



# GROUP OF TWENTY

## G-20 REPORT ON STRONG, SUSTAINABLE, BALANCED, AND INCLUSIVE GROWTH— ONLINE ANNEX

2023



Prepared by Staff of the  
**INTERNATIONAL MONETARY FUND\***

\*Does not necessarily reflect the views of the IMF Executive Board

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## Annex I. Concepts, Definitions, and Measurement

**1. This annex presents concepts, definitions, and measurement relevant for the assessment of the quality of growth and policies.** Detailed charts for the four dimensions of strong, sustainable, balanced, and inclusive growth (SSBIG) are presented in Annex II.

### A. Strong, Sustainable, Balanced, and Inclusive Growth

**2. This section describes how strong, sustainable, balanced, and inclusive growth is operationalized across the four dimensions.** While indicators for each of the four individual aspects of growth are listed below, there are important areas of overlap across these four dimensions. For example, the sustainability of growth ultimately depends on growth also being balanced, and vice versa.

- *Strong growth.* This dimension refers to short-term, cyclical growth. Indicators include GDP growth, the output gap, and inflation (in levels and in deviations from inflation targets, where applicable).
- *Sustainable growth.* This dimension refers to medium- and long-term growth. Indicators include potential growth, total factor productivity growth, labor productivity growth, and progress towards tackling climate change.
- *Balanced growth.* This dimension refers to the composition of growth (e.g., domestic versus external demand) and whether there is a build-up of external and domestic imbalances. *External excess imbalances* are derived from the IMF's External Sector Report, which provides estimates of the extent to which current accounts and real effective exchange rates differ from those warranted by fundamentals and desired policies, while taking into account reserve coverage and international investment position indicators. Indicators of *domestic private imbalances* include (non-financial) private sector debt and asset quality ratios. *Domestic public imbalances* are measured by the level of general government gross debt.
- *Inclusive growth.* This dimension refers to the degree of inequality in *outcomes* and in *opportunities*. Indicators of inequality in *outcomes* include the Gini coefficient and the ratio of the bottom income decile to the top income decile (i.e., the average income of the lowest 10 percent of earners relative to the average income of the top 10 percent of earners). The Gini coefficient captures inequality of outcomes in the broadest sense but is highly sensitive to changes in the middle of the income distribution and is less sensitive to changes in the tails of the distribution. The ratio of the bottom to the top income deciles captures changes in the extreme ends of the income distribution. Indicators of inequality in *opportunities* include measures of access to education and health (e.g., public expenditure on education and health can be an indicative measure of quality and access).

## B. Policies

### 3. This section discusses the indicators used for assessing the policy stances across the fiscal, monetary, and structural reform policy areas.

- *Fiscal policy.* The fiscal policy stance is measured as the change in the cyclically adjusted primary balance (CAPB), where the balance is computed in percent of potential GDP. A contractionary (expansionary) fiscal policy stance reflects a positive (negative) change in the CAPB. The current and projected fiscal policy stance reflects the WEO baseline projections. The deviation of the recommended from the projected stance is expressed as the difference between IMF staff's recommended versus projected change in the CAPB. Therefore, IMF staff recommends a more contractionary (expansionary) fiscal stance than the projected one where the deviation of the recommended from the projected change is positive (negative). The recommended path for the CAPB assumes that recommendations are implemented in each year (e.g., the recommended change in year  $t$  assumes that recommendations for year  $t-1$  are implemented).
- *Monetary policy.* The monetary policy stance is measured as the difference between the actual real policy interest rate and approximations/estimates of the (unobservable) natural real interest rate. A contractionary (expansionary) or tight (accommodative) monetary policy stance reflects an actual real policy interest rate above (below) the natural rate. Given the uncertainty surrounding these measures, the projected baseline path in the heatmaps in the main text is based on IMF staff's assessments, and policy recommendations are expressed as deviations from this path.
- *Structural reforms.* The structural reform policy areas considered are those for which there are quantifiable indicators of structural reforms. These include (i) product market regulation; (ii) trade liberalization; (iii) employment protection legislation; (iv) tax structure reform (direct vs. indirect taxes); (v) Research and Development (R&D) spending; (vi) labor tax wedge; (vii) childcare spending (or other reforms to increase female labor force participation); (viii) active labor market policies; (ix) unemployment benefit replacement rates; (x) environmental policy (both pricing and non-pricing); and (xi) digital transition (reforms to step up digital government or promote investment in digital technologies). While this set of indicators captures key structural reform needs, it does not necessarily provide a complete description of the structural reform agenda for every country. Structural reform recommendations reflect consensus assessments of the IMF and the OECD and are expressed in terms of reform priorities ("high", "medium", or "low").<sup>1</sup>

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<sup>1</sup> IMF and OECD recommendations are based on priorities for additional reforms (relative to reforms already incorporated in the baseline), aggregated based on a simple rule. For example, a "high" priority rating requires that both IMF and OECD staff found reforms in a certain area to be very urgent.

### Box 1. 2023 G-20 Framework Working Group (FWG) Agenda

This box provides an overview of the G-20 FWG agenda and associated G-20 Reports in 2023. Under India's presidency, FWG discussions covered three main topics within the overarching theme of One Earth, One Family, One Future.

**Assessing the macroeconomic impacts of food and energy insecurity and their implications for the global economy.** G-20 Leaders took note of the report published in July in the September 2023 New Delhi Declaration. The report drew on a survey of member countries' experiences supported by inputs from the IMF, the World Bank, the International Energy Agency (IEA), and the UN Food and Agriculture Organization (FAO) to help identify key takeaways on policy actions to address vulnerabilities emanating from volatility in food and energy markets. The report highlighted a role for well-targeted fiscal measures to help manage adverse impacts and improve welfare, while noting the need to gradually phase out emergency market interventions and adopt cost-effective medium-to-long-term measures for future crisis interventions. The report also emphasized the need for multilateral efforts to build resilience.

**Country-driven assessment of the macroeconomic risks stemming from climate change and transition pathways.** G-20 Leaders endorsed the report published in July in the September 2023 New Delhi Declaration. Building on a G-20 members' survey and inputs from IOs (IMF, NGFS, IEA), the report provided an overview of country experiences to provide insights for the development of policy responses to climate change and help identify areas for cooperation. The report noted that the optimal policy mix for transition will vary by country and sector; that transition policies will have effects on macroeconomic variables; and emphasizes the benefits of sharing experiences to aid the design of country-specific transition measures.

**Supporting strong, sustainable, balanced, and inclusive growth in a context of heightened macroeconomic vulnerabilities, interlinkages, and spillovers.** Building on ongoing risk discussions, the Indian Presidency focused on financial globalization and a panel discussion was held on the topic at the 3<sup>rd</sup> FWG Meeting held in June in Kochi.

## Box 2. African Union’s G-20 Membership

At the G-20 leaders’ summit in Delhi on September 9, 2023, the African Union (AU) was granted permanent member status in the G-20 to become the second regional organization to join after the European Union.

The AU was officially launched in 2002 to spearhead Africa’s development and integration, exemplified by Agenda 2063—its strategic framework providing a collective vision and roadmap to build a prosperous and united Africa and achieve the goals of inclusive and sustainable development.<sup>1</sup> The union consists of 55 member states, representing all the countries on the African continent, with a combined GDP of \$2.8 trillion and a population of 1.4 billion.

The accession of the AU as a permanent member will elevate the G-20’s focus on some of the world’s greatest challenges—such as climate change, food security, migration, and debt sustainability—to which countries in the continent are amongst the most exposed. The inclusion of the AU is also significant for global governance, providing the continent an important voice on key global issues.

Over the past year many economies across the African continent have faced slowing external demand, higher domestic interest rates, elevated sovereign spreads, and ongoing exchange rate pressures adding to high debt levels and deep structural reform challenges. As a result, growth in Africa is expected to decline to 3.2 percent in 2023. But there are tentative signs that the outlook in many countries in Africa is improving, with more robust than expected activity in a few of Africa’s larger economies and increased extractive activity among resource-rich countries. Consequently, growth on the continent is projected to strengthen to 3.8 percent in 2024. Inflation is also generally easing, and fiscal imbalances are gradually moderating.

But significant challenges remain. About one-third of countries are still experiencing double-digit inflation (or higher), public debt vulnerabilities remain elevated—more than half of the continent’s countries eligible for concessional lending from the IMF’s Poverty Reduction and Growth Trust are at high risk of debt distress or already in distress—, and medium-term growth prospects are mixed. Against this background, there is a need for policymakers to prioritize efforts to boost resilience by ensuring macroeconomic stability and accelerating structural reforms to foster stronger, more inclusive growth. There is also a significant role for the international community to support the region’s most vulnerable states.<sup>2</sup>

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1/ African Union, 2022, [African Union Handbook](#).

2/ IMF, 2023, [Africa: Special Issue, In Pursuit of Stronger Growth and Resilience](#).

