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The impact of the COVID-19 shock on the euro area potential output – a sectoral approach

OGWG presentation

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- "Official" potential output estimates of the ECB are prepared by the Eurosystem and are confidential.

- An unobserved components model that embeds a production function (Tóth, 2021) is used to internally benchmark these official estimates. The UCM was presented to the OGWG, and features in EB Articles and in a detailed Working Paper.

- The project presented here is based on a different approach and again, cannot be regarded as the official estimate of the Eurosystem.

- Scarring effects of the crisis are still uncertain

- Heterogenous impact of the COVID-19 shock across sectors

- Using sectoral estimates of trend developments may help us to assess
  - the scarring effects of the crisis and to attach a narrative to it;
  - the future path of potential output and the risks around it along different scenarios;
  - the sectoral reallocation needs.

- We develop a novel approach, by combining a state-of-the-art shock identification method with COVID-19-specific sectoral resilience metrics to gauge the impact on potential output of the euro area economy.

- We identify large supply shocks in sectors which cannot operate without personal contacts and were deemed less essential in 2020

- Entertainment activities and trade, transport and accommodation sectors may face significant scarring as they are less resilient

- On the aggregate, we estimate downside risks to available potential growth projections

- There are upside risks to the losses, explained by the within-sector effect

- The policy response remains very important

Methodology

|	1996-2019, q	2020, q	2021-2023, a	2024-2025, a
TFP	Hodrick-Prescott filter	BVAR and sectoral resilience index (SRI)	gradual convergence to the counterfactual, depending on the SRI	full convergence to the counterfactual growth
L (THW)				
K	Sectoral data, not filtered	Panel estimation using sectoral VA	Panel estimation using ECB baseline scenario on sectoral losses	

Policy scenarios	Capital scenarios	Robustness checks
- Policy prevents scarring in L and TFP - Withdrawal of policies in 2022, cliff effect - Withdrawal of policies in 2022, negative effects from 2020 - NGEU scenario	Panel estimations using ECB scenarios on sectoral losses	- No persistence versus high persistence of the shock - 0.8 versus 1.2 times BVAR - Different calculation of the SRI

Trend growth in selected euro area sectors
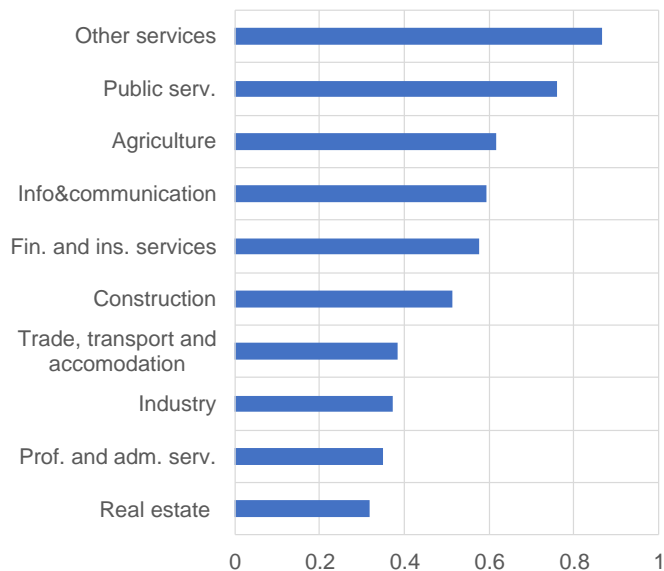*(annual percentage change)*
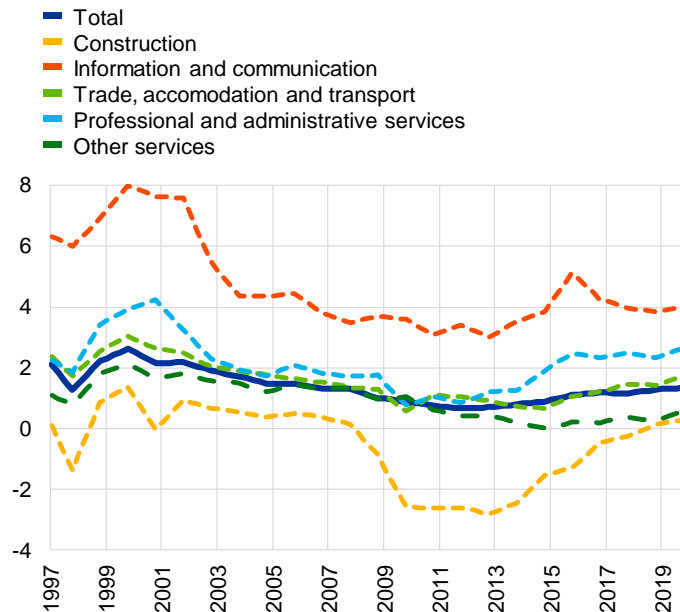
Source: Eurostat, ECB Staff calculations

