Fiscal rules and output gap estimation

The Italian case: key issues and way forward

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Outline of the presentation

- **First part**
  - Stability and Growth Pact: the role of the structural balance.
  - The EU commonly agreed production function
  - Shortcomings of the Common Method (CM)
    - ✓ Revisions and Prociclicality
    - ✓ Economic soundness of the estimates
    - ✓ Italian initiatives at EU level to improve output gap estimates

- **Second part**
  - OGWG
  - NAWRU specification
    - ➢ Italy's proposal: Grid Search
  - TFP specification
    - ➢ Protracted negative trend growth and CUBS issues
  - Medium-term projections
    - ➢ NAWRU anchor

PART I

The Stability and Growth Pact (SGP)

- Stability and Growth Pact (SGP) is a set of rules designed to ensure that fiscal policies of EU Member States are coordinated and able to assure sound public finances, preventing fiscal policies from heading in unsustainable directions or correcting excessive budget deficits or excessive public debt burdens.

- The **preventive arm** of the SGP binds EU governments to reach and maintain, over the cycle, a country-specific budgetary target defined in structural terms, known as Medium Term Objective (MTO). Additional operational guidance to reach or stay at the MTO introduced in 2011: the expenditure rule (upper limit to the net growth of government expenditure).

- The **corrective arm** of the SGP aims to ensure the correction of excessive budget deficits (greater than 3% of GDP) or excessive public debt levels (exceeding 60% of GDP without diminishing at an adequate rate).

The evolution of the SGP: before the crisis

1992

- **MAASTRICTH TREATY IS SIGNED**
- Gov. Deficit<3% of GDP
- Gov. Debt below or converging to 60% of GDP

1997

- **STABILITY AND GROWTH PACT Ver. 1.0**
- Coordination of national fiscal policies to reach the Treaty targets
- Medium term objective for all was deficit close to balance or in surplus (CTBOS)
- Corrective arm for breaching the 3% Deficit Target

2005

- **STABILITY AND GROWTH PACT Ver. 2.0**
- Deficit Targets in structural terms
- Country specific Medium Term Objectives (MTO)
- Tighter link with macroeconomic structural reforms (NRP)
- Streamlined definition of Excessive deficit (corrective arm)

No Output gaps, potential output and structural balance

Commonly agreed production function is used for output gaps and potential output in the preventive arm

The evolution of the SGP: following the crisis

2011

- **STABILITY AND GROWTH PACT Ver 3.0 SIX PACK**
- European Semester
- Preventive arm: expenditure rule (F)
- Significant deviation
- Corrective arm: debt rule (F)
- Transposition in national legislations and constitutions (in IT amendment of art.81 of the Constitution and Law 243/2012)

2013

- **TWO PACK AND FISCAL COMPACT**
- Coordination of national fiscal policies is reinforced
- Draft Budgetary Plans in October
- Increased accountability through the Fiscal councils
- European Commission last word matters
- MTO tightened for high debt Member States

2015

- **FLEXIBILITY OF SGP**
- Convergence to MTO according to cyclical conditions
- Structural reform clause
- Investment clause

OG and potential output relevant for all processes → OG and potential output relevant for all processes → OG and potential output relevant for being entitled to flexibility clauses

The Structural Balance

- Definition of Structural Balance: Cyclically-adjusted General Government balance net of one-off measures

$$SB_t = CAB_t - oneoffs_t$$

- The CAB (% GDP) is the cyclically adjusted budget derived by subtracting from the headline general government balance as percentage of GDP (b) its cyclical component:

$$CAB_t = b_t - \varepsilon \cdot OG_t$$

- The budgetary sensitivity ε is the change in the general government balance as percentage of GDP associated with an additional percentage point of output gap. For Italy ε = 0.54
- The cyclical component is given by the product of ε and the Output Gap (OG), i.e. the distance between the level of actual and potential GDP (in percentage terms)

The required annual fiscal effort

		Required annual fiscal adjustment*	
	Condition	Debt below 60 % and no sustainability risk	Debt above 60 % or sustainability risk
Exceptionally bad times	Real growth <0 or output gap <-4	No adjustment needed	
Very bad times	-4 ≤ output gap <-3	0	0.25
Bad times	-3 ≤ output gap < -1.5	0 if growth below potential, 0.25 if growth above potential	0.25 if growth below potential, 0.5 if growth above potential
Normal times	-1.5 ≤ output gap < 1.5	0.5	> 0.5
Good times	output gap ≥ 1.5 %	> 0.5 if growth below potential, ≥ 0.75 if growth above potential	≥ 0.75 if growth below potential, ≥ 1 if growth above potential

* all figures are in percentage points of GDP

- The estimate of the Output gap at t+1 is a proxy of the cyclical conditions of a MS and determines the fiscal effort, expressed as a change in the structural balance to comply with the SGP and converge to the MTO.

Compliance with the Preventive Arm

- **Ex ante assessment**: compliance for year t, based on forecast data.
- **Ex post evaluation**: compliance with the previous year (t-1) requirement. Based on outturn data. It triggers the Significant Deviation Procedure.

- Significant deviation if:
  a. MTO: for a Member State is not at MTO, the deviation from the path of adjustment in the structural balance is at least 0.5 percentage points in a single year; 0.25 p.p. on average over a two-year period;
  b. Expenditure benchmark: growth rate in expenditure exceeds benchmark by 0.5 p.p. in one year or 0.25 p.p. on average in two consecutive years.

- **In case of noncompliance**, in-depth analysis by the Commission taking into consideration all relevant factors.

Potential output and the output gap

- The OG is the difference between the level of GDP and its potential (as a percent of potential output).
- Before 2002 the official methodology for the estimation of the output gap was the Hodrick-Prescott filter
- The July 2002 ECOFIN Council endorsed the use of the production function (PF) approach as the reference method for the calculation of output gaps when assessing the Stability and Convergence Programmes (SCP).

The production function approach

- Production function to estimate potential output, an approach (commonly agreed at EU level)

$$Y_t = L_t^{\alpha} \cdot K_t^{1-\alpha} \cdot TFP_t$$

- Cobb-Douglas-type PF with constant return to scale on capital (K) and labour (L). TFP is total factor productivity, i.e. the contribution of technical progress to growth.
- α is the output elasticity w.r.t labour coincident to the wage share.
- Potential output is obtained by replacing K, L and TFP with their potential utilisation values as such
- The output gap is then derived as:

$$OG_t = \left[\left(\frac{Y_t}{Y_t^{Pot}} \right) - 1 \right] \cdot 100$$

Estimation of Output gaps – TFP contribution to potential

- Technical progress (TFP) is assumed to be propagated in a neutral way through qualitative improvements both in labour and capital inputs.

$$TFP_t = (E_L^{\alpha} E_K^{1-\alpha})(U_L^{\alpha} U_K^{1-\alpha})$$

- TFP sums up both the level of efficiency of labour and capital inputs and their degree of utilisation.
- TFP decomposition into a trend P and a cycle C such that TFP = P × C with:

$$P = (E_L{}^{\alpha}\, E_K{}^{1-\alpha})$$

Estimation of Output gaps – Capital contribution to potential

- Potential capital stock, measured by the perpetual inventory method, corresponds to its actual value

- Potential capital stock is assumed equal to real capital stock

- The capital is extrapolated in the out-of-sample period according to a given profile of productive investment (estimated through an AR(2) process) and assuming a constant depreciation rate.

Estimation of Output gap: Labour contribution to potential

- Potential labour (LP) is achieved by smoothing a set of exogenous variables over the historical sample and over a medium-term extension period (usually 5y = 2y forecasts + 3 y of technical extrapolation).

$$LP_t = PARTS_t * POPW_t * HOURST_t * (1 - NAWRU_t)$$

- PARTS is the trend component of the participation rate obtained by Hodrick-Prescott (HP) filter. The partecipation rate is extended out of sample using an AR process.
- POPW is the working-age population, extrapolated out of the sample period using the most recent Eurostat population projections.
- HOURST is the trend of average hours worked per employee obtained by Hodrick-Prescott (HP) filter. The hours worked series is extended out of sample using an ARIMA process.
- NAWRU is the non-accelerating wage rate of unemployment.

Critical features of the Common Methodology (CM)

Crucial

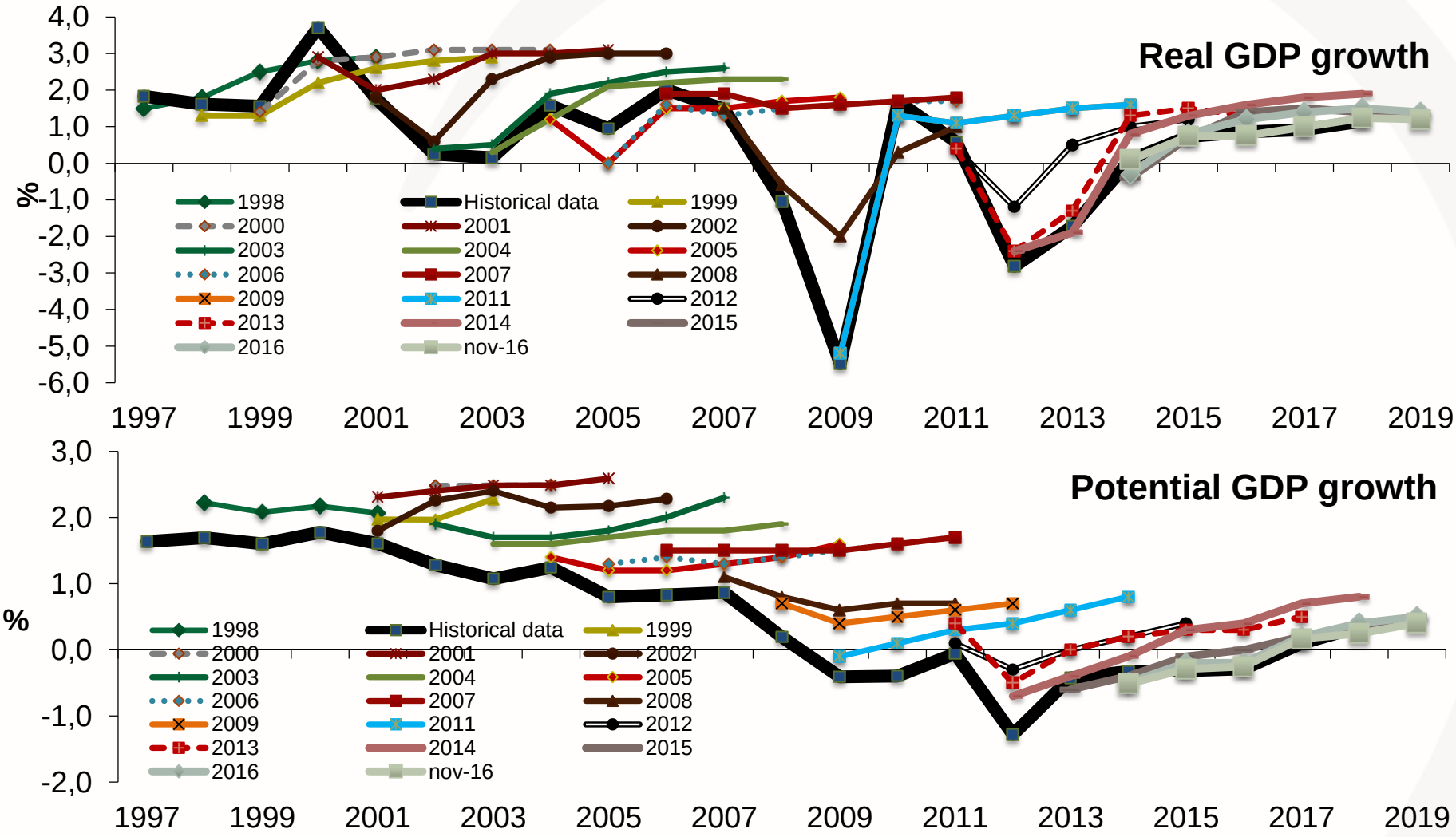
- Size (and sign) of Output Gap
- Speed of closure (for negative OG) and of widening (for positive OG) => growth rate of potential GDP vs headline GDP
- Revisions and Prociclicality
- Effect of reforms is only indirectly captured

On more technical ground

- NAWRU
- TFP
- Treatment of structural labour market reforms
- Lack of plausibility over the forecast period

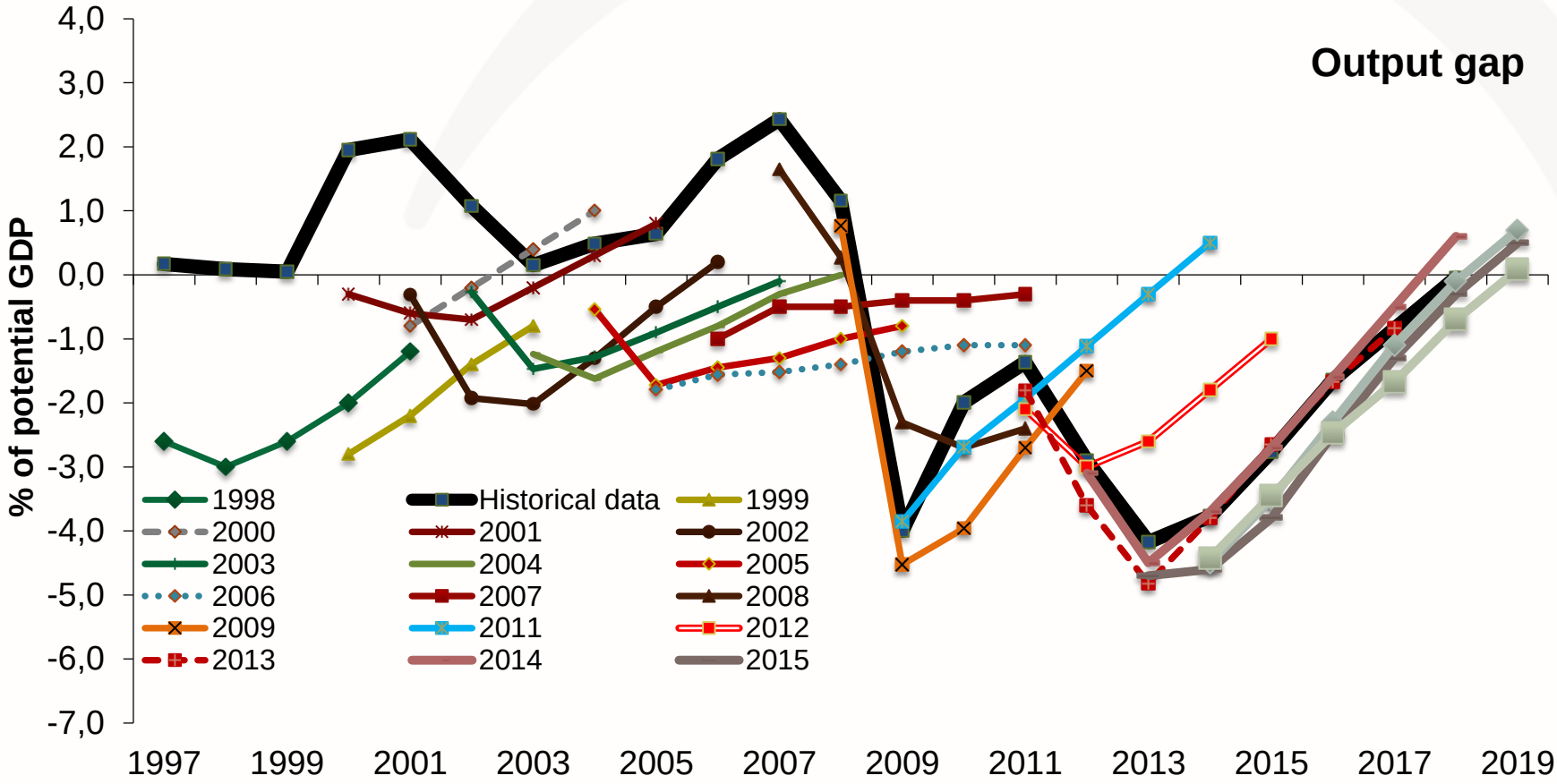
…. estimation problems have worsened since the double recession

Putting forth Italy's case: procyclical revisions



Source: AMECO database for historical data; Italy's Stability Programmes

Output gap revisions: lack of historical consistency

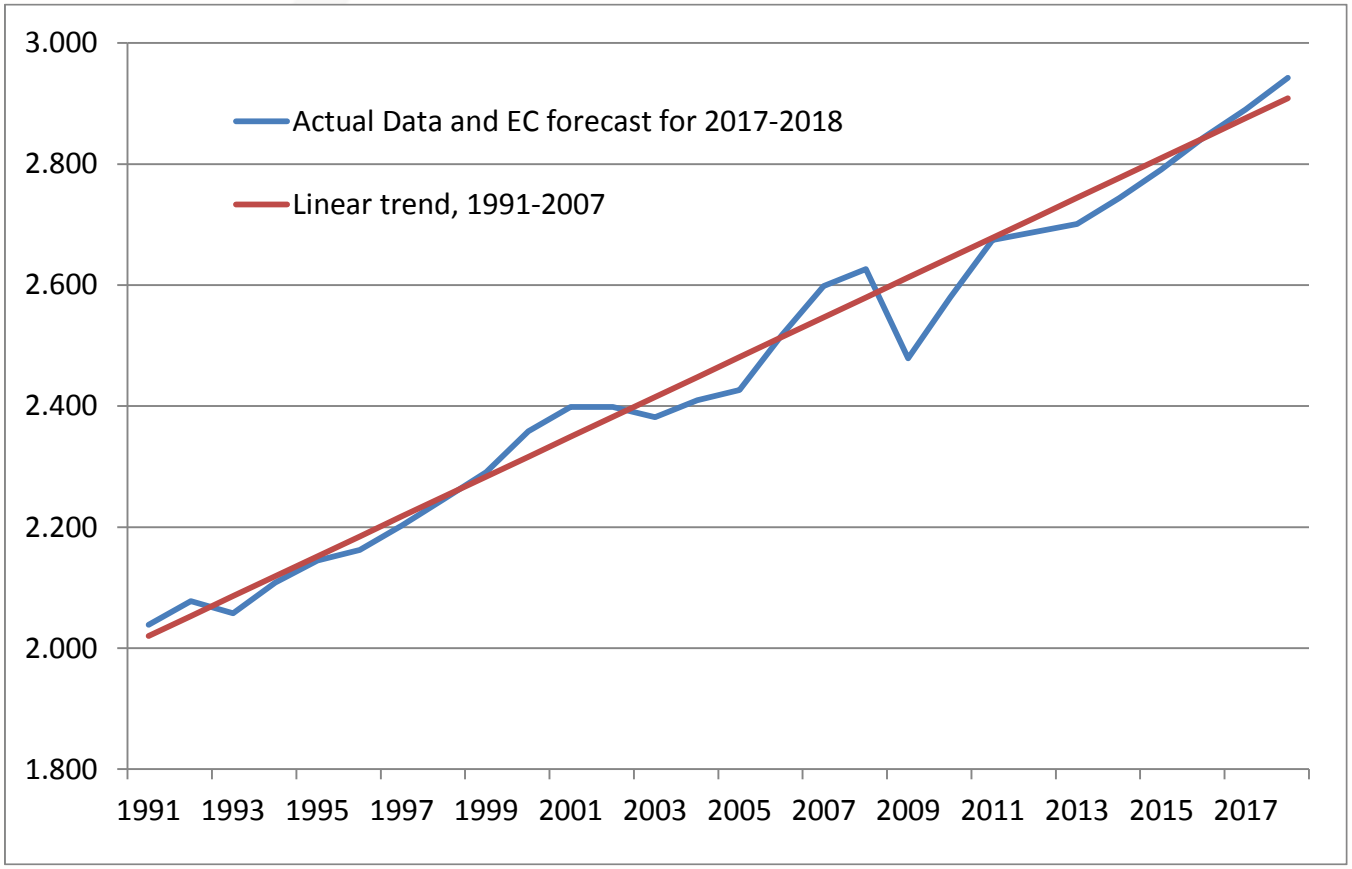


Source: AMECO database for historical data; Italy's Stability Programmes

- Pre-crisis boom is an artifact
- Procyclical revisions in potential output growth are due to the drop in real GDP growth

The pre-crisis trend 'fits' the German data quite well...

