II. Potential output and output gaps against the backdrop of the COVID-19 pandemic

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Abstract: This section examines developments in potential output and output gaps across the euro area against the backdrop of the COVID-19 pandemic. Whilst mindful of the "normal" uncertainty which inevitably surrounds an unobservable variable such as potential output, it stresses that estimating potential has been especially challenging in the current crisis due to the complex mixture of supply, demand and liquidity shocks which COVID-19 provoked. In addition, standard business-cycle filtering methods are susceptible to producing excessively pro-cyclical potential output trends if key features of the COVID-19 crisis, such as labour hoarding and the underutilisation of physical capital, are not properly accounted for. Consequently, to handle the specificities of this unprecedented event, a number of stability-inducing methodological adjustments were made to the European Union's Commonly Agreed Methodology (EUCAM) for the estimation of potential output and output gaps. In terms of results, the current Autumn 2021 EUCAM estimates for the euro area and its Member States do not show any persistent negative impact on potential output from COVID-19, in stark contrast with the global financial crisis and reflecting the different nature of the respective shocks ([49]). It should be noted that the potential implications of Russia's invasion of Ukraine are completely excluded from the analysis since it is based on forecasts from last autumn.

II.1. Introduction

The EU's economy has experienced a recession in 2020 of unprecedented depth, outside of war times. The observed drop in output was caused by a combination of supply shocks (closure of parts of the economy to dampen the propagation of the pandemic); demand shocks (postponed consumer spending and investment plans); and liquidity shocks (precipitate revenue declines, cushioned by public income and liquidity support measures). The relative contribution of these shocks was often not directly observable and their interpretation was plagued with an unusually high degree of uncertainty.

The metaphor of 'frozen' potential output was coined at the outset of the crisis, in spring 2020, to account for the sudden non-availability of a large part of the EU's productive capacity and to reflect the view that, as long as the policy response was sufficiently robust, and the recovery process was rapid, that it was legitimate to expect that the "frozen" portion of the EU's supply side capacity could emerge largely unscathed from the COVID-19 crisis.

This initial "frozen potential" assessment of the effects of the COVID-19 crisis has proven prescient, with incoming data and subsequent forecasting exercises reinforcing the view that any effects of the COVID-19 crisis on the EU's potential output capacity were likely to be temporary in nature.

However, whilst the evidence to date is encouraging, more time is needed before a full assessment can be made of the specific nature and longer run effects of the COVID-19 shock on the EU's supply side capacity ([50]). While strong policy action at the EU and Member-State levels has dampened the initial impact of COVID-19 on workers and businesses and contributed to a rapid and vigorous economic recovery, many uncertainties still persist as to the productivity and labour market implications of COVID-19. In particular, the labour market could suffer more long-term scars (hysteresis) than currently expected; solvency problems could emerge for more companies; and difficulties in the sectoral reallocation processes, combined with greater repatriation of global value chains, could adversely affect the euro area's already fragile productivity trends.

It needs to be stressed that the potential implications of Russia's invasion of Ukraine are not included in the analysis. The effects of the policy decisions which may be made as a result of this invasion could have a large and lasting impact on

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([50]) See, for example, Ademmer et al (2021),'Output Gap Estimates and Fiscal Policy in the context of the Covid-19 crisis', Kiel Institute for the World Economy.

the productive structure of the European Union in the years to come.

Based on the Autumn 2021 Commission forecasts, this section of the QREA is exclusively focused on examining developments in potential output and output gaps across the euro area against the backdrop of the COVID-19 pandemic and based on the **EU**'s **C**ommonly **A**greed **M**ethodology ("EUCAM") for calculating potential output and output gaps. At the outset it should also be noted that this section does not discuss the link between output gaps and current inflation dynamics for a number of reasons. Firstly, this edition of the QREA also includes an article on euro area inflation developments. Secondly, whilst there is undoubtedly a correlation between the output gap and inflation, a one-to-one co-movement relationship should not be expected since inflation is not only driven by demand pressures but also by supply shocks and by shifts in inflationary expectations. Thirdly, whilst economic stability and monetary stability are complementary, the fiscal and monetary authorities focus on different priorities. EUCAM is primarily an economic analysis tool focused on fiscal policy surveillance, not a monetary policy inflation forecasting tool. EUCAM takes the inflation forecasts from ECFIN's desk officers and uses this information, along with a wide range of additional cyclical indicators, to try to isolate where the euro area is currently in the cycle; with the Commission's latest Autumn 2021 forecasts suggesting that the euro area's output gap will be fully closed this year [51].