Contribution to trend growth in 2019
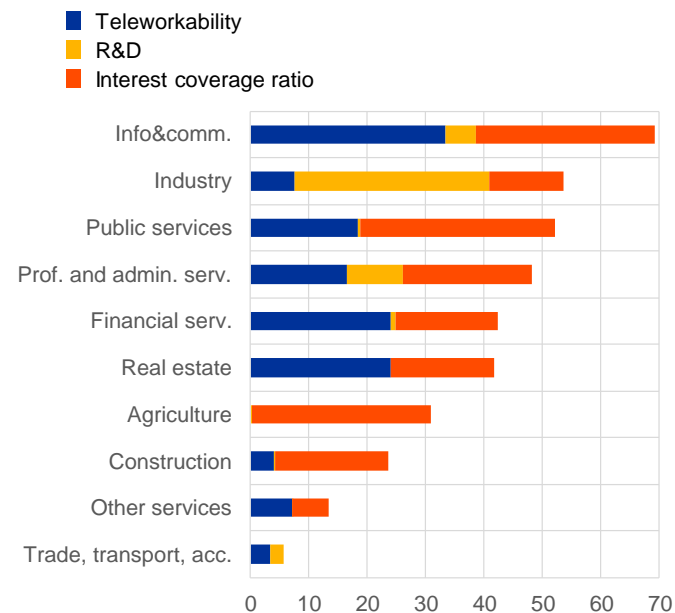*(annual percentage change)*
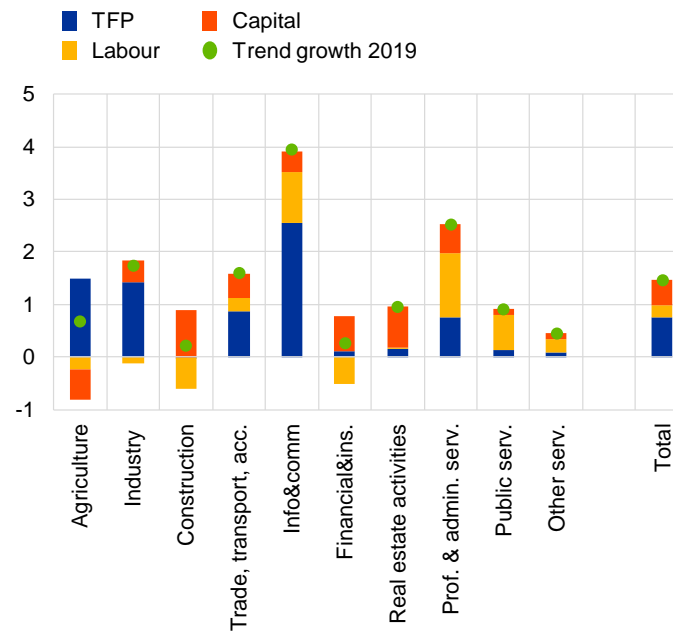
Source: Eurostat, ECB Staff calculations

Supply shock by sectors
(percentage)

Source: Eurostat, ECB Staff calculations
Notes: average of the quarterly estimates

SECTORAL RESILIENCE INDEX (SRI)

Source: OECD , ECB Staff calculations
*Notes: the SRI includes (i) the share of employees in potentially teleworkable jobs;
(ii) R&D expenditure and (iii) the percentage of firms whose interest coverage ratio
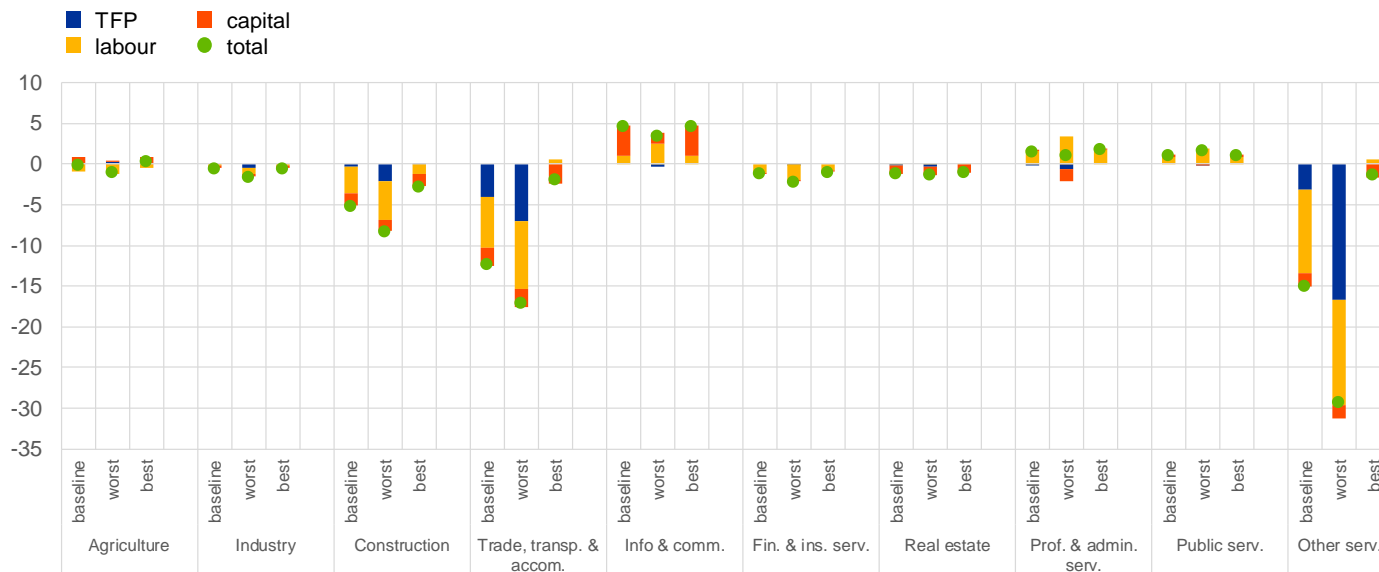does not fall below unity*

