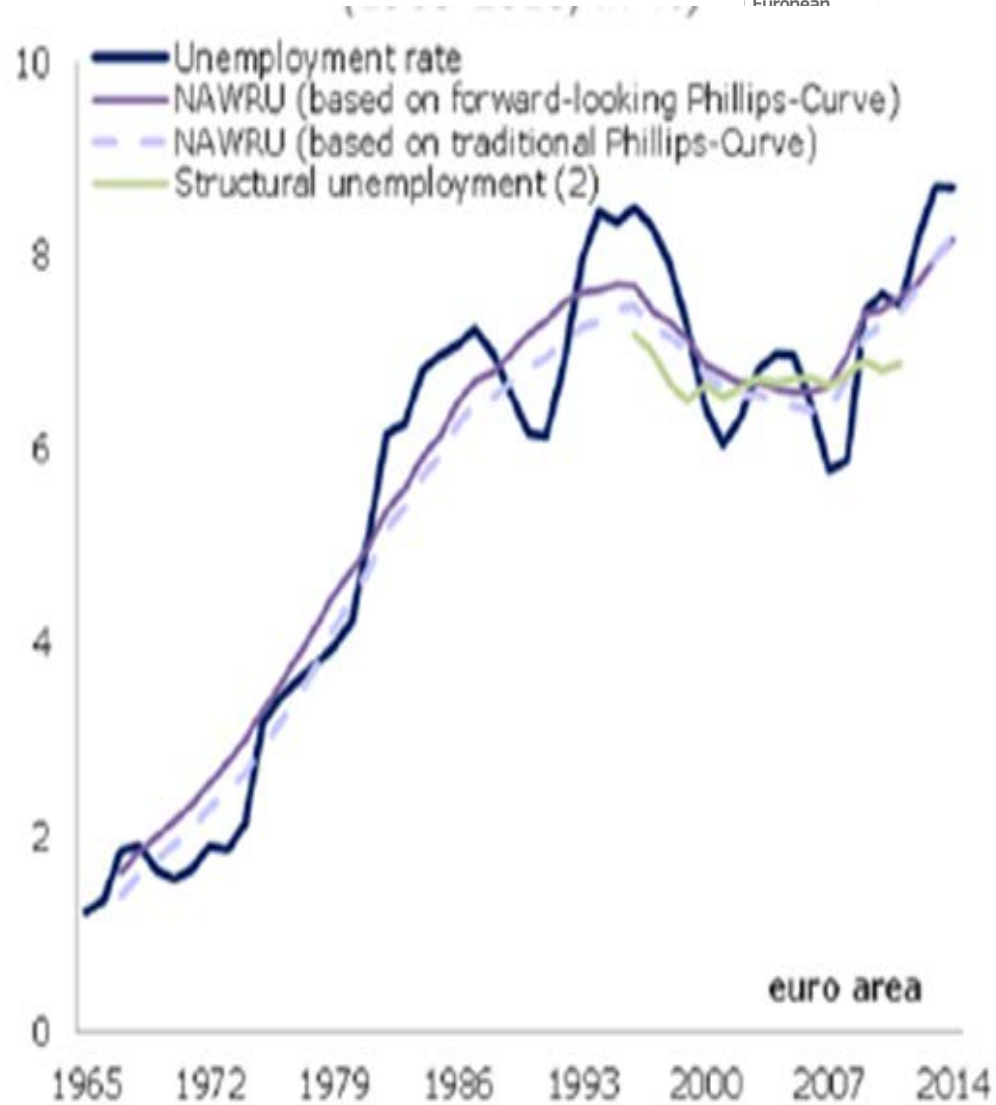
$$YPOT = LP^{.65} K^{.35} SRK$$

