



EUROPEAN CENTRAL BANK

EUROSYSTEM

From laggard to leader? Closing the euro area's technology gap

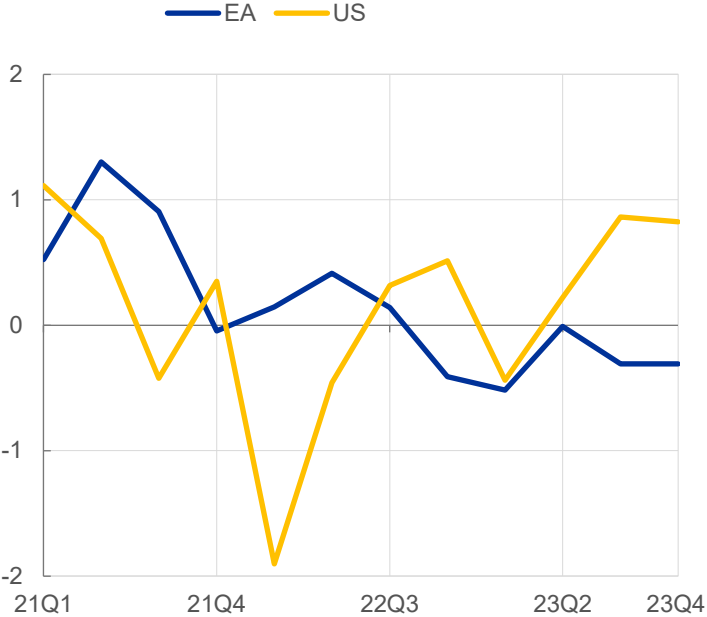
18 April 2024

Isabel Schnabel, Member of the Executive Board of the ECB
2024 Europe – US Symposium, Washington, D.C.



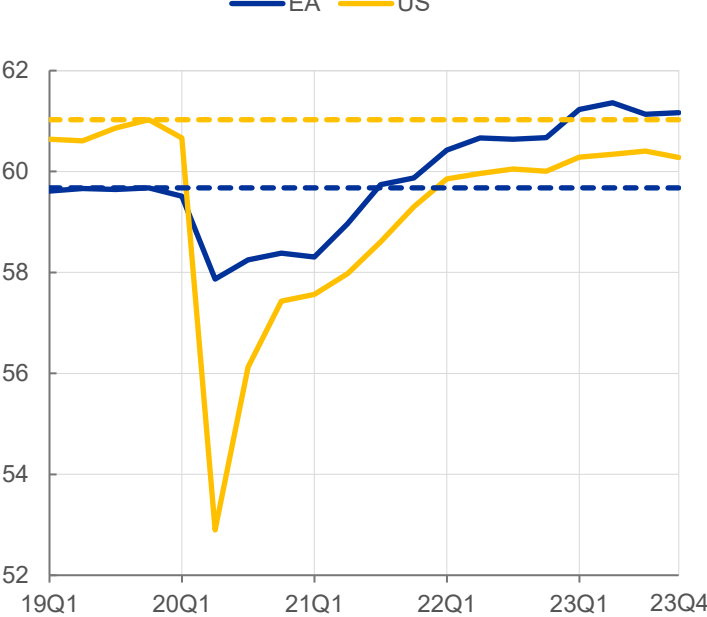
Labour hoarding may explain declining productivity growth in the euro area

Productivity growth per employee (%)



Sources: Eurostat and Haver Analytics.
Latest observation: 2023 Q4.

Employment rate (share of population)

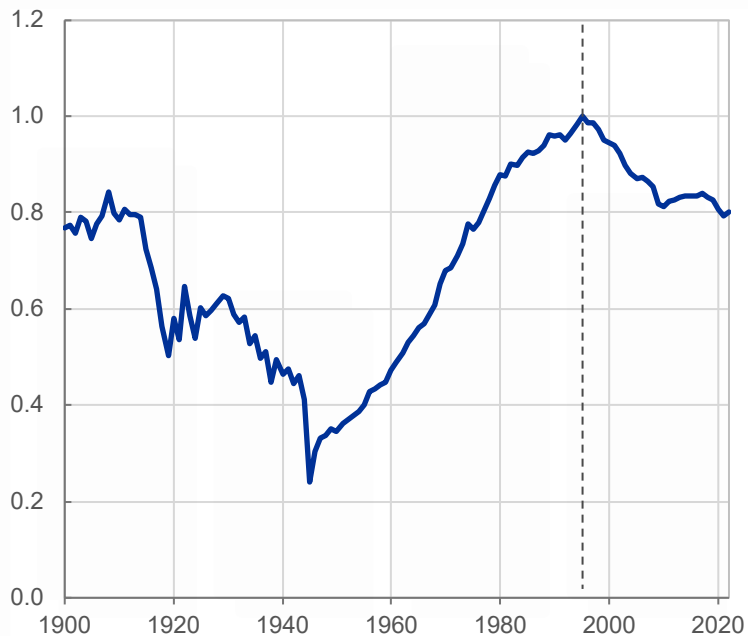


Sources: Eurostat and Haver Analytics.
Notes: The dashed lines represent the pre-pandemic employment rate, i.e. in 2019 Q4, in the corresponding colour for EA and the US.
Latest observation: 2023 Q4.

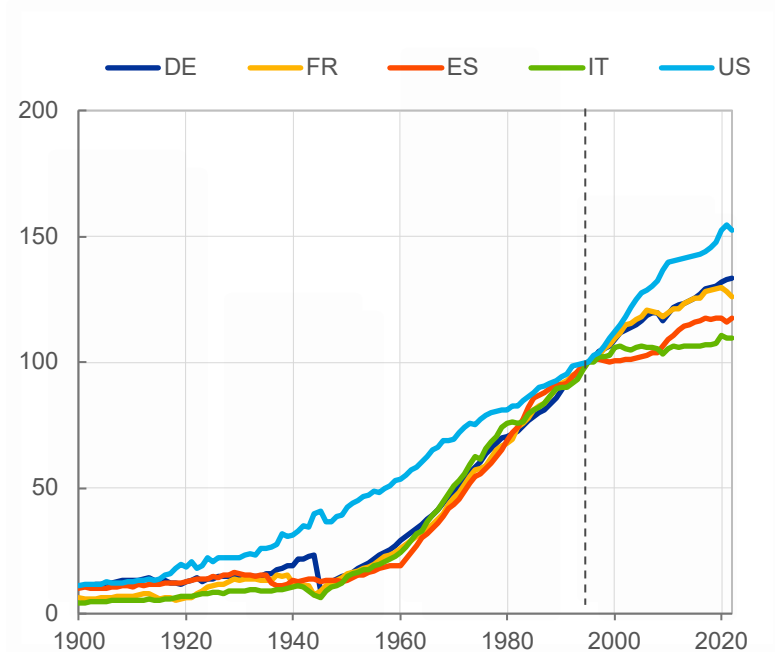
Euro area started to lose competitiveness at the turn of the millennium