II.2. Why was it challenging for EUCAM to estimate output gaps and potential output in the face of the COVID-19 shock?

The EPC's **O**utput **G**ap **W**orking **G**roup (OGWG) has been responsible, over the last 20 years, for the development of EUCAM (the EU's commonly agreed methodology for estimating potential output and output gaps). Over this period of time, EUCAM has been regularly updated, most notably in the aftermath of the 2008 Financial Crisis, with significant changes being made to its core productivity and structural unemployment components. In early 2020, it quickly became clear that COVID-19 would necessitate a series of temporary, stability inducing, adjustments to the methodology to avoid excessive, and unwarranted, procyclicality in its potential output estimates (essentially, the two modifications related to COVID-19, which were introduced in Spring 2020, were first, the use of linear interpolation for the hours worked part of the methodology and, second, the use of "dummy variables" in the NAWRU calculations. See Box II.1for a more detailed description). These adjustments, unanimously endorsed by the OGWG, ensured that almost all of the COVID-19 related downturn in actual GDP went into the output gap estimates rather than into a reduction of potential output. The unprecedentedly large negative output gaps produced by EUCAM in spring 2020, for the year 2020 (more than double that of the financial crisis year of 2009), underpinned the need for a robust policy response.

EUCAM is used by EU policy makers for assessing both the productive capacity and cyclical position of the EU's economies. Its central block for the estimation of potential output is a production function, with potential being represented by a combination of factor inputs (labour and capital), multiplied with the technological level or total factor productivity (TFP). The trend components of the individual GDP production factors are estimated by filtering out trend (potential) and cyclical (output gap) components from noisy real time and forecast data. This decomposition of actual GDP developments into the part linked to the normal transitory fluctuations of the economic cycle and the part that is more permanent in nature, aims to reduce the uncertainty facing policy makers taking policy decisions in real time by providing an assessment of the sustainability of short-term growth patterns over the medium to long run.

Ultimately, the robustness of EUCAM's trend/cycle decomposition of the latest short-term economic developments, depends on the quality of the factor input indicators used by EUCAM's filtering tools to isolate the cyclical component of growth. These are essentially a range of labour market and product market indicators that try to capture shifts in the utilisation patterns of the labour and capital factors of production. In this context, disentangling the supply- and demand-induced effects of the COVID-19 shock has been severely hampered by the lockdown-induced uncertainty around those factor input data,

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[51] For readers interested in a more in-depth discussion on the link between output gaps and inflation, additional information is provided in the December 2021 VOX EU article "Output gaps, potential output and the Covid-19 crisis: Policymaking under uncertainty"

especially for labour (with significant distortions to the employment, wage and productivity indicators). In addition, standard business-cycle filtering methods are susceptible to excess pro-cyclicality in a crisis such as COVID-19, in particular when key features of the crisis, like for example labour hoarding [52], are not properly taken into account in the analysis (see Box II.1 for the technical details).

II.3. Current EUCAM estimates of potential output and output gaps

As mentioned earlier, since the COVID-19 pandemic affected both supply and demand over the same short run time horizon, this inevitably led at the outset of the crisis to the emergence of different conceptual interpretations of the effects of COVID-19 and, as a consequence, on the appropriate short and longer run policy responses. Faced with this enormous degree of uncertainty, there were two extreme ways of interpreting the effects of COVID-19 put forward in the literature [53]:

- Under the first interpretation, one could assume that the available supply of the factors of production are not directly affected by the lockdown measures so that the degree of potential capacity is unchanged (implying a large output gap and stable potential output). Under this view, the temporarily "frozen" capital and labour supply side elements, as well as the demand side "COVID-19 restrictions" part of economic slack, should both be included in the output gap estimates. In terms of policy, this view stresses that a robust, policy-induced, recovery process is essential for avoiding any scarring of this "frozen" portion of the euro area's supply side capacity.