Estimated sectoral trend growth rates
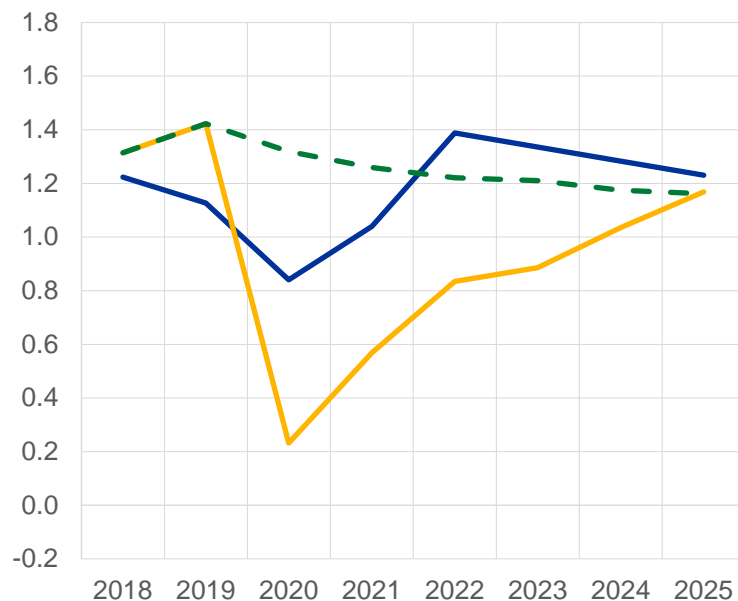*(annual percentage changes)*
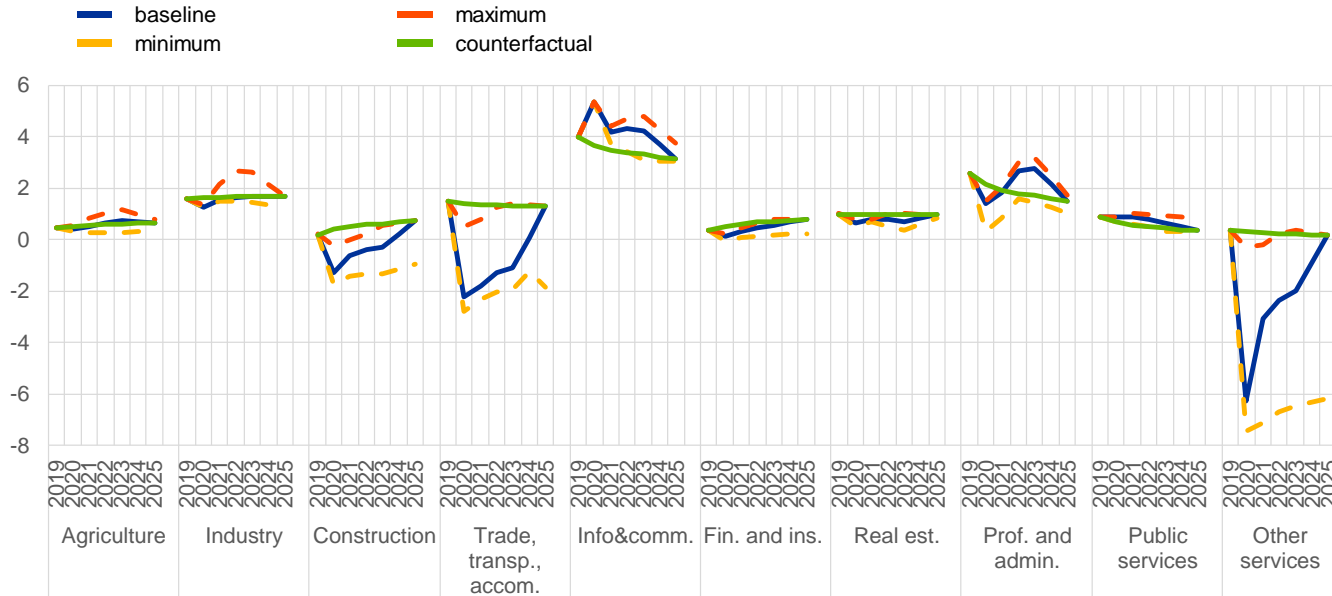
Source: ECB Staff calculations