Long-term developments in productivity per hour worked

Ratio of EA-4 to US



Index: 1995 = 100



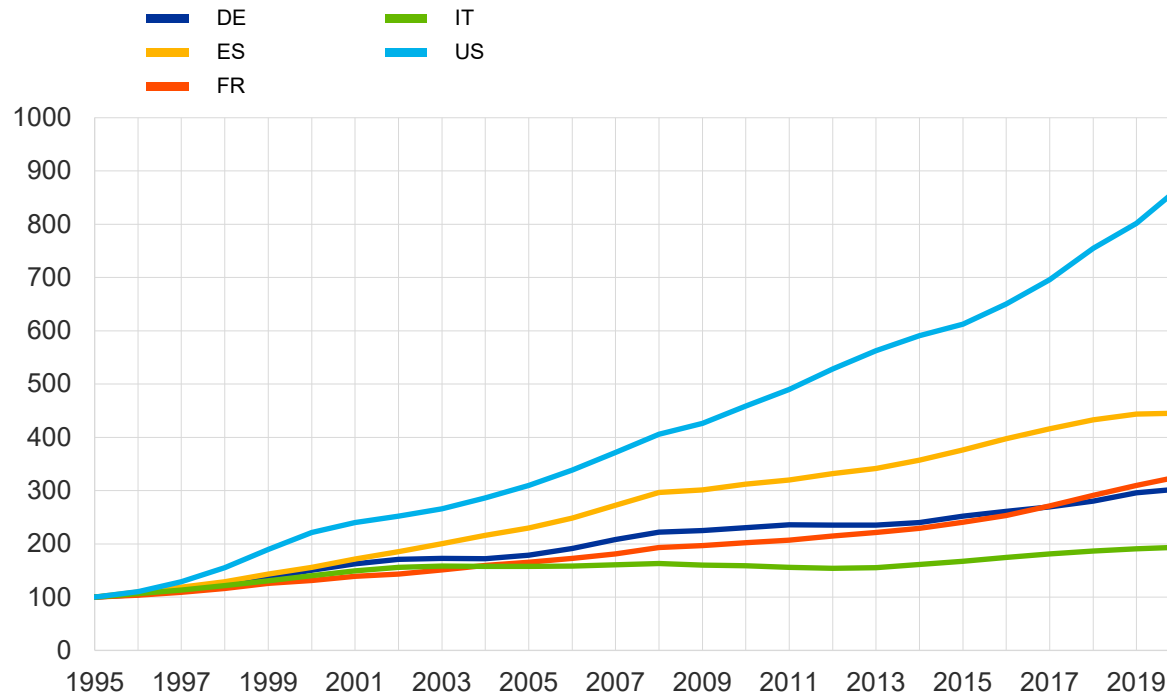
Source: Long-Term Productivity Database and ECB calculations.
Notes: EA-4 is a weighted average of productivity developments in Germany, France, Italy and Spain.

Source: Long-Term Productivity Database and ECB calculations.

Rising gap in IT-related capital stock between euro area and United States

Real IT-related capital stock

(index: 1995 = 100)



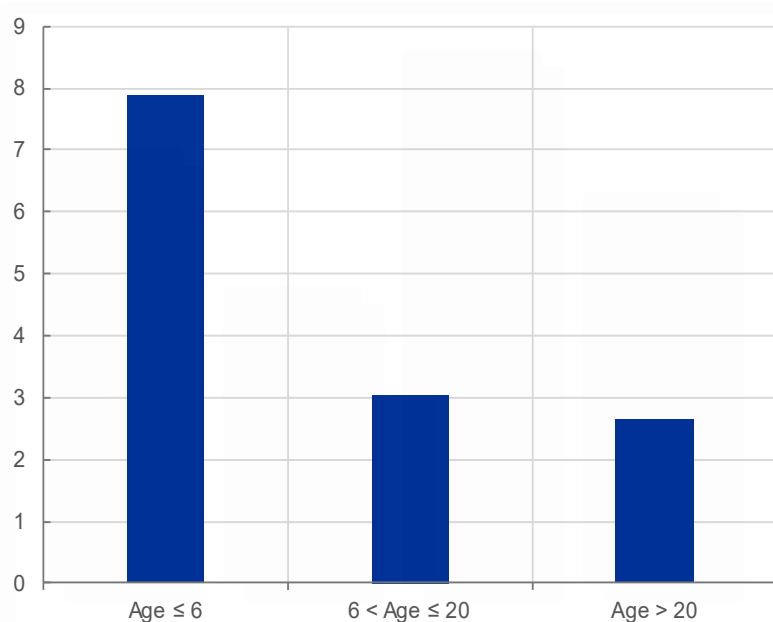
Source: EUKLEMS.

Note: IT-related capital stock is the sum of computing equipment and computer software & databases for all NACE industries. See Schivardi, F. and Schmitz, T. (2020), "The IT Revolution and Southern Europe's Two Lost Decades", *Journal of the European Economic Association*, Vol. 18(5), pp. 2441–2486.

Lower barriers to entry and higher competition support rise of young superstar firms

Annual labour productivity growth of surviving firms by age group

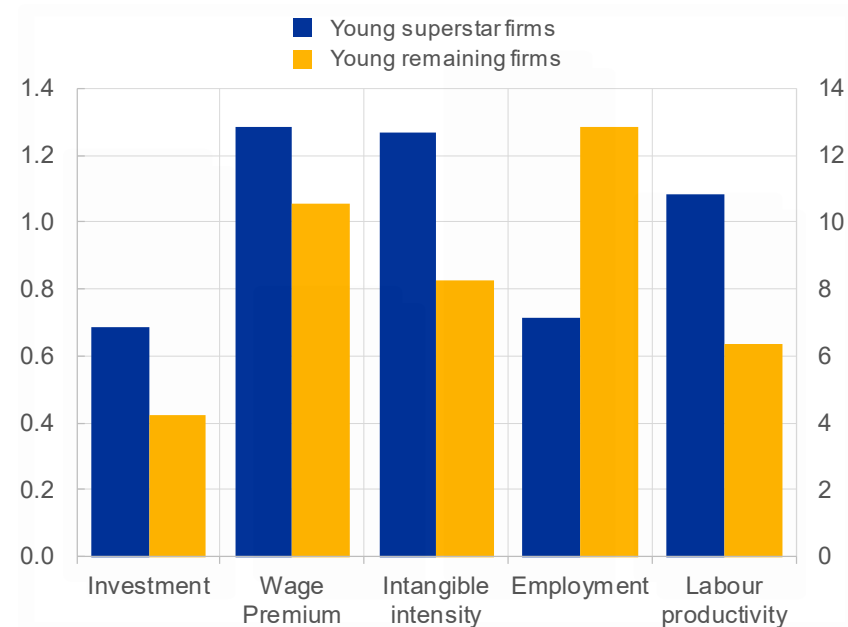
(mean, in %)



Source: ECB Economic Bulletin Issue 1(2022). Data from Bureau van Dijk Orbis, the Bank for the Accounts of Companies Harmonized (BACH) database and ECB staff calculations.