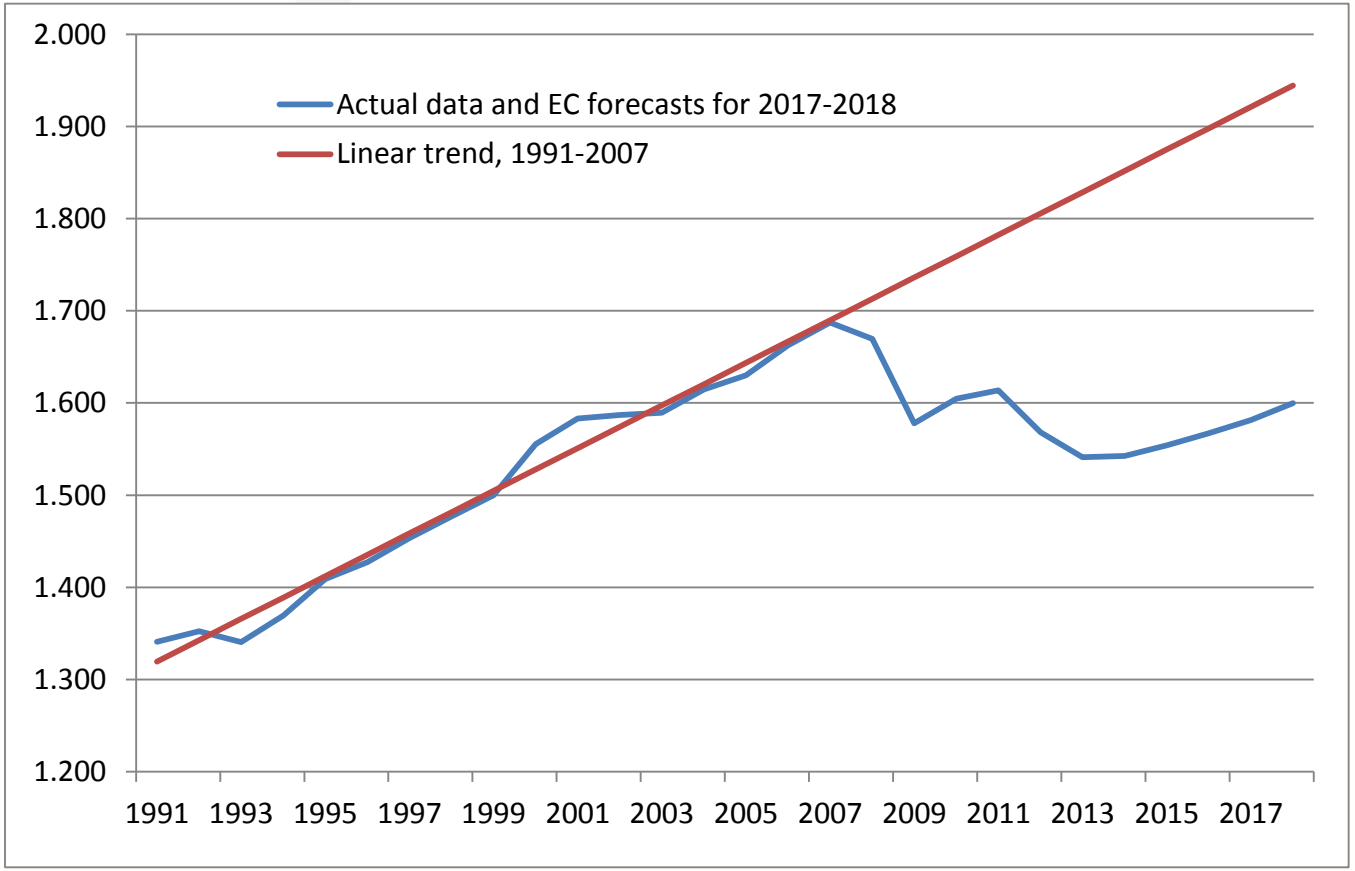
Real GDP, chain-linked at 2010 prices



Source: AMECO database, author's estimates.

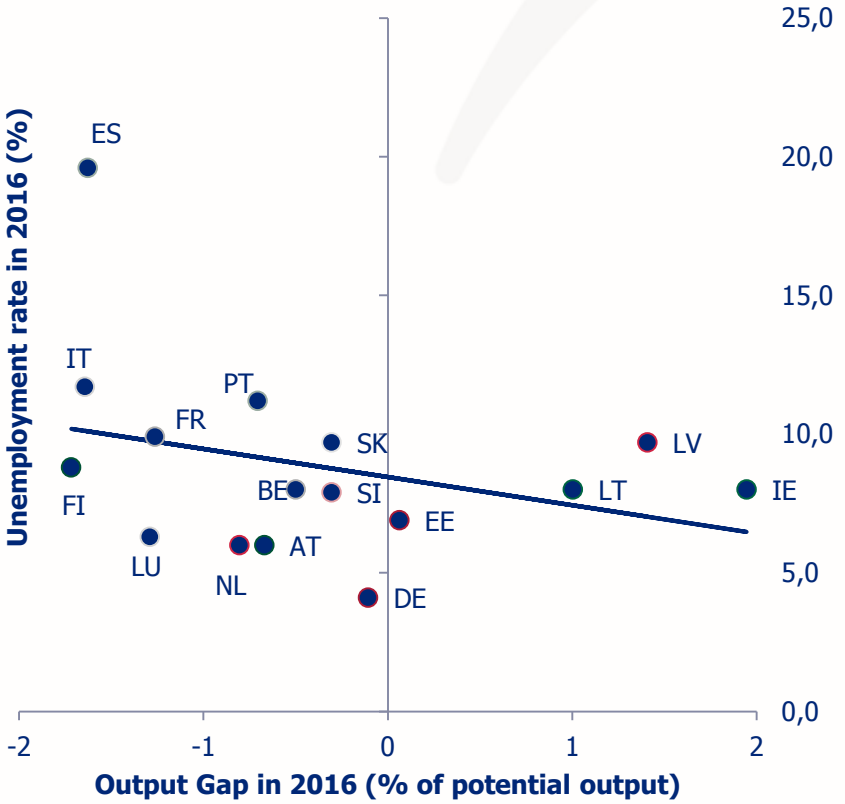
...but exposes methodological issues in Italy's case

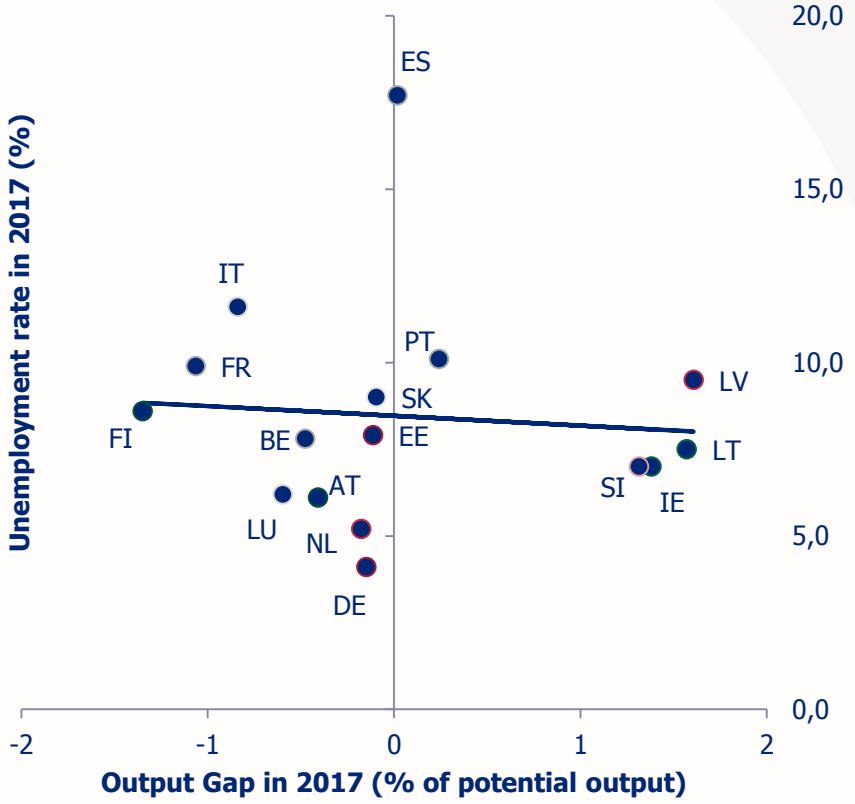
Real GDP, chain-linked at 2010 prices



Source: AMECO database, author's estimates.

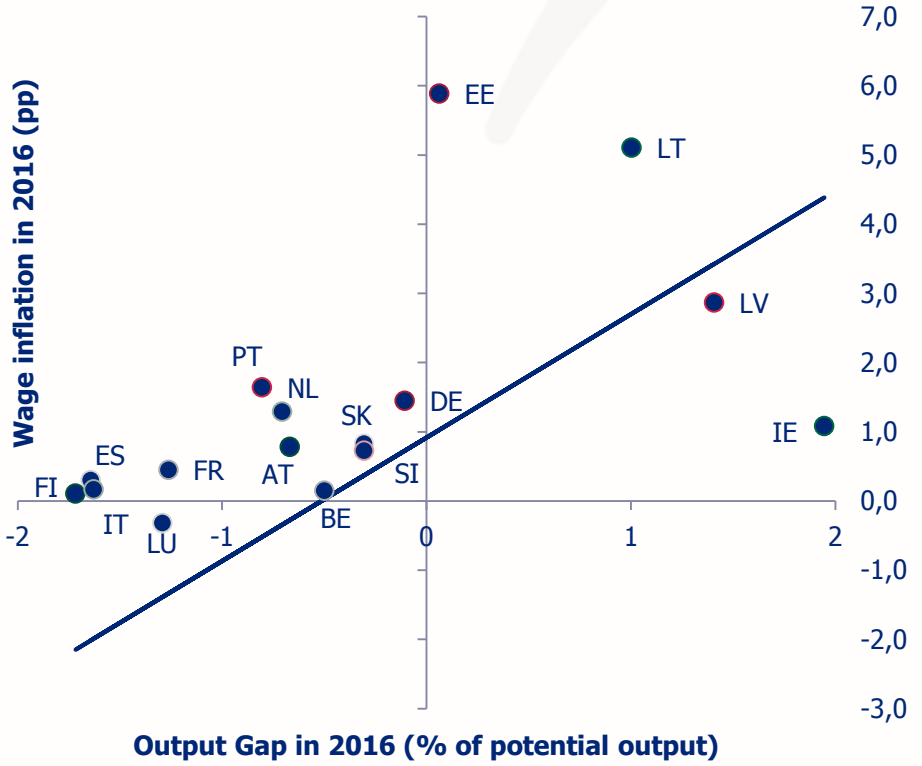
Macroeconomic intuition: output gap vs. unemployment rate

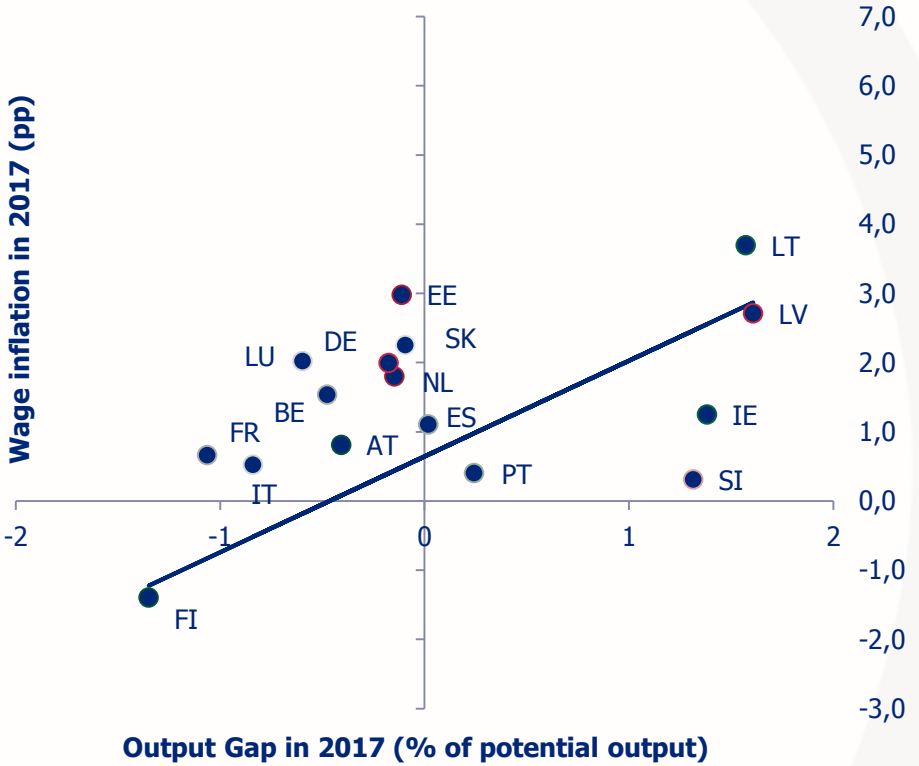




- Output gap estimates are uncorrelated with the unemployment rate

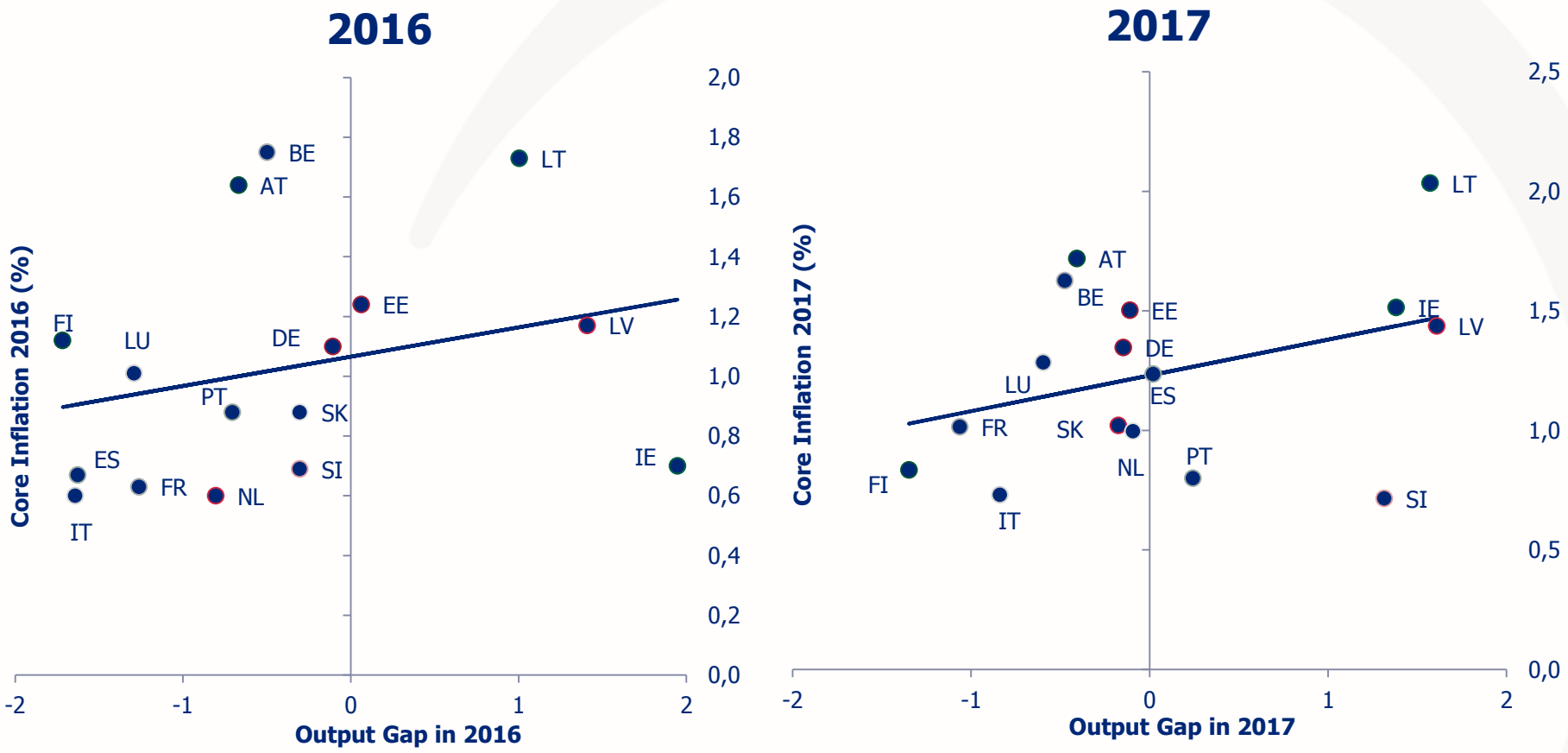
Output gap vis-à-vis wage inflation





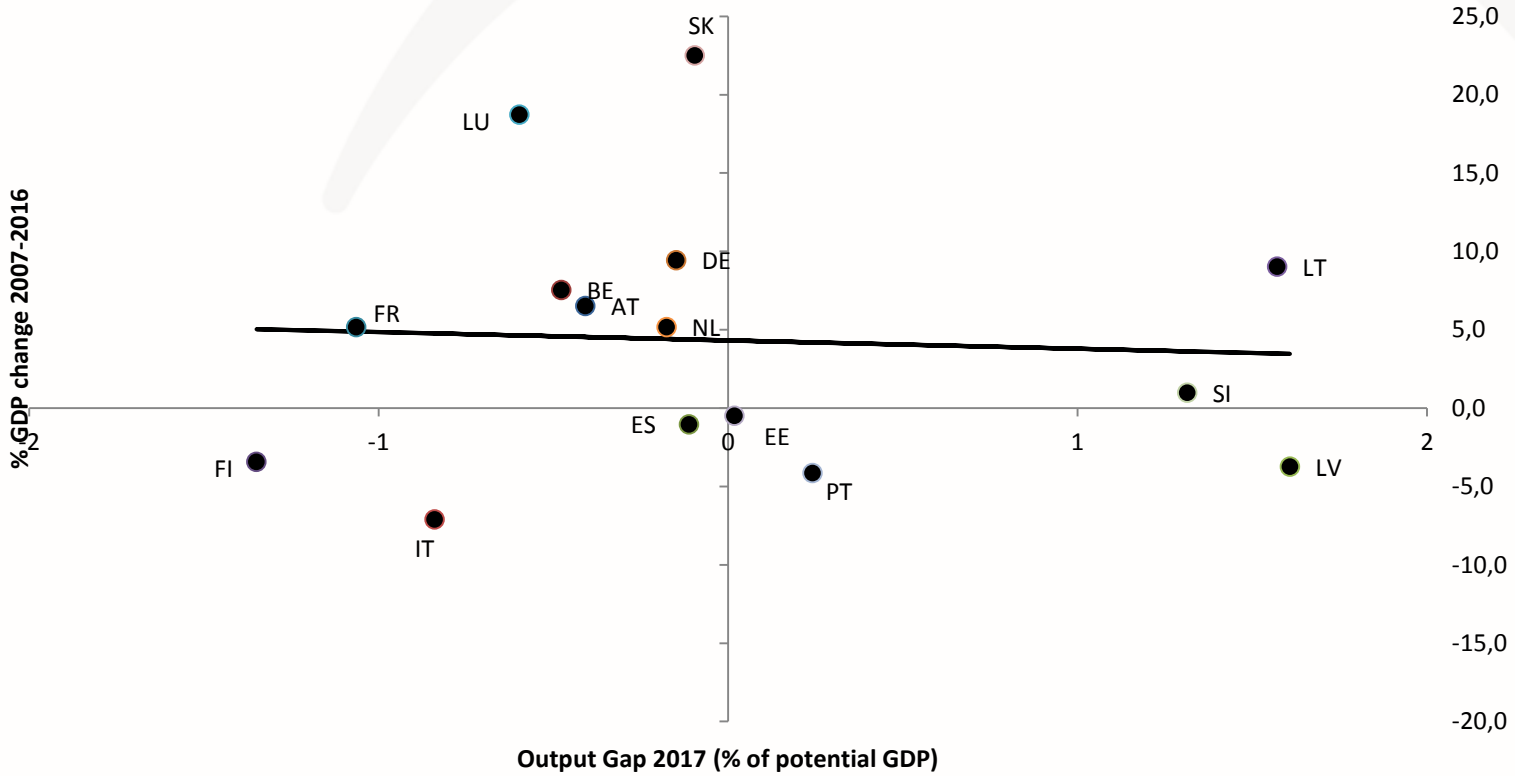
- Huge cross country heterogeneity of MS output gap vs wage inflation (COM forecasts)
- Correlation vanishes if exclude LT and LV

Output gap vis-à-vis core inflation



- Huge cross country heterogeneity of MS output gaps vs OECD core inflation in 2016 and 2017
- Correlation virtually disappears if we omit a few small countries