Sectoral losses in 2025
(percentage point)

Source: ECB Staff calculations

Aggregate potential growth
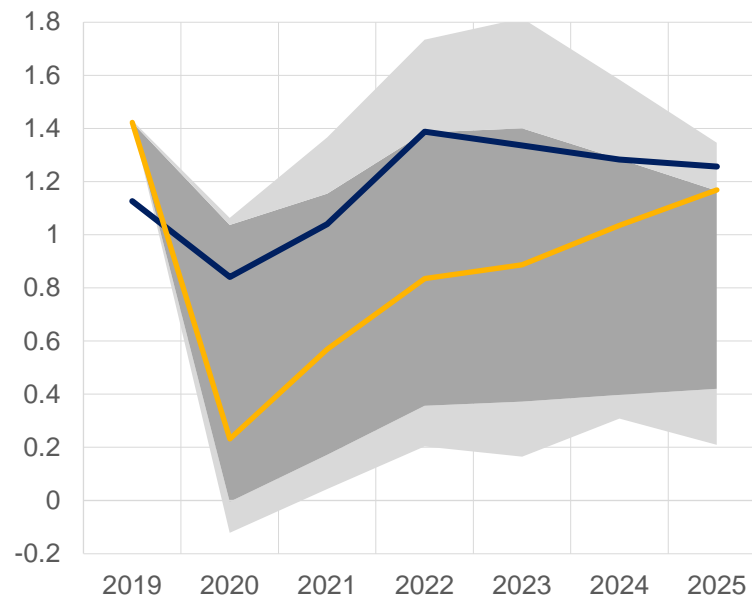*(annual percentage change)*

- EC, 2021 Spring forecast
- Counterfactual
- Sectoral baseline

Source: ECB Staff calculations

**Aggregate potential growth – scenarios**
(annual percentage change)

- EC 2021 Spring
- min-max range, scenarios
- Sectoral baseline
- min-max range, factors

Source: ECB Staff calculations
Notes: the min-max range of factors shows the potential output growth calculated with the minimum/maximum level of the three factors of production across all scenarios.

Estimated range of losses
(percent)
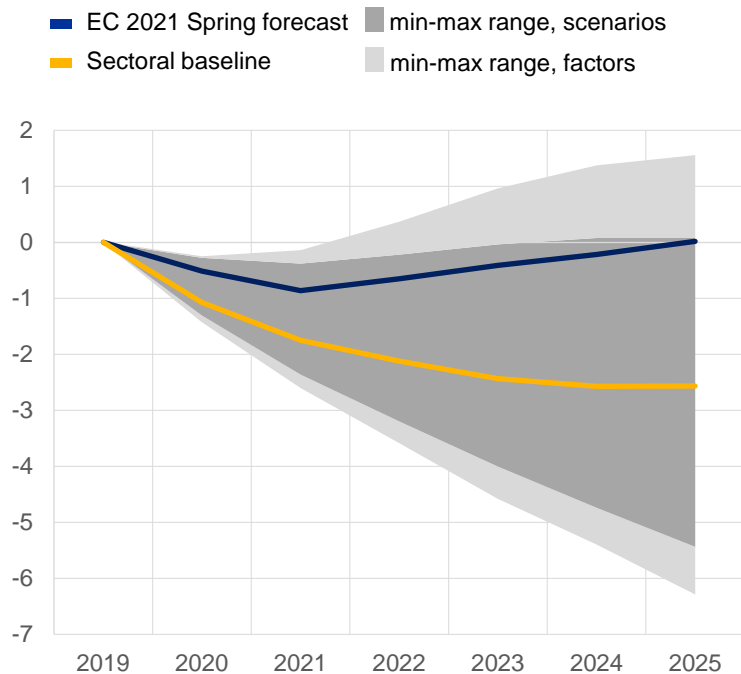
- EC 2021 Spring forecast
- min-max range, scenarios
- Sectoral baseline
- min-max range, factors