## Annex II. Supplementary Charts

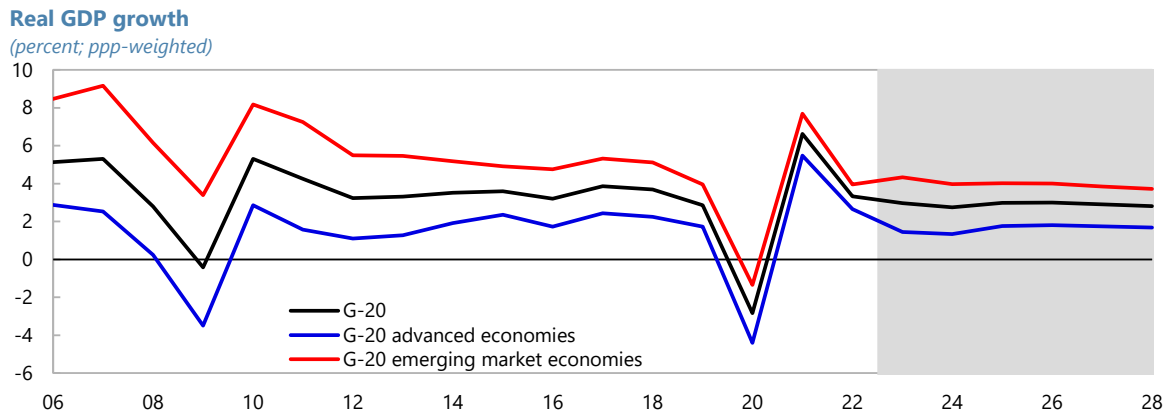
**1. This annex presents statistics on Strong, Sustainable, Balanced, and Inclusive Growth (SSBIG) and the macroeconomic policy stance.** The indicators for SSBIG correspond to those described in Annex I: (i) strong growth; (ii) sustainable growth; (iii) balanced growth; and (iv) inclusive growth. Data are mainly from the October 2023 WEO database, complemented with other sources where needed and as specified in footnotes to the charts. Aggregates include the European Union, unless otherwise specified. While the European Union includes both advanced and emerging market economies, for presentational purposes, it is depicted in charts among advanced economies.

**2. The size of output and inflation gaps as well as the assessment of policy stances are qualified relative to historical fluctuations.** In particular, the standard deviation of historical realizations across G-20 economies are added to some charts. Differentiation by advanced and emerging market economies is used in some cases. Where relevant, shadings in the charts indicate the following ranges: within  $\frac{1}{2}$  standard deviation from 0; within  $\frac{1}{2}$  and 1 standard deviation from 0; and outside the 1 standard deviation interval.

**3. Measurement uncertainty is illustrated for the output gap.** The charts show three different methods for estimating potential output and the output gap: one method where the estimates and projections are from the WEO database and two alternative methods to illustrate measurement uncertainty. The alternative methods include (i) one where potential output is derived from a simple HP filter; and (ii) one which is based on consensus forecasts of 1-, 2-, and 5-year-ahead growth rates.

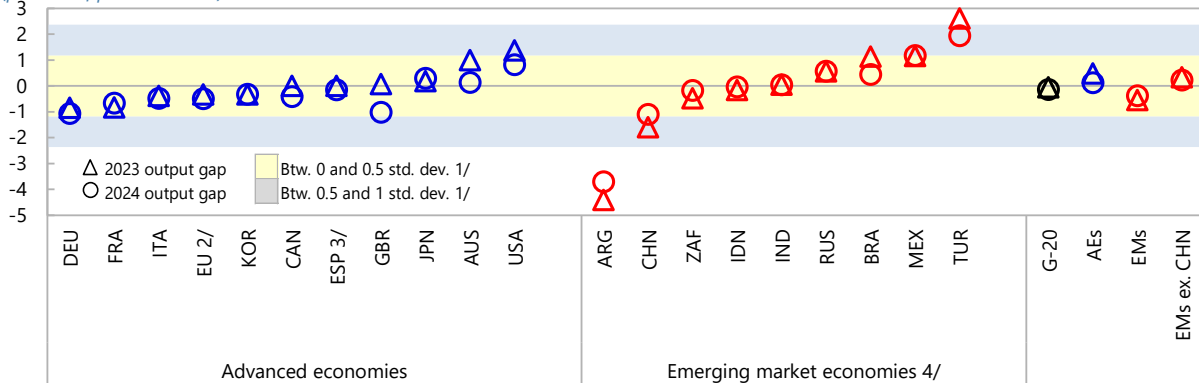
## A. Dimension: Strong Growth

Figure AII.1. Real GDP Growth And Output Gap, 2000–28



**WEO output gap estimate**

(percent of potential GDP)



Sources: IMF, *World Economic Outlook*; IMF staff calculations.

Note: AEs = G-20 advanced, EMs = G-20 emerging, EMs ex. CHN = G-20 emerging excluding China.

1/ Standard deviations are calculated from 1990 to 2019, excluding outliers above 99% and below 1% for each income group.

2/ EU: consists of both advanced economies and emerging market economies.

3/ ESP: permanent invitee.

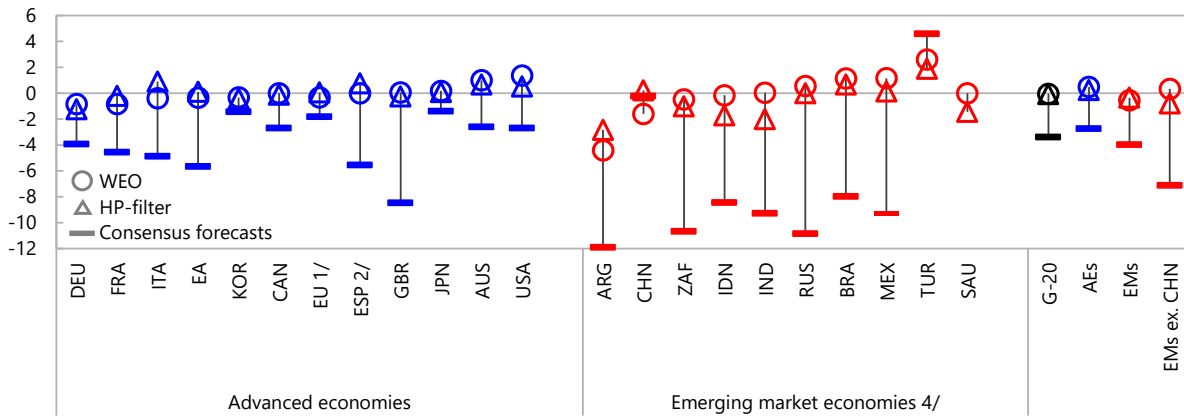
4/ SAU: output gap estimates for 2023 and 2024 are not available.



**Figure AII.2. Output Gap: Alternative Estimates, 2023 and 2024**

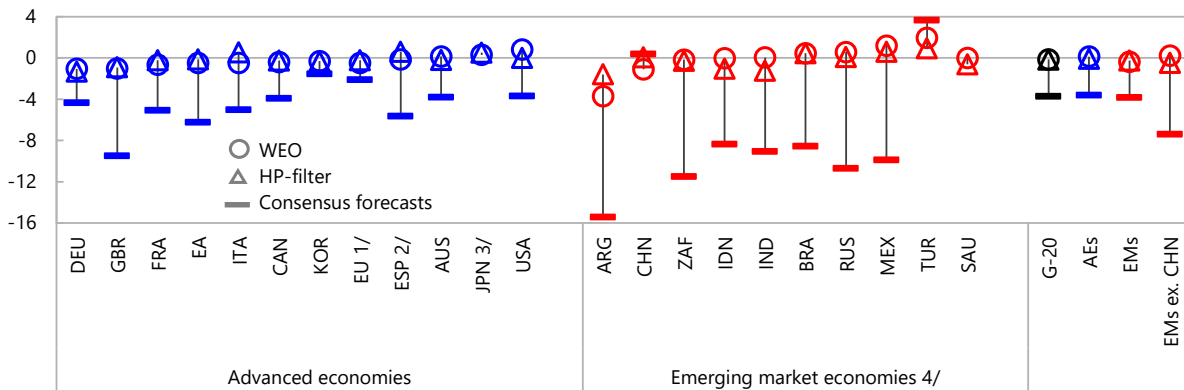
**Different measures of output gap, 2023**

(percent of potential GDP)



**Different measures of output gap, 2024**

(percent of potential GDP)



Sources: IMF, *World Economic Outlook*; Consensus Forecasts; and IMF staff calculations.

Note: AEs = G-20 advanced, EMs = G-20 emerging, EMs ex. CHN = G-20 emerging excluding China. As time-series estimates for potential growth are not available from Consensus Economics, Output gap estimates based on Consensus forecasts use real and potential GDP projections based on current year and 5-year-ahead growth rates from Consensus Economics, September 2023 and 2023Q3, respectively.

