



Estimation of output gaps and potential output in times of COVID: the “EUCAM” approach

Joint OGWG-ECFIN-JRC Conference: “Assessment of output gaps and potential output in the context of the COVID-19 pandemic and its aftermath”

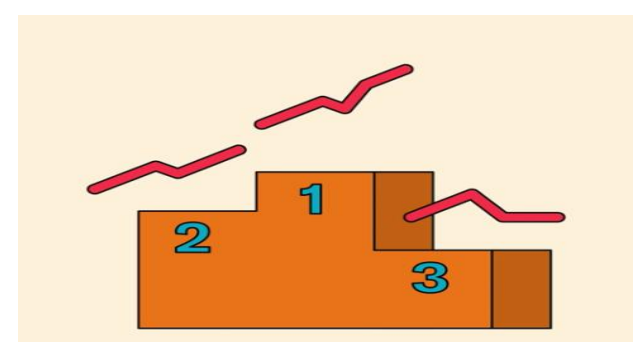
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Introduction



- COVID-19 – a large exogenous shock surrounded by uncertainty:
 - (+) faster than expected rebound of global demand, marked acceleration in the national vaccination programs, roll-out of national and EU policy responses e.g. NextGenEU
 - (-) corporate financial distress, labour scarring once furlough schemes reduced, emergence of new, more contagious virus strains (race vaccine/variant)
- Estimation of output gaps and potential output in times of COVID:
 - Cyclical shock or slow adjustment process ahead?
 - Challenges: disentangling demand from supply shocks; data uncertainty; labour hoarding and underutilisation of capital and labour need to be taken into account in standard filtering tools
 - EUCAM method applied by EC was adjusted to address these challenges with the main motivation to prevent excess pro-cyclicality

Outline of the talk

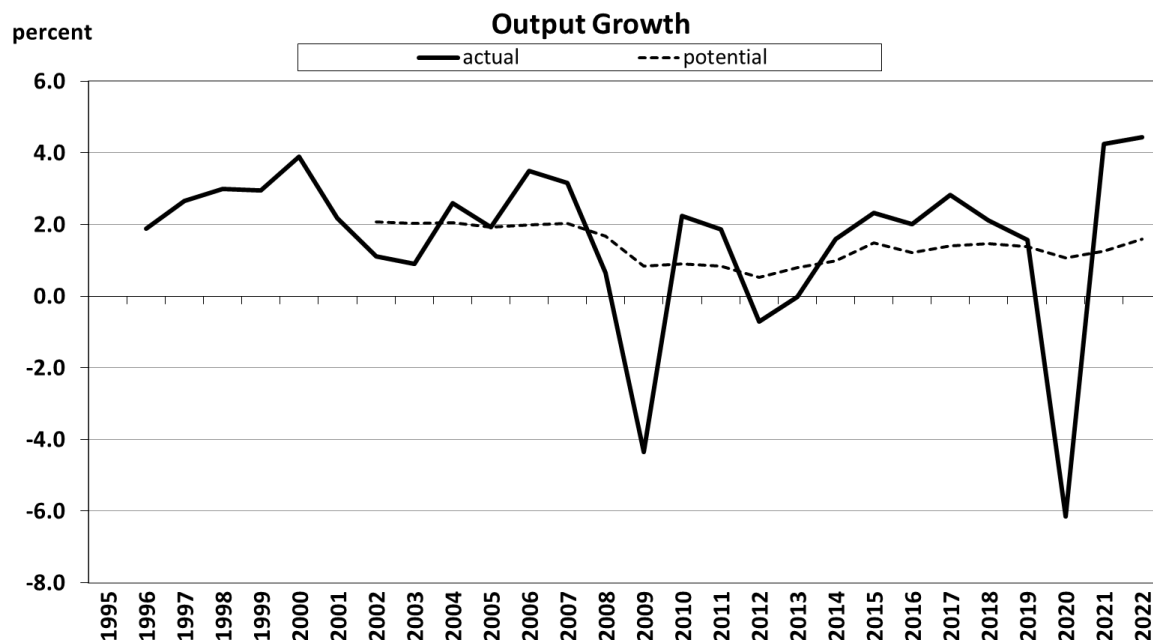
1. What is the “EUCAM”?
2. Output gaps and potential output in times of COVID – the EUCAM point of view
3. Output gap estimation challenges in times of COVID
4. How did EUCAM address these challenges in practice?
 - Trend average hours worked per person employed
 - Trend unemployment: the NAWRU
 - Productivity trends and the capacity utilisation indicator
5. Conclusion