Average characteristics of young superstar firms and other young firms

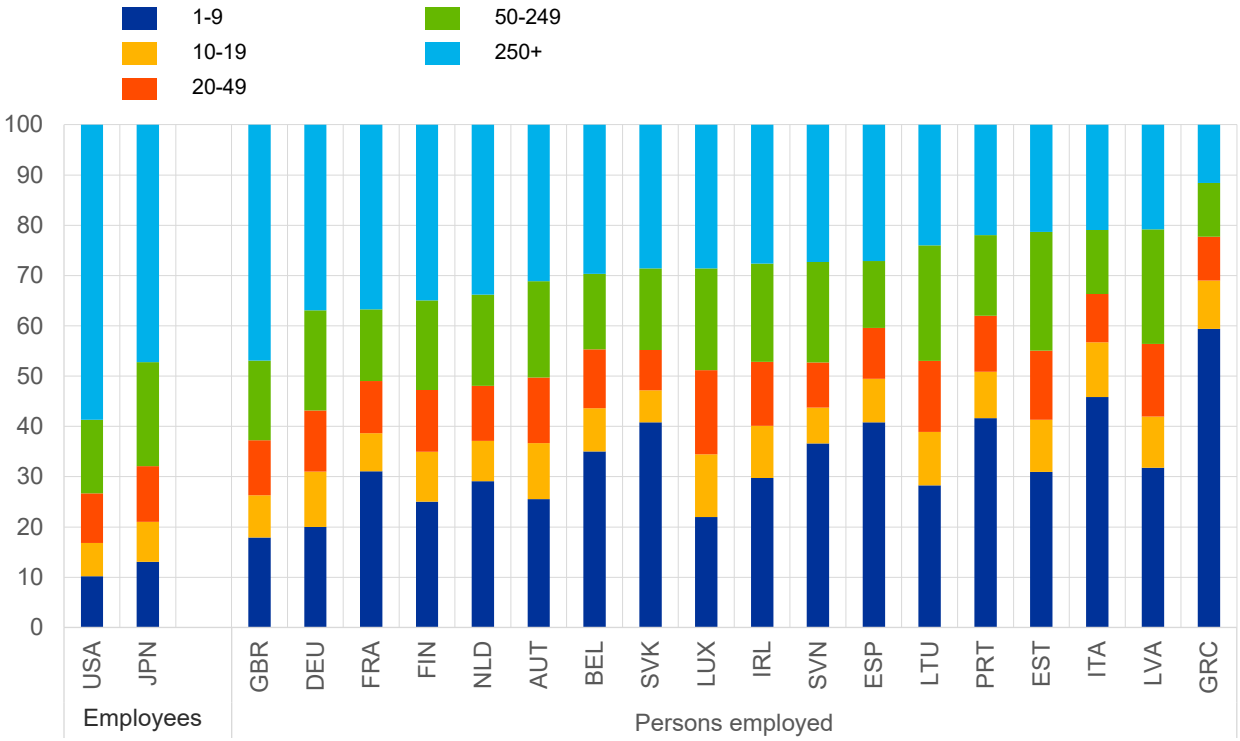
(lhs: ratio; rhs: number of employees, intangible intensity in EUR thousands, labour productivity in EUR ten-thousands)



Notes: Each bar represents the coefficient from a regression of each variable listed in the x-axis on a dummy for the firm being a young superstar firm and a set of fixed effects controlling for the different countries, sectors and years. Productivity is computed as real value added per employee at the firm level. Intangible intensity is computed as the ratio of intangible capital to number of employees. Investment is computed as the change in real fixed tangible capital over the previous period's real fixed tangible capital. The period considered begins after the great financial crisis to avoid potential slumps.

Large firms invest more in ICT, but most firms in the euro area are small

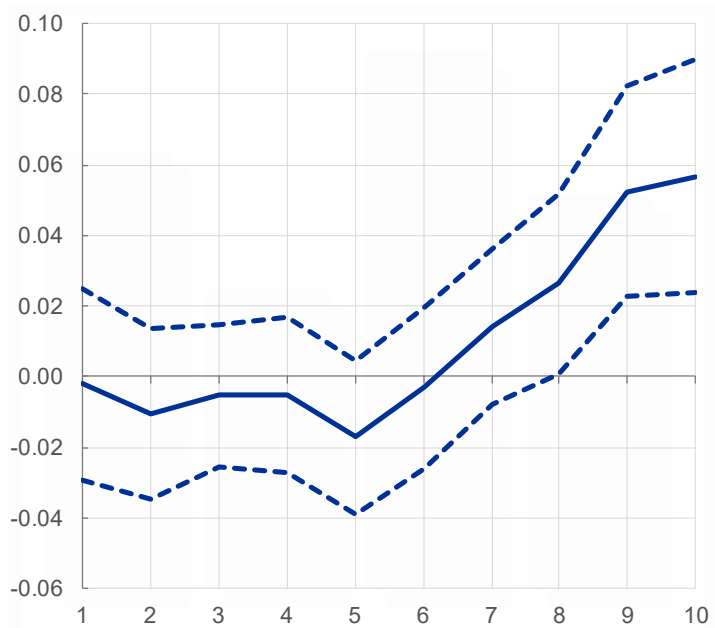
Employment by enterprise size, business economy (percentage of total employment)



Source: OECD.
Notes: Legend refers to number of employees/ persons employed at firm level.