1/ EU: consists of both advanced economies and emerging market economies.

2/ ESP: permanent invitee.

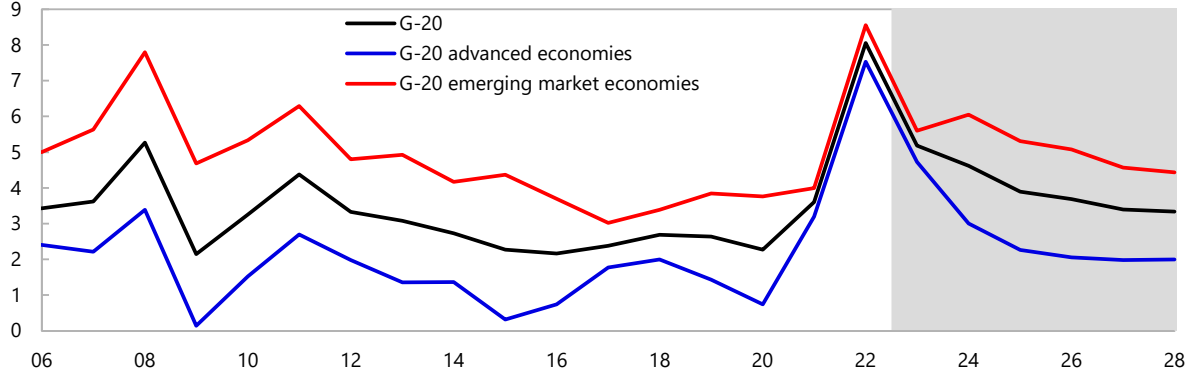
3/ JPN: no consensus forecast for 2024.

4/ SAU: output gap, HP-filter estimate, and 5-year ahead Consensus Forecast data are not available.

**Figure AII.3. Inflation, 2000–28**

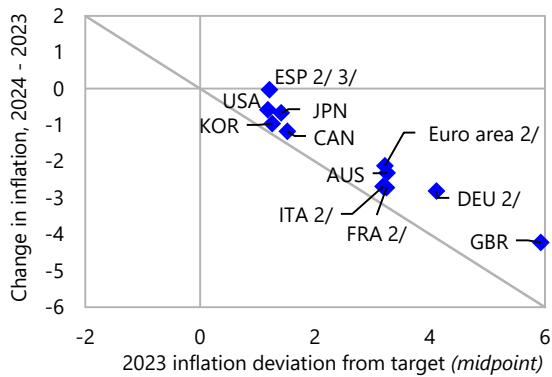
**CPI inflation**

(percent; ppp-weighted)



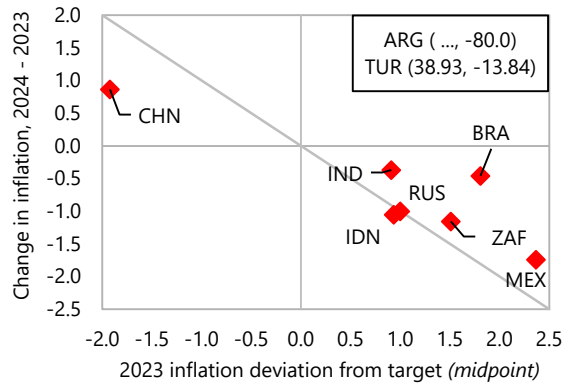
**Change in annual inflation and deviation from inflation target: Advanced economies 1/**

(percentage points)



**Change in annual inflation and deviation from inflation target: Emerging market economies 4/**

(percentage points)



Sources: IMF, *World Economic Outlook*; National Central Banks; and IMF staff calculations.

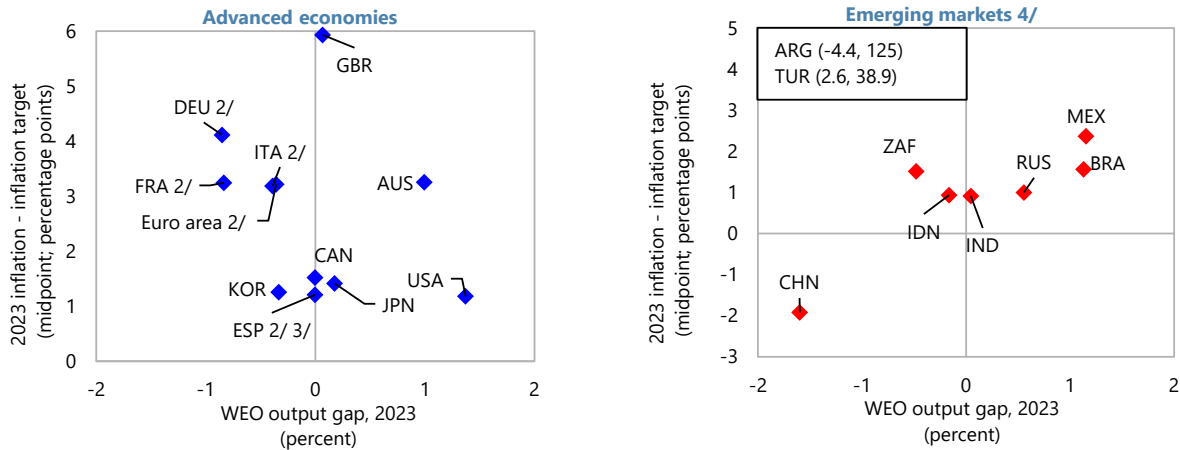
1/ PCE inflation projections have been used for USA and period-average CPI inflation projections for all other countries.

2/ The European Central Bank (ECB) targets the Harmonized Index of Consumer Prices as a medium-term objective for the euro area as a whole. For presentational purposes, the ECB objective is also used for individual euro area members.

3/ ESP: permanent invitee.

4/ SAU: does not have an inflation target.

**Figure All.4. Output Gaps And Deviations From Inflation Targets, 2023 1/**



Sources: IMF, *World Economic Outlook*; IMF staff calculations.

1/ US: PCE inflation projections; ARG, TUR, RUS: end-of-period CPI inflation projections; period-average CPI projections for all other countries.

2/ The European Central Bank (ECB) targets the Harmonized Index of Consumer Prices as a medium-term objective for the euro area as a whole. For presentational purposes, the ECB objective is also used for individual euro area members.

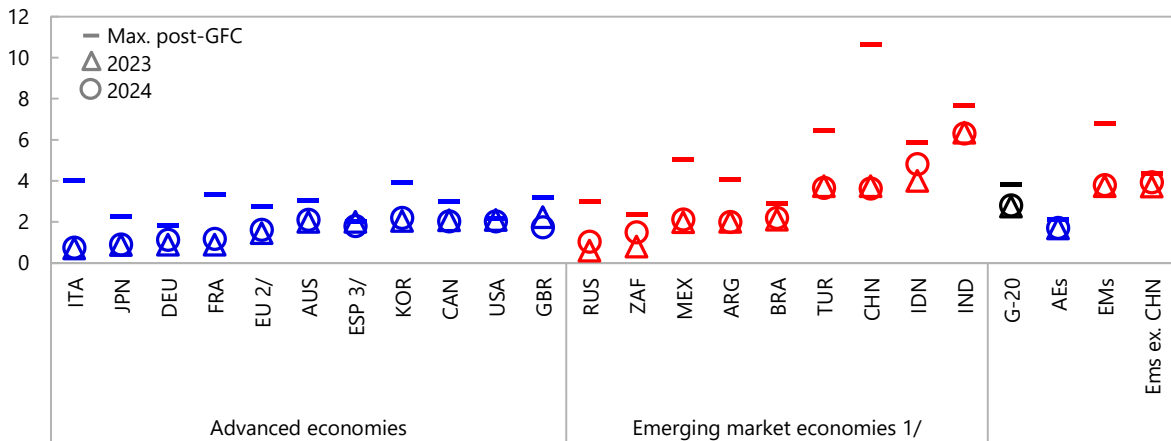
3/ ESP: permanent invitee.

4/ SAU: does not have an inflation target.

## B. Dimension: Sustainable Growth

**Figure All.5. Potential Growth, 2023–24**

**Potential output growth**  
(percent)



Sources: IMF, *World Economic Outlook*; IMF staff calculations.

Note: AEs = G-20 advanced, EMs = G-20 emerging, EMs ex. CHN = G-20 emerging excluding China.

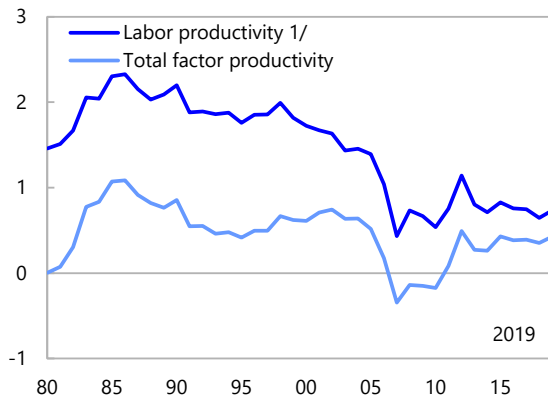
1/ SAU: potential GDP estimates for 2023 and 2024 are not available.