Output gap in 2017 vis-à-vis post-crisis GDP loss (2007-16)



- Member states which experienced the largest GDP loss in 2007-2016 are also those with smallest or even positive OGs.
- MS with higher GDP gains are those with larger negative OGs

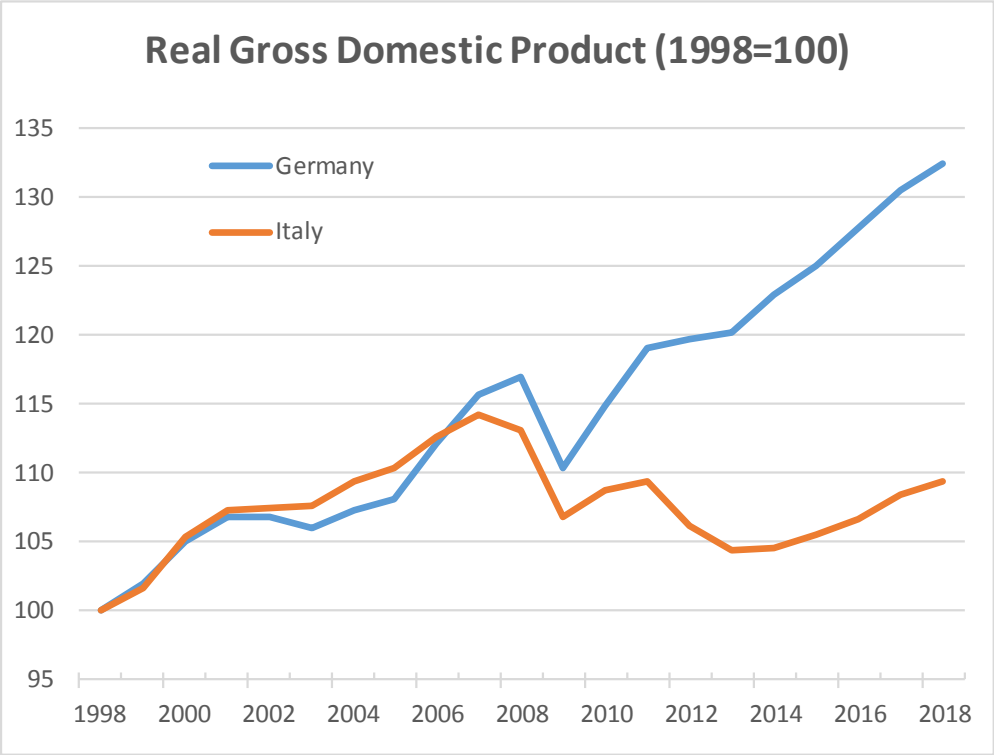
Outcome of discussions within Output Gap Working Group

- Efforts of Italian and like-minded delegations within the OGWG and bilateral dialogue lead to broad acknowledgement of procyclicality problem and lack of macroeconomic intuition
- German delegation proposes plausibility test, which, however, suffers from shortcomings.
- In 2017, revised plausibility test flags Italy as one of the member states for which the OG estimates are not fully plausible and country-specific modifications may be considered.
- OGWG ultimately endorses two changes proposed by the Italian delegation (grid search for NAWRU and CUBS indicator for services) but rejects the most impactful one (using CIG data in the TFP estimation).
- European Commission revises up Italy's potential output by half of a percent

Key issues remain

- Following the 2018 slowdown and as a result of lower projections for 2019 and 2020, Commission has revised down Italy's potential growth rate, to 0.3% for this year and 0.5% for 2020.
- Italy's projected OG is -0.3% for this year and -0.1% for 2020. Germany's levels are almost identical, -0.2% for this year and -0.1% for 2020!
- The Commission's estimate implies that from the standpoint of the preventive arm of SGP, Italy is in normal times as long as real GDP growth is positive.
- According to the government's estimates, Italy in 2019 will be in 'bad times' as a result of an output gap exceeding -1.5 percentage points and a growth rate below potential.
- Required adjustment in the structural balance would be 0.25 instead of 0.6 p.p.
- Key factors explaining the difference in OG estimate: T+4 vs. T+2; different macroeconomic forecasts; priors for TFP estimation.

Having said all that, the data speak for themselves…



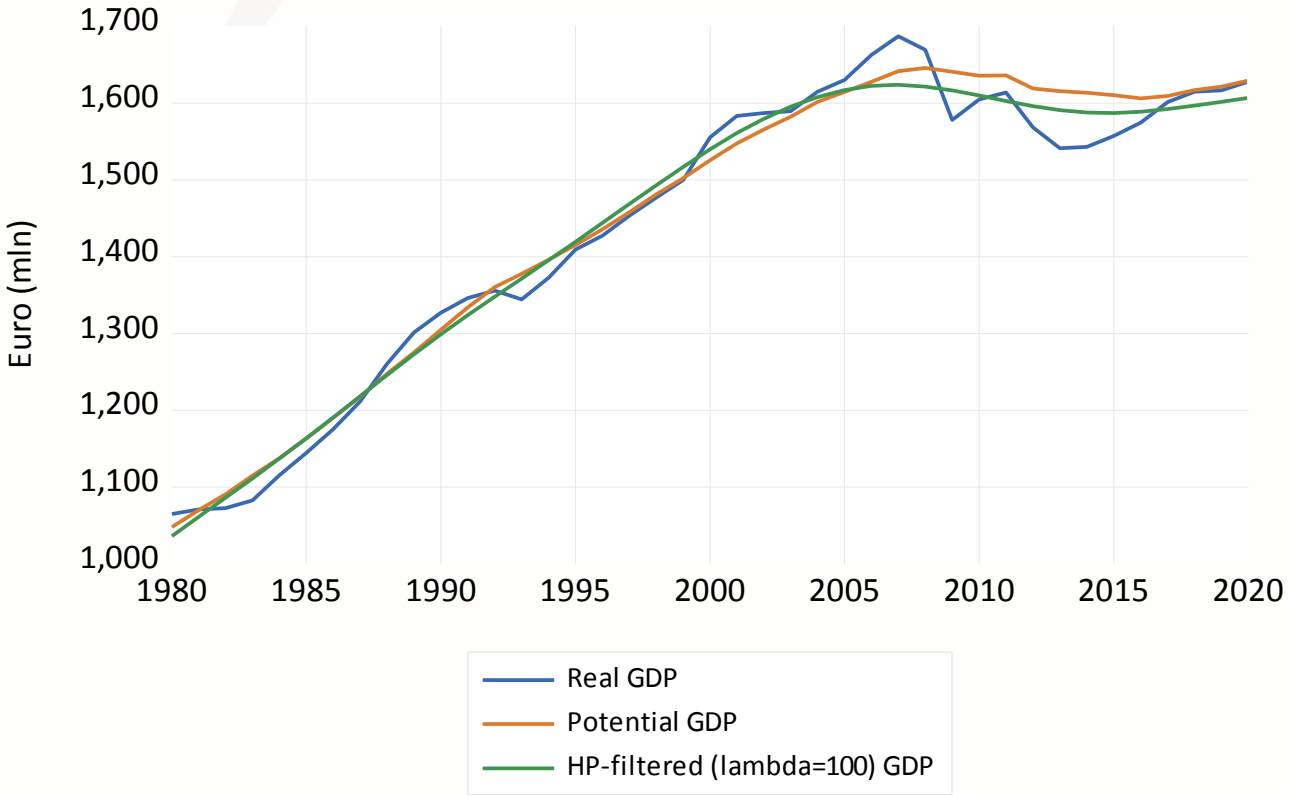
Source: Author's computations on Eurostat data

Real GDP growth rates

	ITA	GER
Average 1999-2007	1,5%	1,6%
Average 1999-2018	0,5%	1,4%
Trimmed 1999-2018 average	0,8%	1,8%
EC pot. growth est. 2020 (SF 2019)	0,5%	1,4%
EC pot. growth est. 2020 (AF 2018)	0,8%	2,0%

Source: European Commission, author's computations on Eurostat data

… even though size of output gap matters!



PART II

Output Gap Working Groop (OGWG)

- **Mandate and composition**

- **Guiding principles concerning the methodology**

  Simple, fully transparent and stable

  Equal treatment while recognizing country-specific characteristics

  Unbiased assessment while aiming to include the effect of structural reforms

  Limiting the pro-cyclicality

- **Annual work program endorsed by EPC**

- **Revision Policy**

- **Procedure to deal with country-specific issues**

NAWRU specification

- NAWRU is estimated through a Kalman filter. The observed unemployment (U) series is decomposed into a trend (NAWRU) and a cyclical component (C)
- The trend component is modelled as a random walk with drift. The cyclical component is obtained via a Phillips curve which regresses the change in wage inflation on cyclical unemployment
- Since 2015 could choose between the Traditional Phillips curve (TKP) curve vs New-Keynesian Phillips curve (NKP)
  - Rational expectations: NKP. The indicator for unemployment cyclicality is the growth rate of real unit labour cost
  - Adaptive expectations: TKP. The indicator for unemployment cyclicality is the growth rate of unit labour cost as the indicator for unemployment cyclicality
- 21 MS use the NKP specification, 7 MS (including Italy) use the TKP specification

NAWRU specification for ITALY

- TKF specification
- The cyclical component C_t (unemployment gap) follows an autoregressive process of second order

$$U_t = N_t + C_t$$
$$N_t = N_{t-1} + \rho_{t-1} + \varepsilon_{1t}$$
$$\rho_t = \rho_{t-1} + \varepsilon_{2t}$$
$$C_t = \delta_1 C_{t-1} + \delta_2 C_{t-2} + \varepsilon_{3t}$$
$$\Delta W_t = \alpha + \beta_1 C_t + \beta_2 C_{t-1} + \beta_3 C_{t-2} + \varepsilon_{4t}$$
$$with \quad \varepsilon_{it} \cong N\left(0, var(\varepsilon_{it})\right) \quad i = 1..4$$

- Since AF2016 new approach. Model run until t+10, NAWRU estimates converge at t+10 to the level of structural unemployment (the so-called “anchor”).
- Slight implications for real time NAWRU estimates

NAWRU, main issues under the current specification

Estimates suffer from several drawbacks:

a) excessive prociclycality

b) high relevance of discretionary variance bounds

c) exogenous variables for the Phillips curve are not significant for Italy

d) lack of statistical robustness and extremely low β coefficients for the Philips curve

e) no explanatory variables in the Philips curve

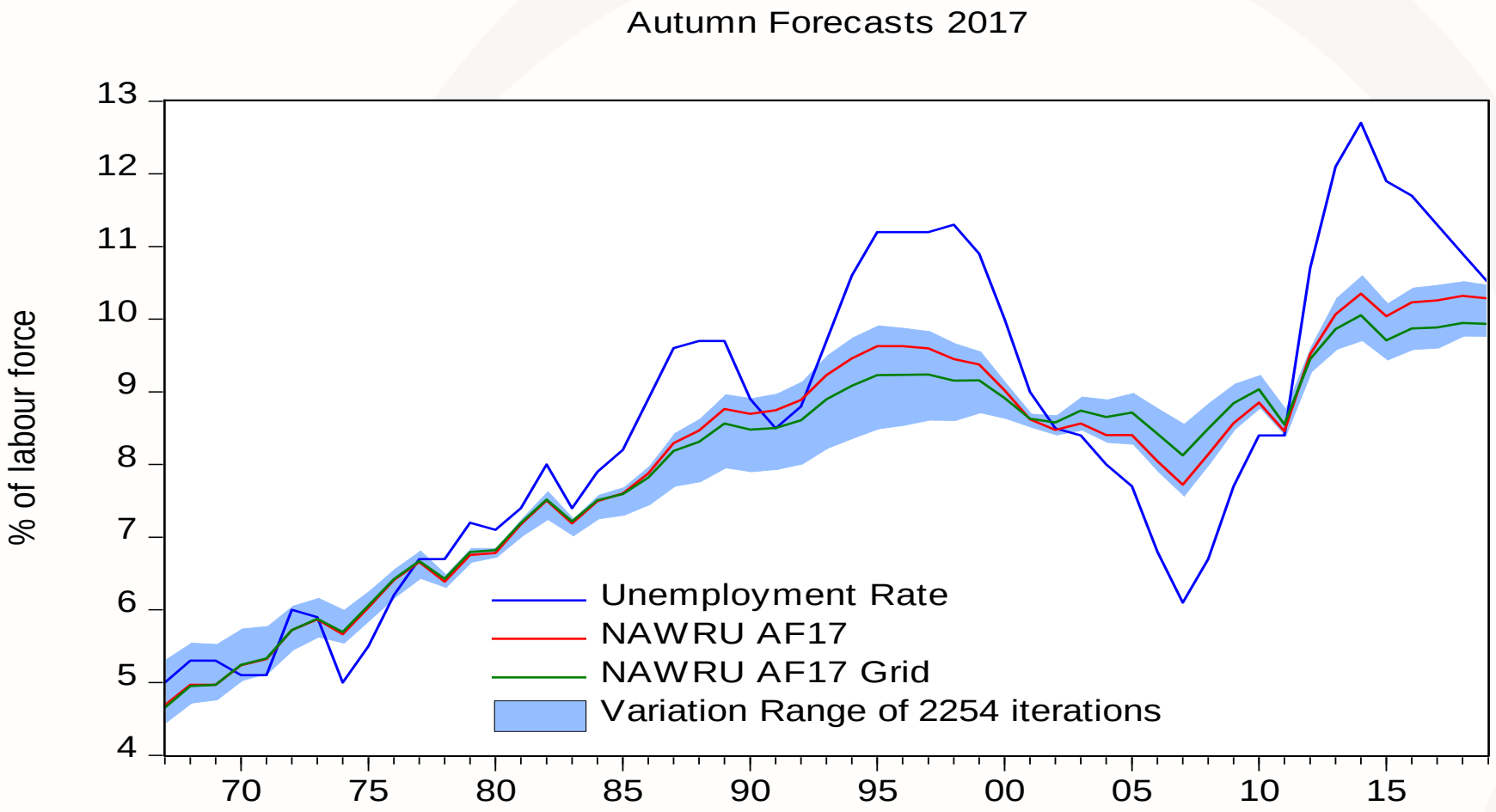
f) 2015-2018: increasing NAWRU despite decreasing UR

Italy's proposal: GRID Search

- The Commission chooses initial variance bounds for the NAWRU (ε_1, ε_2, ε_3) in a judgmental fashion.
- Case for prociclicality if bounds are systematically reached and systematically revised downward (which was the case for IT)
- The use of a Grid search procedure can reduce it
- A large number of replications of the NAWRU model are carried out, then the estimate considered "optimal" from a statistical point of view is selected on the basis of a hierarchy of criteria.
- Taking as a reference the values of the bounds identified by the Commission for the round of forecast preceding the current one, a convenient set of intervals is built around such parameters ⟶ thousands of different NAWRU estimates are obtained. F

  Proposal endorsed for Italy under the country specific revision procedure. Under evaluation for other Member Countries

Grid search Results



- Using the NAWRU derived on the basis the Grid search for estimating potential GDP, the output gap widens on average by 0.3 percentage points with respect to the Commission's official results

Remaining issues

- Philips curve
  - Additional exogenous explanatory variables in the equation (e.g. labour productivity, terms of trade …)
  - Additional/alternative proxies for labour market tightness

- More effort on the structural rate of unemployment (see later)

Estimation of TFP trend

- In the Common Method (CM), technical progress (TFP) is assumed to be propagated in a neutral way (Harrod neutral) through qualitative improvements both in labour and capital inputs.
- Where EL and E_K are the efficiency levels and U_L and U_K the Capacity Utilisation indexes.

$$TFP_t = (E_L^{\alpha} E_K^{1-\alpha})(U_L^{\alpha} U_K^{1-\alpha})$$

- Trend TFP is obtained through a a bivariate Kalman Filter (KF) model applied to the Solow Residual
- Trend TFP (P) is separated from the cyclical component (C) by applying a Bayesian estimation technique to the bivariate model in a state-space specification
- which exploits the link between the TFP cycle and the degree of capacity utilization in the economy

TFP specification; a proxy for capacity

- Capacity utilisation of the Capital component UK is measured using two type of indicators: the Capacity Utilization Indicator (CUI), which is available for manufacturing only, and the Business Survey Capacity Indicator (BS) collected for the construction and services sectors
- The official methodology currently uses the Capacity Utilisation Index (CUBS) as a proxy for U_K , CUBS is a weighted average of CUI and BS.
- It is assumed that total capacity C and U_K are significantly correlated.
- As for U_L, the average hours worked per employee contain some cyclical movements, so the link with labour utilization should be somewhat looser.
- If the fluctuations in the degree of labour hoarding are not captured by the hours worked series, a correlation between labour and capital utilization may nevertheless be present.

TFP specification and main issues

$$tfp_t = p_t + c_t$$

$$u_t = \mu_U + \beta c_t + e_{Ut}$$

$$e_{Ut} = \delta e_{Ut-1} + a_{Ut} \qquad \mathrm{V}(a_{Ut}) = V_U$$

$$\Delta p_t = \mu_{t-1}$$

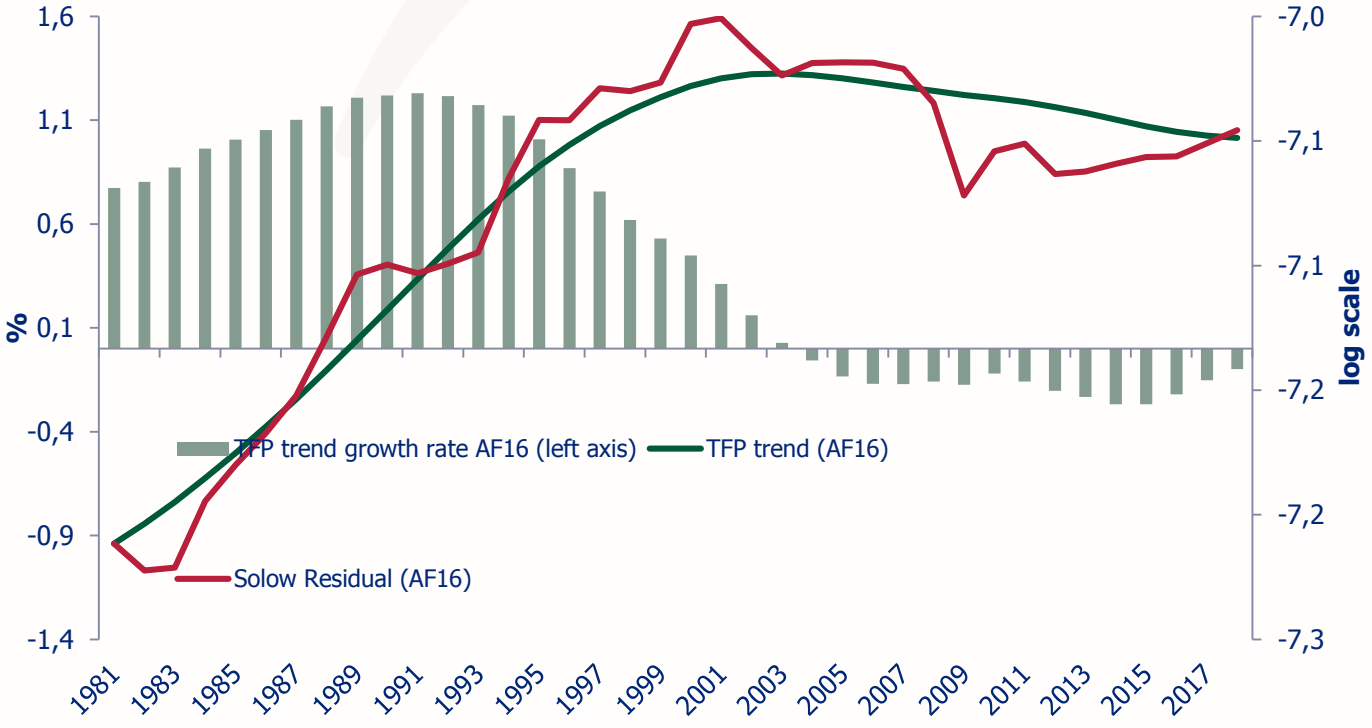
$$\mu_t = \omega(1-\rho) + \rho\mu_{t-1} + a_{\mu t} \qquad \mathrm{V}(a_{\mu t}) = V_\mu$$

$$C_t = 2A\cos(2\pi/\tau).c_{t-1} - A^2 c_{t-2} + a_{Ct} \qquad \mathrm{V}(a_{Ct}) = V_C$$