Source: ECB Staff calculations
Notes: the min-max range of factors shows the potential output growth calculated with the minimum/maximum level of the three factors of production across all scenarios.
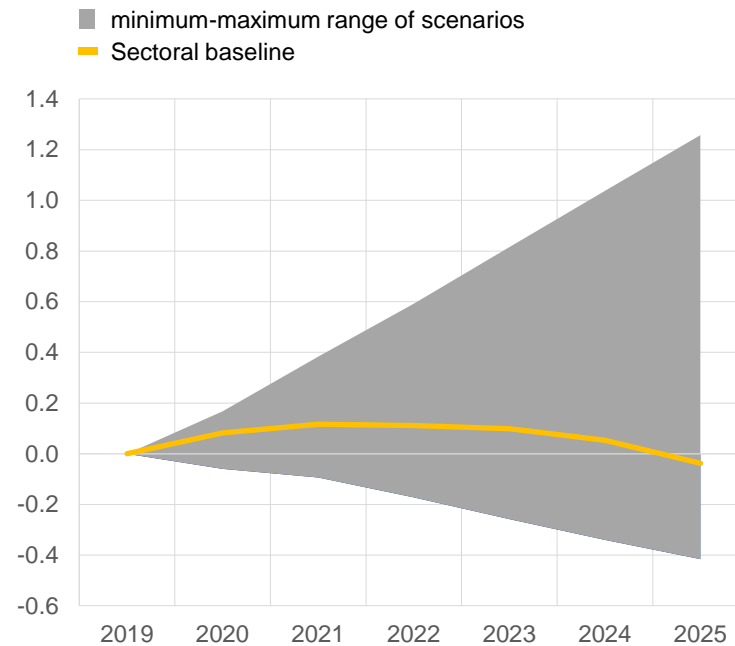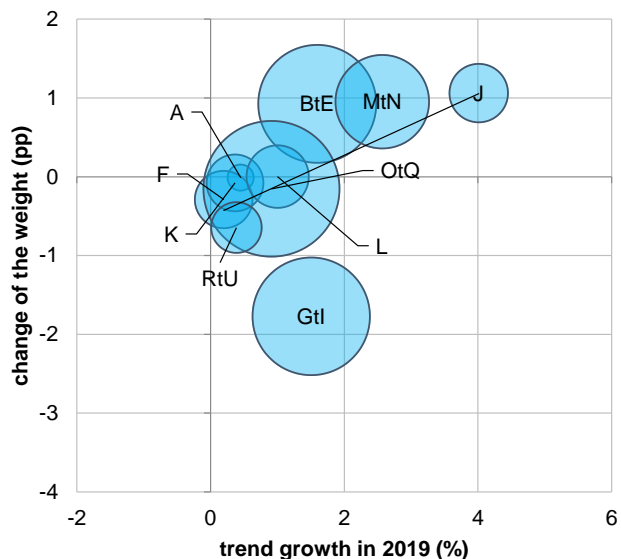
The impact of sectoral reallocation on the level of aggregate potential output
(percent)

- minimum-maximum range of scenarios
- Sectoral baseline

Source: ECB Staff calculations

Results: Sectoral reallocation

The impact of sectoral reallocation on aggregate potential growth in our baseline scenario
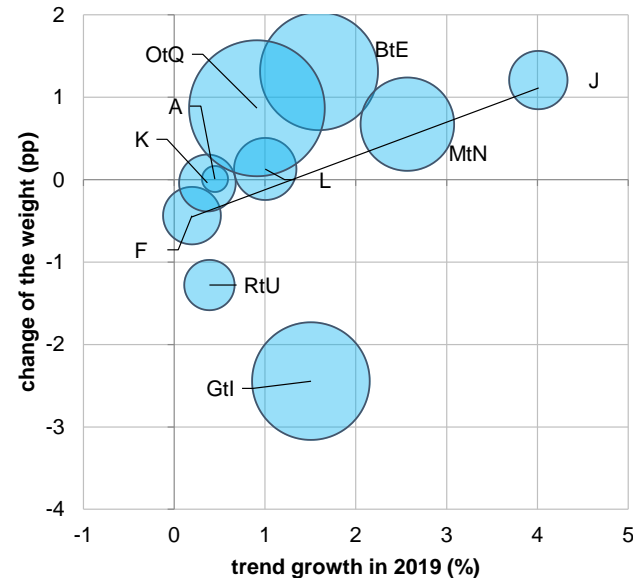*(x axis: percent, y axis: percentage point)*

The impact of sectoral reallocation on aggregate potential growth in our most severe scenario
(x axis: percent, y axis: percentage point)

Source: ECB Staff calculations

Source: ECB Staff calculations

Note: the size of the bubbles represents the sector's value added weight in 2019.
A - Agriculture, forestry and fishing; BtE – Industry (except construction); F - Construction; GtI – Wholesale and retail trade, transport, accommodation; J – Information and communication; K – Financial and insurance services; L – Real estate activities; MtN – Professional, scientific and technical activities; administrative and support service activities; OtQ – Public administration, defence, education, human health and social work activities; RtU - Other services

- We develop a novel approach to estimate potential output as an aggregation of sectoral trends. It is a flexible tool that can incorporate further variables and assumptions.