2/ EU: consists of both advanced economies and emerging market economies.

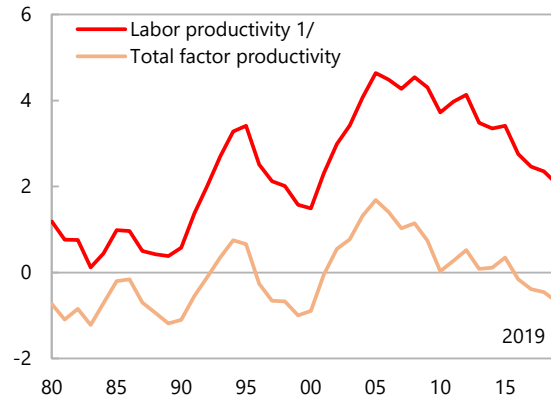
3/ ESP: permanent invitee.

**Figure AII.6. Productivity Growth, 1980–2019**

**Productivity growth: Advanced economies 2/**  
(ppp-weighted; 5-yr center moving average)



**Productivity growth: Emerging markets 3/**  
(ppp-weighted; 5-yr center moving average)



Sources: Feenstra, Robert C., Robert Inklaar and Marcel P. Timmer (2015), "The Next Generation of the Penn World Table" American Economic Review, 105(10), 3150-3182, available for download at [www.ggd.net/pwt](http://www.ggd.net/pwt); IMF, *World Economic Outlook*; and IMF staff calculations.

1/ Labor productivity is calculated as real GDP per person employed.

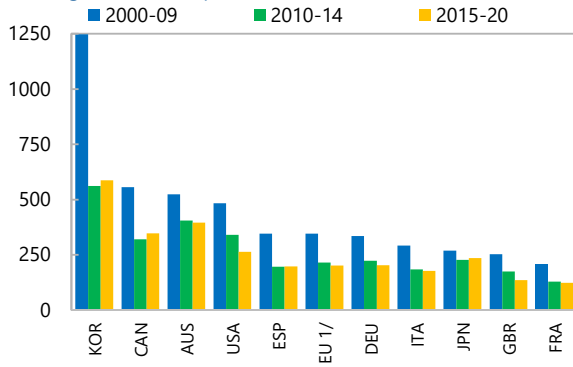
2/ Includes ESP, but not other EU advanced economies due to data limitations.

3/ Excludes RUS, SAU, and other EU emerging market economies due to data limitations.

**Figure AII.7. Climate, 2000–21**

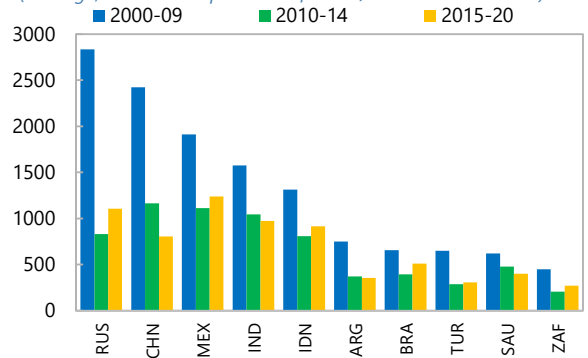
**G-20 advanced economies: Emissions intensity of output**

(Average; total CO<sub>2</sub> equivalent of GHGs/ million dollar GDP)



**G-20 emerging markets: Emissions intensity of output**

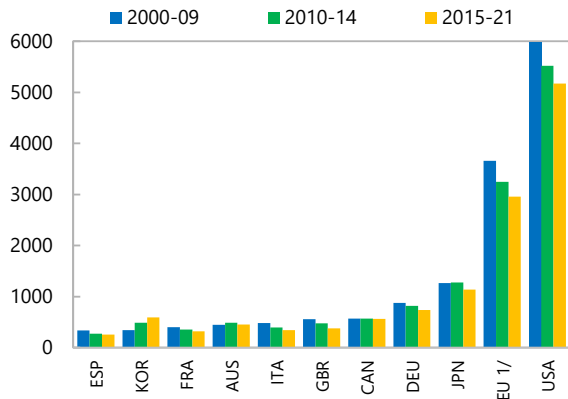
(Average; total CO<sub>2</sub> equivalent of GHGs/ million dollar GDP)



**Figure AII.7. Climate, 2000–21 (concluded)**

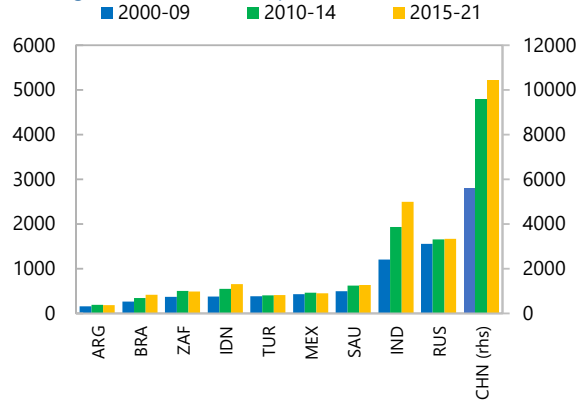
**G-20 advanced economies: Total emissions**

(Average; metric ton of CO2 equivalent of GHGs)



**G-20 emerging markets: Total emissions**

(Average; metric ton of CO2 equivalent of GHGs)



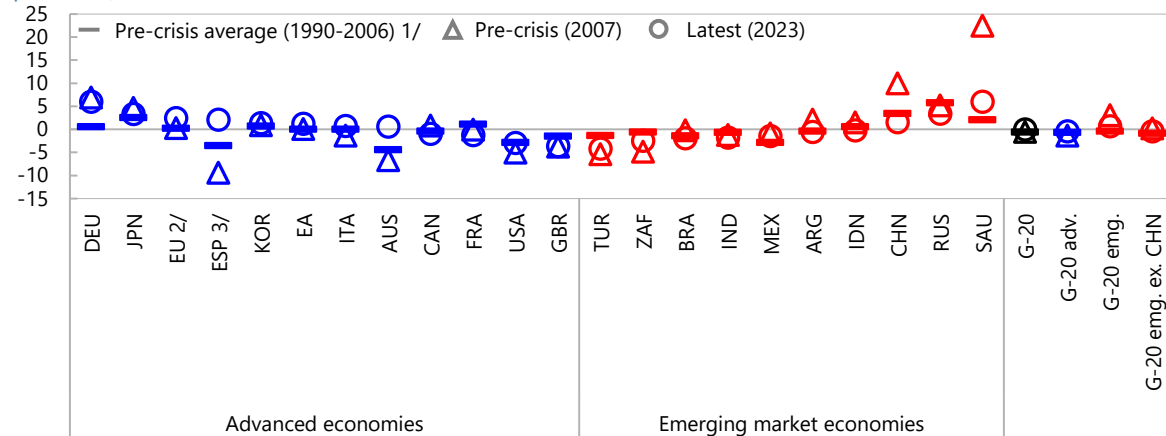
Sources: Global Carbon Project/Climate Watch; IMF staff calculations.  
1/ EU: consists of both advanced economies and emerging market economies.

**C. Dimension: Balanced Growth**

**Figure AII.8. Current Accounts, 1990–2023**

**Current account balance**

(percent of GDP)

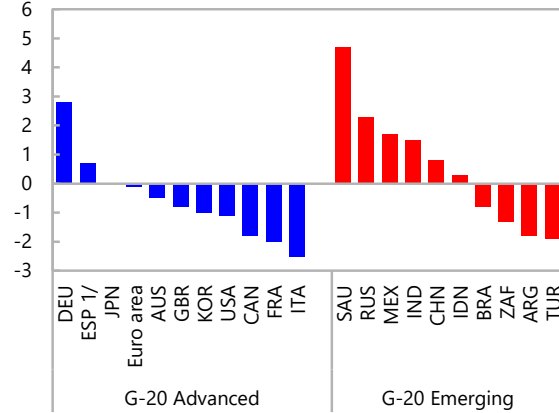


Sources: IMF, World Economic Outlook; IMF staff calculations.  
1/ RUS: earliest data from 1992; other EU advanced and emerging market economies from 1995; CHN and euro area from 1997.  
2/ EU: consists of both advanced economies and emerging market economies.  
3/ ESP: permanent invitee.