- An alternative interpretation is that, during lockdown, full capacity collapses to zero in firms that are closed. This is equivalent to a steep drop in supply and thus in potential output, with the result that the output gap is significantly smaller than under the first interpretation. Under this view, as the containment measures are gradually lifted, the degree of full capacity will only gradually recover towards its level before the crisis. In other words, this view stresses that the recovery of the "frozen" portion of the euro area's supply side capacity could be a much slower process. As the economic recovery process is more drawn out, the medium to long-term impact of the crisis on potential growth would be much more negative.

The view taken in successive European Commission Economic Forecasts since Spring 2020 [54], was much more consistent with the first interpretation of the crisis, given their repeated prediction of a close-to-V shaped actual GDP recovery. This interpretation led to the conclusion that the euro area's potential output would in fact stay very stable and would not decline. More precisely, EUCAM suggested in spring 2020 that, with a forecast for a rapid and vigorous actual GDP recovery, the effects on potential output of the crisis would be limited and transitory, with over 90% of the fall in actual GDP in 2020 being reflected in the output gap, rather than the potential, component of growth. In terms of numbers, in spring 2020 the output gap for the euro area was estimated by EUCAM at -7.3% compared with -3.5% in the financial crisis year of 2009.

The unprecedented size of EUCAM's negative output gap for the euro area supported a strongly expansionary policy response to the crisis and underlined the key message for policy makers that the weaker the policy response, the greater the risk of long-term damage to the EU's supply potential. The latter would emanate from a range of transmission channels including delayed or cancelled investments; skill losses due to disrupted education and training; scarring effects in the labour-market; and from frictions in the reallocation of capital and labour.

This policy message from EUCAM has been consistent since the start of the crisis in spring 2020. Indeed Graph II.1 shows that EUCAM's potential growth rate estimates for 2020 remained

[52] See Hristov, A. and A. Thum-Thysen (2022), 'Measuring Labour Hoarding with Existing Firm-Level Survey Data', (Forthcoming); Leitner, S. M. and R. Stehrer (2012), 'Labour hoarding during the crisis: evidence for selected new member states from the financial crisis survey', *wiiw Working Paper* No. 84.; Hristov, A (2022), 'Labour Effort and the European Wage Phillips Curve', (Forthcoming).

[53] See, for example, Bodnar, K., Le Roux, J., Lopez-Garcia, P. and B. Szoerfi (2020), 'The impact of COVID-19 on potential output in the euro area', *ECB Economic Bulletin*, Issue 7/2020.

[54] European Commission (2020), European Economic Forecast. Spring 2020, *European Commission Institutional Paper* No. 125.

remarkably stable over all of the subsequent forecast vintages, with little evidence of any procyclicality bias. For the euro area aggregate, while GDP growth was revised down from about 1% to around -7½ % and then back up to -6½ % over the different post-Spring 2020 forecast vintages, potential growth estimates always stayed strongly positive. Graph II.1 also highlights the fact that the output gap continued to absorb the vast bulk of the shock in all of the forecast vintages [55].

Graph II.1: **Revisions for 2020 in potential growth, GDP growth (and the output gap) over all available vintages since the onset of the pandemic, EA19**
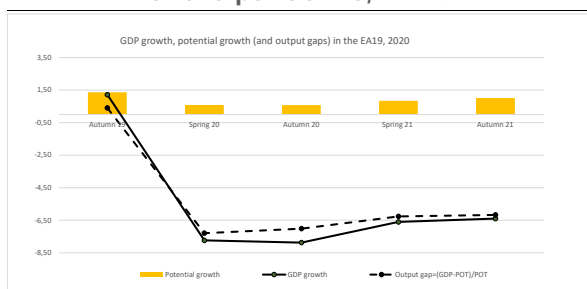
Source: Own calculations

In addition, as shown in GraphII.2, in stark contrast with the global financial crisis, and reflecting the different nature of the shocks, EUCAM does not currently project any persistent negative impact on potential output from the COVID-19 shock.