Estimated impact of digitalisation on TFP growth of firms with different initial TFP levels

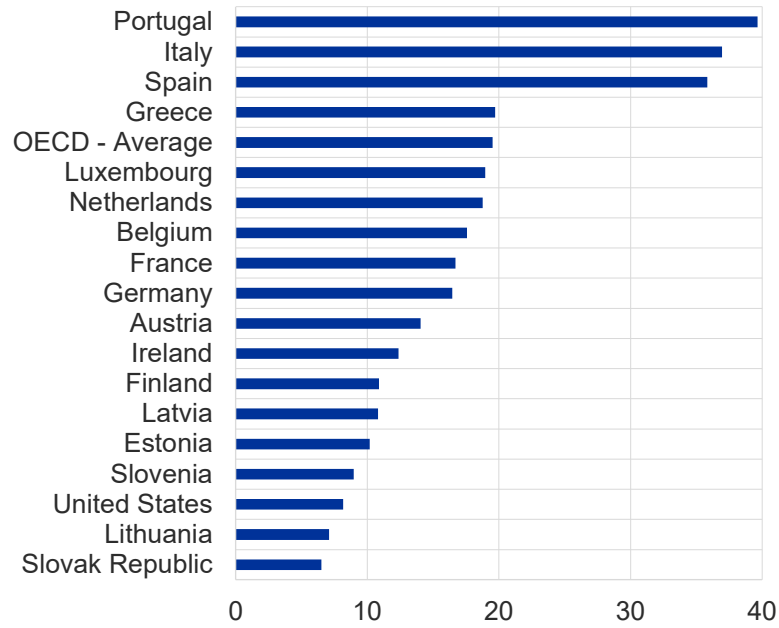
(digital investment intensity)



Source: Anderton, R., Botelho, V. and Reimers, P., "Digitalisation and productivity: gamechanger or sideshow?", Working Paper Series, No 2794, ECB, March 2023.
 Note: x-axis: proximity to frontier (decile, lowest-highest). Dashed lines refer to confidence intervals.

Share of adults without upper secondary education

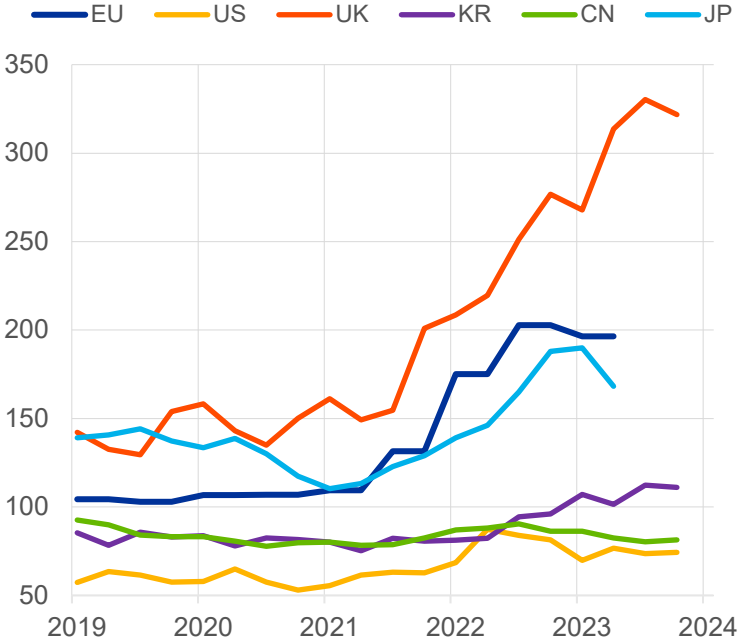
(% of 25-64 year-olds)



Source: OECD.
 Notes: Data refer to 2022 or latest available.

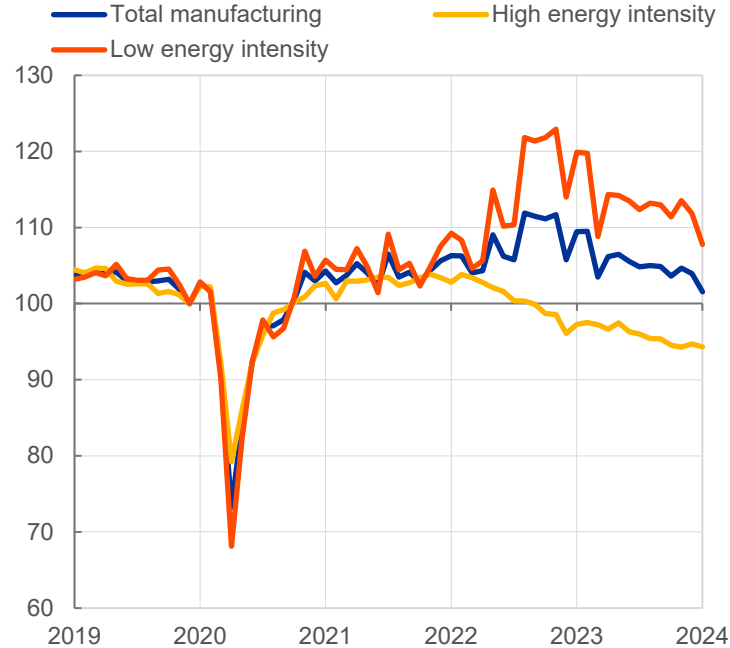
Higher electricity prices undermine price competitiveness and industrial production

Industrial retail electricity prices (EUR/MWh)



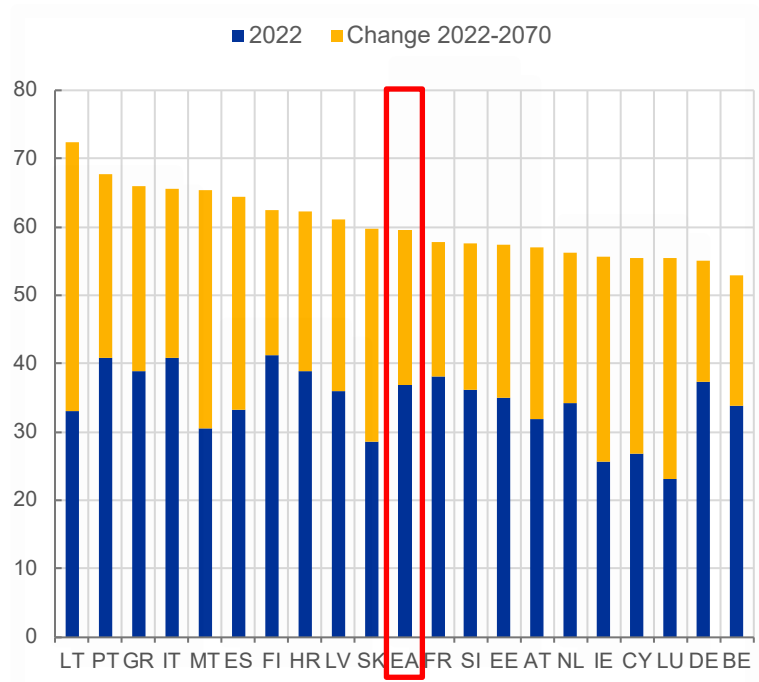
Sources: Eurostat, EIA, DESNZ, CEIC, METI and ECB staff calculations.
Latest observation: Q2 2023 for EU and JP, Q4 2023 for US, UK, KR and CN.