**Figure All.9. Current Account Gaps, 2021-22**

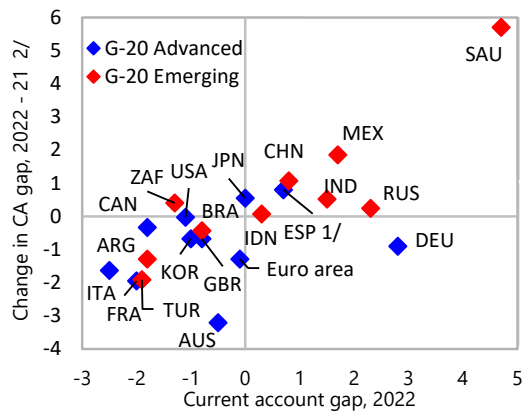
**Current account gap, 2022**

(percentage points)



**Current account gap assessment, 2022-21**

(percentage points)



Source: IMF, [External Sector Report](#), 2023.

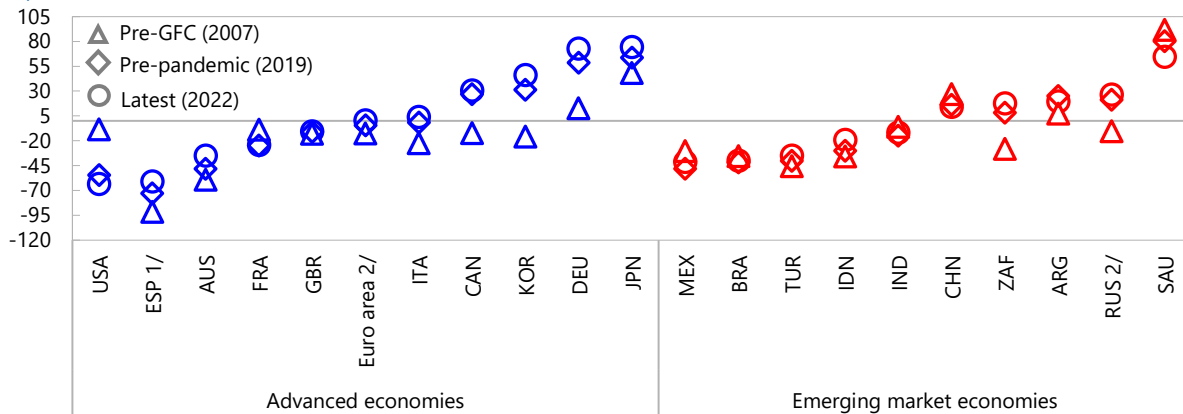
1/ ESP: permanent invitee.

2/ CA denotes the current account. Gaps are relative to IMF staff assessed current account norms.

**Figure All.10. Net International Investment Positions, 2007-22**

**Net international investment position**

(percent of GDP)



Sources: IMF, *Balance of Payments Statistics*; IMF, *World Economic Outlook*; and IMF staff calculations.

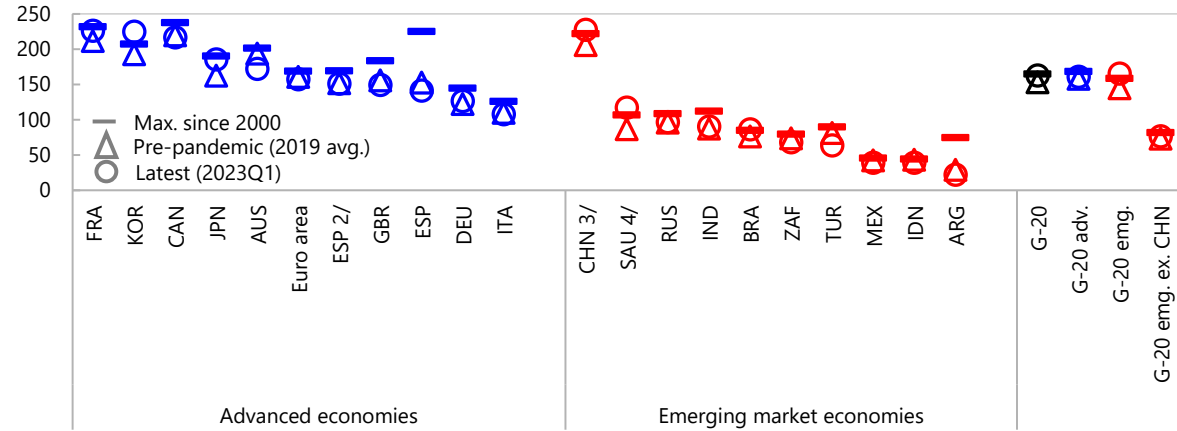
1/ ESP: permanent invitee.

2/ Euro area, RUS: latest data from 2021.

**Figure All.11. Private Non-Financial Sector Debt, 2000–23**

**Private debt 1/**

(percent of GDP)



Sources: BIS; Haver Analytics; IMF, *World Economic Outlook*; and IMF staff calculations.

1/ Credit to the private non-financial sector, which includes borrowing by non-financial corporations and households and reflects lending by domestic and foreign banks, as well as holdings of debt securities.

2/ ESP: permanent invitee.

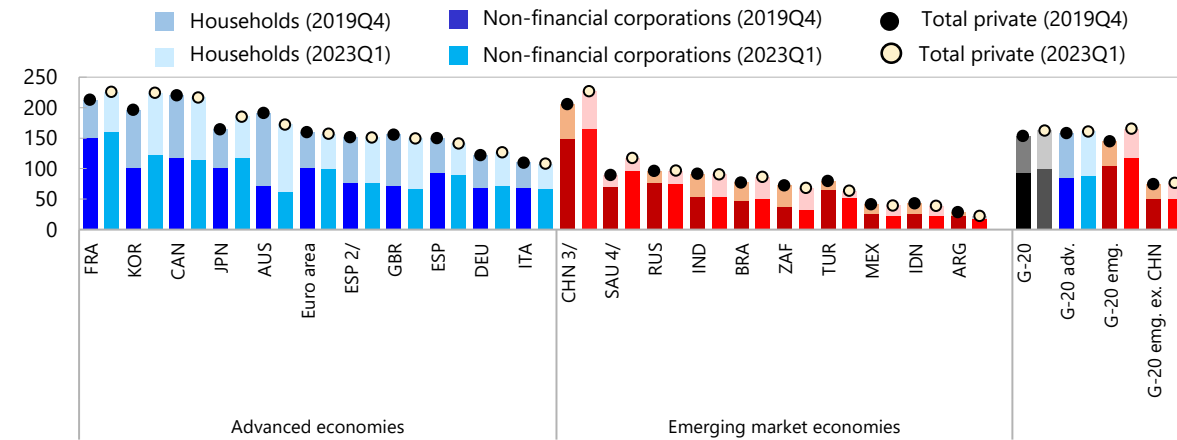
3/ CHN: private debt includes local government financing vehicles (LGFV) debt.

4/ SAU: data expressed in percent of non-oil GDP.

**Figure All.12. Private Non-Financial Sector Debt by Sector, 2019–23**

**Private debt by sector 1/**

(percent of GDP)



Sources: BIS; Haver Analytics; IMF, *World Economic Outlook*; and IMF staff calculations.

1/ Credit to the private non-financial sector, which includes borrowing by non-financial corporations and households and reflects lending by domestic and foreign banks, as well as holdings of debt securities.

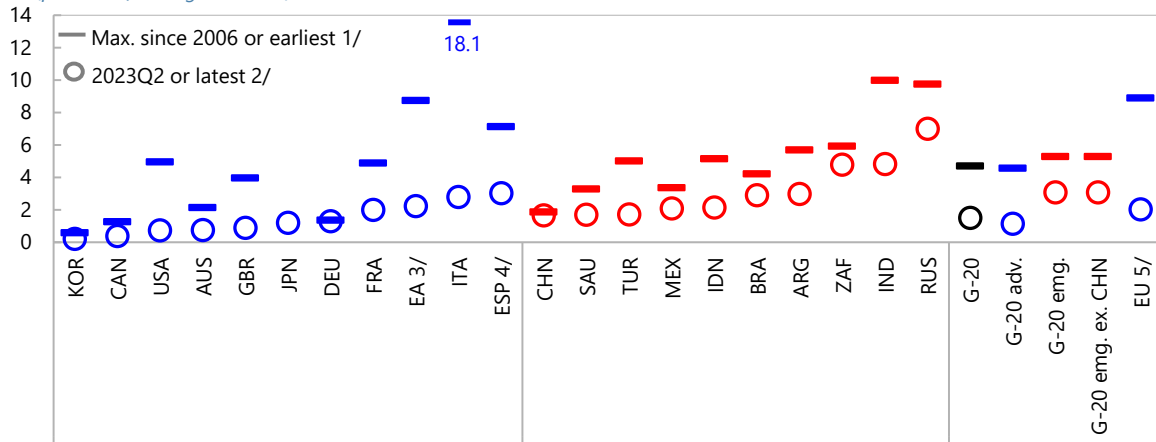
2/ ESP: permanent invitee.