Estimates suffer from several drawbacks

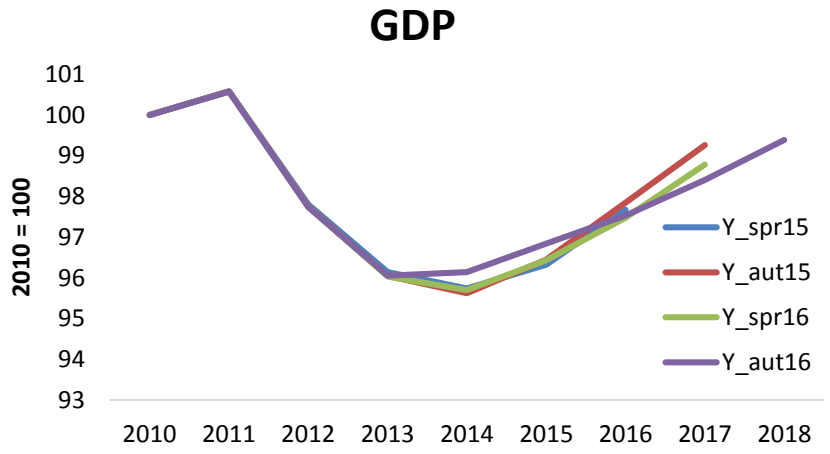
a) protracted negative trend growth
b) strong sensitivity to CUBS values
c) disconnection with activity indexes

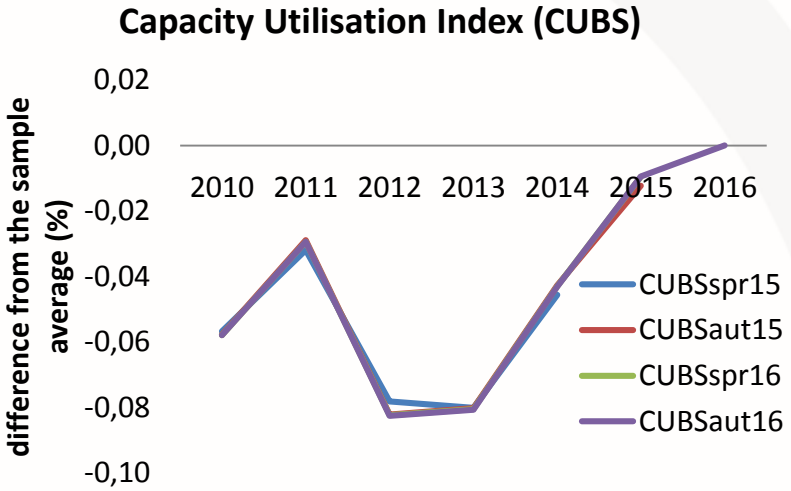
a) TFP: IT negative trend growth rates from 2003

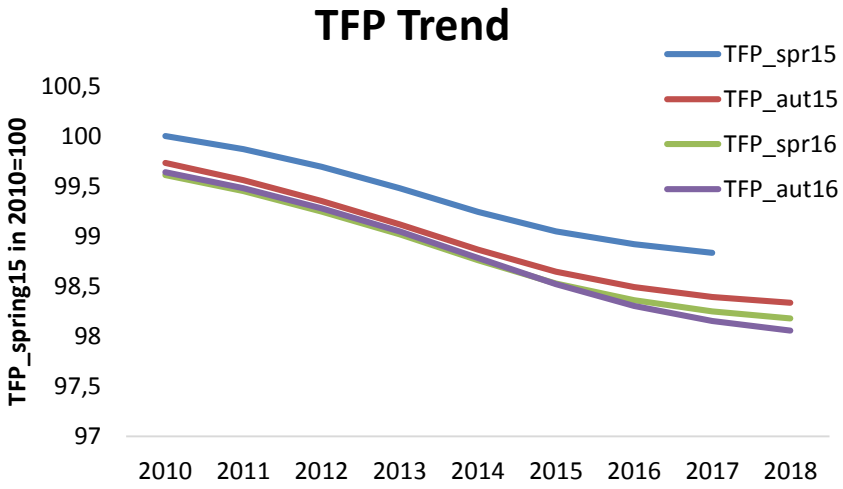


Source: Commission forecasts

b) Sensitivity of trend estimates to values of the CUBS series







- An upward shift in the CUBS series in the 2015 AF produces a significant shift in trend estimates.
- Impact of forecasts but not of GDP revisions.
- No economic explanation of such shifts

b) Sensitivity of trend estimates to revisions in the CUBS series

CHANGES IN OUTPUT GAP: 2016 SPRING FORECASTS VS 2015 SPRING FORECASTS

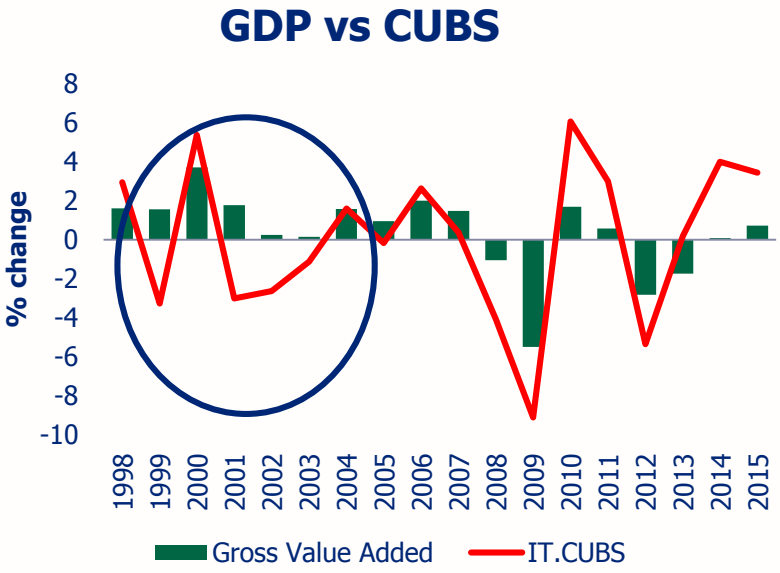
	2014	2015	2016
Total Change in Output gap (t)	0.3	0.6	0.4
of which due to the CUBS observation for 2015	0.3	0.4	0.5
BASE REVISION EFFECT			
Labour gap (t-1)	-0.4	-0.3	0
Unemployment gap (t-1)	*-0.1*	*-0.2*	*0*
Participation rate (t-1)	*0*	*0.1*	*0*
Hours worked (t-1)	*-0.2*	*-0.2*	*0*
TFP gap (t-1)	0.4	0.6	0.6
of which due to the CUBS observation for 2015	*0.2*	*0.3*	*0.4*
GROWTH REVISION EFFECT			
GDP growth rate (t)	0.1	0.2	-0.3
Potential growth (t) (-)	0.2	0.2	0.1
of which due to the CUBS observation for 2015	*0.1*	*0.1*	*0.1*
Potential Growth contributions			
Potential labour growth (t) (-)	*0.2*	*0.1*	*0*
Capital growth (t) (-)	*0*	*0*	*0*
Potential TFP (t) (-)	*0*	*0*	*0*
of which due to the CUBS observation for 2015	*0.1*	*0.1*	*0.1*

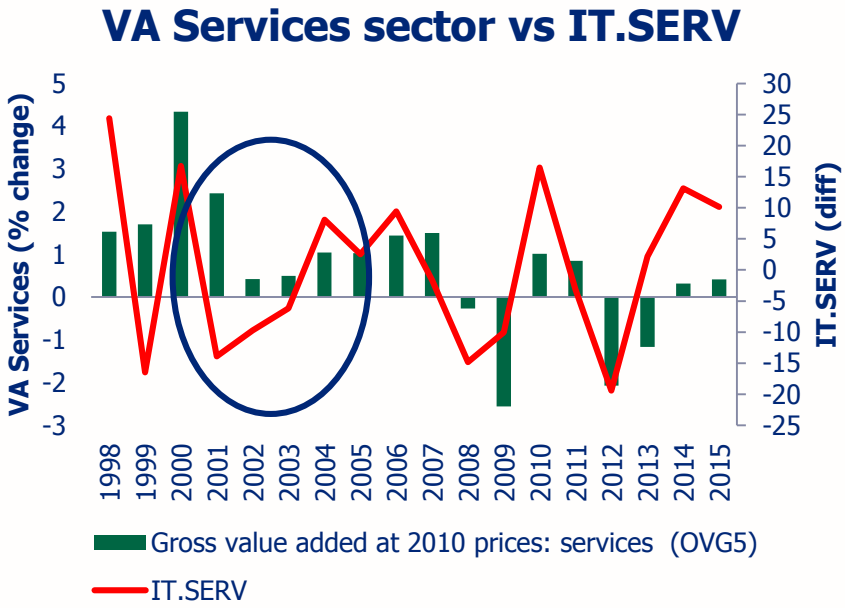
Source: MEF elaborations.

Note: Output gaps in 2014, 2015 and 2016 have been approximated according to the following specification : $OG_t \cong OG_{t-1} + (y_t - \bar{y}_t)$ where $y_t$and $\bar{y}_t$ are, respectively, real GDP growth and potential growth. In turn, OG_{t-1} can be further decomposed as follows: $OG_{t-1} = 0.65 * (Labour\ gap)_{t-1} + 1.0 * (TFP\ gap)_{t-1}$. Labour gap can be decomposed in unemployment gap, participation rate and hours worked gaps. At the same time, potential growth contribution $\bar{y}_t$ can be decomposed in potential labour growth, capital growth and potential (trend) TFP growth.

c) CUBS for IT: historical pattern

- Both the CUBS series and its components do not seem to follow the pattern of real activity





Possible remedies and first wave of attempts

- Zero lower bound for TFP growth proposal

  rejected

- Address critical features of the CUBS variable
  - Deal with issues related to the Business Confidence indicator in the Service sector
  - Utilisation of capacity measure for U_L : hours of Cassa Integrazione

CUBS Issues

- In order to deal with the statistical drawbacks of the CUBS indicator, Italy proposed to replace the services sentiment indicator with the capacity utilisation index for the services sector, available as of 2010.

- The discussion in the OGWG concluded that it was premature to use data for capacity utilisation as data are not yet available over a full economic cycle.

- The Commission proposed to exclude the economic sentiment indicator for services for the period before 2003 because of the poor quality of the data over the period 1998-2002

- A 3-step approach is now used for Italy (F) (it allows to discard volatile and unreliable data for ESI.serv before 2003 and maintain the information of IT.BUILD). The output gap widens on average by 0.2 percentage points with respect to the Commission's official results

TFP: a labour hoarding index based on CIG (1)

- Italy proposal: alternative labour hoarding index to measure capacity utilisation based on Cassa Integrazione Guadagni (CIG)

- **PROS:**
  - Is a real/administrative variable collected for the whole economy and not a survey based figure;
  - Collected monthly since 1970, whereas the CUBS only since 1985
- **CONS (EU objections):**
  - Discretionary changes in CIG abound and make it difficult to distill the cyclical signal
  - Moral hazard issues with the scheme (workers and firms collude to extract payments from the government)

F

Sizable gain F but
CIG proposal not endorsed under the country specific revision procedure

Where we stand and way forward

- TFP trend projections under current methodology are not «acceptable»
  - very low potential growth and unfavourable output gap pattern
  - also, “adverse” consequences also in the medium to long term (see later)

- Different bounds underpinning Italian government estimates

  … but the Commission sticks to its projections

WAY FORWARD.

No short term enhancements foreseen in the OGWG program, but open debate is ongoing

- More work on the proxy for cyclical conditions
- Specification of the time-varying trend in the Kalman filter
- Is β (i.e. the relationship between capacity and its proxy) steady?

Plausibility tool

- PT is a complementary tool for signalling those cases where the PF method might be over- or underestimating output gaps.
- The PT answers to the question: “Given actual cyclical economic indicators, which output gap would the common method have delivered in the past (after revisions)?”
- Panel regression that uses data that is typically highly correlated with the business cycle (price and utilization dynamics) as explanatory variables
- PT is run on the basis of outturn or near-outturn data. It is not possible to generate a plausibility range for future years or even the current year (at least not until the autumn forecast is available).

Alternative estimation methods? benchmarking?

- Plausibility tool is not meant to represent an alternative estimate
- Revisions planned/contemplated OGWG work programme F
- No radical changes foreseen.
- OECD (production function method) and IMF models (Multivariate Filter approach augmented with a Phillips curve and a dynamic Okun's law) are occasionally used as benchmarks, for instance when assessing forecast performance in real time

Medium Term projections (t+3 → t+10)

- **Relevant for:**
  - DSA analysis
  - Hinges on long term projections of AWG and LT sustainability analysis
- **Key Components:**

	T+2 macro forecast	T+3 - T+5	T+6 - T+10
NAWRU	Kalman Filter	Mechanical rule $N_{t+3}= N_{t+2}+0.5(N_{t+2}-N_{t+1})$ $N_{t+5}= N_{t+4}= N_{t+3}$	Linear convergence to NAWRU Anchor
TFP	Kalman Filter	Extrapolation of the Kalman Filter	
Capital	EU Forecasts	Investment rule	
	Perpetual inventory method		
Trend Participation Rate	HP filter		Cohort simulation model
Trend Hours Worked	HP filter		Mechanical rule

NAWRU Anchor

- The Structural Unemployment Anchor is estimated through a panel regression with fixed effects using the following determinants: Tax Wedge (TW), Replacement Rate of Unemployment Benefits (RR), ALMPs, Union Density (UD) plus a set of macro variables such as TFP, real interest rate and weight of the construction sector on the economy.

$$\mathrm{NAWRU}_{it} = c_i + \sum_j \alpha_j \mathrm{STR}_{jit} + \sum_k \beta_k \mathrm{CYC}_{kit} + \varepsilon_{it}$$

- i denotes countries and t time; STR_j is structural indicator j; CYC_k is cyclical indicator k; c_i are the country-fixed effects
- The **T+10 NAWRU** is the fit (in period T) of the regression that features the four labour market economic indicators. The effect of the macroeconomic variables is removed from the fit
- When the fit of the regression generates an value deemed implausible, a "prudent rule" is applied, which entails using an average of the fit of the regression and the last NAWRU, rather than just the fit.

Stability of the NAWRU Structural Anchor parameters

- The regression coefficients are not statistically stable over different estimation vintages (Wald test)
- Fixed effects are often not significant or change sign between two vintages
- The anchor is not stable but is a moving target
- Anchor values can be very sensitive to the size of estimated coefficients
  RR rate and ALMP values in 2019 to be “monitored”
- Issues with variable selection and ecometric specification

NAWRU Anchor: possible ways forward

- Improve the panel regression
- Dependent variable (NAWRU vs UR)
- Check for the “quality of variables (e.g. RR under scrutiny)
- Add structural variables influencing the labour market equilibrium and control variables
- ECM and cointegration
- Deal with cross section correlation
- …

Basic references

- Karel Havik, Kieran Mc Morrow, Fabrice Orlandi, Christophe Planas, Rafal Raciborski, Werner Röger, Alessandro Rossi, Anna Thum-Thysen, Valerie Vandermeulen , **The Production Function Methodology for Calculating Potential Growth Rates & Output Gaps"** EUROPEAN ECONOMY Economic Papers 535 (2014), also available at: http://ec.europa.eu/economy_finance/publications/economic_paper/2014/pdf/ecp535_en.pdf

- Marco Cacciotti, Riccardo Conti, Roberto Morea, Serena Teobaldo, "**The estimation of Potential Output for Italy: an enhanced methodology**", Rivista Internazionale di Scienze Sociali n. 4 (2017), pp. 351-388, Università Cattolica del Sacro Cuore

- MEF, **Relevant Factors Influencing Debt Developments in Italy**, February 2017, http://www.mef.gov.it/inevidenza/documenti/Italy_Relevant_Factors_February_2017.pdf

Basic references

- Fabrice Orlandi, " **Structural unemployment and its determinants in the EU countries**", European Economy Economic Paper, No 455 (2012), DG ECFIN, European Commission, also available at: http://ec.europa.eu/economy_finance/publications/economic_paper/2012/pdf/ecp_455_en.pdf

Thank you for your attention

OGWG – MANDATE AND COMPOSITION

- The Output Gap Working Group (OGWG) is a technical group of the Economic Policy Committee (EPC) setted up in 1999 as an "ad-hoc working group on the calculation of "output gaps" (…), [aiming] to prepare an opinion on the methodology and the use of different concepts of output gaps."

- The OGWG comprises representatives from national authorities, the European Commission and the ECB. Other institutions (IMF, OECB) could be invited.

- In 2004, the OGWG was also mandated to monitor the update of the main parameters and the refinement of the methodology used to compute the cyclically adjusted government budget balances (CAB).

- In November 2011, EPC gave a mandate to the OGWG to come up with a new T+10 projection methodology. The methodology was endorsed by the EPC in November 2012.

B

OGWG – GUIDING PRINCIPLES

- **Main Objective**: to ensure scientifically robust and transparent potential output and output gap estimations, for the period up to T+10

- **Principles concerning the methodology**:
  - It has to be relatively simple, fully transparent and stable
  - It should strive for equal treatment for all EU MS, whilst in exceptional circumstances recognising country-specific characteristics
  - It should provide an unbiased assessment of the past and future potential growth in the EU MS, while aiming to include the effects of all adopted structural reforms.
  - It should aim at limiting the pro-cyclicality of potential growth estimates

- The OGWG draws up an annual work programme, which has to be presented to the EPC for information. At least once a year, the OGWG presents a progress report to the EPC, reporting on the work done in the OGWG

B

OGWG – PROCEDURAL ISSUES

- Potential output estimation should reflect country specificities in order to avoid implausible results, *within the agreed methodology*.
- Involve Ecfin country desks in the work of the models unit, allowing 'constrained judgement', especially in the presence of implausible results.
- Extend the mandate of the OGWG, allowing peer review of results if country-specific variables are introduced.
- Reduce the large differences existing between COM estimates and national estimates due to the forecast horizon and the CONV method.
- A revision policy was endorsed by EPC in October 2015, with the objective of giving MS a greater degree of certainty and transparency as to **when** and **how** future methodological changes to the Production Function (PF) methodology will be introduced in the surveillance framework.

B

OGWG – REVISION POLICY

- **Large changes** ("all non-technical changes to the method") would only ever be introduced in the Autumn forecasting exercise (one-year revisions policy).
  - EPC will endorse the changes only after OGWG assessment of the impact of the change by applying it to the most recently published Commission services forecasting exercise
  - Following EPC endorsement, there will be an additional "lead in" period of at least one forecasting exercise, to ensure that the earlier assessment is still valid.

- **Small changes** ("technical changes necessary to ensure a credible assessment of the most recent time series information during the Commission's Winter, Spring and Autumn forecasting exercises"), the Commission has a certain degree of flexibility, on the understanding that any small changes made during their regular forecast exercises are clearly documented and communicated, as soon as is feasible.

B

OGWG – COUNTRY SPECIFIC ISSUES

- Letter of 18 March 2016 from eight Finance Ministers (ES, IT, LT, LU, LV, PT, SI, SK) and letter of 3 May 2017 from four Finance Ministers (ES, FR, IT, PT) to Commission express concerns regarding the estimation of potential output and its implications in terms of fiscal surveillance
- In September 2017, EPC endorsed a new procedure to deal with **Country specific issues**
- Governance process for handling country specific changes is guided by technical considerations linked to improving the common methodology, by the results of the Plausibility Tool (SEE LATER)
- Country-specific amendments is introduced in very specific circumstances and only after a structured process, which is aimed at ensuring consistency and avoiding political interference.

B

OGWG – 2019 Work Programme

- Country-specific issues

- Horizontal issues:
  - Improve the NAWRU anchor – in particular for the new Member States;
  - Assess whether the common method can be improved by determining country-specific smoothing parameters;
  - Decide whether to roll out the grid search currently used to determine the variance bounds in the grid search for Italy to all Member States;
  - Continue exploring how to best take into account the uncertainties around the output gap estimations. Principle Component Analysis vs Plausibility Tool.

B slide OGWG B slide Forward

The Preventive Arm of the SGP: the expenditure rule

- After the crisis, the convergence to the MTO has been reinforced through the so-called expenditure rule
- The presumption is to use the unexpected extra revenues windfalls for deficit and debt reduction while keeping expenditure on a stable and sustainable path over the cycle.
- The excess of growth of expenditure in real term should be matched by discretional revenue measures.
- The Commission and the Council assess the growth path of government expenditure against a reference medium-term rate of potential GDP growth
- The reference medium-term rate of potential GDP growth is determined by regulatory updated forward-looking projections and backward-looking estimates

The Preventive Arm of the SGP: the Expenditure rule

- The net expenditure aggregate is net of items that are not directly controlled by the Government

$$E_t^{\ net} = G_t - U_t^{\ c} - I_t - GFKF_t + \frac{1}{4}\sum_{i=0}^{3} GFKF_{t-1} - DRM_t - RML_t$$

- Total expenditure is net of: 1) interests; 2) expenditure on EU programs; 3) cyclical component of unemployment-benefit; 4) four-year average of investment spending; 4) Discretionary Tax Measures and Revenue mandated by Law.