Euro area industrial production (index: December 2019 = 100)



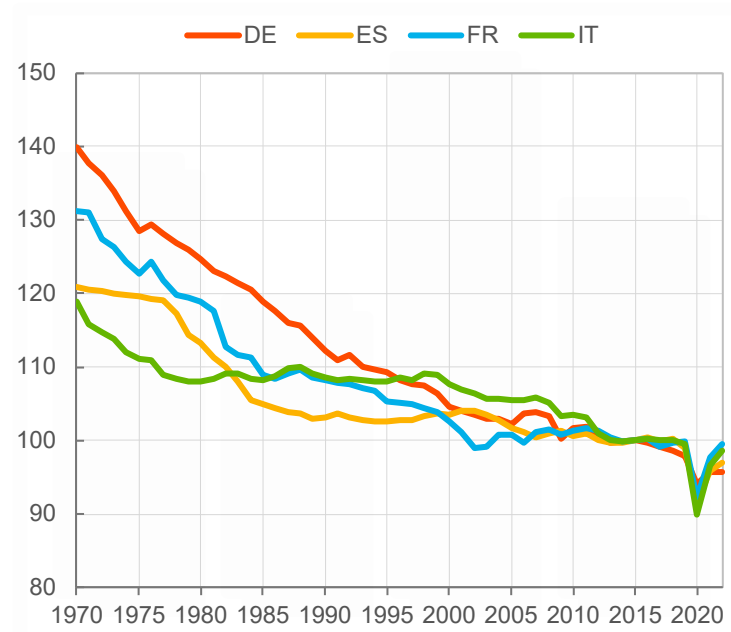
Sources: Eurostat, Trade Data Monitor and ECB staff calculations.
Notes: Data are seasonally-adjusted. Industrial production indices for individual sectors are aggregated with value-added weights. Low (high) energy-intensity sectors are defined as those with an energy intensity lower (higher) than that of the median sector. For more details, see [Chiacchio, De Santis, Gunnella and Lebastard \(2023\)](#).
Latest observation: January 2024.

Old-age dependency ratio in 2022 and increase until 2070



Source: European Commission Europop 2023 population projections.
 Note: The old-age dependency ratio is the population aged 65 and over as a % of the population aged 20-64. Data are shown as the proportion of dependents per 100 persons of working-age.

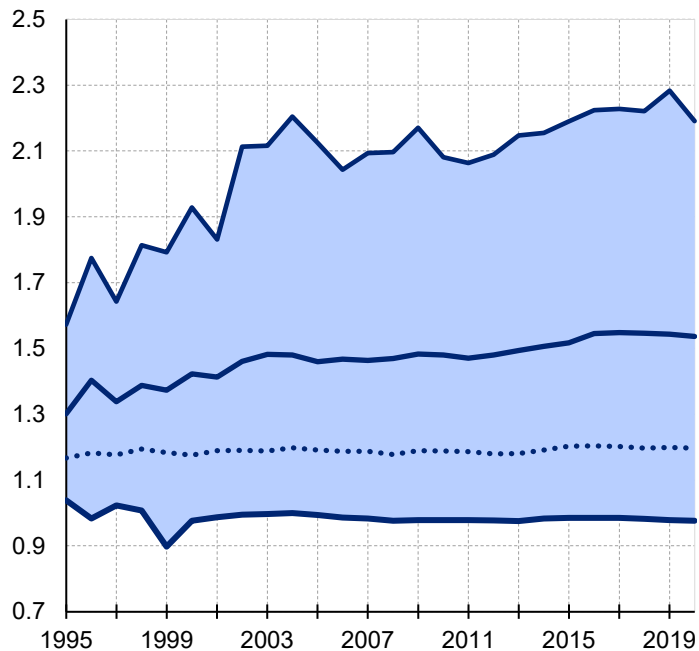
Average hours worked per person employed (index: 2015=100)



Source: OECD data.

Slow diffusion of technologies can give rise to “winner-takes-most” dynamics

Euro area mark-up distribution

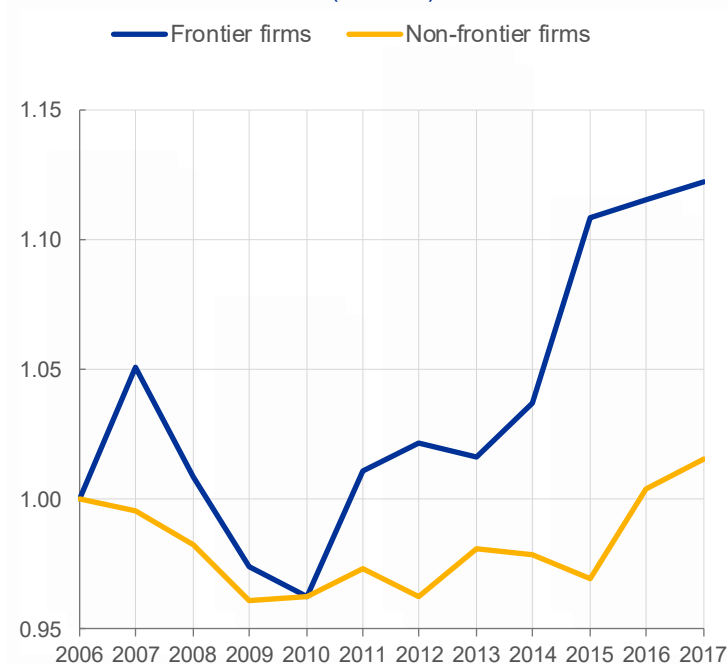


Sources: Kouvavas et al. (2021), “Markups and inflation cyclicality in the euro area”, ECB Working Paper No. 2671.

Notes: The dotted line shows the weighted median, the continuous line the weighted average, and the range is between the weighted 10th and 90th percentiles. See the paper for the calculation of markups using firm-level data.