1. What is the “EUCAM”?

- EUCAM = EU-Commonly Agreed Methodology endorsed by ECOFIN Council in 2002 (safe-guarded by the “OGWG”)
 - for calculation of EU member states’ output gaps and potential output run by the EC
- Based on Cobb-Douglas production function approach (labour, capital, productivity with labour elasticity=0.65):
 - De-trend components:
 - NAWRU using multi-variate Kalman filter (Philipps curve; wage indicators)
 - TFP trend using multi-variate Kalman filter (capacity utilisation)
 - Trend hours worked per person employed, trend participation rates using HP filter
 - Capital, working-age population use actual data (no trend)
 - Annual data at member state level (AMECO; including European Commission forecast data to T+2 ⇔ interaction with country desks)
 - Software package EUCAM: simplified user interface integrating all operations (Python calling “GAP” software)
 - References: Havik et al (2014) and Blondeau et al (forthcoming)

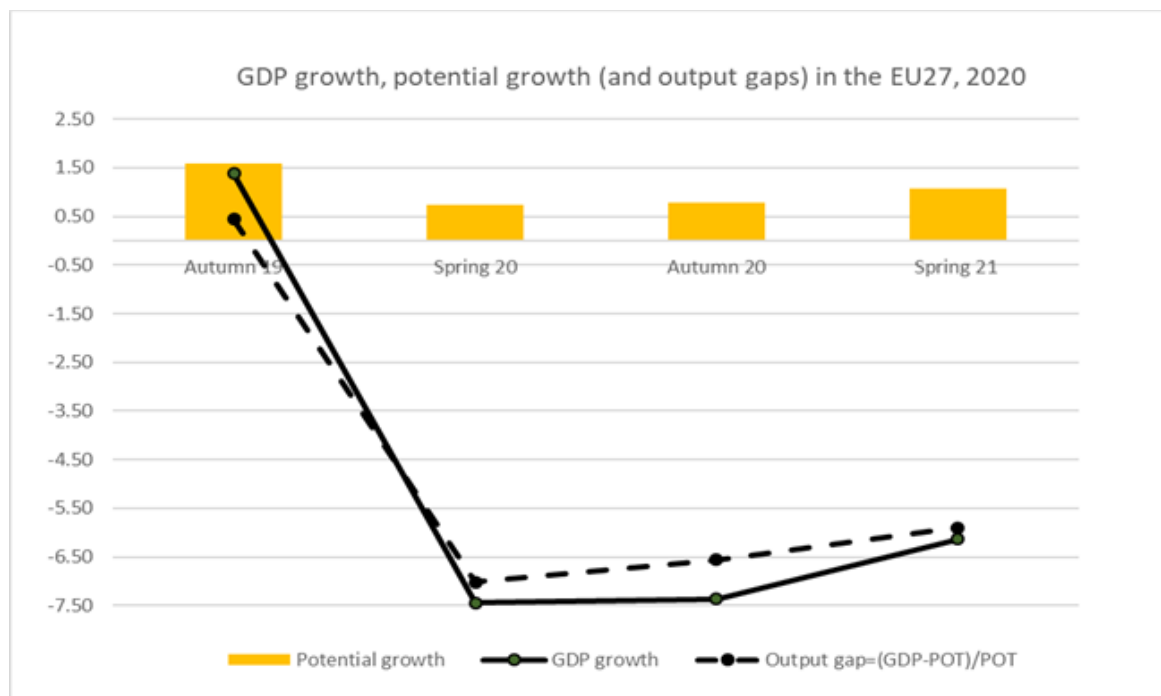
2. Output gaps and potential output in times of COVID – the EUCAM view