- Net expenditure growth rate $\dot{e_t}$ is calculated and deflated (GDP deflator)

$$\dot{e_t} \leq \begin{cases} r_t & if \ \ the\ country\ is\ at\ the\ MTO \\ r_t - C_t & if \ \ the\ country\ is\ NOT\ at\ the\ MTO \end{cases}$$

- r_t is the 10 year potential growth average over [t-4; t+5]. C_t is the convergence margin modulating the fiscal effort in line with the matrix of requirements (B)

The Corrective Arm of SGP: The Excessive deficit procedure

- The Commission will always prepare a report for Excessive Deficit Procedure when at least one of the following conditions holds:
  1. A planned government deficit exceeds the reference value of 3% of GDP;
  2. Government debt ratio is above the reference value of 60% of GDP and its differential w.r.t. the reference value has not decreased at a rate of at least 1/20 (over the past 3 years with or without cyclical correction or over a forward-looking configuration).

- Relevant Factors can be invoked.

The Corrective Arm of SGP : The Debt Rule Benchmarks

- Compliance is granted if debt/GPD is not > 60% or is sufficiently diminishing and approaching the reference value at a satisfactory pace.

- Sufficiently diminishing = reduction in line with of the debt reduction benchmark

$$bb_t = 60\% + 0.95/3\ (b_{t-1} - 60\%) + 0.95^2/3\ (b_{t-2} - 60\%) + 0.95^3/3\ (b_{t-3} - 60\%)$$

- Distance with respect to the 60% of GDP reference value has d eclined over 3 preceding years at an average rate of 1/20th per year.

- Otherwise, forward looking assessment and correction for the cycle
  - *Forward looking: Based on unchanged policy, would the debt benchmark be met in two years' time?*
  - *The cycle: If it weren't for the effect of the cycle, would the debt criterion be met now?*

The building bricks of the debt criterion

- The backward-looking benchmark:

$$bb_t = 60\% + 0.95/3\ (b_{t-1} - 60\%) + 0.95^2/3\ (b_{t-2} - 60\%) + 0.95^3/3\ (b_{t-3} - 60\%)$$

- The forward-looking benchmark as estimated by the Commission under the 'no-policy-change' assumption:

$$b_{t+2} < bb_{t+2} = 60\% + 0.95/3\ (b_{t+1} - 60\%) + 0.95^2/3\ (b_t - 60\%) + 0.95^3/3\ (b_{t-1} - 60\%)$$

- Debt ratio adjusted for the cycle: Subtract cyclical component of the balance from debt, in the numerator + Use potential growth in the denominator over the time period considered

$$\left(\frac{B_t}{Y_t}\right)^{3-years-adjusted} = \left(\frac{B_t + \sum_{j=0}^{2}(C_{t-j})}{Y_{t-3}\prod_{h=0}^{2}(1+y_{t-h}^{pot})(1+p_{t-h})}\right)$$

- Debt corrected for the cycle< backward looking benchmark →compliance

The Preventive Arm of the SGP: The Structural Reform Clause

- Structural reforms must have (i) a verifiable positive impact on the long-term sustainability of public finances, (ii) be major and (iii) be fully implemented.
- Member States in the Preventive Arm of the SGP can temporarily deviate from the MTO or the appropriate adjustment path towards it in t+1.
- the deviation should not lead to a breach of the 3% of GDP deficit threshold and a safety margin, i.e. a structural deficit compatible with normal cyclical conditions (minimum benchmark), to this threshold should be continuously preserved.
- The deviation will not exceed 0.5% of GDP (unless for pension reforms).
- The deviation is allowed for only 1 year. The convergence to the MTO should resume from t+2.
- In case of implementation structural reforms, the initial structural deficit cannot be higher than 1,5% of GDP so not to prevent in normal cyclical conditions to converge to the MTO in t+4.

The Preventive Arm of the SGP: The Investment Clause

- Member States in the Preventive Arm of the SGP can temporarily deviate from the MTO or the appropriate adjustment path towards it in t+1 for the amount of national share of EU co-financed investments (and the increase of it from t+2 onwards).
- The deviation will not exceed 0.5% of GDP or 0.25% of GDP if also the Structural Reform clause has been granted.
- the deviation should not lead to a breach of the 3% of GDP deficit threshold and a safety margin should be continuously preserved.
- The Member State is eligible if the OG is wider than -1,5% (bad cyclical conditions)
- The deviation is allowed for only 1 year. The convergence to the MTO should resume from t+2.
- The initial structural deficit cannot be higher than 1,5% of GDP so not to prevent in normal cyclical conditions to converge to the MTO in t+4.

The debt criterion: a quick background

- Debt requirements operationalised with the 2011 reform of the SGP (6-pack)
- Definition of sufficiently diminishing = compliance with the debt reduction benchmark
- Debt reduction benchmark = reduction of 5% per year on average over 3 years of the gap to 60% (taking the cycle into account or compliance in the next two years)
- Transition period for 3 years after the correction of the excessive deficit: no full implementation of the rule but sufficient progress to be made

GRID search: steps (1/2)

1. The iterations are ordered on the basis of the root mean squared error (RMSE) with respect to the pre-existing European Commission's NAWRU series ⟶ to identify all the scenarios that ensure a good fit vis-à-vis the historical trend of the NAWRU estimated by the EC. NAWRU series that are too different to the historical trend identify by the EC are all discarded

2. Dickey-Fuller tests are carried out on the trend (NAWRU) and unemployment gaps of the chosen combinations ⟶ to establish if the selected NAWRU series are random walks (non-stationary in levels) and the corresponding unemployment gaps are integrated of order zero and stationary. NAWRU series that are I(0) or unemployment gaps that are I(1) are all discarded.

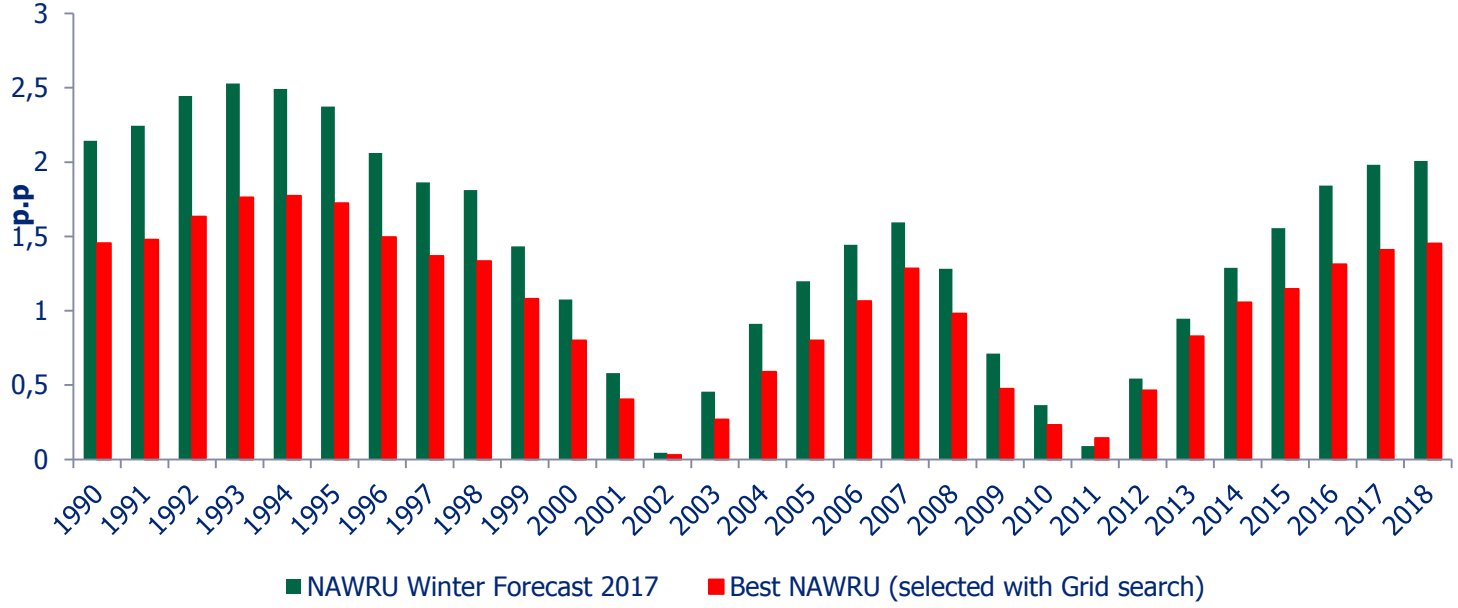
GRID search: steps (2/2)

3. Among all the remaining iterates, choose all the NAWRU series for which the parameter β_1 presents a level of significance equal to or above 99.5 per cent, discard all the others series ⟶ this is the selection criterion agreed by the Output Gap Working Group

4. Among all the remaining iterates, select the NAWRU series with the highest log likelihood parameter in absolute terms ⟶ optimal statistics

NAWRU: grid search vs EC judgemental bounds selection

Distance of NAWRU estimates distribution from the median



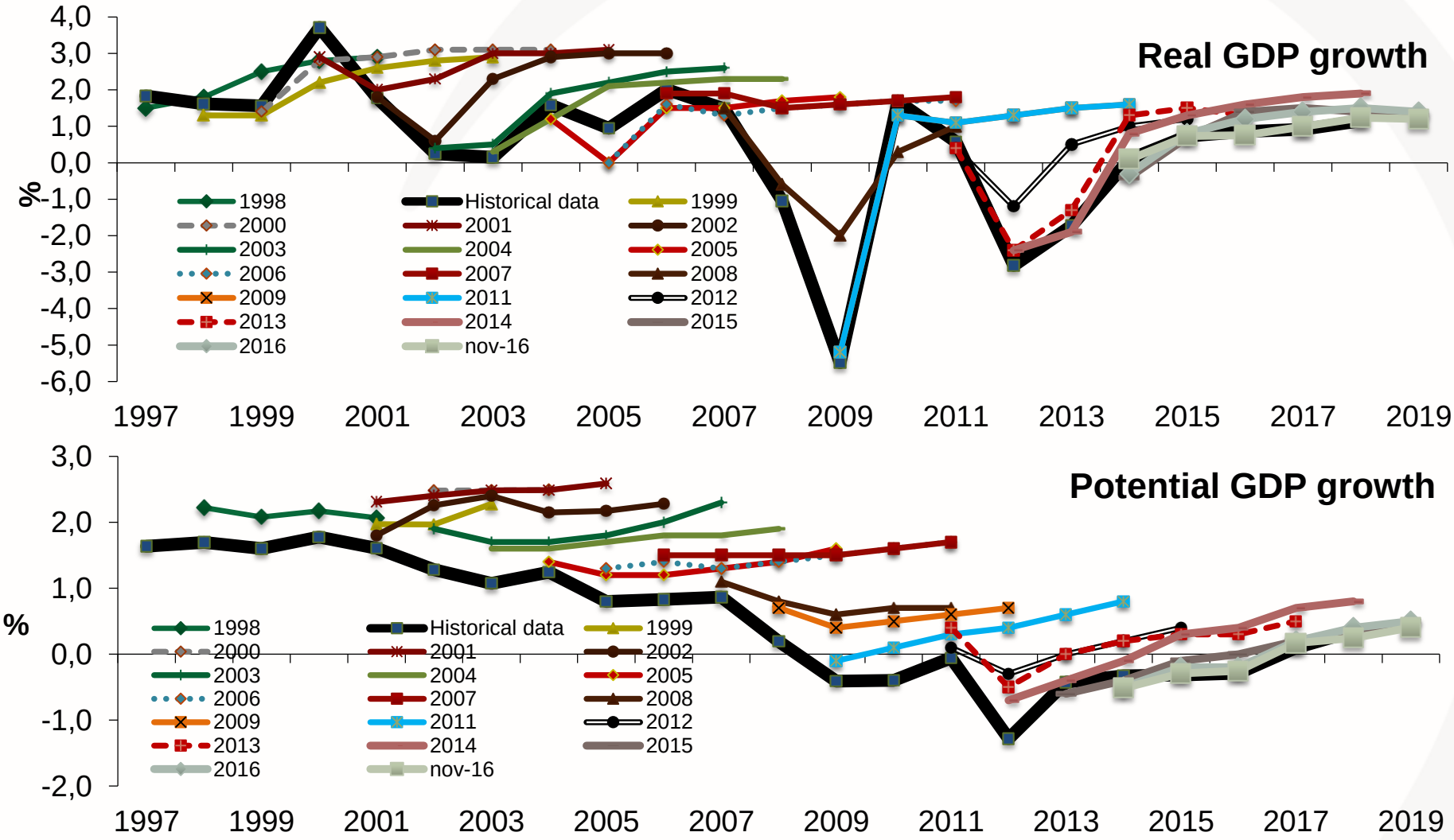
Source: European Commission 2017 Winter Forecasts and own elaborations.

B

QUI DETTAGLI CUBS

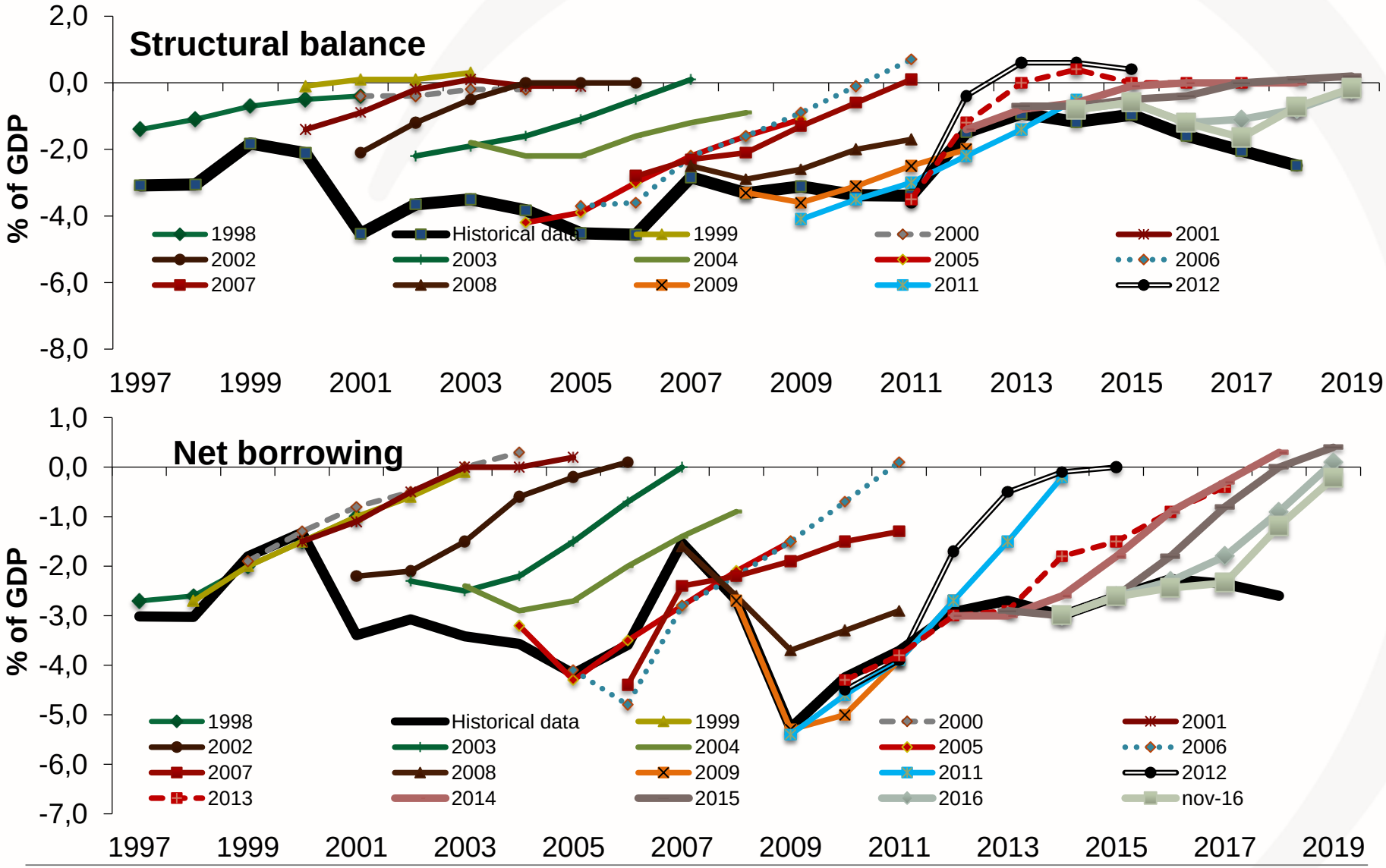
- For a majority of member states (in particular in EU15) CUBS is based solely on the CU indicator in the first part of the sample. Then, CUBS becomes a weighted average of CU, ESI.SERV and ESI.BUIL only in the year when all the three indicators become available. (Two steps procedure)

Real and Potential Growth revisions



Source: AMECO database for historical data; Italy's Stability Programmes

General Government and structural balances revisions



Source: AMECO database for historical data; Italy's Stability Programmes

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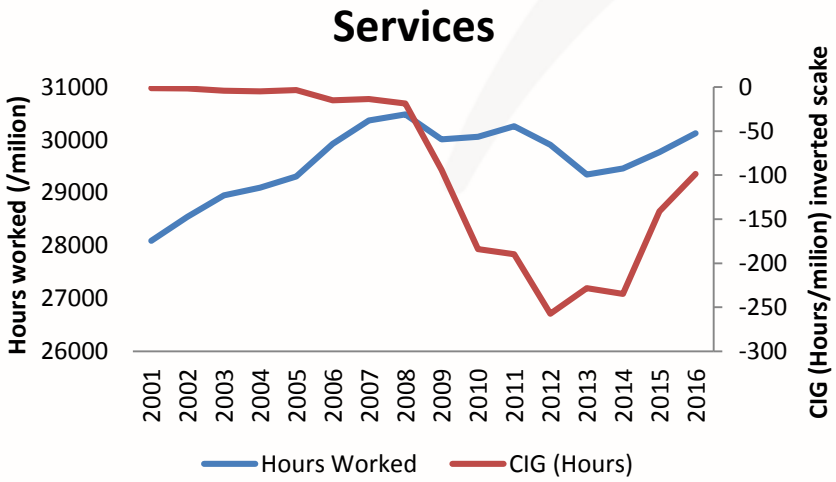
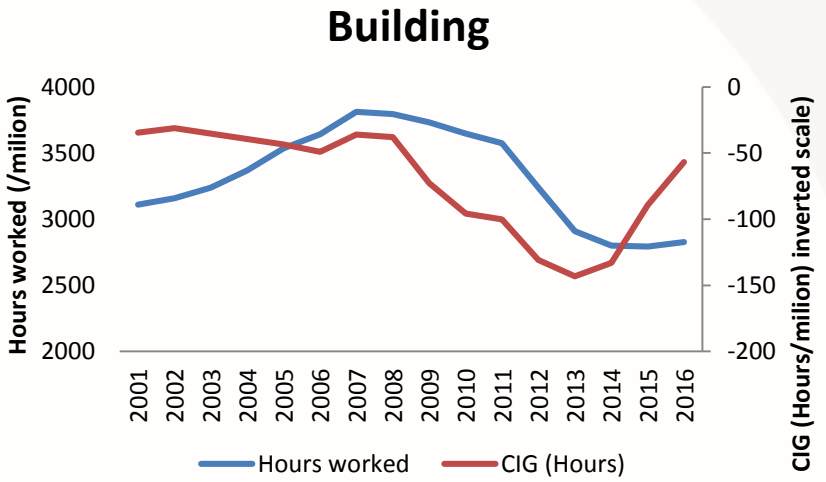
ESI serv: 2 or 3-step approach?