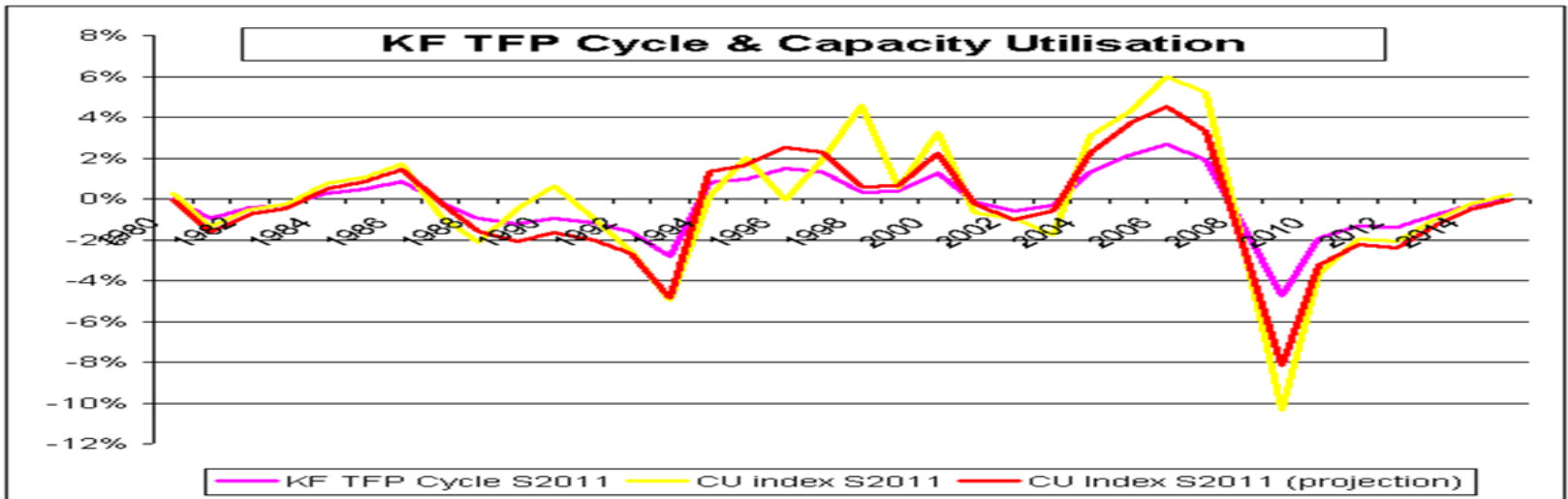
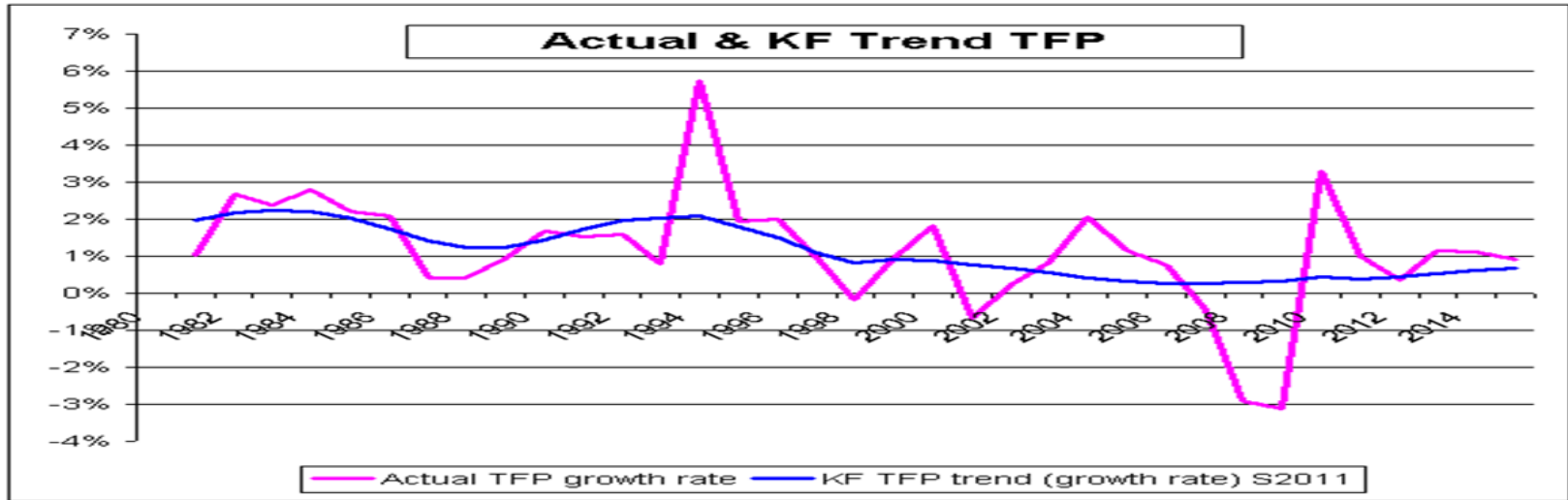
4. OUTPUT GAP