Indeed, while the global financial crisis was characterised by a sustained decline in investment, with knock-on negative implications for the efficiency of the capital stock and labour demand, the COVID-19 shock is characterised by a collapse in demand provoked by much more transitory, private consumption-driven, factors [56]. One would consequently expect an economic shock of the COVID-19 type to be associated with much less pronounced medium-term supply-side effects. The COVID-19-type of shocks need to be clearly distinguished from the asset-bubble induced 2009 recession, which had much more profound implications for potential output, not least due to

the shifts in expectations it induced regarding long-run rates of return on capital.

Incoming data have tended to support the view that potential output has not been severely and persistently affected. Employment in the euro area was already higher at the end of 2021 than at the end of 2019, and the unemployment rate lower. Broader underemployment is being absorbed and has fallen almost to its pre-pandemic level (Commission Winter Forecast).

Gross fixed capital formation dropped sharply in the first half of 2020, but rebounded afterwards. While it remains somewhat below pre-COVID-19 levels so far, it is projected to recover further this year and next.

Graph II.2: **GFC and COVID-19 projections of euro-area potential output compared to baseline (index)**
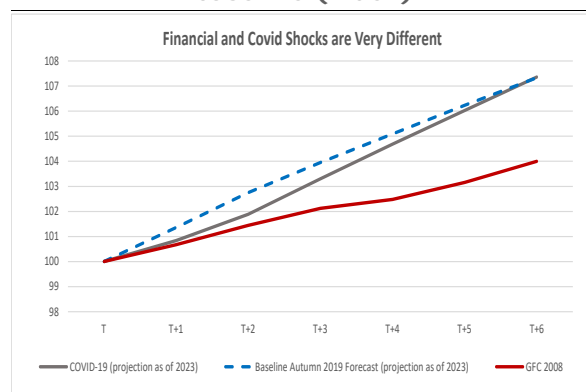
(1) T refers to the pre-crisis value of the GFC crisis (i.e. 2008) and the COVID-19 crisis (i.e. 2019) respectively. T+1, T+2, etc. refer to 1,2, etc. years after the pre-crisis value. For 'COVID-19' and 'Baseline Autumn 2019 Forecast', the graph is based on realised data for 2020, DG ECFIN's short-term forecast for 2021 and 2022 and a technical extension of the short-term forecasts for 2023 to 2026. For GFC 2008 the graph shows only realised data (2008-2014) i.e. it also includes the effects of the subsequent Euro Area debt crisis characterised by a double-dip recession.
Source: Own calculations, based on Autumn 2021 Forecast

EUCAM's T+10 estimates, based on the Commission's Autumn 2021 forecasts [57], continue to project weak scarring effects on potential output over the coming decade, at least at the euro area aggregate level. In fact, thanks to the policy support at national and EU levels, potential output in the coming years is even estimated to be slightly higher than expected back in 2019. EUCAM estimates that average potential growth

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[55] Note that the output gap is expressed as the difference between GDP and potential output as a percentage of potential output and can hence not be directly compared with the growth figures.

[56] See Croitorov, O., Filippeschi, G., Licchetta, M., Pfeiffer, P., Reut, A., Simons, W., Thum-Thysen, A., Vandeplas, A. and L. Vogel (2021), 'The macro-economic impact of the COVID-19 pandemic in the euro area', *Quarterly Report of the Euro Area,* Vol. 20, No.7.