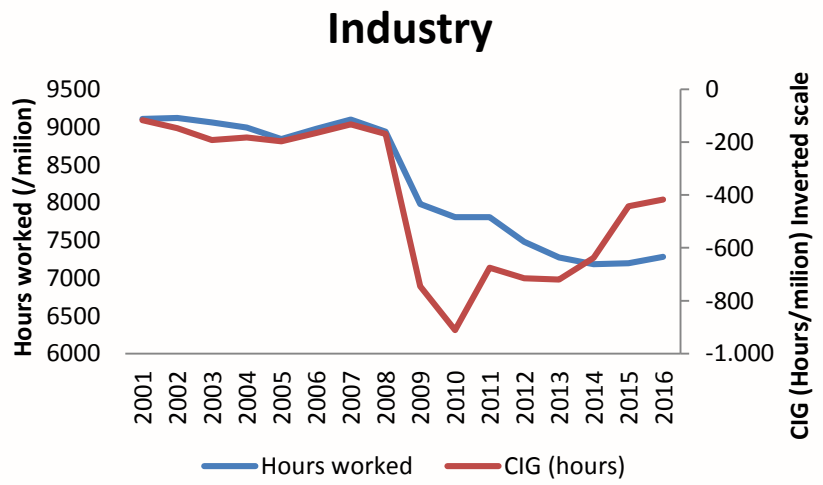
	first year of availability for ESI serv ser	First year of the CUBS index	Notes
AT	1996	1996	
BE	1995	1985	
BG	2002	-	No CUBS
CY	2002	2008	
CZ	2002	1995	
DE	1995	1985	
DK	2000	1987	
EE	2002	1995	
EL	1997	1985	
ES	1996	1987	
FI	1996	1996	AR1 & data available from 1993
FR	1988	1985	AR1
HU	2002	1996	
IE	1998	1985-2008	Dummy from 2015
IT	1998	1985	Rescaling in 2010
LT	2002	2002	
LU	2005	1985	
LV	2002	2002	
MT	2007	2003	
NL	1996	1985	
PT	1997	1987	
RO	2002	2001	
SE	1996	1996	
SI	2002	1995	AR1
SK	2002	2002	

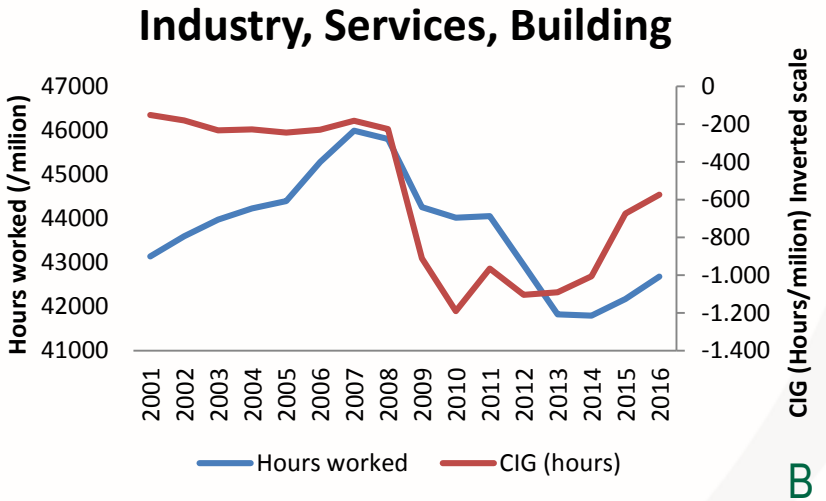
- 2or 3-step in building the CUBS is a conventional choice.
- For instance on FI it has been decided to start on 1996 instead of 1993
- Period averages are already differentiated (B)

TFP: a labour hoarding index based on CIG (2)





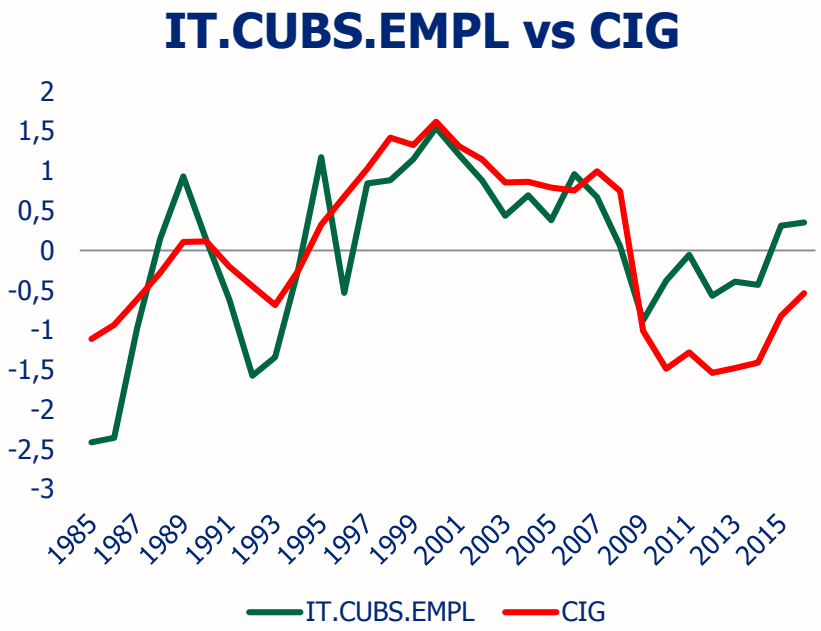


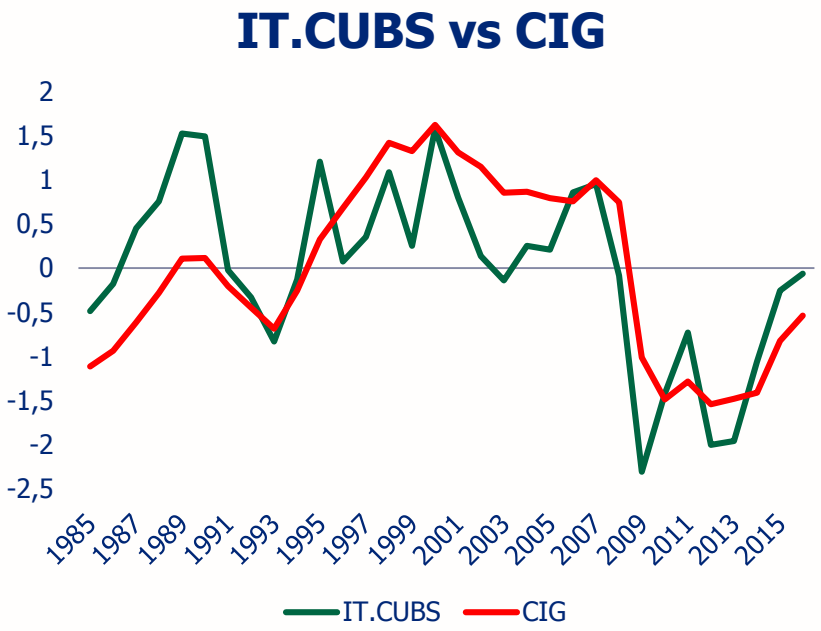


B

TFP: a labour hoarding index based on CIG (3)

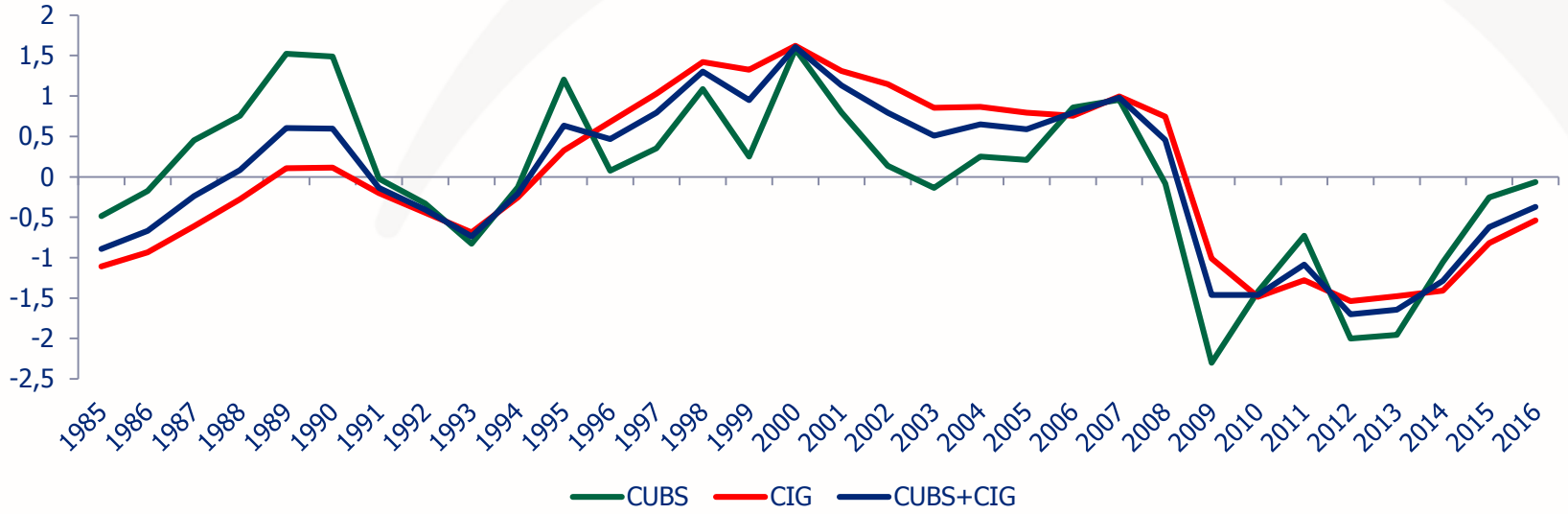
- CIG is correlated with an alternative CUBS index computed on the basis of employment related questions of the DG-ECFIN Survey





B

TFP: a labour hoarding index based on CIG (4)



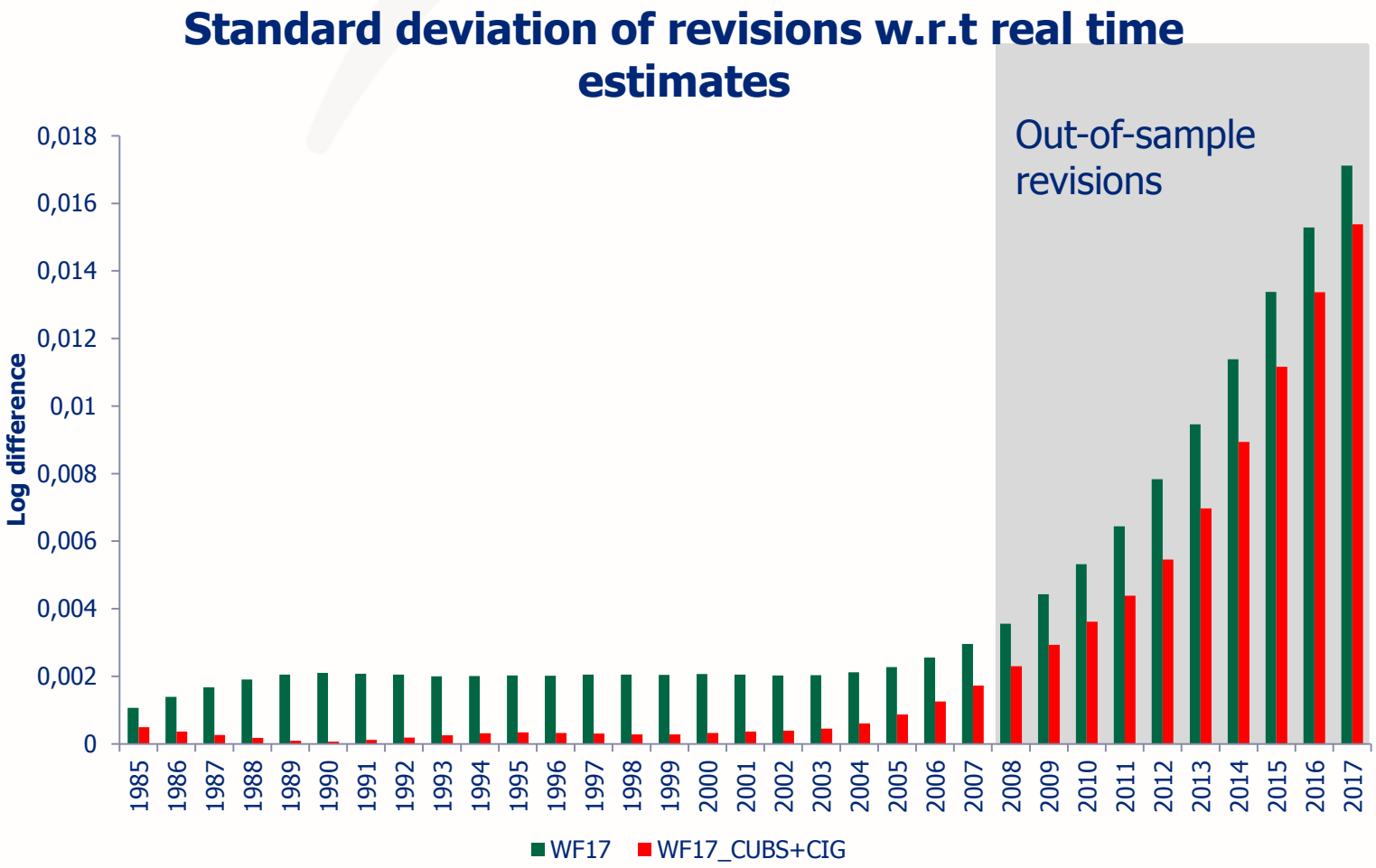
- In order to take into account the impact of both Capital and Labour Utilisation, a new index CIG+CUBS has been estimated combining the standardized CIG and CUBS series with the labour share (α=0.65) as weighting parameter.

$$CUBS + CIG = 0.35 * CUBS + 0.65 * CIG$$

- The Index CUBS+CIG performs relatively well as capacity utilisation indicator as it tracks the turning points of the CUBS index while being less volatile

B

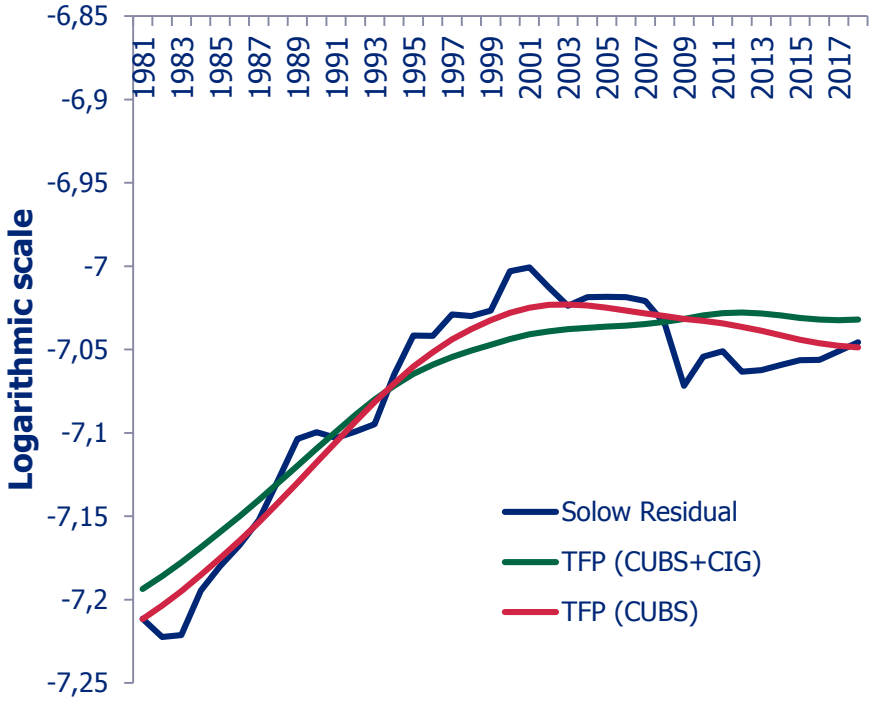
TFP revisions with CUBS+CIG vs CUBS ?

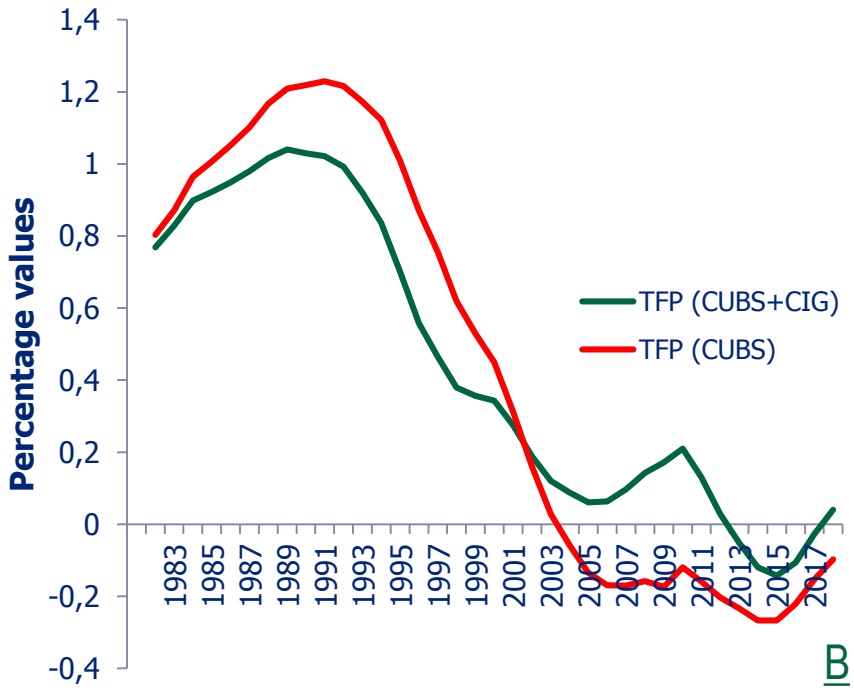


B

TFP trend levels and growth

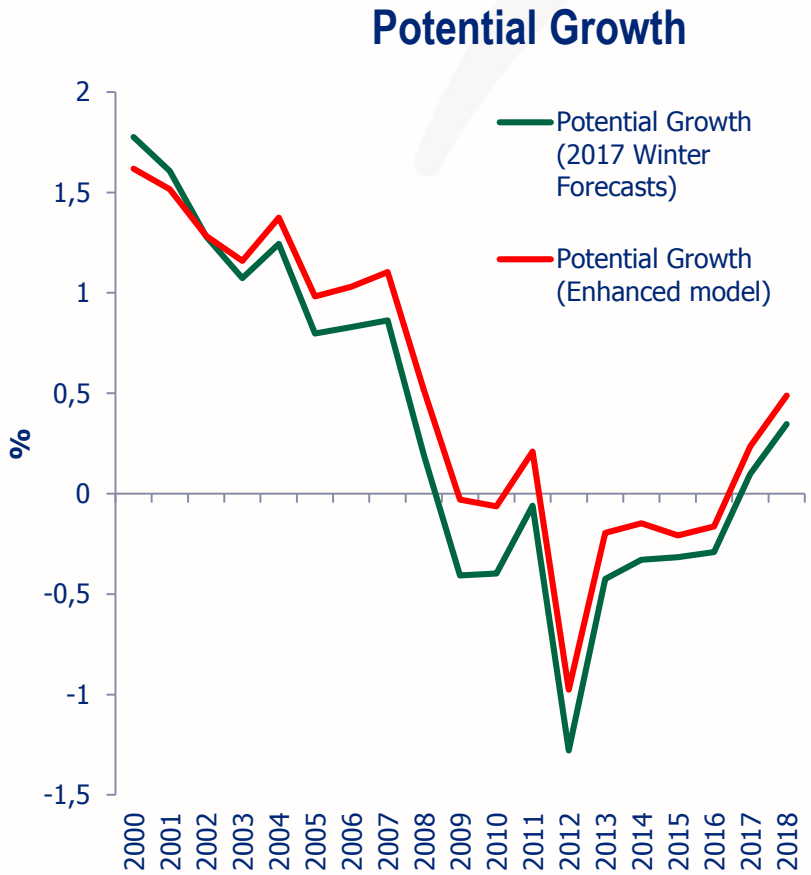
- If the alternative methodology is implemented, the growth rate of the TFP trend is shown to decelerate rapidly over the last decades but such a pattern is not as strong as in the official Commission estimates
- The use of a real indicator CIG produces a negative TFP cyclical gap which is not expected to close over the forecast horizon.