- Potential in the EU affected only slightly: potential output growth positive in 2020 & falls only by 0.1 p.p. despite a fall of nearly 8 p.p. in the actual GDP growth rate
- Potential growth projected to nearly reach pre-crisis value in 2021 (1.3% vs 1.4%)
- Potential output levels to reach their 2019 path again by around 2026



2. Output gaps and potential output in times of COVID – the EUCAM view

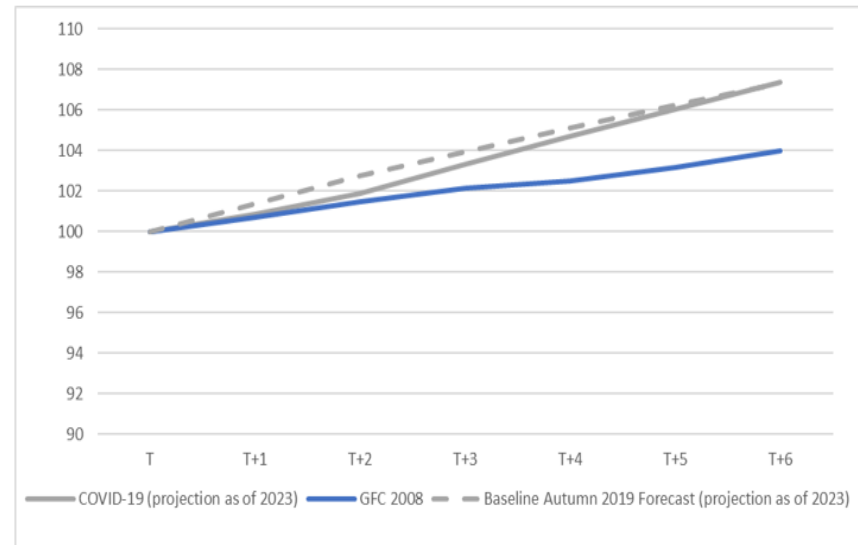
- Excess pro-cyclicality was largely contained over all forecast vintages since the onset of the pandemic
- Upward revision in Spring 2021 is explained mainly by the successful development of effective vaccinations and their validation as well as the roll-out of the NextGenEU programme



2. Output gaps and potential output in times of COVID – the EUCAM view

- Effects of the COVID-19 shock on potential output appear to be less severe than those of the global financial crisis (GFC)
- GFC characterized by a sustained decline in investment and COVID-19 shock rather transitory and consumption-driven
- However, technical T+10 extension surrounded by uncertainty and a few elements not taken into account (discontinued policy schemes, NextGenEU spending beyond 2023)

Figure 3: Recovery in the euro area, potential output levels compared to the pre-crisis path and the global financial crisis



Source: own calculations.