[57] European Commission (2021), European Economic Forecast. Autumn 2021, *European Commission Institutional Paper* No. 160.

rates will be a ¼ of a percentage point higher over the coming decade than in the equivalent pre-COVID-19 baseline from the Autumn 2019 projections, with the euro area now expected to grow over the period 2022-2031 at an annual average potential growth rate of 1 ¼%, instead of 1%.

The somewhat surprising aspect with this better-than-expected growth outlook is the fact that roughly half of the growth rate gain comes from the labour component of growth ([58]). This is driven by the unexpectedly strong resilience of European labour markets. Euro area labour markets performed remarkably well in the re-opening phase of COVID-19 in spring 2021, with a better-than-expected employment creation performance. In addition, unemployment rates have quickly moved back towards their pre-crisis levels and average hours worked per worker have rebounded swiftly, as many workers exited job retention schemes.

Some caution is needed however in over-interpreting the sustainability of this seemingly robust labour market performance, due to the caveats raised earlier about a number of the labour market input variables. Regarding the non-labour growth drivers, small labour productivity improvements explain the other half of the hike in euro area potential growth rates over the coming decade. In addition, it is important to stress that whilst the projections at the ten-year horizon do allow for NGEU / RRF investments, they do not include the effects of the structural reforms part of NGEU / RRF which constitute a significant upside potential for the euro area's growth potential going forward.

Whilst the Autumn 2021 forecasts are reassuring, some caveats / downside risks need to be borne in mind in interpreting the results ([59]), since it is still much too early to reach a definitive conclusion regarding the effects of COVID-19 over the medium to long-term :

- The first caveat is that the pandemic is not over and it continues to exert a significant constraining influence on the consumption and investment drivers of output growth.

Graph II.3: **Output growth and output gap, Autumn Forecast 2021**

Output Growth - EA19 (Aut. 2021 forecast)

Output gap - EA19 (Aut. 2021 forecast)
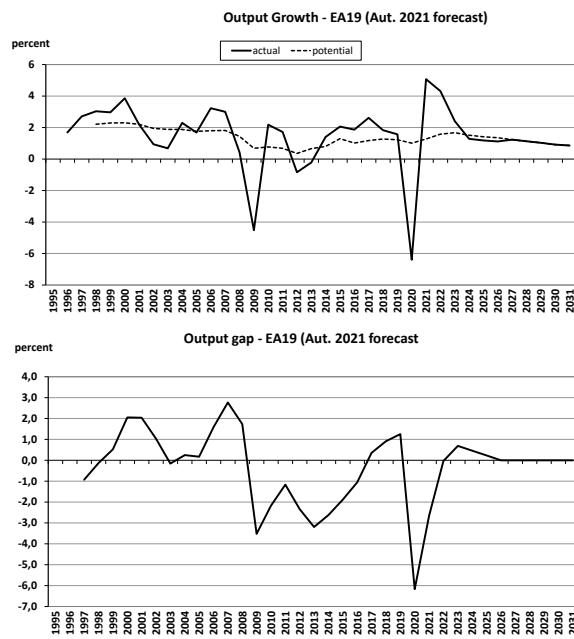
Source: own calculations

- Secondly, there is a considerable risk that, without sustained policy support and the implementation of targeted structural reforms, the COVID-19 shock could still inflict permanent damage to the productive capacity of euro area economies. Policy measures implemented so far have avoided severe damage to the euro area's economic tissue but many more structural measures will be needed to prepare for the future, in the form of facilitating the reallocation of resources and the reskilling / upskilling of workers to avoid skill mismatches. The more these processes are blocked, the greater the impact on potential and the slower the process of reallocating workers / capital from declining sectors towards the new digital & green sectors which constitute the lynchpins of the EU's long run sustainable growth ambitions.

- Finally, it should be remembered that various pre-COVID-19 headwinds to potential growth have not gone away. In particular the euro area's ageing population constitutes a persistent drag on potential growth going forward. Moreover, the jury is still out as to whether the secular decline in the euro area's TFP growth rate experienced in the run up to COVID-19 can be reversed, post COVID-19, via the

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([58]) Box II.1 describes how labour hoarding affected the estimation of the NAWRU.
([59]) Please note that the potential implications of Russia's invasion of Ukraine are excluded from this analysis, including the medium to long term implications of energy diversification etc.

investments and structural reforms linked to the NGEU.