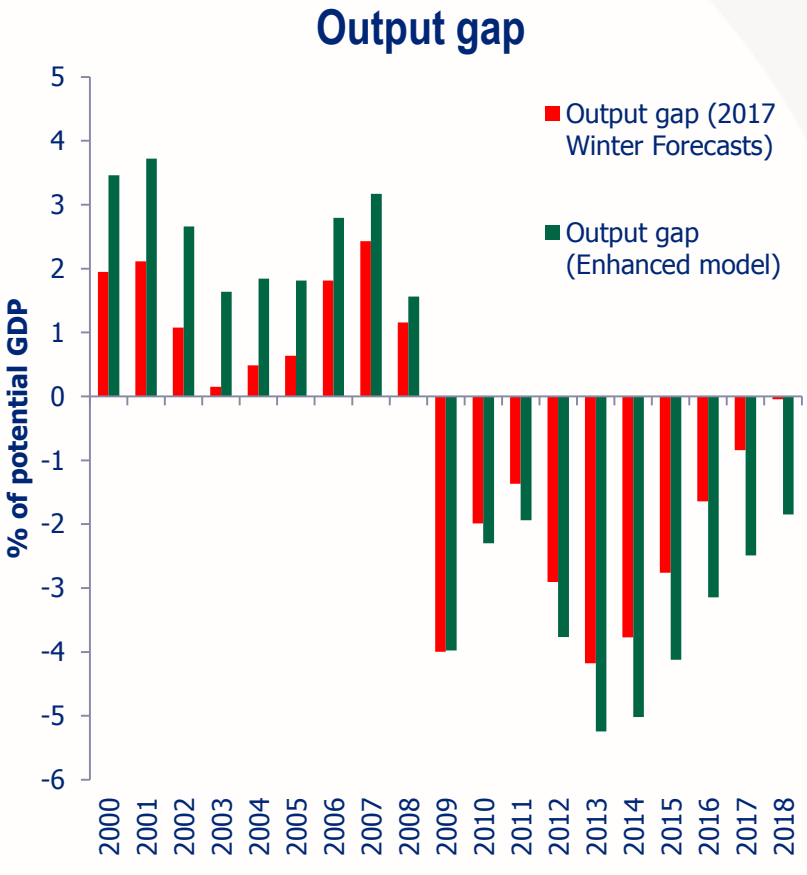




B

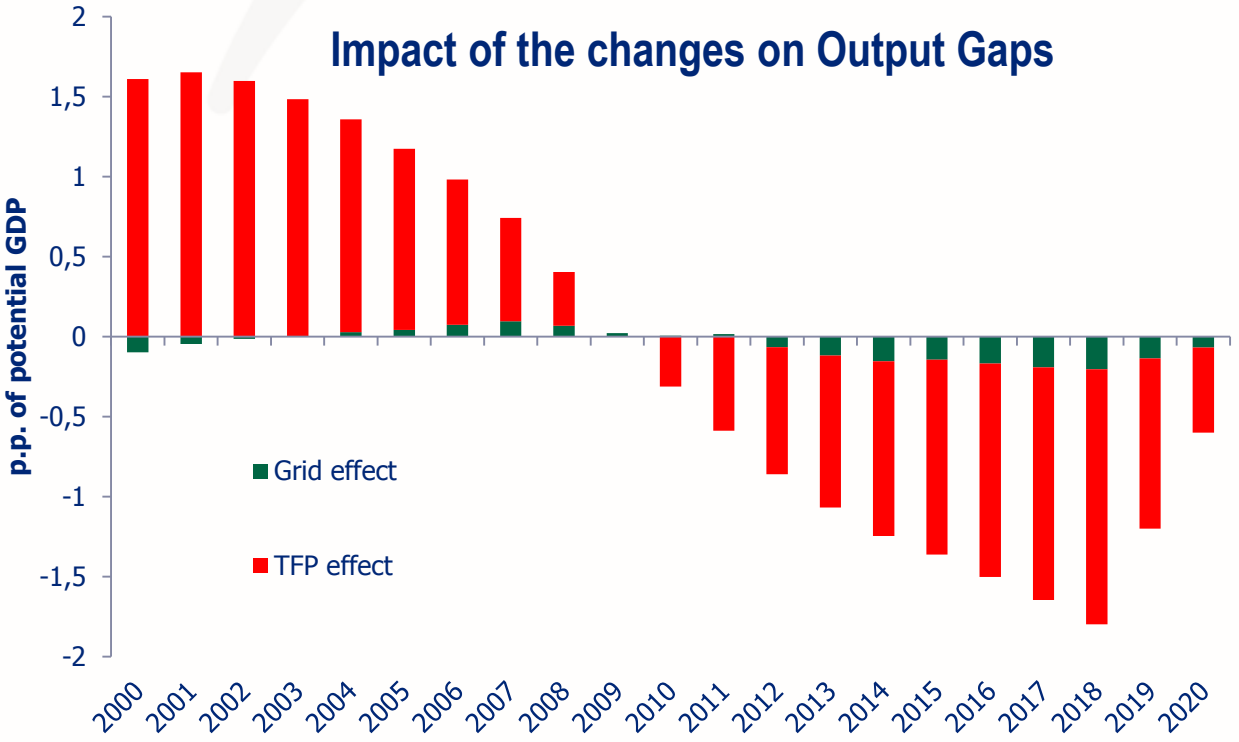
Enhanced model: a comparison with the WF17 forecasts (1)





B

Enhanced model: a comparison with the WF17 forecasts (2)



B

Enhanced model: a comparison with the WF17 forecasts (2)

	Output Gap	
	2017 Winter Forecasts	Enhanced methodology
2014	-3.8	-5.0
2015	-2.8	-4.1
2016	-1.6	-3.1
2017	-0.8	-2.5
2018	0	-1.8

(-)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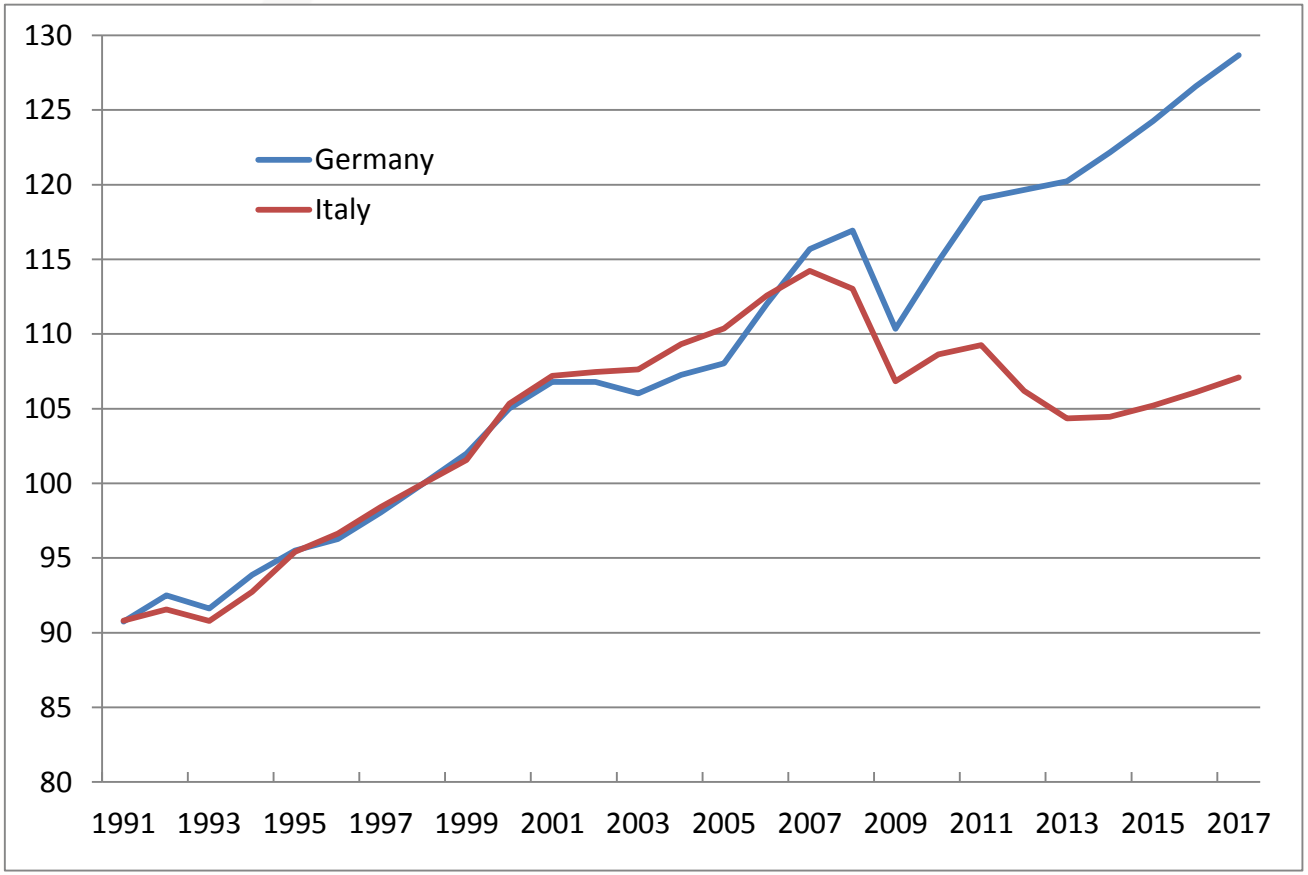
Additional slides for in-depth discussion

Growth divergence raises methodological and policy issues

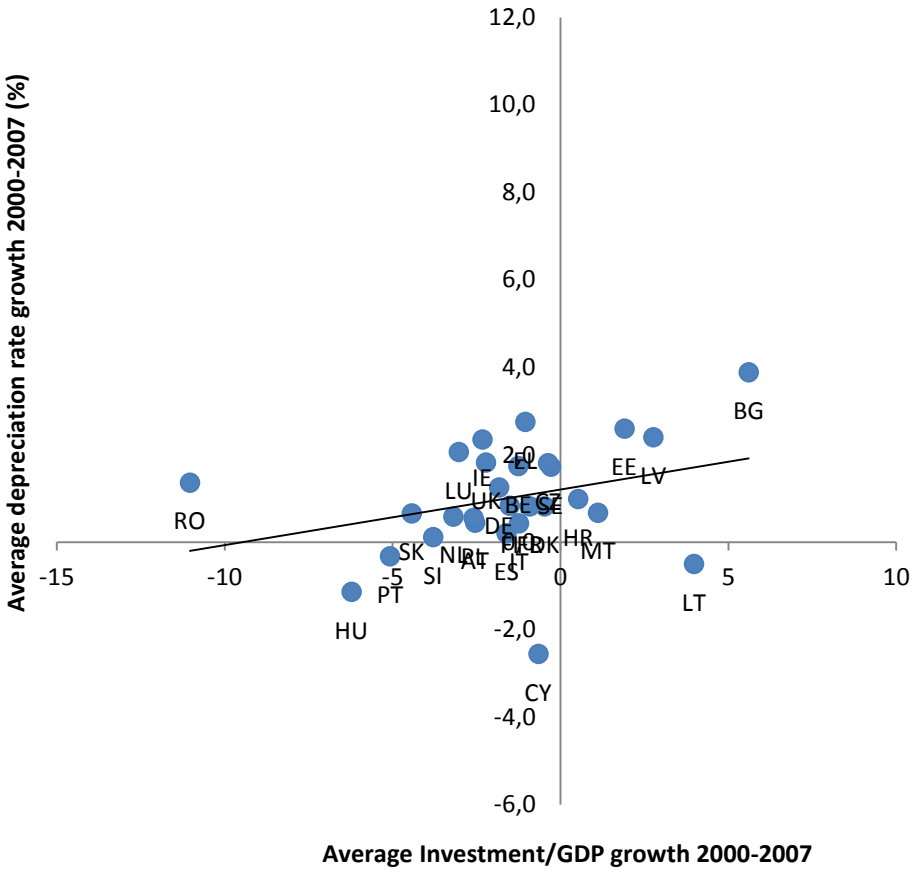
Real GDP, 1998=100



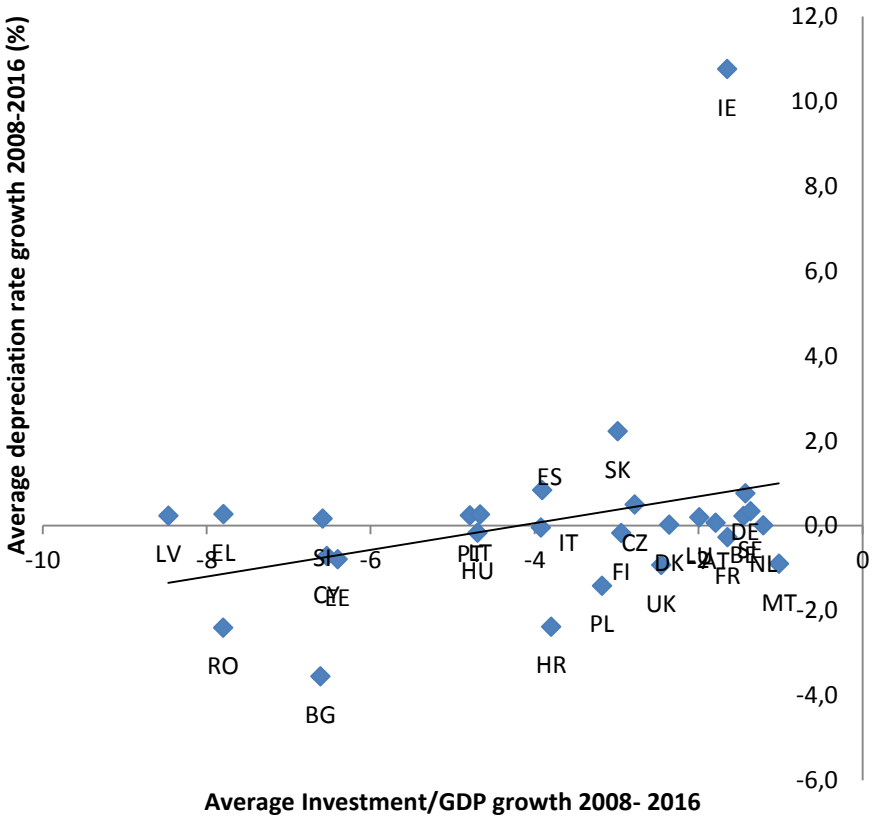
Source: AMECO database

Investment fall during the crisis but no change in depreciation

Pre-crisis 2000-2007

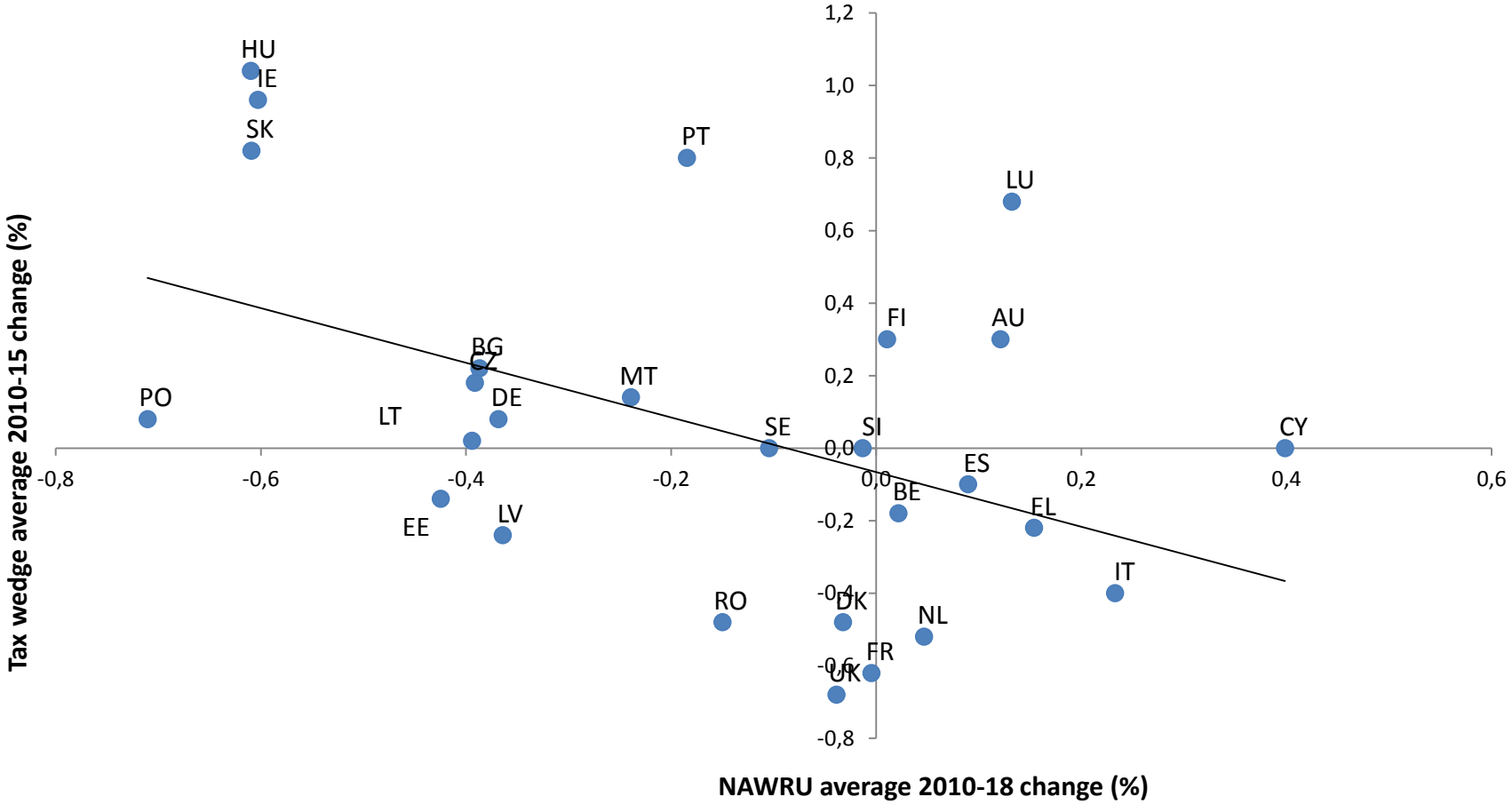


Crisis period 2008-2016



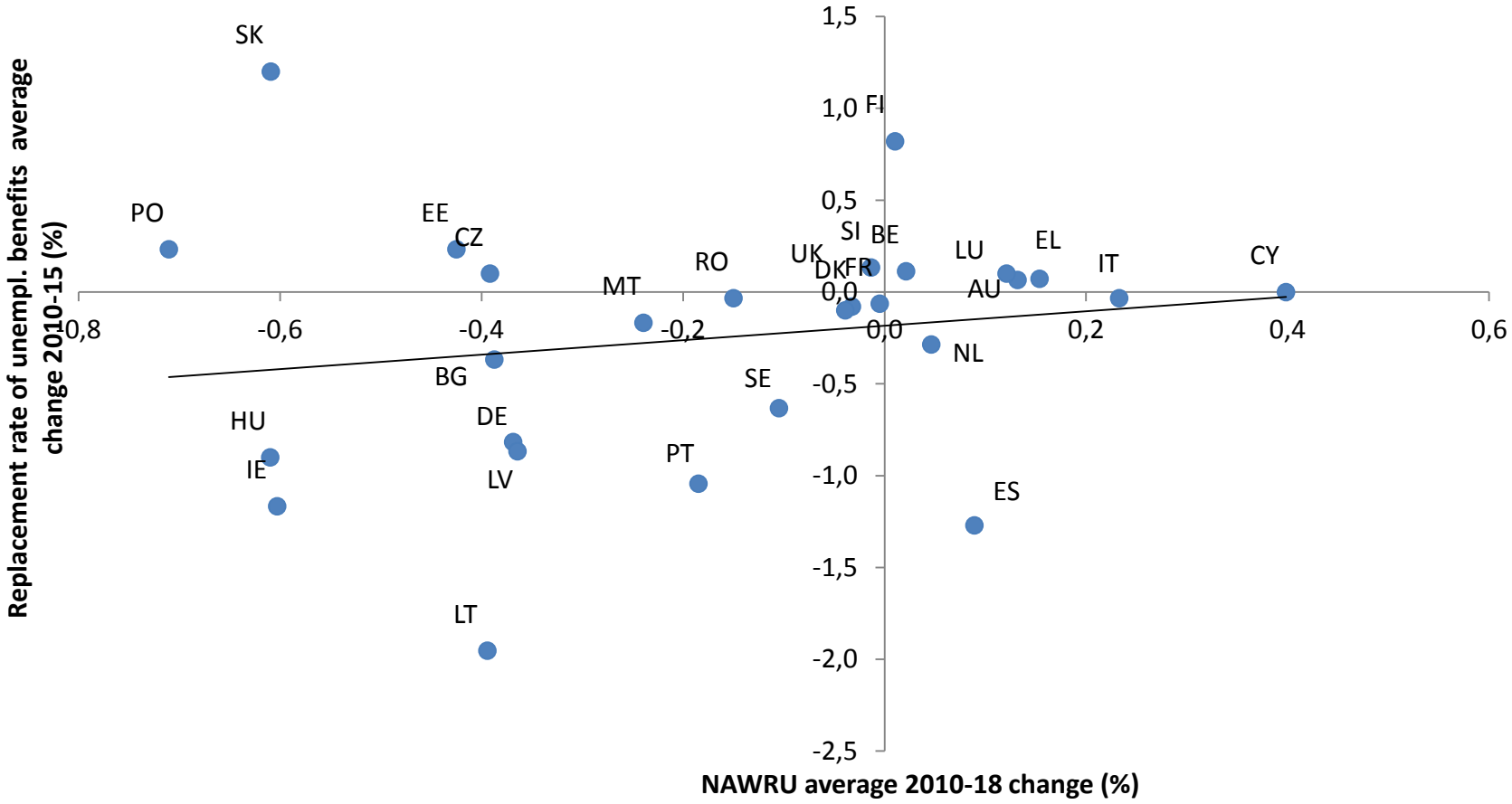
- The CM does not imply any change in depreciation rates growth as a consequence of the crisis
- Firms may have reacted using existing capital for a longer period of time (decreasing depreciation)