$$YGAP = (Y / YPOT - 1)$$

Closer look at the Euro Area NAWRU

(Unemployment Gap & Change in NULC or RULC)







3, What information is given to Policy Makers

PF Method : Tabular "outputs"



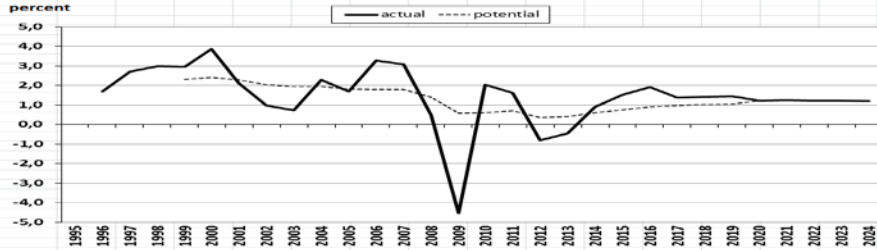
EURO AREA 19	Output Gaps (% of Potential)		Actual Output Growth (annual % change)	Potential Growth (annual % change)		Contributions to Potential Growth*					Determinants of Labour Potential and Capital Accumulation			
	HP Filter	PF method		HP Trend Growth	PF Potential Growth	Total Labour (Hours) Contribution	Labour (persons) Contribution	Changes in Hours (per Empl) Contribution	Capital Accumulation Contribution	TFP Contribution	Growth of Working Age Population (annual % change)	Trend Participation Rate (% of Working Age Population)	NAWRU (% of Labour Force)	Investment Ratio (% of Potential Output)
1999	-0,1	0,7	3,0	2,3	2,3	0,4	(0,7)	(-0,3)	0,9	1,0	0,2	62,6	9,3	22,2
2000	1,5	2,1	3,9	2,3	2,4	0,5	(0,8)	(-0,3)	0,9	1,0	0,3	63,2	9,1	22,7
2001	1,4	2,0	2,1	2,2	2,3	0,5	(0,8)	(-0,3)	0,8	1,0	0,4	63,3	9,0	22,5
2002	0,4	0,9	1,0	2,0	2,0	0,4	(0,7)	(-0,3)	0,7	0,9	0,5	63,7	8,9	21,8
2003	-0,7	-0,3	0,7	1,9	1,9	0,5	(0,7)	(-0,2)	0,7	0,8	0,5	64,0	9,0	21,7
2004	-0,2	0,1	2,3	1,7	1,9	0,5	(0,7)	(-0,2)	0,7	0,7	0,5	64,3	8,9	21,8
2005	0,0	0,0	1,7	1,5	1,8	0,4	(0,6)	(-0,2)	0,7	0,6	0,5	64,6	9,0	22,0