3. Output gap estimation challenges in times of COVID

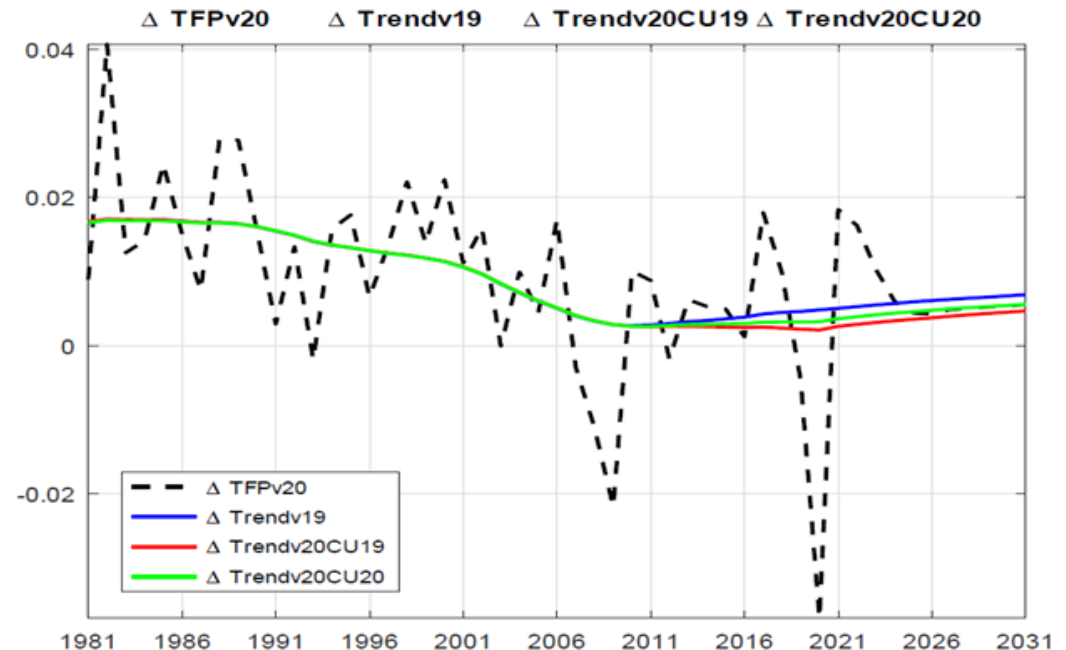
- Data uncertainty:
 - Hours worked; labour cost indicators, labour force survey revision (*see also Session 3 presentations by Eurostat)
- Demand and supply shock disentangling:
 - Potential typically determined by supply shocks and we aim to identify those
 - During COVID: supply shocks triggering demand shocks larger than supply shocks “Keynesian demand shocks” or demand shocks may have persistent effects (see GFC)
- Standard filtering tools indicate important trend effects if labour hoarding and capacity utilisation developments (e.g. underutilisation of capital and labour) are not taken into account sufficiently
 - Note that even under negative short-term forecasts, long-term could be determined by digital technology providing a positive impact on potential/productivity (home office, telework,..) -> see paper [“COVID-19 acceleration in digitalisation, aggregate productivity growth and the functional income distribution”](#) (Doehring et al 2021, International Economics and Economic Policy)

4. How did EUCAM address estimation challenges in practice?

- Main goal: reduce excess pro-cyclicality by controlling for labour hoarding and under-utilisation:
 - Trend TFP:
 - capacity utilisation indicator (adjustment needed only in Spring 2020)
 - Trend labour components:
 - Adjustments to NAWRU
 - Adjustments to trend hours worked per employee
 - Trend participation rate (more vulnerable groups affected?); working age population - so far no adjustment needed
 - Capital (not de-trended): some types of capital becoming obsolete (air planes) while others flourish (digital)? - so far, no adjustment needed (but follow closely ESTAT task force)