Structural reforms: NAWRU vis-à-vis tax wedge changes



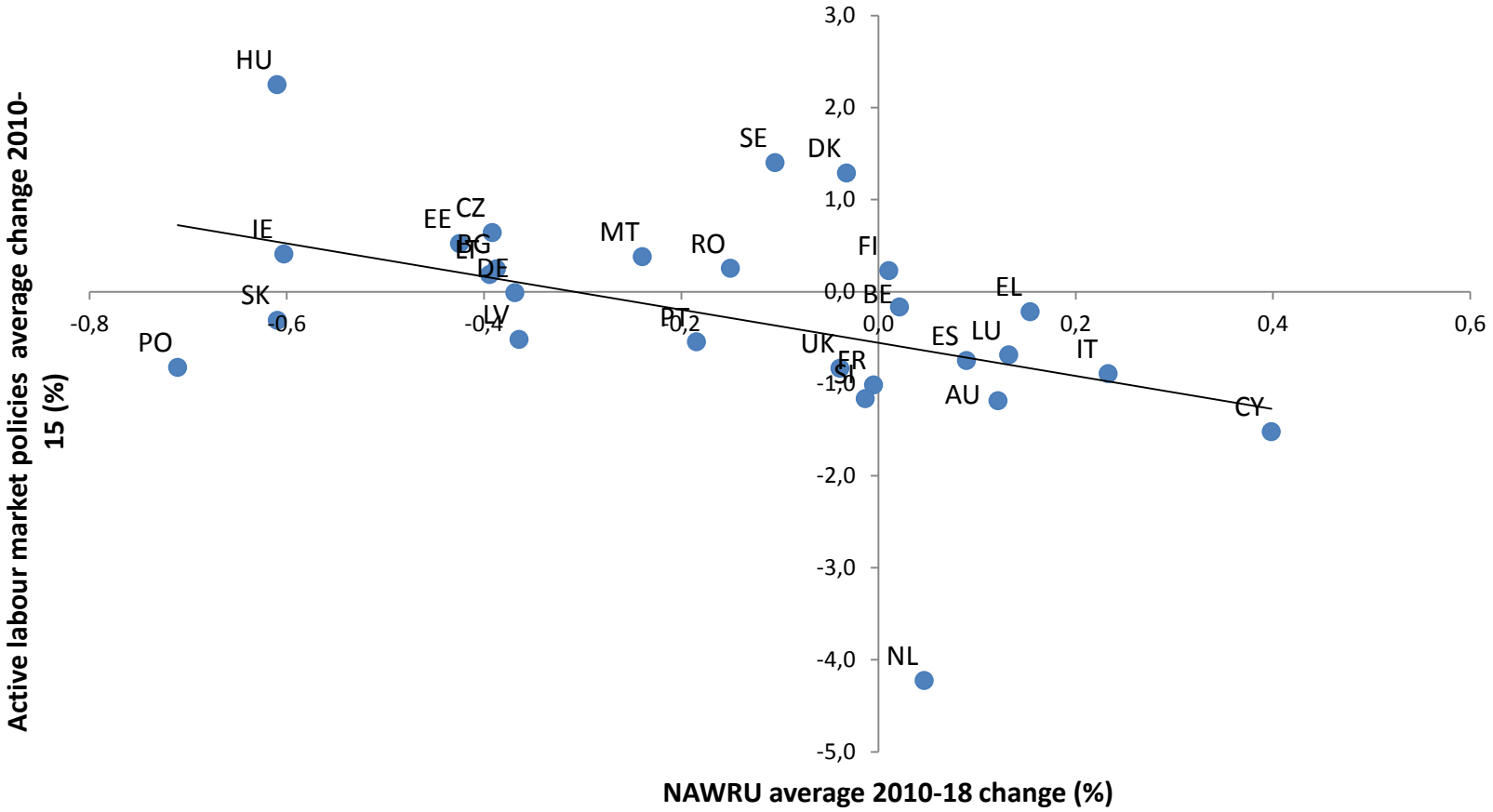
- NAWRU change during the crisis period appears negatively correlated to the change in the tax wedge, even for MS that undertook reforms aimed at reducing labour costs (i.e ES, IT, EL)

Structural Reforms: NAWRU vis-à-vis changes in the replacement rate of unemployment benefits



- NAWRU change during the crisis period is not significantly correlated with the underlying change in the replacement rate of unemployment benefits.

Structural Reforms: NAWRU changes versus ALMPs



- NAWRU average change over the crisis period is not connected with underlying change in Active Labour Market Policies (ALMPs) expecially for MS that undertook structural reforms aimed at streamlining participation in the labour market (i.e ES, IT, EL)

Procedure in case of observed significant deviation

- The Commission addresses a warning to the Member State.
- The Member State is invited to present all relevant factors that may explain its departure from the deficit /debt reduction benchmark.
- The Commission prepares a report pursuant to Article 126(3) TUEF, containing:

a. **overall assessment** of the deficit and debt situation and the context in which it occurred and

b. **opinion** whether the launch of an Excessive Deficit Procedure is warranted, based on a consideration of all factors pertinent to such a decision.

Launch of the EDP procedure: further steps

- The EFC formulates an opinion on the Commission overall report.
- If the Commission considers that an excessive deficit exists:
  1) issues an opinion to the Member State concerned under Article 126(5) TFEU.
  2) prepares a proposal for an Article 126(6) TFEU Council decision on the existence of an excessive deficit
- The Council **adopt a recommendation under Article 126(7) TFEU setting out adjustment requirements and a time limit** to correct the Member State's public finance imbalances.
- Within a deadline set out in the recommendation, the Member State must show that it has taken **corrective actions** to address its excessive deficit.

The Preventive Arm of the SGP: the expenditure rule

- After the crisis, the convergence to the MTO has been reinforced through the so-called expenditure rule
- The presumption is to use the unexpected extra revenues windfalls for deficit and debt reduction while keeping expenditure on a stable and sustainable path over the cycle.
- The excess of growth of expenditure in real term should be matched by discretional revenue measures.
- The Commission and the Council assess the growth path of government expenditure against a reference medium-term rate of potential GDP growth
- The reference medium-term rate of potential GDP growth is determined by regulatory updated forward-looking projections and backward-looking estimates

The Preventive Arm of the SGP: the Expenditure rule

- The net expenditure aggregate is net of items that are not directly controlled by the Government

$$E_t^{\ net} = G_t - U_t^{\ c} - I_t - GFKF_t + \frac{1}{4}\sum_{i=0}^{3} GFKF_{t-1} - DRM_t - RML_t$$

- Total expenditure is net of: 1) interests; 2) expenditure on EU programs; 3) cyclical component of unemployment-benefit; 4) four-year average of investment spending; 4) Discretionary Tax Measures and Revenue mandated by Law.

- Net expenditure growth rate $\dot{e_t}$ is calculated and deflated (GDP deflator)

$$\dot{e_t} \leq \begin{cases} r_t & if\ \ the\ country\ is\ at\ the\ MTO \\ r_t - C_t & if\ \ the\ country\ is\ NOT\ at\ the\ MTO \end{cases}$$

- r_t is the 10 year potential growth average over [t-4; t+5]. C_t is the convergence margin modulating the fiscal effort in line with the matrix of requirements (B)

The Corrective Arm of SGP: The Excessive deficit procedure

- The Commission will always prepare a report for Excessive Deficit Procedure when at least one of the following conditions holds:
  1. A planned government deficit exceeds the reference value of 3% of GDP;
  2. Government debt ratio is above the reference value of 60% of GDP and its differential w.r.t. the reference value has not decreased at a rate of at least 1/20 (over the past 3 years with or without cyclical correction or over a forward-looking configuration).

- Relevant Factors can be invoked.

The Corrective Arm of SGP : The Debt Rule Benchmarks

- Compliance is granted if debt/GPD is not > 60% or is sufficiently diminishing and approaching the reference value at a satisfactory pace.

- Sufficiently diminishing = reduction in line with of the debt reduction benchmark

$$bb_t = 60\% + 0.95/3\ (b_{t-1} - 60\%) + 0.95^2/3\ (b_{t-2} - 60\%) + 0.95^3/3\ (b_{t-3} - 60\%)$$

- Distance with respect to the 60% of GDP reference value has d eclined over 3 preceding years at an average rate of 1/20th per year.

- Otherwise, forward looking assessment and correction for the cycle
  - *Forward looking: Based on unchanged policy, would the debt benchmark be met in two years' time?*
  - *The cycle: If it weren't for the effect of the cycle, would the debt criterion be met now?*

The building bricks of the debt criterion

- The backward-looking benchmark:

$$bb_t = 60\% + 0.95/3\ (b_{t-1} - 60\%) + 0.95^2/3\ (b_{t-2} - 60\%) + 0.95^3/3\ (b_{t-3} - 60\%)$$

- The forward-looking benchmark as estimated by the Commission under the 'no-policy-change' assumption:

$$b_{t+2} < bb_{t+2} = 60\% + 0.95/3\ (b_{t+1} - 60\%) + 0.95^2/3\ (b_t - 60\%) + 0.95^3/3\ (b_{t-1} - 60\%)$$

- Debt ratio adjusted for the cycle: Subtract cyclical component of the balance from debt, in the numerator + Use potential growth in the denominator over the time period considered

$$\left(\frac{B_t}{Y_t}\right)^{3-years-adjusted} = \left(\frac{B_t + \sum_{j=0}^{2}(C_{t-j})}{Y_{t-3}\prod_{h=0}^{2}(1+y_{t-h}^{pot})(1+p_{t-h})}\right)$$

- Debt corrected for the cycle< backward looking benchmark →compliance (B)

The Preventive Arm of the SGP: The Structural Reform Clause

- Structural reforms must have (i) a verifiable positive impact on the long-term sustainability of public finances, (ii) be major and (iii) be fully implemented.
- Member States in the Preventive Arm of the SGP can temporarily deviate from the MTO or the appropriate adjustment path towards it in t+1.
- the deviation should not lead to a breach of the 3% of GDP deficit threshold and a safety margin, i.e. a structural deficit compatible with normal cyclical conditions (minimum benchmark), to this threshold should be continuously preserved.
- The deviation will not exceed 0.5% of GDP (unless for pension reforms).
- The deviation is allowed for only 1 year. The convergence to the MTO should resume from t+2.
- In case of implementation structural reforms, the initial structural deficit cannot be higher than 1,5% of GDP so not to prevent in normal cyclical conditions to converge to the MTO in t+4.

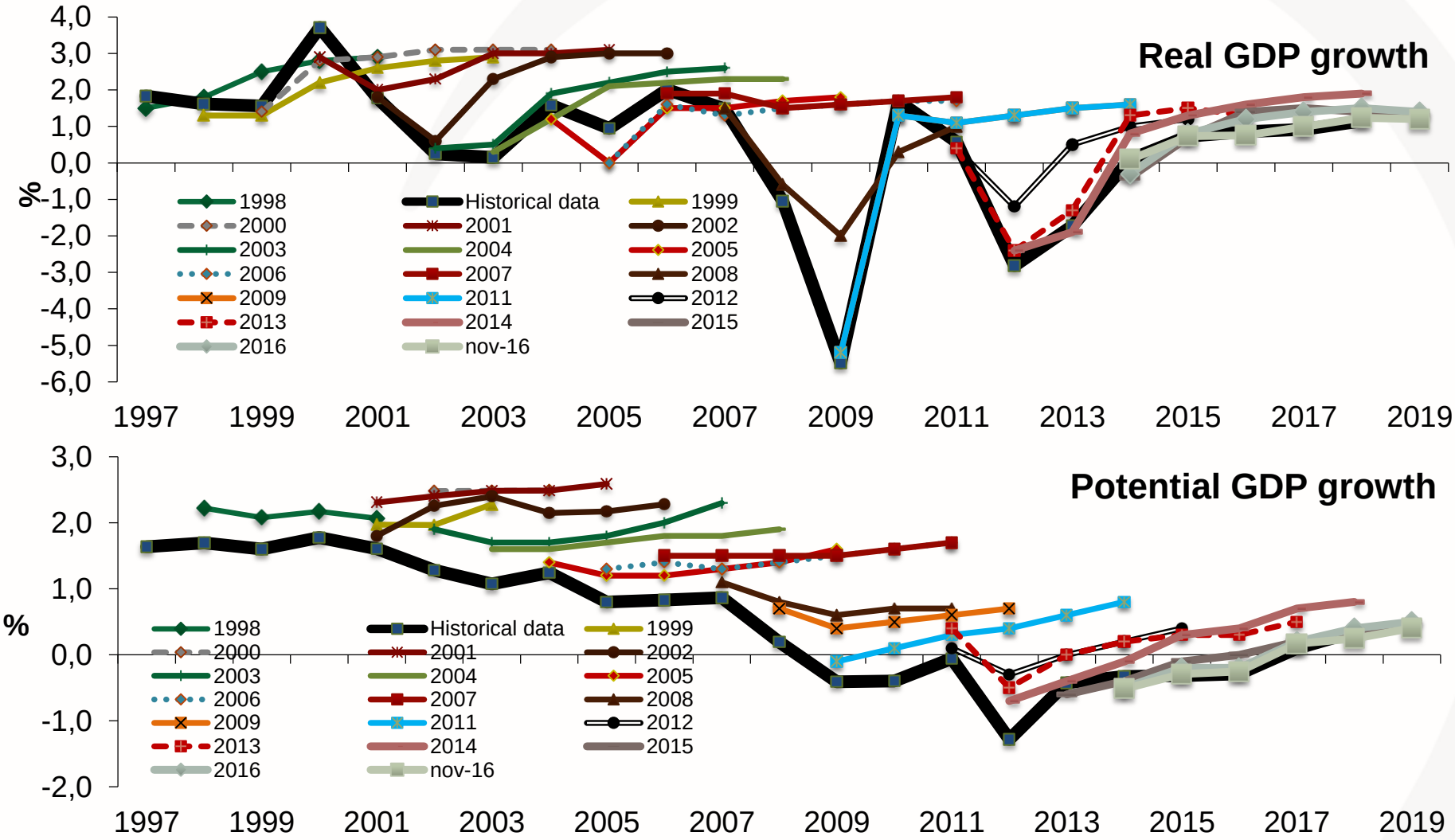
The Preventive Arm of the SGP: The Investment Clause

- Member States in the Preventive Arm of the SGP can temporarily deviate from the MTO or the appropriate adjustment path towards it in t+1 for the amount of national share of EU co-financed investments (and the increase of it from t+2 onwards).
- The deviation will not exceed 0.5% of GDP or 0.25% of GDP if also the Structural Reform clause has been granted.
- the deviation should not lead to a breach of the 3% of GDP deficit threshold and a safety margin should be continuously preserved.
- The Member State is eligible if the OG is wider than -1,5% (bad cyclical conditions)
- The deviation is allowed for only 1 year. The convergence to the MTO should resume from t+2.
- The initial structural deficit cannot be higher than 1,5% of GDP so not to prevent in normal cyclical conditions to converge to the MTO in t+4.

The debt criterion: a quick background

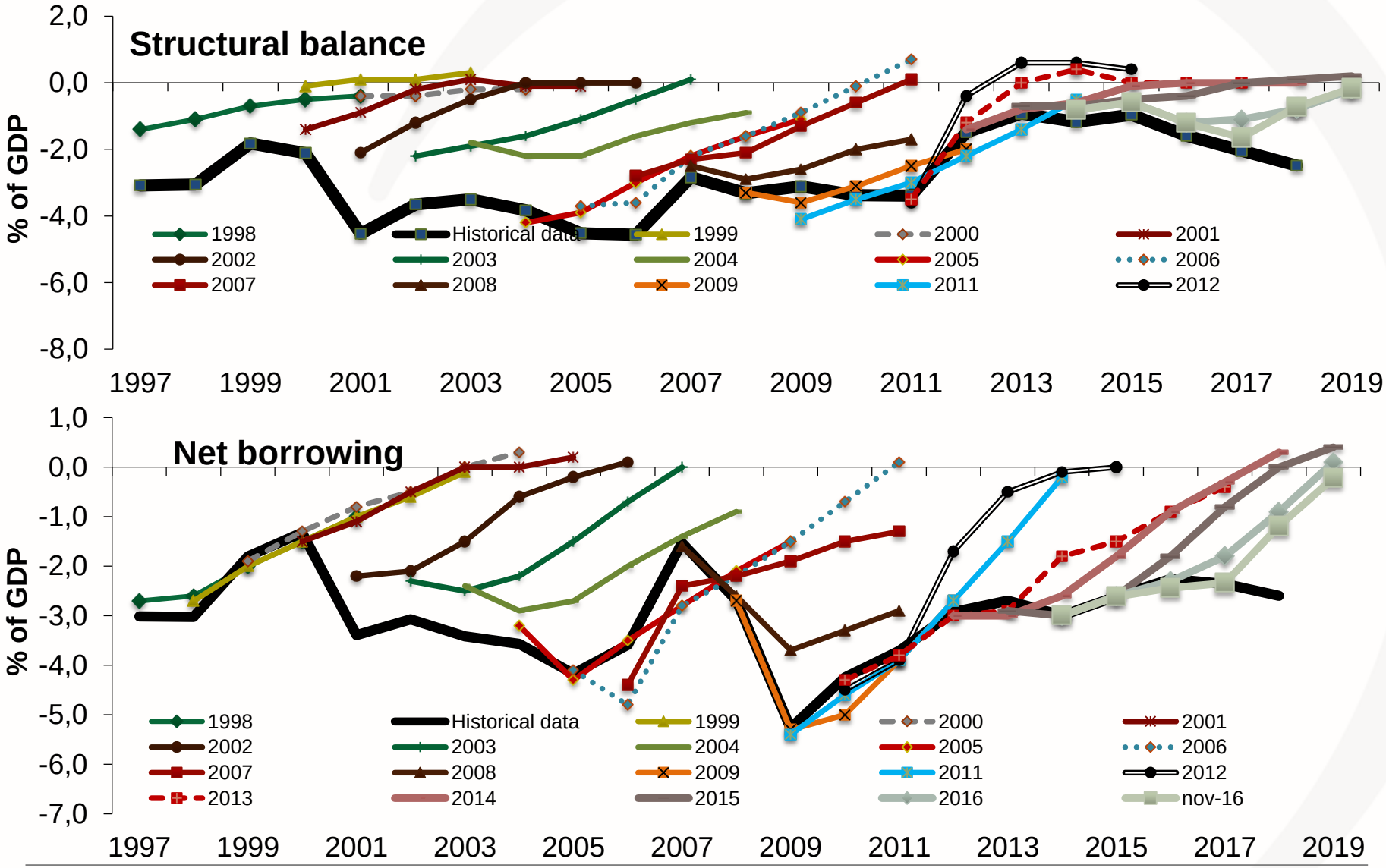
- Debt requirements operationalised with the 2011 reform of the SGP (6-pack)
- Definition of sufficiently diminishing = compliance with the debt reduction benchmark
- Debt reduction benchmark = reduction of 5% per year on average over 3 years of the gap to 60% (taking the cycle into account or compliance in the next two years)
- Transition period for 3 years after the correction of the excessive deficit: no full implementation of the rule but sufficient progress to be made

Real and Potential Growth revisions



Source: AMECO database for historical data; Italy's Stability Programmes

General Government and structural balances revisions



Source: AMECO database for historical data; Italy's Stability Programmes

MEF Dipartimento del Tesoro