2006	1,9	1,4	3,3	1,3	1,8	0,4	(0,6)	(-0,2)	0,8	0,6	0,4	64,9	8,9	22,8
2007	3,9	2,7	3,1	1,1	1,8	0,4	(0,6)	(-0,2)	0,8	0,5	0,4	65,2	8,9	23,5
2008	3,5	1,8	0,5	0,9	1,4	0,2	(0,4)	(-0,2)	0,8	0,5	0,4	65,5	9,0	23,1
2009	-2,0	-3,4	-4,5	0,7	0,6	-0,2	(0,0)	(-0,3)	0,4	0,4	0,1	65,6	9,3	20,4
2010	-0,6	-2,1	2,0	0,6	0,6	-0,2	(0,1)	(-0,3)	0,4	0,4	0,0	65,7	9,4	20,2
2011	0,4	-1,1	1,6	0,6	0,7	-0,1	(0,2)	(-0,2)	0,4	0,4	0,0	65,7	9,3	20,4
2012	-1,0	-2,3	-0,8	0,6	0,4	-0,3	(-0,0)	(-0,2)	0,2	0,4	0,1	66,2	9,5	19,6
2013	-2,1	-3,1	-0,5	0,7	0,4	-0,2	(0,0)	(-0,2)	0,2	0,4	0,0	66,2	9,7	19,0
2014	-1,9	-2,8	0,9	0,7	0,6	0,0	(0,2)	(-0,1)	0,2	0,4	0,1	66,3	9,7	19,1
2015	-1,3	-2,1	1,5	0,9	0,8	0,1	(0,2)	(-0,0)	0,2	0,4	0,1	66,4	9,8	19,3
2016	-0,4	-1,1	1,9	1,0	0,9	0,2	(0,2)	(-0,0)	0,3	0,4	0,1	66,6	9,8	19,9
2017				1,1	1,0	0,2	(0,2)	(-0,0)	0,3	0,5	0,1	66,8	9,8	20,4
2018				1,2	1,0	0,2	(0,2)	(-0,0)	0,4	0,5	0,1	66,9	9,8	20,7
2019				1,2	1,0	0,1	(0,2)	(-0,1)	0,4	0,5	0,0	67,1	9,8	21,0
2020				1,4	1,2	0,3	(0,3)	(-0,0)	0,4	0,5	0,1	67,2	9,7	21,1
2021				1,3	1,3	0,3	(0,3)	(0,0)	0,4	0,5	0,0	67,3	9,5	21,2
2022				1,4	1,2	0,2	(0,2)	(0,0)	0,4	0,5	-0,1	67,3	9,2	21,2
2023				1,4	1,2	0,2	(0,2)	(0,0)	0,4	0,6	-0,1	67,4	8,9	21,2
2024				1,4	1,2	0,2	(0,1)	(0,0)	0,4	0,6	-0,1	67,4	8,6	21,2
Ave 1999-2007					2,0	0,5	0,7	-0,2	0,8	0,8	0,4	64,0	9,0	22,3
Ave 2015-2024					1,1	0,2	0,2	0,0	0,4	0,5	0,0	67,0	9,5	20,7