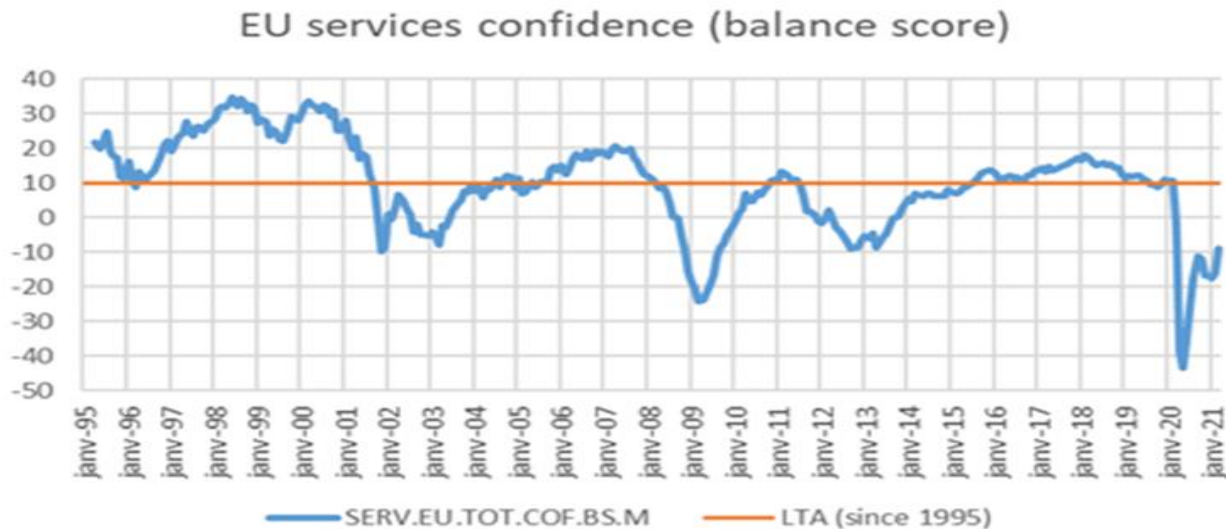
4. How did EUCAM address estimation challenges in practice? *Trend TFP*

- TFP is detrended using EU Business Survey capacity utilisation question >> proves to be very useful in context of COVID
- In Spring 2020, not enough data was available and we needed to calculate a proxy based on GFC, which fared well



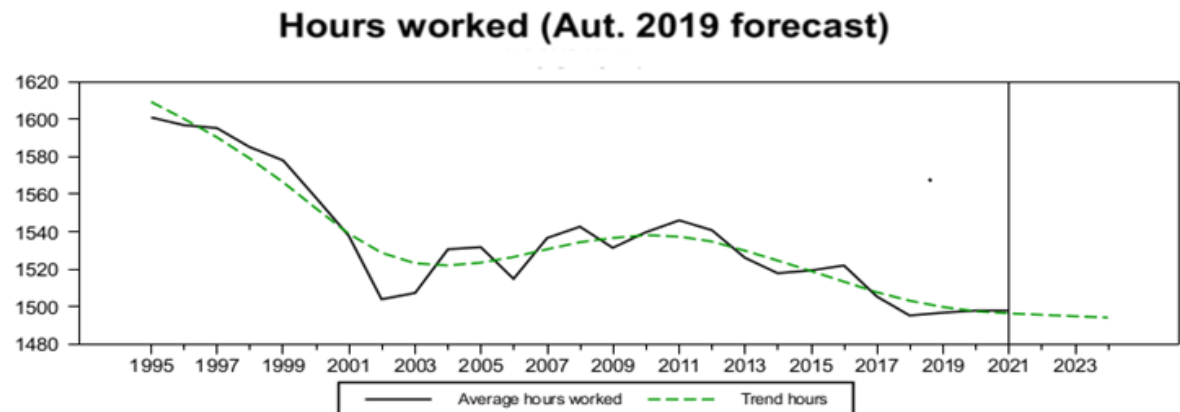
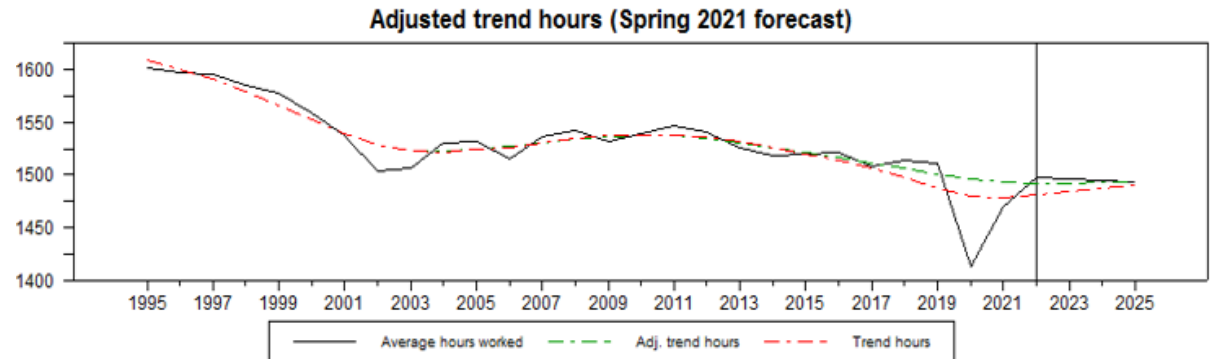
4. How did EUCAM address estimation challenges in practice? *Trend TFP*