II.4. Conclusions

The COVID crisis has underlined, yet again, that policymaking under uncertainty is an unavoidable fact of life and that a deep analysis of the likely implications on potential growth of any crisis constitutes an essential first step in drawing up an effective policy response. In this context, from the outset of the crisis in spring 2020, EUCAM's potential growth and output gap estimations provided valuable information to policy-makers regarding the short, medium and longer-term economic implications of COVID, including in particular an assessment of the temporary versus permanent nature of the associated economic disruption.

The key macroeconomic take away from EUCAM's analysis of the crisis so far is that the COVID-19 shock to the EU's potential output is very different from that of the 2008-2009 Financial Crisis, with the likelihood of limited long term scarring effects on the level of GDP, also thanks to the policy support that has been deployed. In this context, the EU's coordinated discretionary fiscal response, in the form of NGEU / RRF, has undoubtedly helped in stabilising growth expectations.

The pandemic led to large and overlapping shocks to supply, demand and liquidity, with the result that trend developments became much more difficult to isolate. This article has reviewed the adaptations to EUCAM in this particularly challenging context. These methodological adaptations have so far been successful in ensuring that the method produced realistic and relatively stable potential output estimates in real time, thereby reducing, to the greatest extent possible, the risk of policy errors.

On the basis of the Autumn 2021 forecasts, EUCAM's trend growth projections, over the coming decade, are pointing to an annual average growth rate which is about a ¼ of a percentage point higher than the one predicted just before the onset of the COVID-19 crisis in Autumn 2019. This encouraging outlook however mainly reflects an unexpectedly robust recovery in the contribution of labour to growth, with some question marks continuing to surround the sustainability of this specific trend. Small impulses to trend growth are also evident from both the

coming on stream of a wide range of RRF related investments and from TFP. It has to be stressed once again, however, that the analysis does not cover the potential consequences for trend growth from Russia's invasion of Ukraine.

Whilst the policy decisions taken so far in the COVID-19 crisis have been judicious, the relatively modest current improvement in TFP (the key long-term driver of growth), combined with the ongoing uncertainties regarding potential employment, could be an early signal to policymakers of the emergence of a number of new secular growth headwinds to add to the pre-existing ones. Many of these headwinds are linked to a reversal of some of the pivotal factors that have underpinned trend growth (and low trend inflation rates) over the last 30 years and constitute downside risks to EUCAM's baseline projection for the coming decade:

- Firstly, the risks related to de-globalisation have increased, with a specific concern linked to the future economic relationship between the US and China;

- Secondly, related to the wider de-globalisation issue, is the specific COVID-related risk that given the production bottlenecks experienced during COVID-19 and the logistical disruptions at the start of the "re-opening" phase, there is a risk that efficient, pre-COVID-19, global supply chains could lead to less efficient, more fragmented, regional variants;

- Finally, in addition to the relatively recent emergence of concerns related to globalisation and COVID-19, the pre-existing issues of ageing populations / shrinking labour forces and the entrenched decline in trend TFP growth rates in the pre-COVID-19 period, constitute two fundamental risks that always need to be considered in forming any realistic assessment of the EU's, post-COVID-19, growth prospects.

Box II.1: **Adjustments to EUCAM introduced in 2020**

The Output Gap Working Group (OGWG) of the EU Council's Economic Policy Committee is responsible for determining the underlying growth potential of the EU's economies. It has developed, and regularly adapted, EUCAM over the last 20 years. This box summarises the adjustments to EUCAM made in Spring 2020 in order to disentangle the various supply and demand side aspects of the COVID-19 crisis and to avoid any excess procyclicality in the potential output estimations.