PF Method : Graphical "outputs"

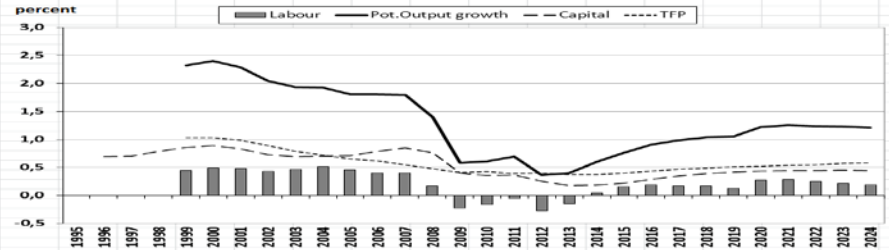


European

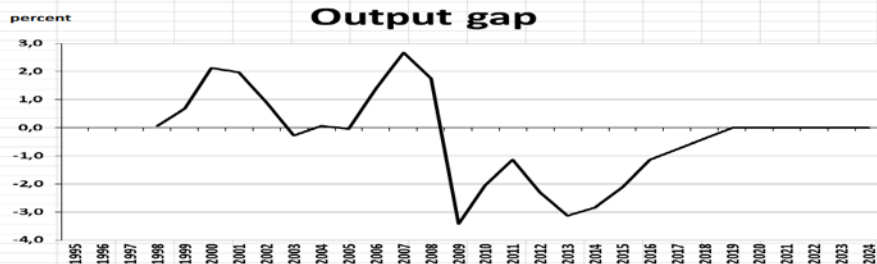
EA19 Output Growth



Contributions to Potential Output



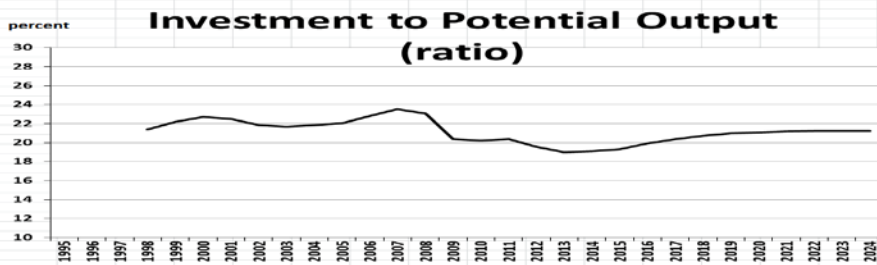
Output gap



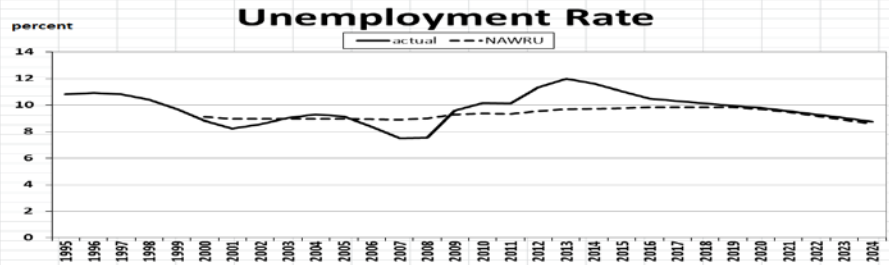
TFP Growth



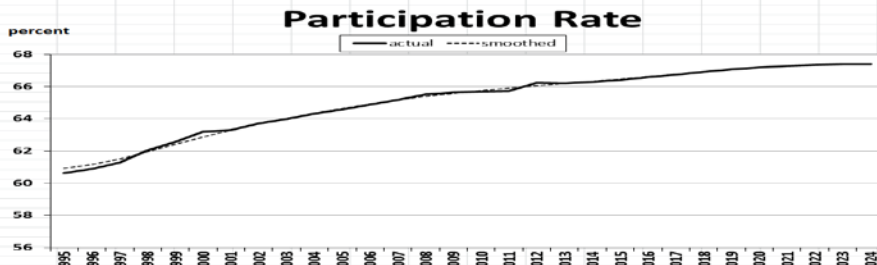
Investment to Potential Output (ratio)



Unemployment Rate



Participation Rate



Population of Working Age





4, How reliable is this information ?