TFP levels of frontier and non-frontier firms in the services sector

(2006=1)



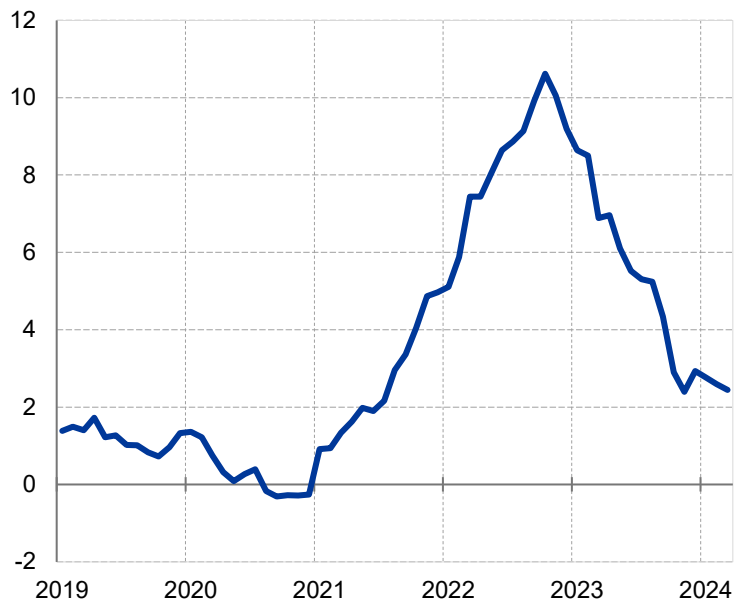
Sources: Occasional Paper Series No. 268 (ECB). Own calculations using ECB iBACH-Orbis Database.

Notes: Frontier firms are defined as those at the top 5% of the TFP distribution in a given year in a 4-digit industry. Non-frontier firms are defined as the median firm in a given year in a 4-digit industry.

Low productivity growth puts pressure on unit labour costs and hence inflation

Headline inflation in the euro area (HICP)

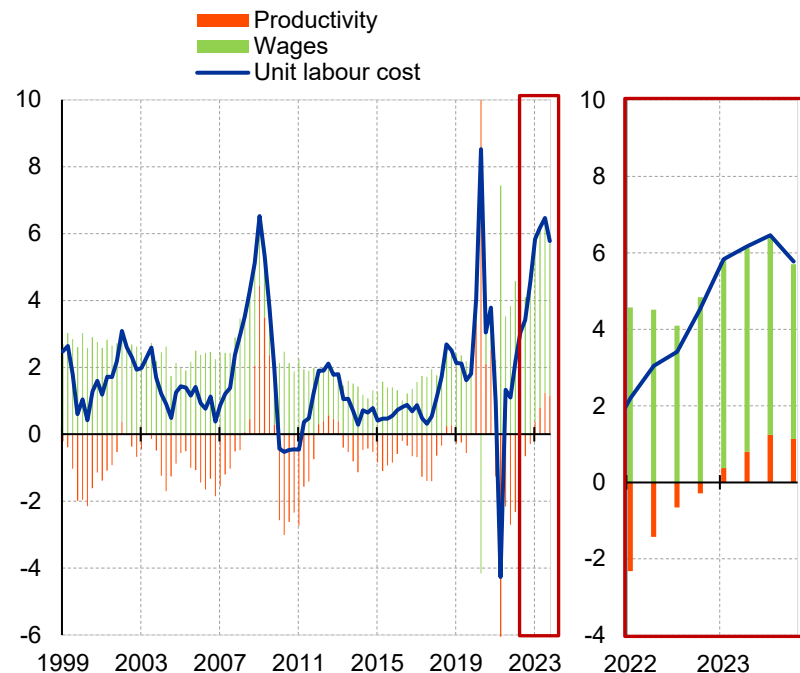
(annual percentage changes)



Source: Eurostat.
Last observation: March 2024.

Unit labour costs

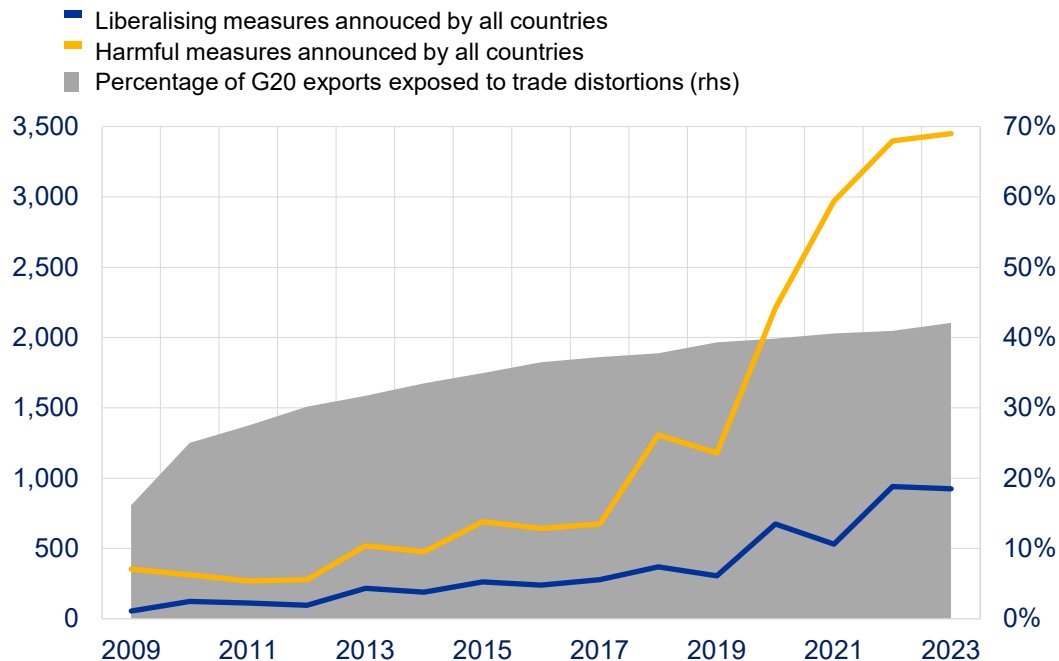
(annual percentage changes)



Source: Eurostat and ECB calculations.
Note: A positive contribution of productivity to unit labour costs implies negative productivity growth.
Last observation 2023 Q4.

Global trade measures

(lhs: number; rhs: percentage)



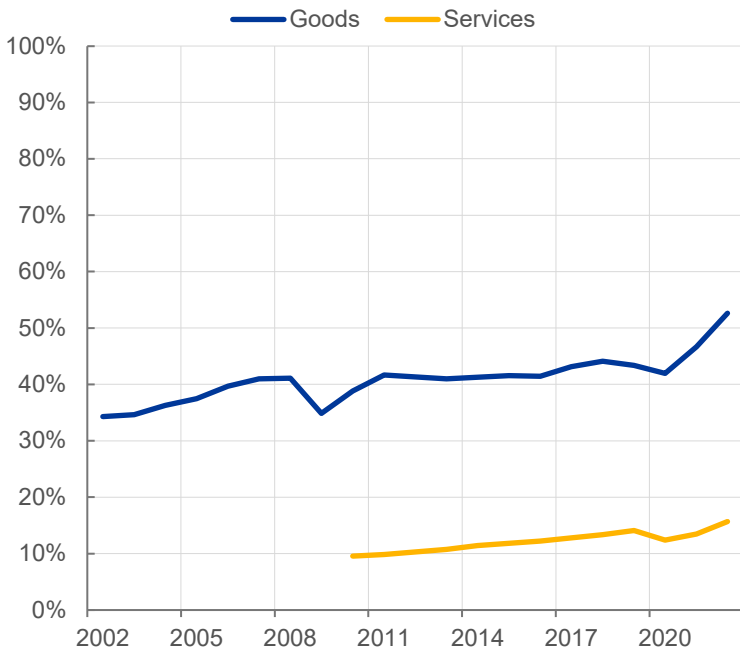
Source: Global Trade Alert (GTA) and ECB staff calculations.