Potential output is commonly viewed as being determined by supply shocks [1] and hence for an estimation of potential output one would aim at identifying the nature of such supply shocks – i.e. shocks which are typically persistent. In the case of the COVID-19 pandemic, it is however not clear a priori whether supply or demand shocks prevailed. Moreover, as Guerrieri et al (2020) discuss [2], one shock can trigger the other: the authors refer to "Keynesian supply shocks" in which supply shocks can trigger demand shocks that are larger than the initial supply shocks and they argue that the economic shocks related to COVID-19 may be of this kind.

Bodnar et al (2020) provide a short empirical literature overview and point towards mixed evidence regarding the type of shock stemming from COVID-19. The authors also argue that, whatever the nature of the shock, it is likely to fade out relatively quickly – based on an analysis of previous similar shocks. In a recent paper and based on a structural macro-economic model for the euro area, Croitorov et al (2021) argue that the COVID-19 pandemic shock is mainly driven by a collapse in domestic demand and most notably in private consumption. This feature distinguishes COVID-19 from the Global Financial Crisis which was much more driven by a period of extended low investment.

Filtering methods are useful for identifying slow-moving trends, which are typically interpreted as supply developments. Adding additional informative variables as well as structural relationships can also be of help – especially if the added variables are mainly correlated with the cyclical elements of output. An example of such variables are changes in real unit labour costs and the unemployment gap and their relationship via the wage Phillips curve.

At the heart of EUCAM lies a Solow growth model where potential output (YPOT) is linked to labour input (L), the capital stock (K) and total factor productivity (TFPS) through a Cobb-Douglas production function (i.e. assuming constant returns to scale and a factor price elasticity equal to one and that factor elasticities equal factor shares):

$$YPOT_{it} = L_{it}^{\alpha} K_{it}^{(1-\alpha)} TFPS_{it}$$

The output gap (YGAP) is defined as the difference between actual and potential output in percent [3].

$$YGAP_{it} = \frac{Y_{it}}{YPOT_{it}} - 1$$

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[1] See Chen, J. and L. Górnicka. Measuring Output Gap: Is It Worth Your Time?. International Monetary Fund, 2020.

[2] Guerrieri, V., Lorenzoni, G., Straub, L. and Werning, I. (2020). Macroeconomic implications of COVID-19: Can negative supply shocks cause demand shortages? (No. w26918). National Bureau of Economic Research.

[3] For a complete overview see Havik, K., Mc Morrow, K., Orlandi, F., Planas, C., Raciborski, R., Röger, W., Rossi, A., Thum-Thysen, A. and Valerie Vandermeulen. The production function methodology for calculating potential growth rates and output gaps. No. 535. Directorate General Economic and Financial Affairs (DG ECFIN), European Commission, 2014; Blondeau, F., Planas, C. and A. Rossi (2021), Output Gap Estimation using the European Union's Commonly Agreed Methodology, ECFIN Discussion Paper 148.

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The containment measures and policy support to workers and firms during the COVID-19 pandemic have necessitated adaptations to the estimation of labour supply. As firms received support for keeping workers with reduced or zero hours on their payroll (labour hoarding); hours worked ceased to be a good proxy for the amount of labour going into production. To a lesser extent, adaptations to the estimation of the TFP trend were also necessary, while the capital stock was relatively less affected (notwithstanding the possibility that some capital may have experienced a process of accelerated obsolescence). Below is a short summary of all of the modifications made to EUCAM at the outset of the crisis in Spring 2020 :

1.Average hours worked per person employed : In normal times, the official statistics for average hours worked per person employed are expected to make a clear distinction between hours actually worked and paid hours. However, during COVID-19, given the temporary nature of the short-time work schemes, this distinction between paid, and worked, hours became more difficult to disentangle from the official statistics. The actual data at the time of the Spring 2020 Commission forecasts were pointing to a significant decline in hours worked in 2020, with ECFIN's desk officers forecasting that such declines would be temporary and that there would be a large bounce back in 2021. Since EUCAM's potential growth and output gap estimates are strongly driven by the desk officer forecasts, and in order to avoid unrealistic second-round effects in terms of trend hours worked, it was agreed that an adjustment was needed to avoid excessively pro-cyclical movements of trend hours. Following a comparison of the effects of a number of options for smoothening out the effect of such large, but temporary, shifts in hours worked, it was decided to replace the 2020 average-hours-worked value by a simple linear interpolation of the 2019 value and the 2021 forecast. As graph 1 below indicates, this adjustment had the desired effect of cushioning the labour market impact linked to the widespread adoption of various types of short-term work schemes by the EU's Member States.