- Is the EU business survey capacity utilisation question a good indicator or could managers be shifting their assessment of what constitutes normal output (during COVID)?
 - unprecedented slump in services capacity utilization suggests that it was a widespread phenomenon for managers to interpret potential full capacity as fairly constant



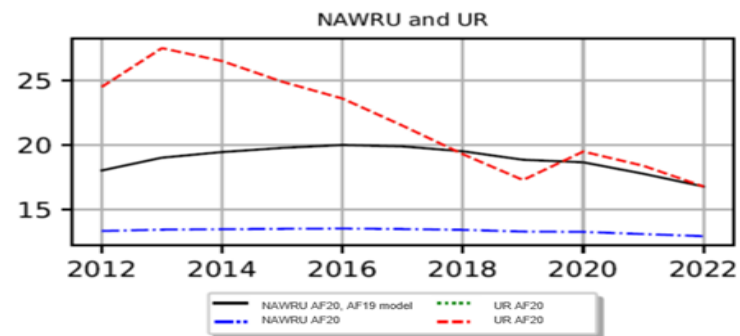
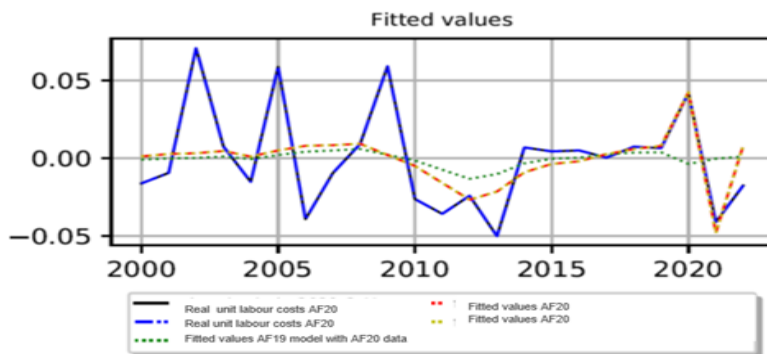
4. How did EUCAM address estimation challenges in practice? *Trend hours*

- Hours per employee extended by AR-process and then de-trended via HP filter
- HP filter: even clearly temporary shocks have trend effects
- Current solution:
 - linear interpolation 2019 and 2021 for 2020 value
- Current research:
 - specify dummy variables for 2020&2021 in AR process or directly in filter