Notes: Total number of liberalising and harmful measures announced globally each year (adjusted for reporter lag at 31 of December each year). For the rhs series, affected flow includes outward and outward subsidies that are evaluated as red and harmful by the GTA during the coverage period shown without an adjustment for reporting lag.

Latest observation: 2023.

Intra-EU trade in goods and services

(annual, in percentage of GDP)

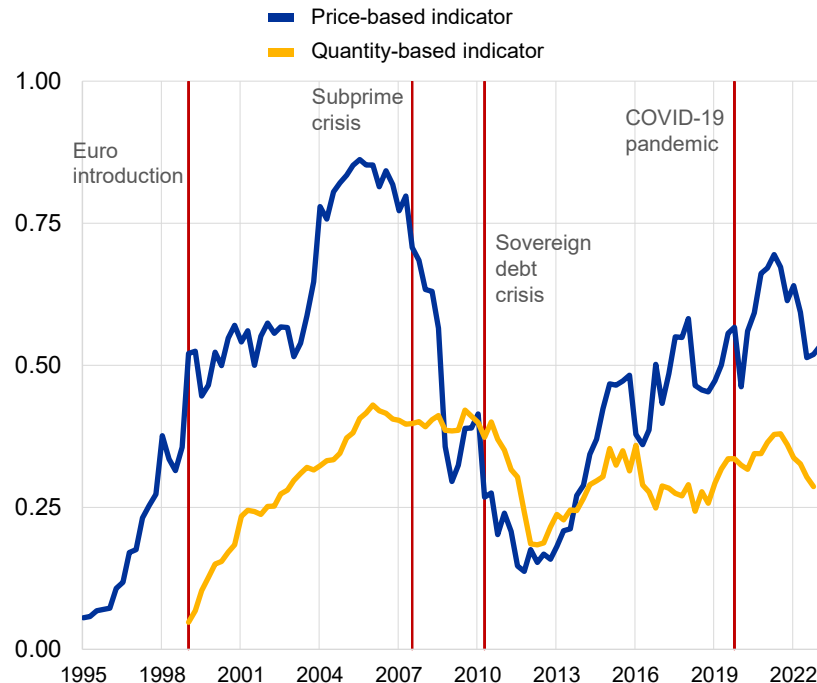


Source: Eurostat and ECB staff calculations.

Notes: Intra-EU trade is obtained by summing intra-exports and imports as a ratio of GDP, measured in euros.

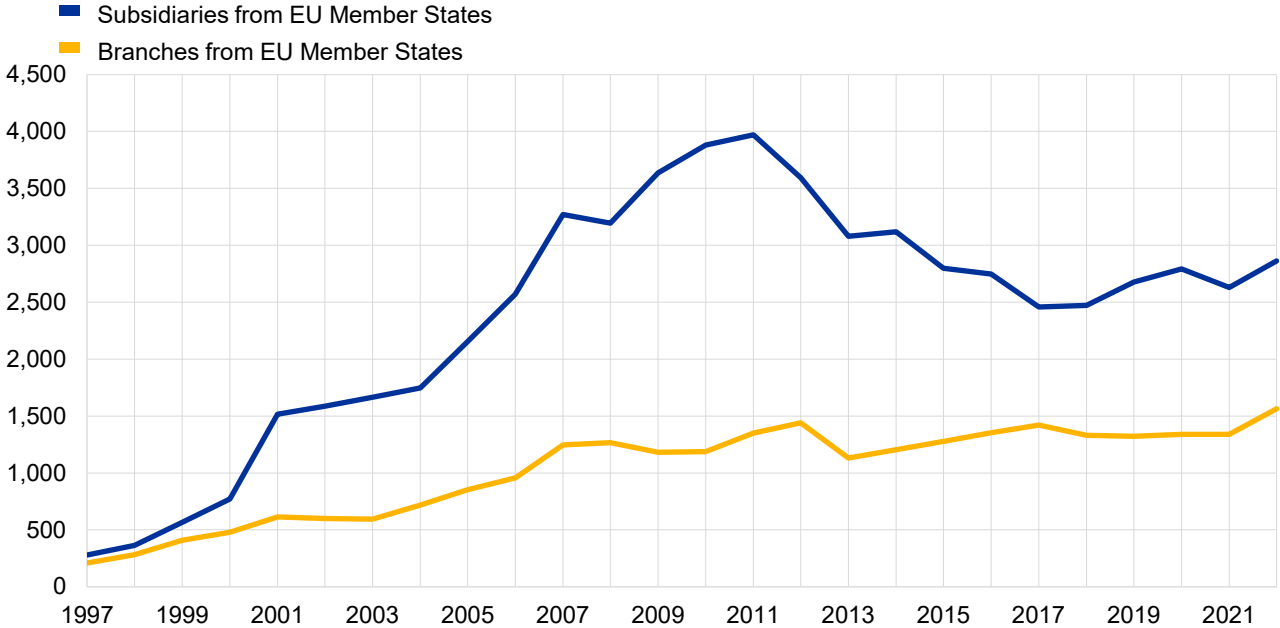
Latest observation: 2022.

Price-based and quantity-based composite indicators of financial integration



Source: ECB staff calculations.