Graph 1: Average hours worked per employed person for the Euro Area, Autumn 2021 and Autumn 2019 forecast vintages
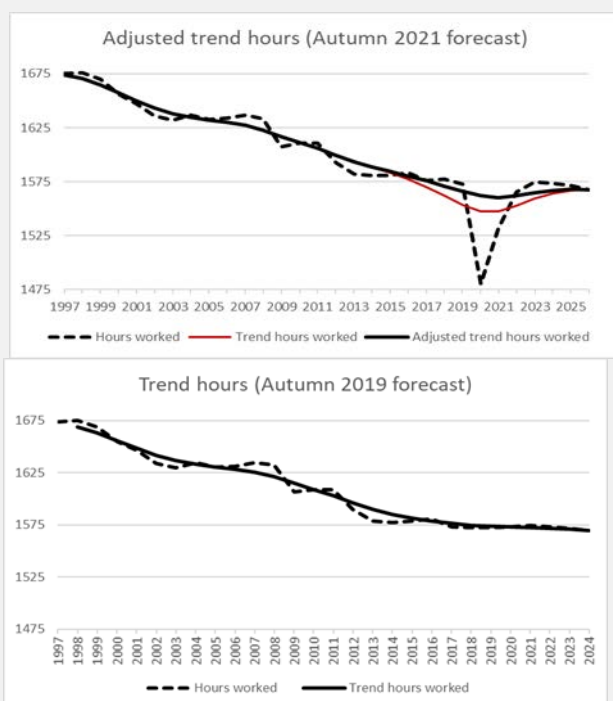
Source: own calculations

2.Non-accelerating wage rate of unemployment (NAWRU) : Labour hoarding also affected the estimation of trend unemployment (the NAWRU). Labour cost statistics provided in the national income accounts do not reflect the savings to employers from using short-time work. This is because both the benefits to the workers and the full social security payments are initially paid by the employer and only

Box (continued)

subsequently rebated. In order to dampen the impact of particularly noisy compensation data, "labour hoarding/short-time work" dummy variables were introduced into EUCAM.

3. Total Factor Productivity (TFP) : Data on capacity utilisation from business surveys is taken into account in the TFP detrending procedure. Only a minor adjustment was needed to the TFP methodology in the Spring 2020 forecast exercise to reflect the fact that insufficient monthly survey data for 2020 was available at the time when the effects of COVID-19 started to impact economic trends in March 2020. To overcome this problem, a proxy capacity utilisation value for 2020 was calculated based on forecasted 2020 TFP growth, adjusted on the basis of the change in capacity utilisation in the year following the financial crisis. By Autumn 2020, this short term data problem had been resolved and no further adjustments were necessary on the TFP side. Nonetheless, it should be noted that capacity utilisation from survey data captures mainly utilisation patterns on the capital side but is an imperfect control for utilisation on the labour side. The labour hoarding indicator under development may therefore also lead to an improvement in terms of TFP trend estimation.

At the current juncture, the use of interpolation for hours worked and dummy variables for the NAWRU have proven to help considerably in addressing the risk that a failure to allow for the distorting effects of labour hoarding could lead to excessively pro-cyclical potential output estimates. But this is manifestly only a short term solution. The ongoing development of a specific labour-hoarding indicator aims at a more structural improvement of EUCAM. In this context, and with the goal of making the method more robust to the use of temporary labour protection mechanisms in future crisis situations, the integration of a suitable pan-EU labour hoarding indicator constitutes an important research goal, with the OGWG already making progress in this area.