- Our baseline estimates point to downside risks to available potential output growth estimates in 2020 and beyond for the euro area.

- Losses in some services sectors and sectoral reallocation needs may be considerable given (accelerated) structural changes.

- At the same time, upside risks linked to the positive implication for potential growth of a boost in technology adoption ("*accidental digitalisation*").

RESERVE SLIDES

## Standard deviation of indicators across euro area sectors

- Value added
- Total hours worked
- Employment
- Productivity per head
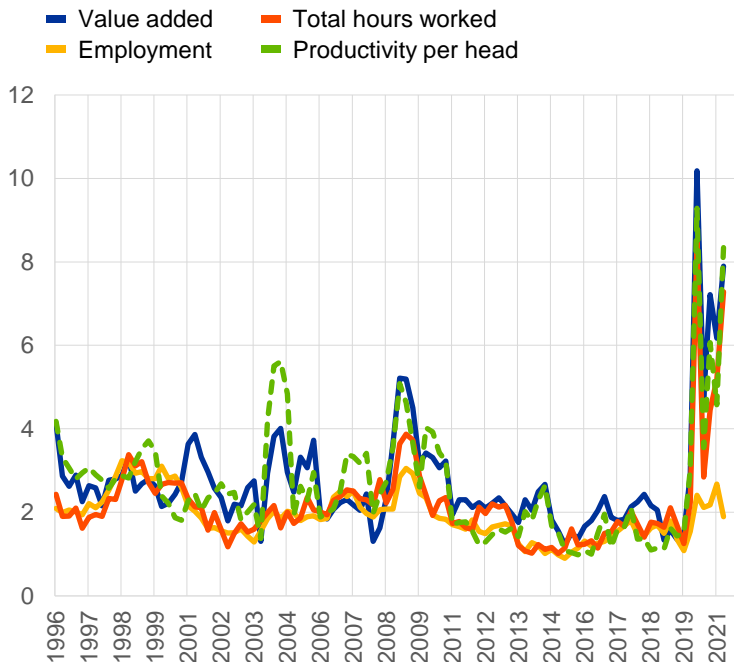
Source: Eurostat, ECB Staff calculations
Notes: standard deviation of annual growth rate of selected indicators by sectors
*Last observation: 2021q2.*

Peak-to-trough developments in sectoral value added in the euro area
(percentage points)

- 2008q1-2013q2, peak-to-trough
- 2019q4-2021q2, peak-to-trough
- 2021q2, pp difference to 2019q4
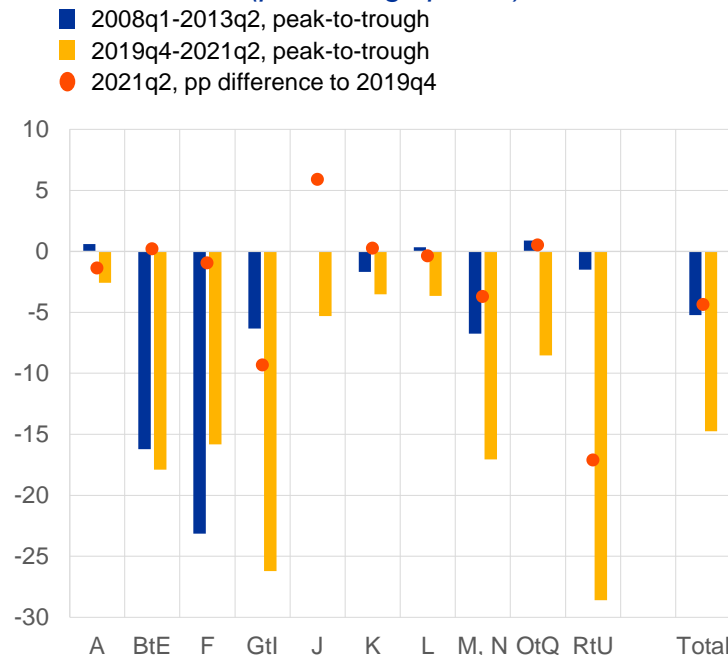
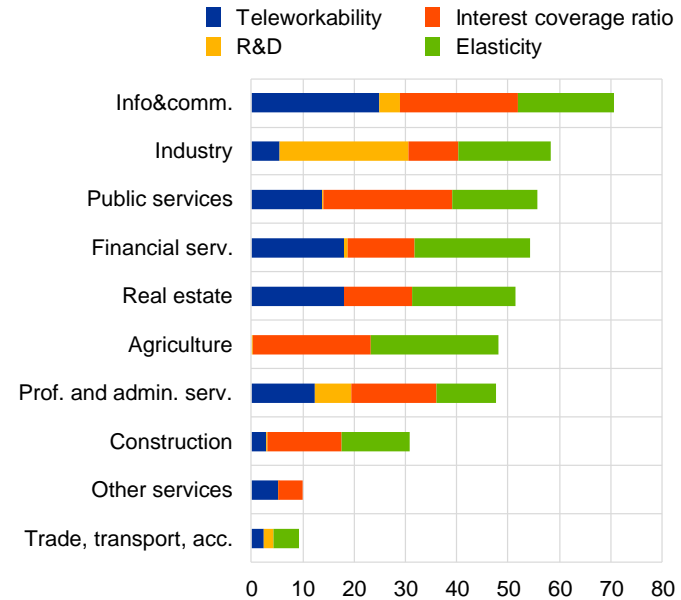*Source: Eurostat, ECB Staff calculations*
Notes: 2008-2013: minimum value between 2008q1 and 2013q2, compared to 2007q4; 2020: minimum value between 2020q1 and 2021q2, compared to 2019q4.