3/ CHN: private debt includes local government financing vehicles (LGFV) debt.

4/ SAU: data expressed in percent of non-oil GDP.

**Figure All.13. Non-Performing Loans, 2006–23**

**Non-performing loans**  
(percent of total gross loans)



Sources: IMF, Financial Soundness Indicators; IMF, *World Economic Outlook*; and IMF staff calculations.

1/ FRA, GBR, IND, KOR, RUS, ZAF: data available from 2008; SAU, USA: from 2009; CHN: from 2010; JPN: excluded due to data limitations.

2/ AUS, BRA, DEU, FRA, GBR, JPN, MEX, TUR, USA: latest data from 2023Q1; IND, ITA: latest data from 2022Q4; CHN, ZAF: latest data from 2022Q3; KOR: latest data from 2022Q2; RUS: latest data from 2021Q3.

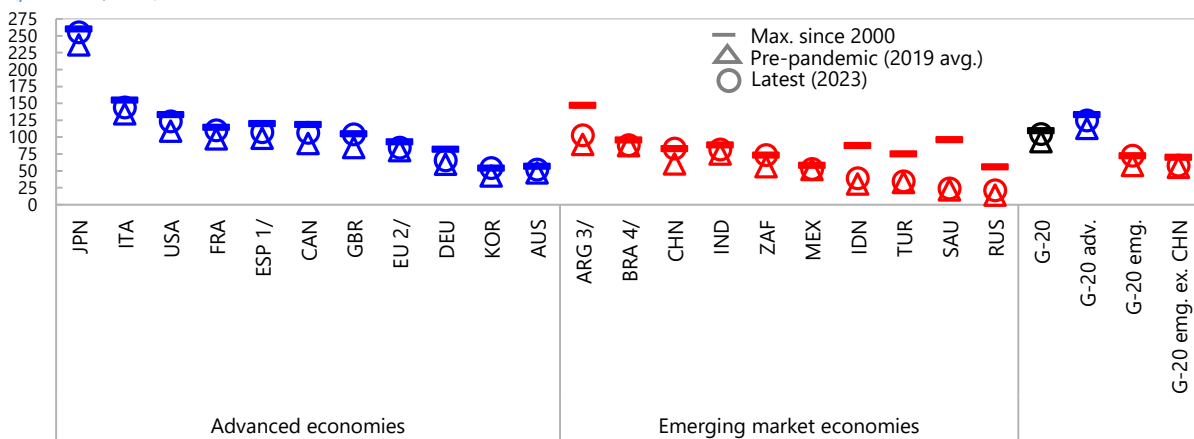
3/ Euro area: average of NPLs of 17 countries, weighted by nominal GDP. FIN and LUX are excluded due to data limitations.

4/ ESP: permanent invitee.

5/ EU: consists of both advanced economies and emerging market economies.

**Figure All.14. Public Sector Debt, 2000–23**

**General government gross debt**  
(percent of GDP)



Sources: IMF, *World Economic Outlook*; and IMF staff calculations.

1/ ESP: permanent invitee.

2/ EU: consists of both advanced economies and emerging market economies.

3/ ARG: data cover federal government gross debt in percent of GDP.

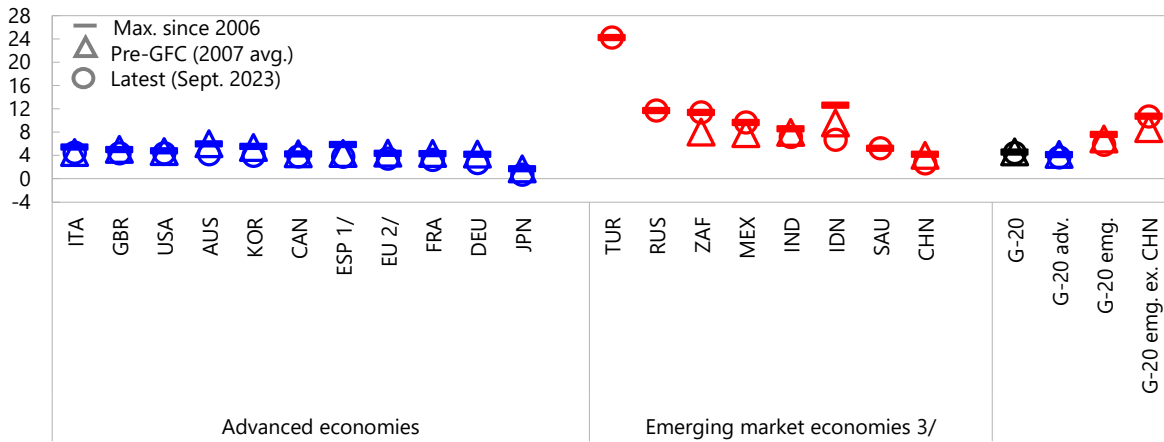
4/ BRA: general government data refer to the nonfinancial public sector.



**Figure AII.15. Sovereign Bond Yields, 2006-23**

**10Y sovereign bond yield**

(percent)



Sources: Bloomberg L.P.; Haver Analytics; European Central Bank; IMF, *World Economic Outlook*; and IMF staff calculations.

1/ ESP: permanent invitee.

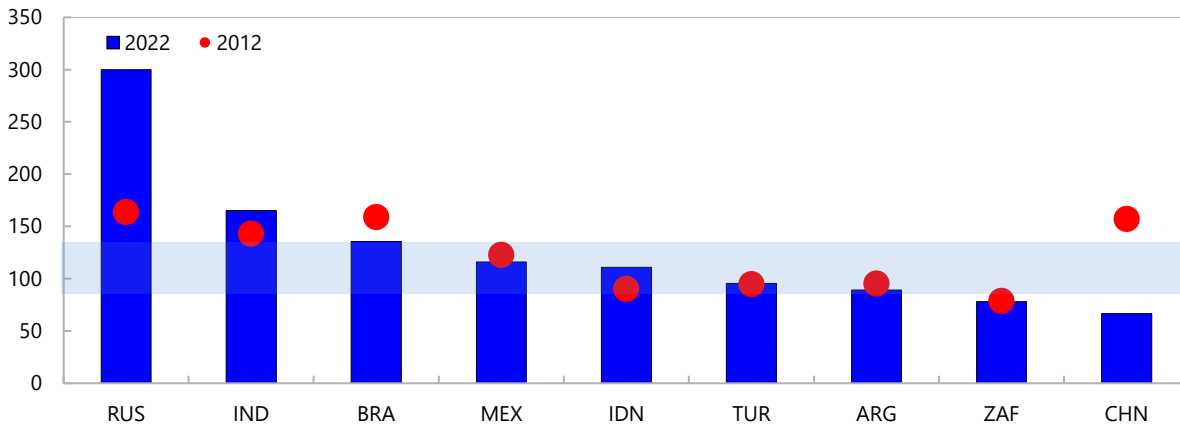
2/ EU: consists of both advanced economies and emerging market economies.

3/ ARG: missing historical data due to data limitations; RUS and TUR: data start from 2010; SAU: data start from 2016.

**Figure AII.16. Reserve Adequacy In Emerging Market Economies, 2012–22**

**Reserve adequacy**

(percent of unadjusted ARA metric)