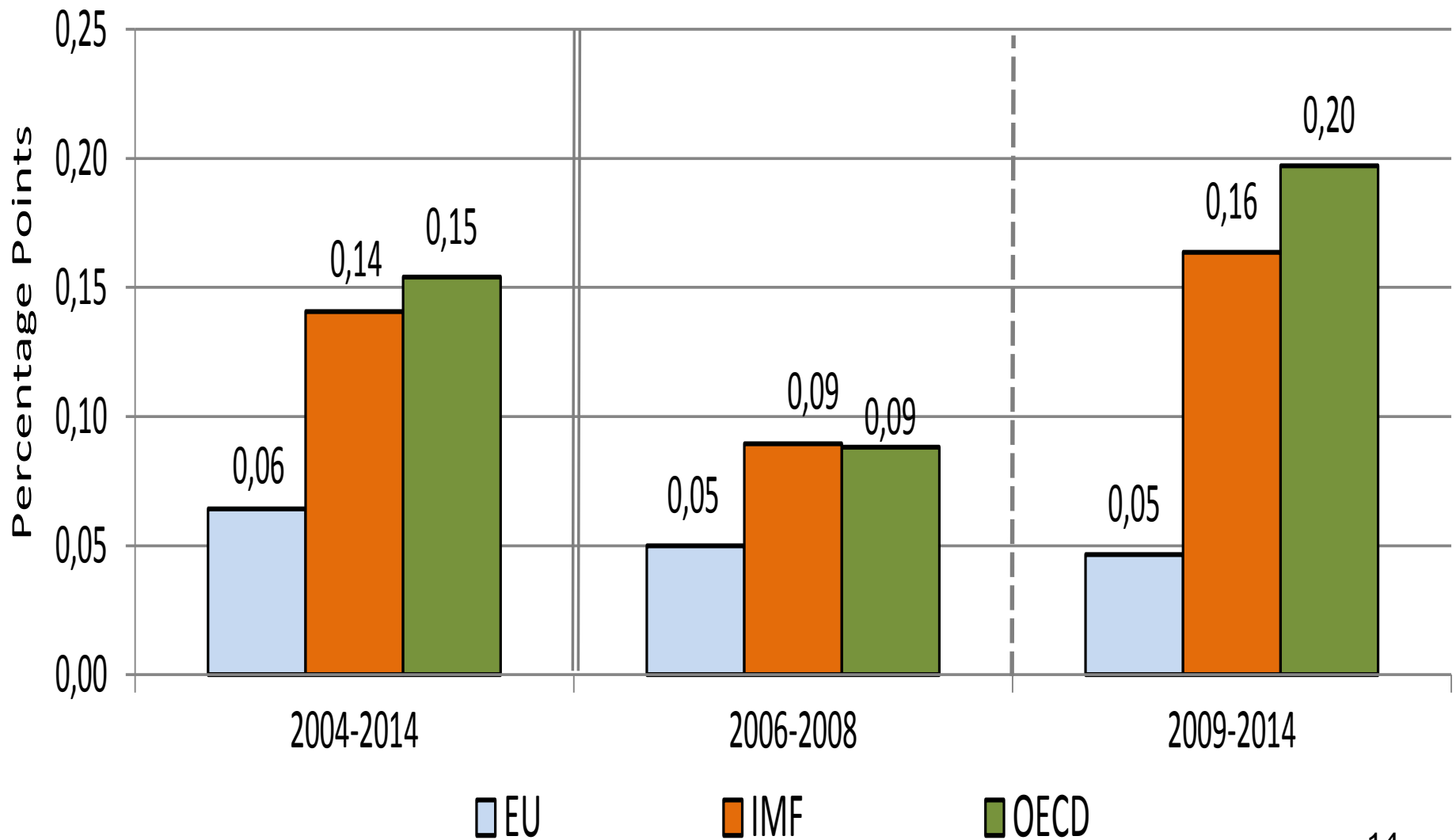
**Are the output gap estimates from the EPC's PF Methodology less stable & less reliable than those of OECD & IMF ?
(Relative performance for EA- 2004-2014)**

**1, Short run stability
(Change in Structural Balance)**

**2, Long Run Real Time Reliability
(Reduce policy errors in real time – 1970's Oil shocks)**

(Data Sources : CIRCABC; successive IMF WEO & OECD EO Databases)