Sectoral resilience index
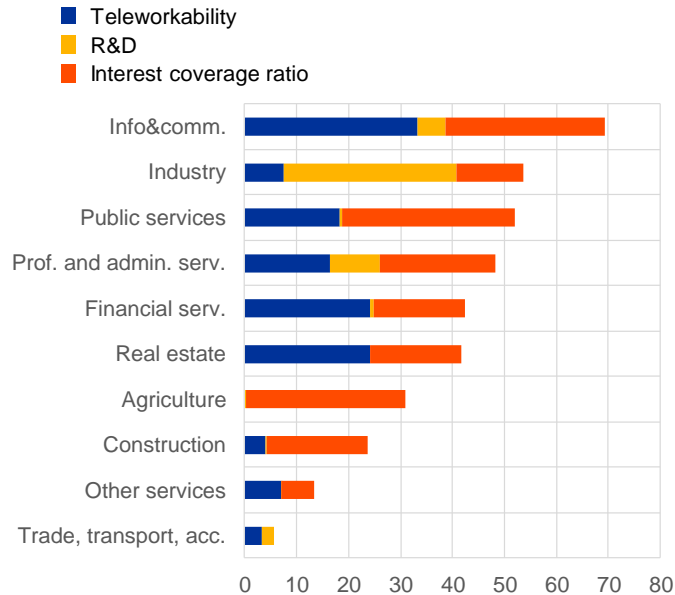
Sectoral resilience index – alternative definition

Source: OECD and ECB Staff calculations

Source: OECD and ECB Staff calculations

Data

We analyze 10 sectors.

NACE code	A	BtE	F	GtI	J	K	L	MtN	OtQ	RtU	TOT
Title	Agriculture, forestry and fishing	Industry (except construction)	Construction	Wholesale and retail trade, transport, accomodation	Information and communication	Financial and insurance services	Real estate activities	Professional, scientific and technical activities; administrative and support service activities	Public administration, defence, education, human health and social work activities	Other services	Total

- TFP and L estimation, 2020:

$$\bar{x}_t^k = \bar{x}_{t-4}^k + (\bar{x}_{t-4}^k - \bar{x}_{t-8}^k) + (x_t^k - x_{t-4}^k) \times bvar_t^k \times Max((50 - SRI^k), 0)$$

- K, 2020-2023:

$$dlog(GFCF_{t,i}) = \beta_0 + \beta_1.dlog(VA_{t,i}) - \beta_2.\left(log(GFCF_{t-1,i}) - log(VA_{t-1,i})\right) + \varepsilon_{i,t}$$