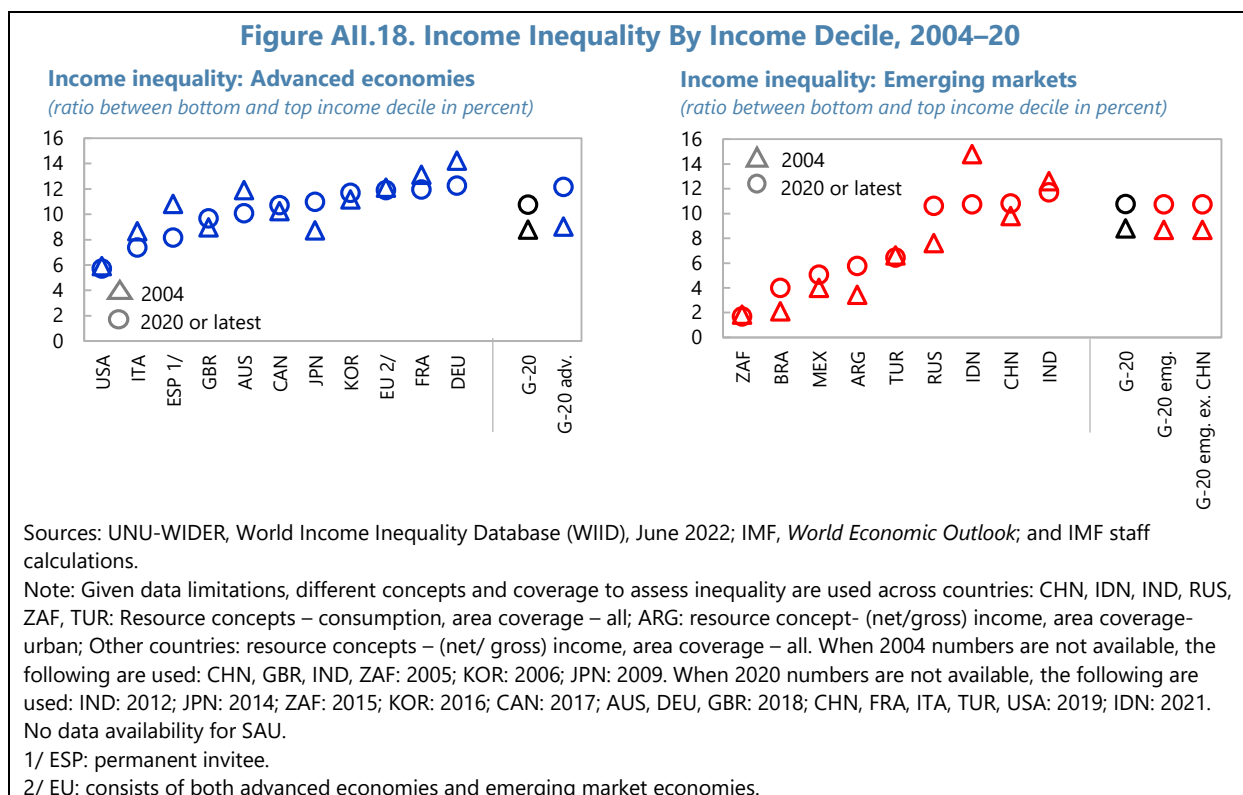
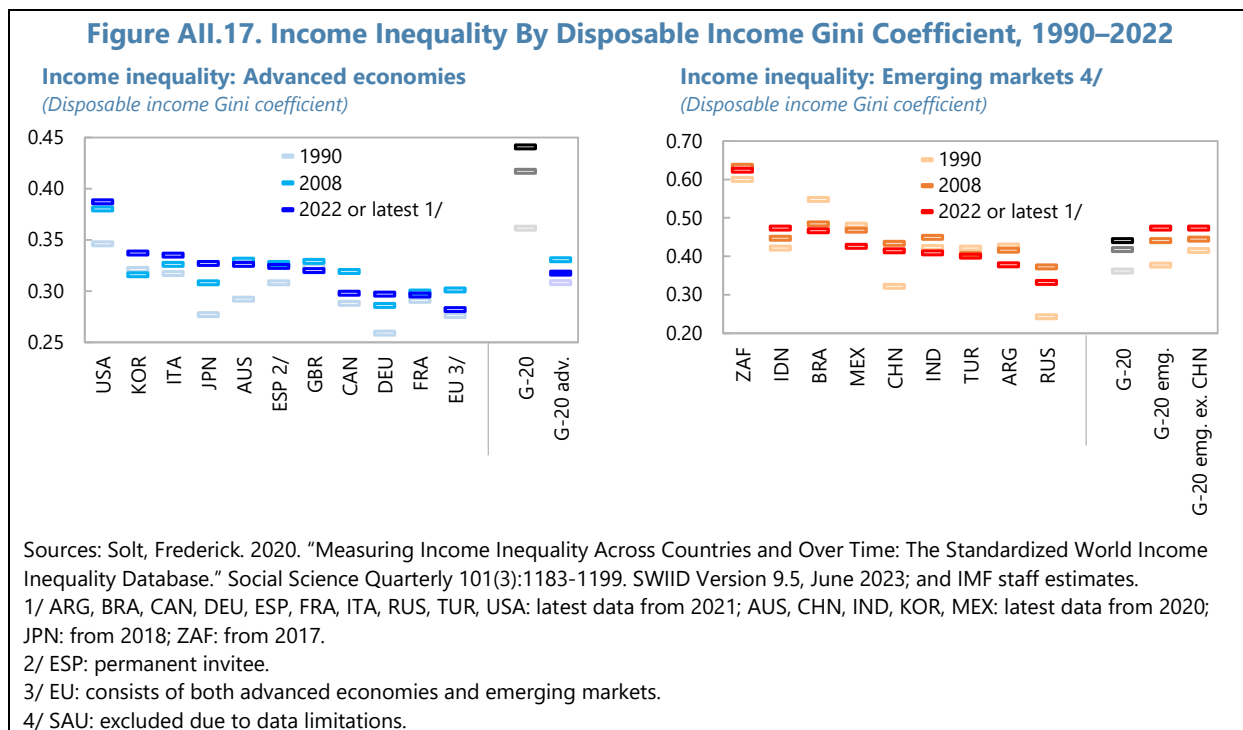


Source: IMF, *Assessing Reserve Adequacy*.

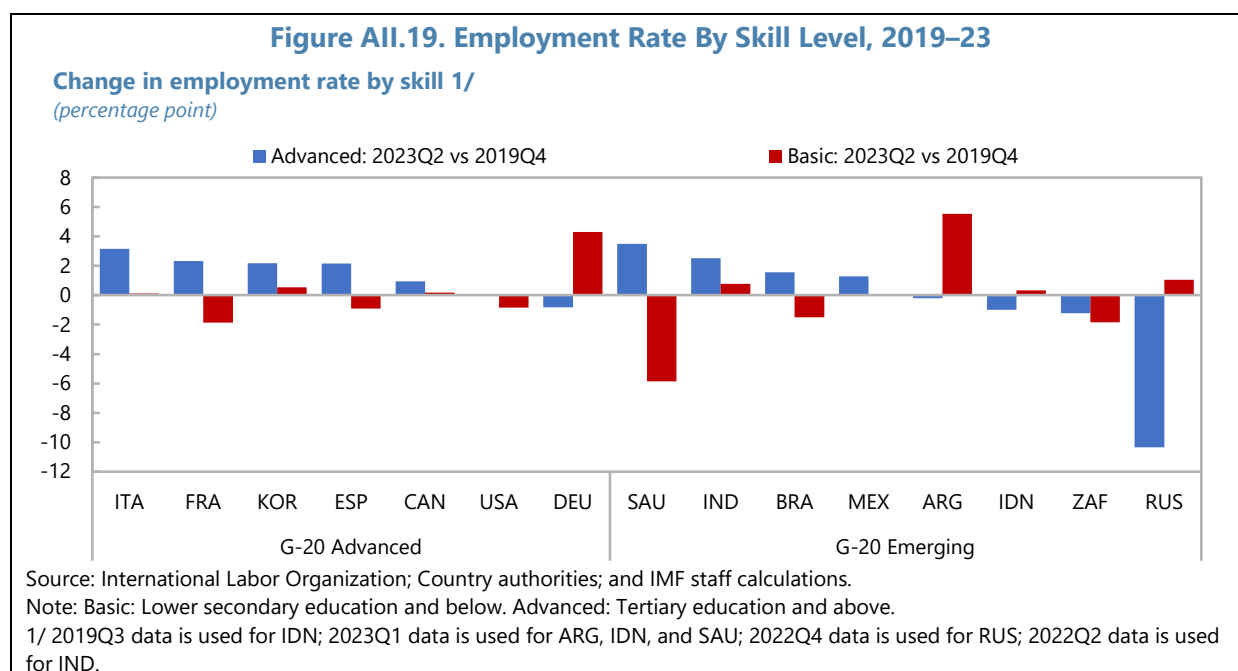
Note: Shaded area reflects the range within which reserves are assessed as broadly adequate based on the IMF composite Assessing Reserve Adequacy (ARA) metric. See IMF, 2015, "[Assessing Reserve Adequacy—Specific Proposals](#)". China: use ARA metric adjusted for capital controls.