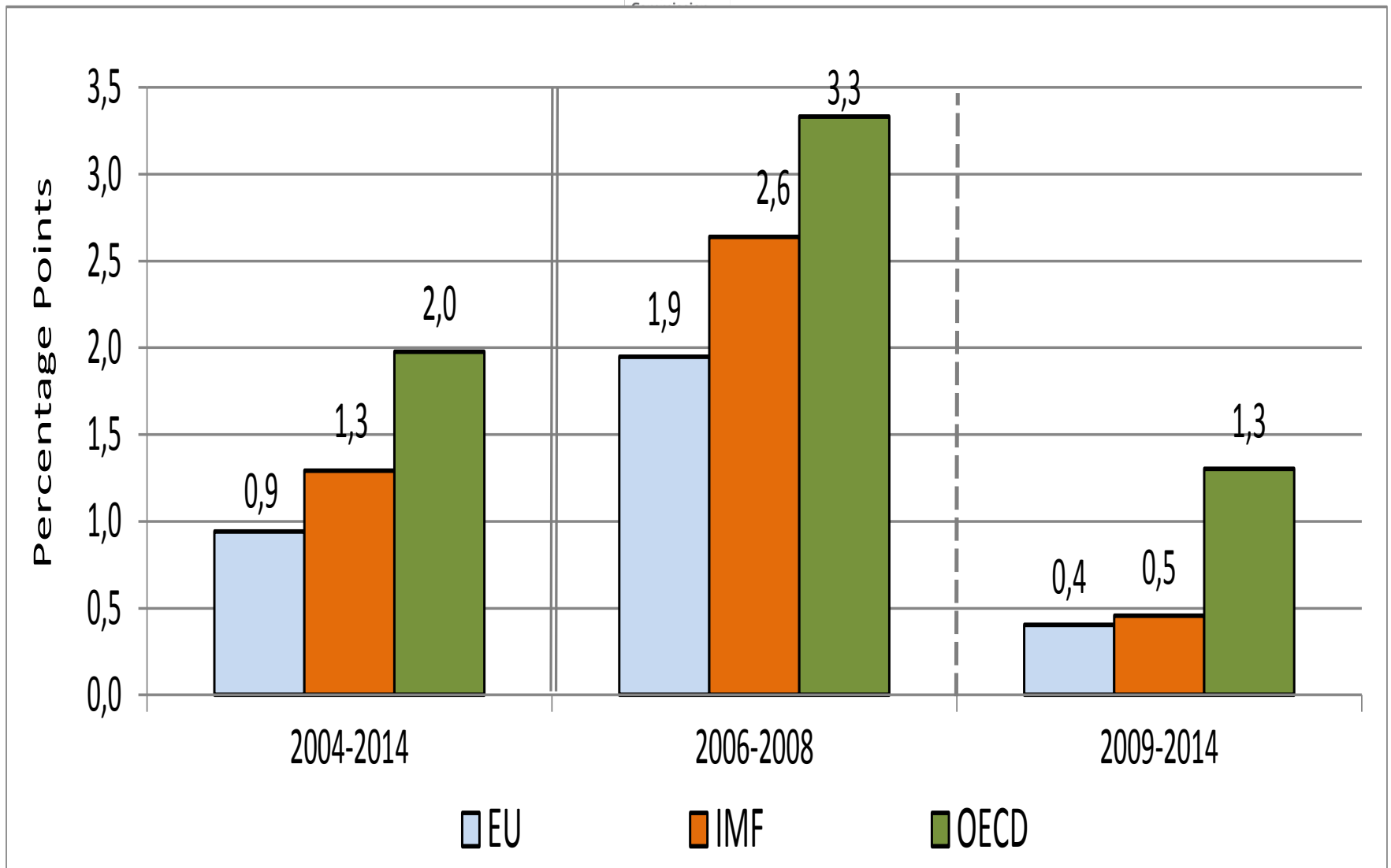
Short Run (Forecast-to-Forecast) Stability (Euro Area) (2004-2014)



Long Run (Real Time) Reliability (Euro Area) (2004-2014)



European
Central Bank



Concluding Remarks (Future Changes)

European
Commission

1, Presentation has provided an overview of the PF methodology which has been developed by the OGWG & endorsed by the EPC / ECOFIN Council

2. **Uncertainty / Revisions will always be a feature of OG calculations but in relative terms, the stability & real time reliability performance of the EU's calculation method has been superior to that of the OECD & IMF methodologies over the period 2004-2014 (+ performance has steadily improved over time -low absolute revisions in the post crisis years).**

3. **Upswing stage of cycles is the ongoing "achilles heel" of all mainstream OG estimation methods ("Good economic times" is where the most significant fiscal & structural policy errors are made)**

4, **Future Changes - Method will always be "Work in Progress" (although the trend is clearly towards greater methodological stability)**

- Individual country experiences (feedback from ECFIN desk officers)
- Alternative specifications / estimation approaches
- New data sources / Developments in literature