Total EU cross-border assets in the euro area (Total assets, EUR billions)

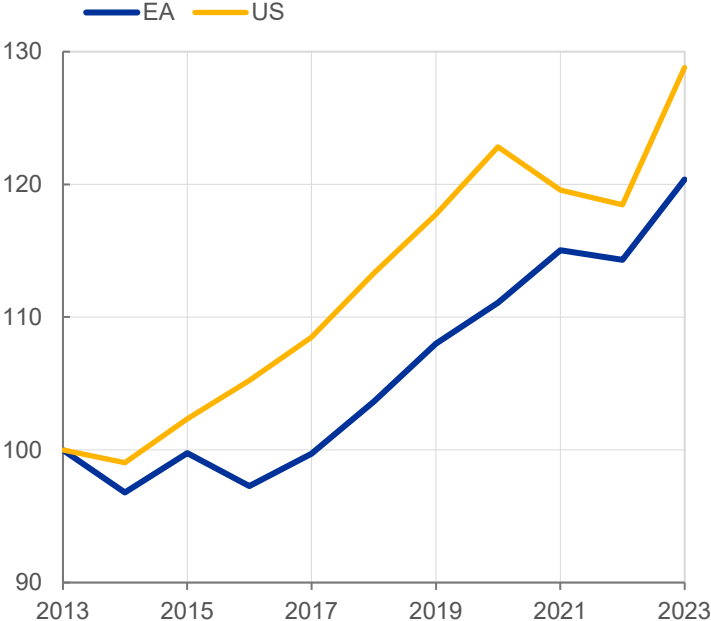


Source: ECB Structural Financial Indicators.

Public investment can boost productivity growth and potential output

Public investment

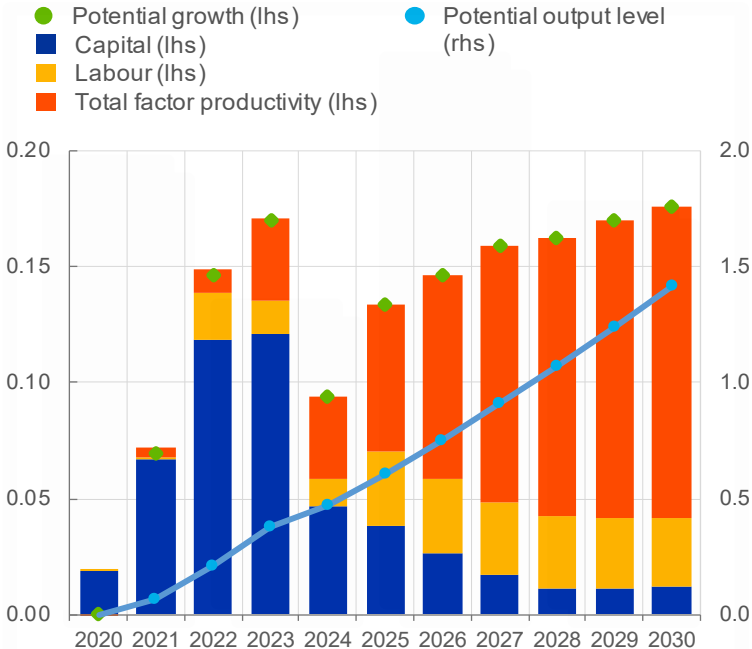
(index: 2013 = 100)



Sources: European Commission (AMECO), Bureau of Economic Analysis and ECB staff calculations.
 Latest observation: 2023.

Impact of NGEU on potential output and growth of seven euro area countries

(impact on level in percentages, on growth and contributions in percentage points)

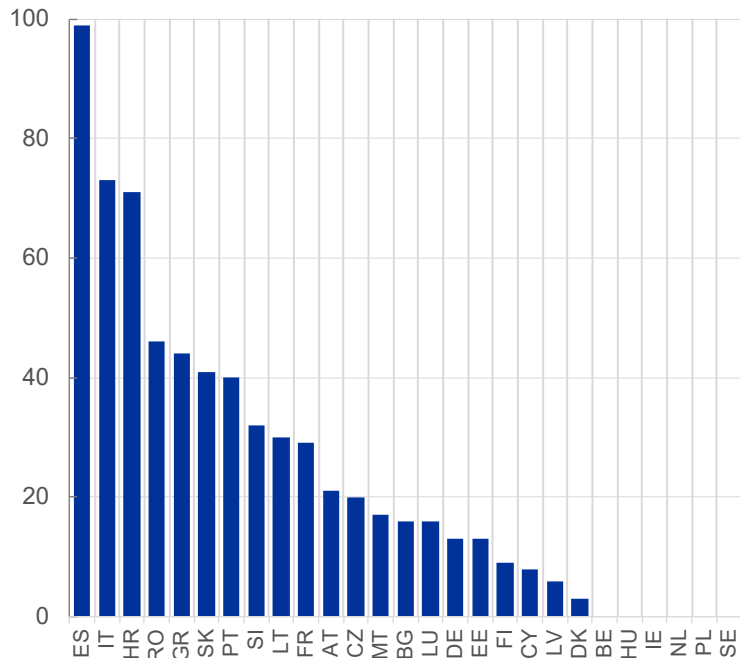


Source: ESCB staff calculations (Bańkowski et al. 2022).
 Note: Countries included: DE, ES, FR, GR, IT, MT and PT.

Significant number of fulfilled reform-related RRF milestones and targets

Fulfilled reform-related RRF milestones and targets: breakdown by country

(total number)

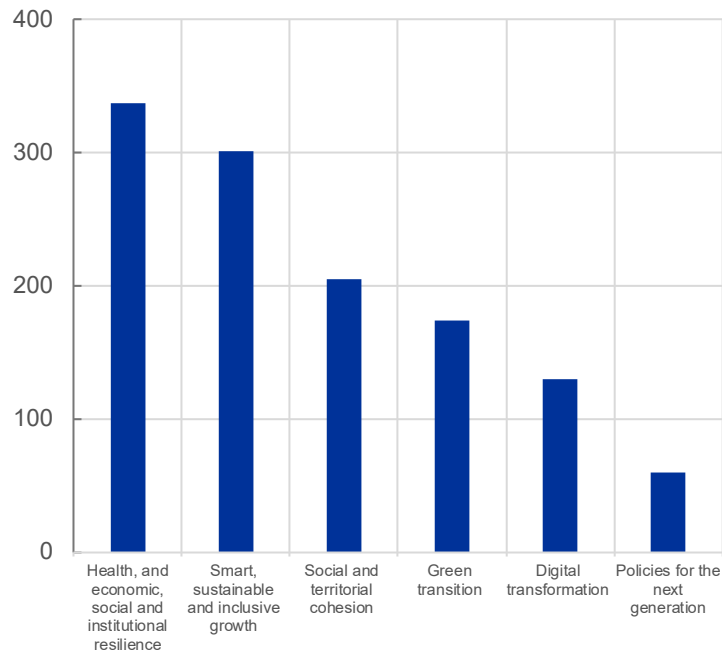


Source: ECB illustration based on European Commission data.

Note: Database accessed on 4 April 2024. All EU Member States included.

Fulfilled reform-related RRF milestones and targets: breakdown by policy pillar

(total number)



Source: ECB illustration based on European Commission data.

Note: Database accessed on 4 April 2024. All EU Member States included. Some milestones and targets are related to more than one policy pillar.

Thank you very much for your attention!