- SRI: if the SRI is larger than 50, we set the discounting factor to 0

- TFP: estimated trend growth rates in 2021-2023 smaller than zero are replaced by zero, avoiding negative trend growth rates in years which are supposed to bring recovery.
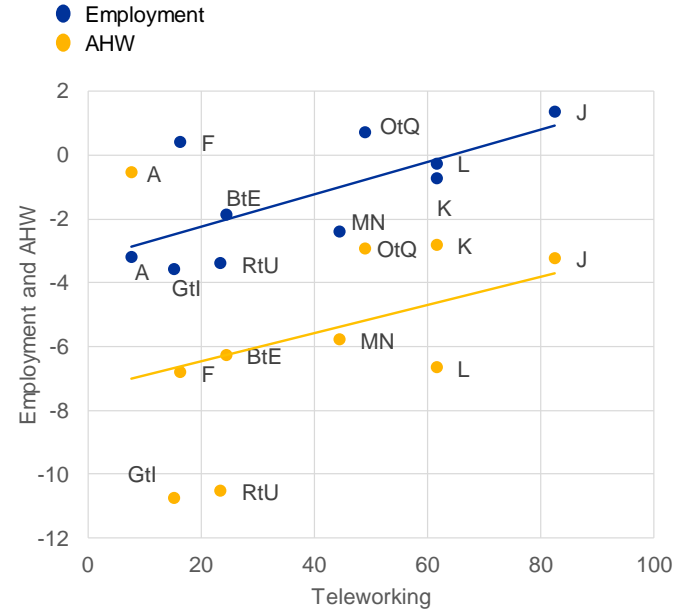
The change in employment, AHW and value added by sectors
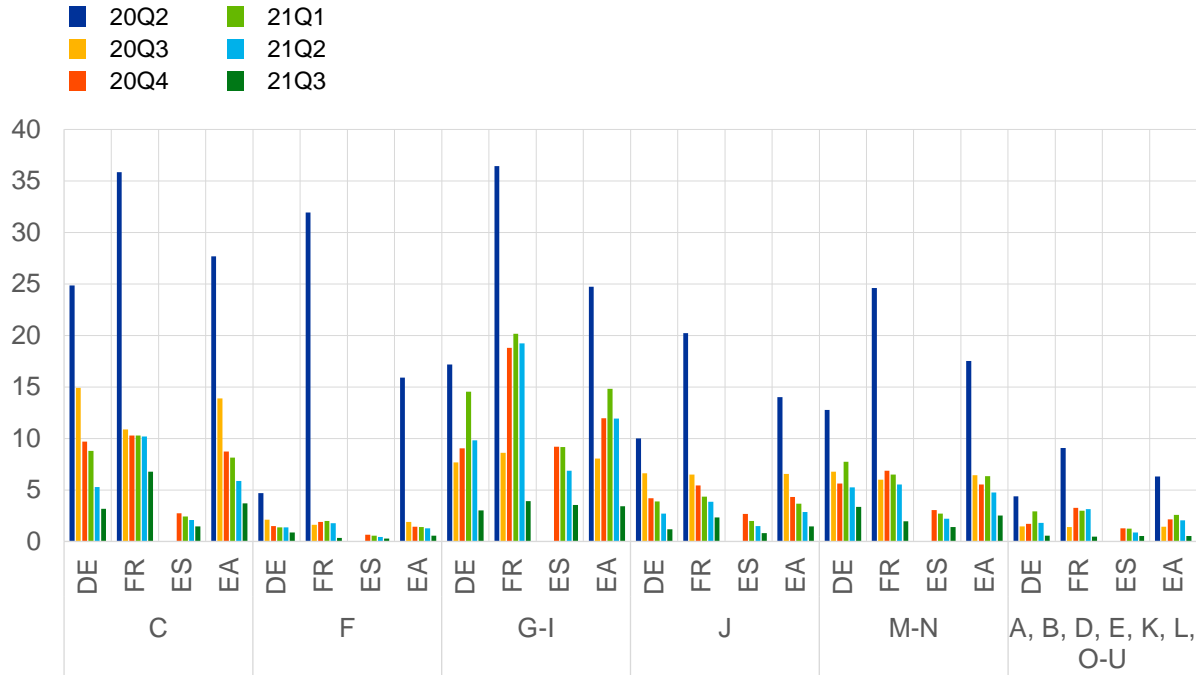(annual % change in 2020)
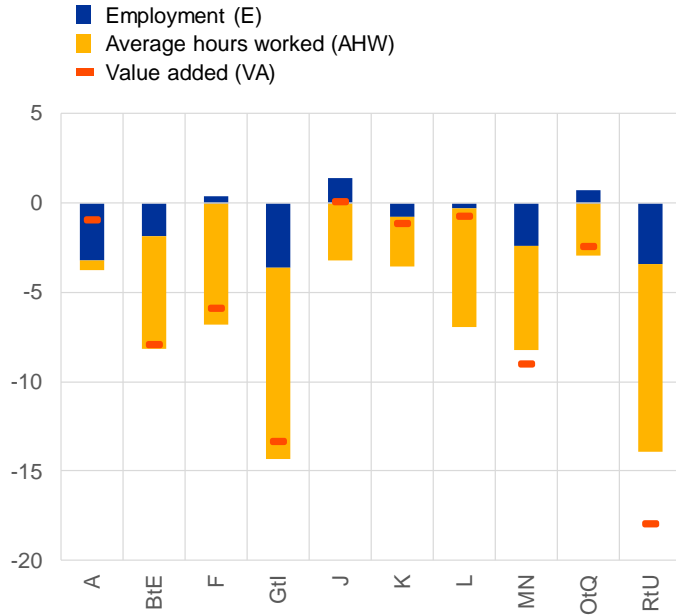
Source: Eurostat

Teleworkability and the change in employment and average hours worked by sectors
(% of workers, % change of E/AHW between 2019 and 2020)

Source: Eurostat, ECB Staff calculations

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Sectoral share of workers in STW schemes
(% of sectoral employment)

Source: DE: Federal Employment Agency Germany, ifo Institute Munich; FR: Ministère du Travail, de l'Emploi et de l'Insertion; ES: Ministerio de Inclusión, Seguridad Social y Migraciones
Notes: for 2020Q2 and Q3, EA includes DE and FR only