4. How did EUCAM address estimation challenges in practice? *NAWRU*

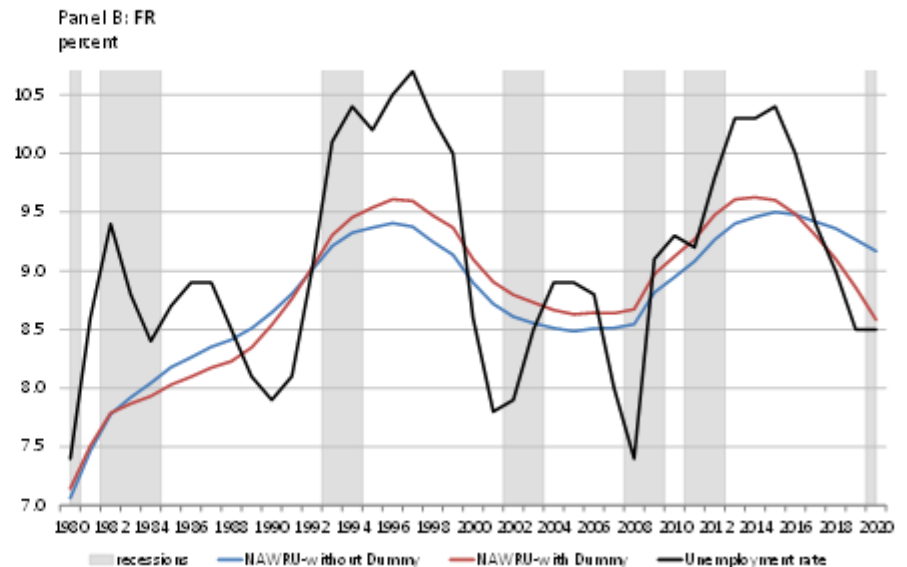
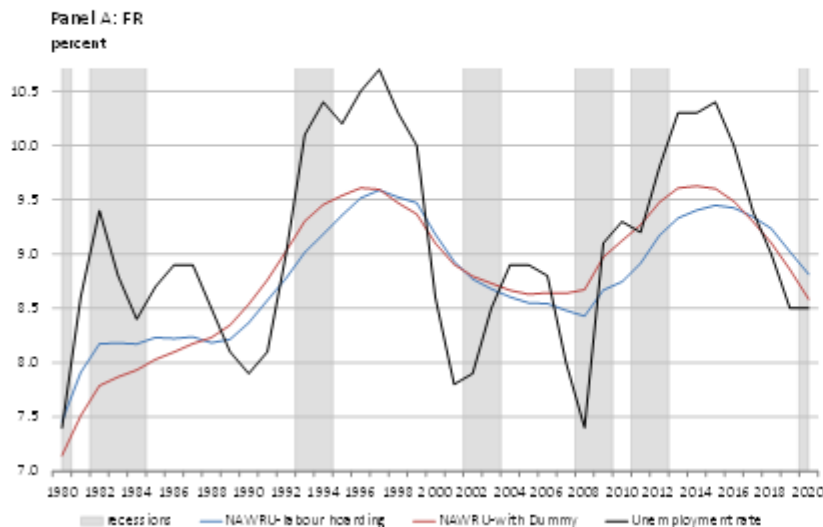
- Unemployment is de-trended based on wage Philipps curve
 - Uncertainty surrounding labour cost indicator: furlough schemes not fully captured (compensation could be over-estimated)
 - Breaking down of the Philipps curve in some member states: unemployment stable while real unit labour costs rising (as labour productivity declines)
 - Solution: “labour hoarding” dummy variable for 2020; 2021 in some member states to stabilise the Philipps curve relationship



4. How did EUCAM address estimation challenges in practice? *NAWRU*

- On-going research on incorporating labour hoarding indicators (*see also Session 2 presentation by A. Hristov)
- Pan-EU indicator based on firm-level EU-Business Survey data (pattern whereby (expected) output is falling and (expected) employment is not falling as much could be used as an indirect measure of labour hoarding)

Figure 7: *NAWRU estimates with and without controlling for labour hoarding, Spring 2021 Forecast*



5. Conclusions

- Medium-term impact of COVID on potential likely to be limited (especially EU aggregates) – based on extrapolation of SF21 data trends
- Accounting for COVID-related shocks:
 - TFP: capacity utilisation indicator highly useful in the COVID context (no adjustment needed)
 - Hours worked: interpolation approach and continuing to monitor the results from different approaches as data comes in
 - NAWRU: “labour hoarding” dummy variables in the Philipps curve proven useful.
- Further research is ongoing regarding method of hours worked adjustment and labour hoarding indicator as well as Philipps curve specification

Thank you!