## D. Dimension: Inclusive Growth

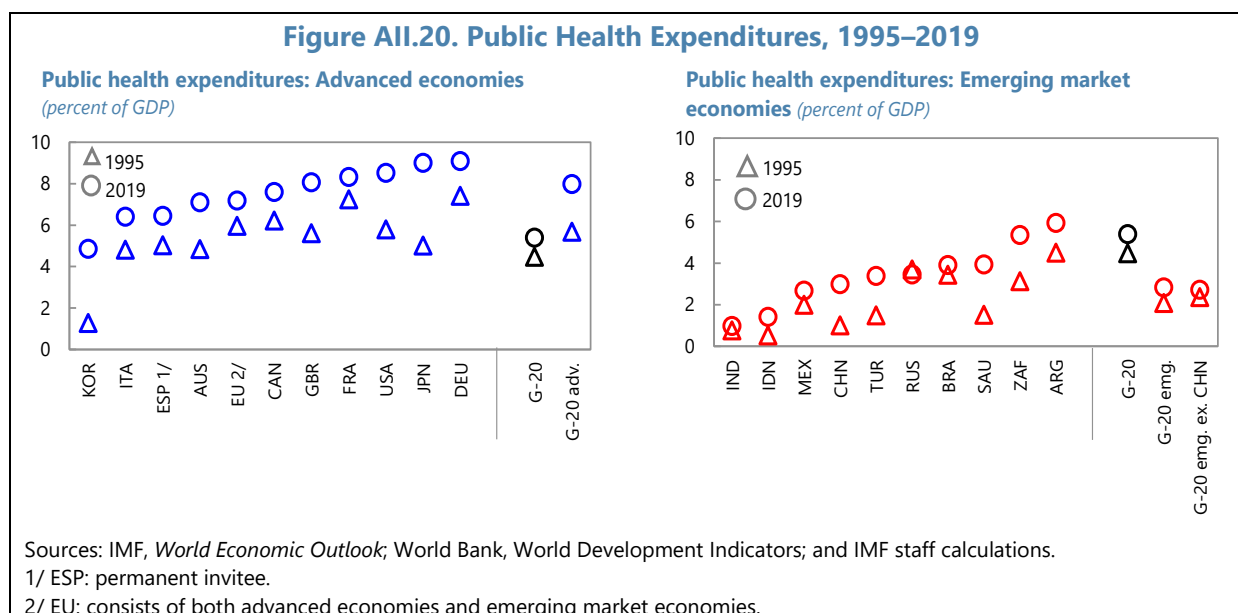
### Income Inequality Trends



## Indicative Measures for Inequality

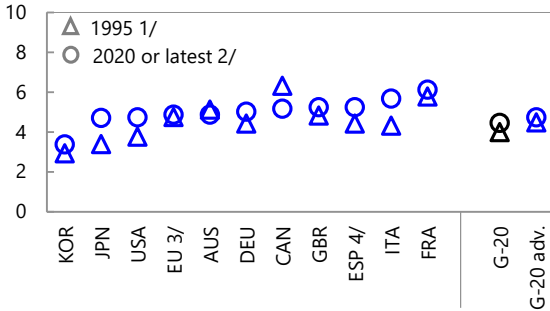


## Health and Education Spending Trends

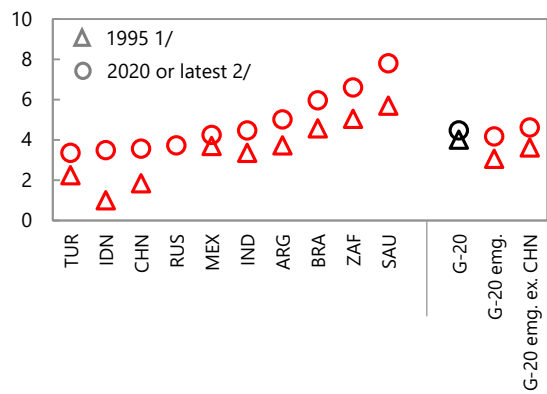


**Figure AII.21. Public Education Expenditures, 1995–2020**

**Public education expenditures: Advanced economies (percent of GDP)**



**Public education expenditures: Emerging market economies (percent of GDP)**



Sources: IMF, *World Economic Outlook*; World Bank, World Development Indicators; OECD; Ministry of Finance; and IMF staff calculations.

1/ IND: earliest data are from 1997; ARG and ZAF: from 1996; and RUS: no data for 1995.

2/ MEX: latest data are from 2018; BRA, KOR: from 2019. Data for AUS, DEU, ESP, FRA, GBR, ITA, JPN, KOR, and USA are from the OECD database.

3/ EU: consists of both advanced economies and emerging market economies.

4/ ESP: permanent invitee.

## Annex III. Simulations: Impact of Policy Recommendations

**1. This annex describes how the impact of implementing recommended policies is estimated and presents simulation results.** The impact on Strong Sustainable, Balanced, and Inclusive Growth is computed using the IMF's G-20 model.<sup>1</sup> The model evaluates the economic impact of a change in policies to reflect IMF staff's recommendations relative to those projected under the current baseline projections in a dynamic general equilibrium setting. The quantification of specific policies is described in section A of this annex. Simulation results are shown in section B.

### A. Quantifying Policy Recommendations

**2. The simulations are based on a quantification of policy recommendations as follows:**

- *Fiscal policy.* A more contractionary (expansionary) fiscal policy corresponds to a positive (negative) deviation between the recommended and projected changes in the cyclically adjusted primary balance (CAPB). The deviation is quantified by IMF staff's recommendations for the changes in the CAPB, including the channels through which this change is recommended to occur, i.e., via changes in revenue (labor, consumption, or indirect taxes) and / or changes in expenditures (consumption, investment, and transfers). Further, even if CAPB is not recommended to deviate from projections, any recommended changes to expenditures or revenues are included in the model (e.g., increase in public investment funded by additional tax revenue).
- *Monetary policy.* A moderately more contractionary (expansionary) monetary stance corresponds to a 75 basis points increase (decrease) in the policy rate relative to the baseline. A substantially more contractionary (expansionary) corresponds to a 150 basis points increase (decrease).
- *Structural reforms.* The simulations assume that recommended structural reforms are gradually implemented over 15 years, starting in 2023. The magnitude of the changes in the structural reform indicators is based on historical episodes of major reforms, with the speed of implementation reflecting the behavior exhibited by G-20 countries in the implementation of their growth strategies so far. Policy recommendations with higher priority are modeled as larger shocks to the relevant indicator, with reform priorities reflecting a consensus assessment by IMF and OECD staff. The quantitative evaluation of the impact of structural reforms on productivity and labor markets is based on a series of OECD analytical papers.<sup>2</sup> Note that trade liberalization, climate, and digitalization reforms are not included in the simulations due to modeling limitations.

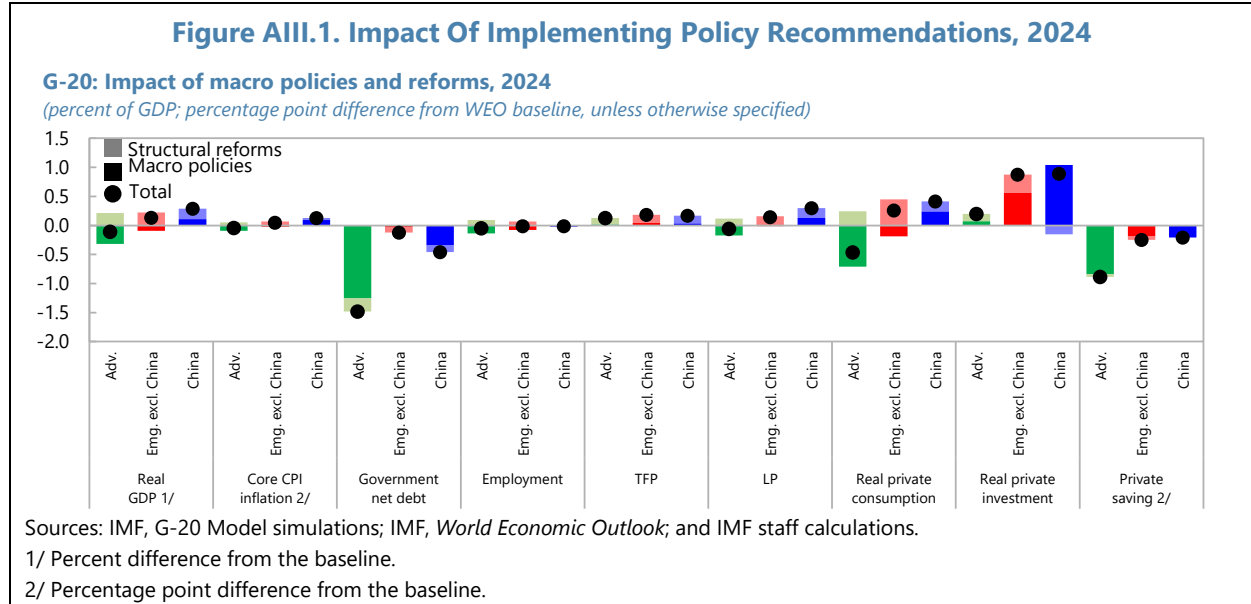
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<sup>1</sup> Andrieu, M., P. Blagrove, P. Espaillet, K. Honjo, B. Hunt, M. Kortelainen, R. Lalonde, D. Laxton, E. Mavroeidi, D. Muir, S. Mursula, and S. Snudden, 2015, [The Flexible System of Global Models – FSGM](#), IMF Working Paper No. 15/64.

<sup>2</sup> Examples include Egert, B. and P. Gal, 2017, [The Quantification of Structural Reforms in OECD Countries: A New Framework](#), OECD Economics Department Working Paper No. 1354; Bouis, R. and R. Duval, 2011, [Raising Potential Growth After the Crisis: A Quantitative Assessment of the Potential Gains from Various Structural Reforms in the OECD Area and Beyond](#), OECD Economics Department Working Papers No. 835.

## B. Simulation Results: Impact of Policy Recommendations

### Short-Term Impact



### Medium-Term Impact

