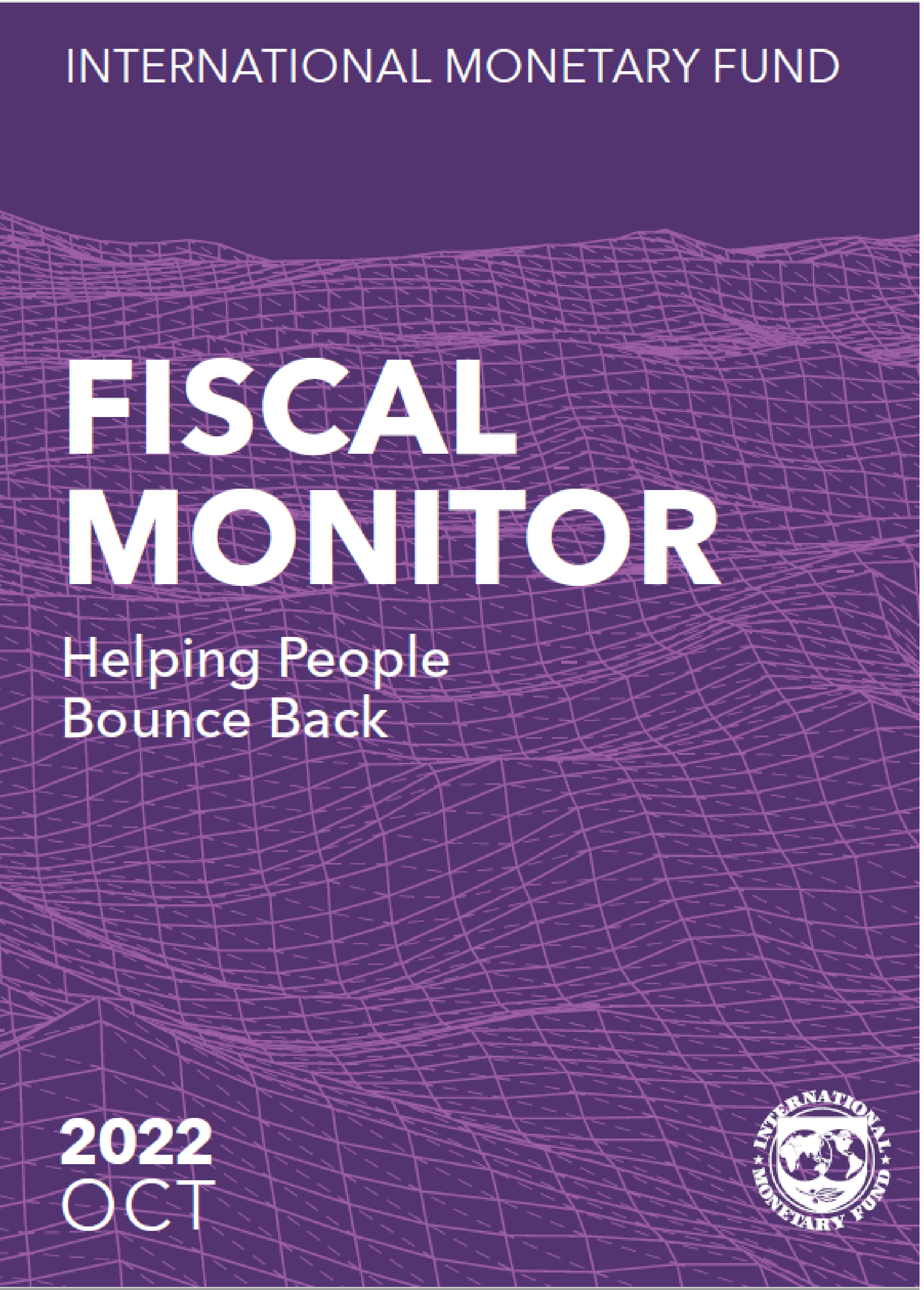


FISCAL AFFAIRS

Fiscal Policy & Inflation

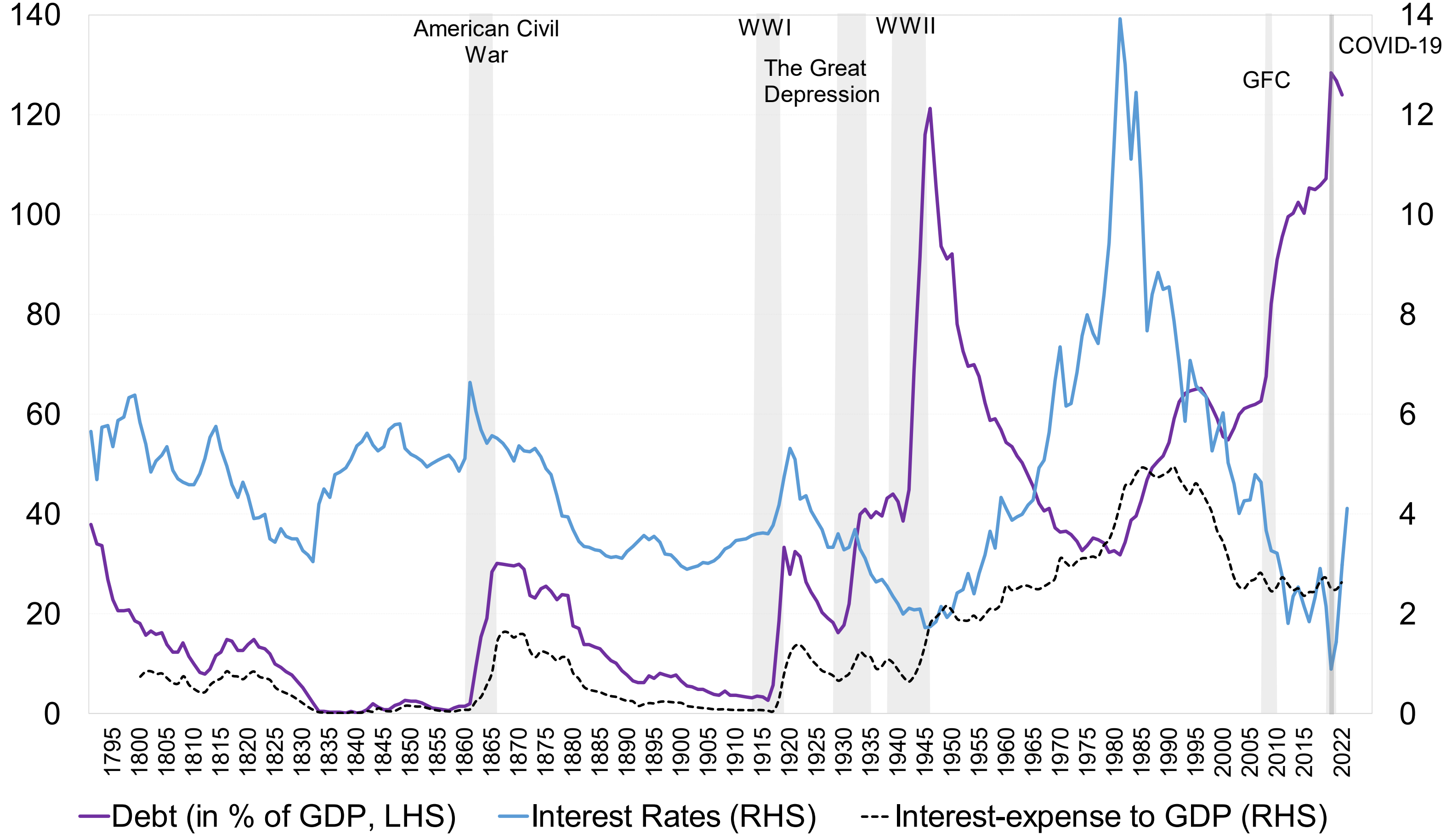
PRESENTATION AT THE NATIONAL ECONOMIC ADVISORY COUNCIL'S INTERNATIONAL CONFERENCE

AT THE KOREA DEVELOPMENT INSTITUTE, SEOUL, DECEMBER 5, 2022

Vitor Gaspar
Director
Fiscal Affairs Department

US Debt and Interest Rates

US Federal Debt (% of GDP), Long-Term Nominal Interest Rates (in percent) and Federal Interest Expenses (in percent of GDP), 1791-2022

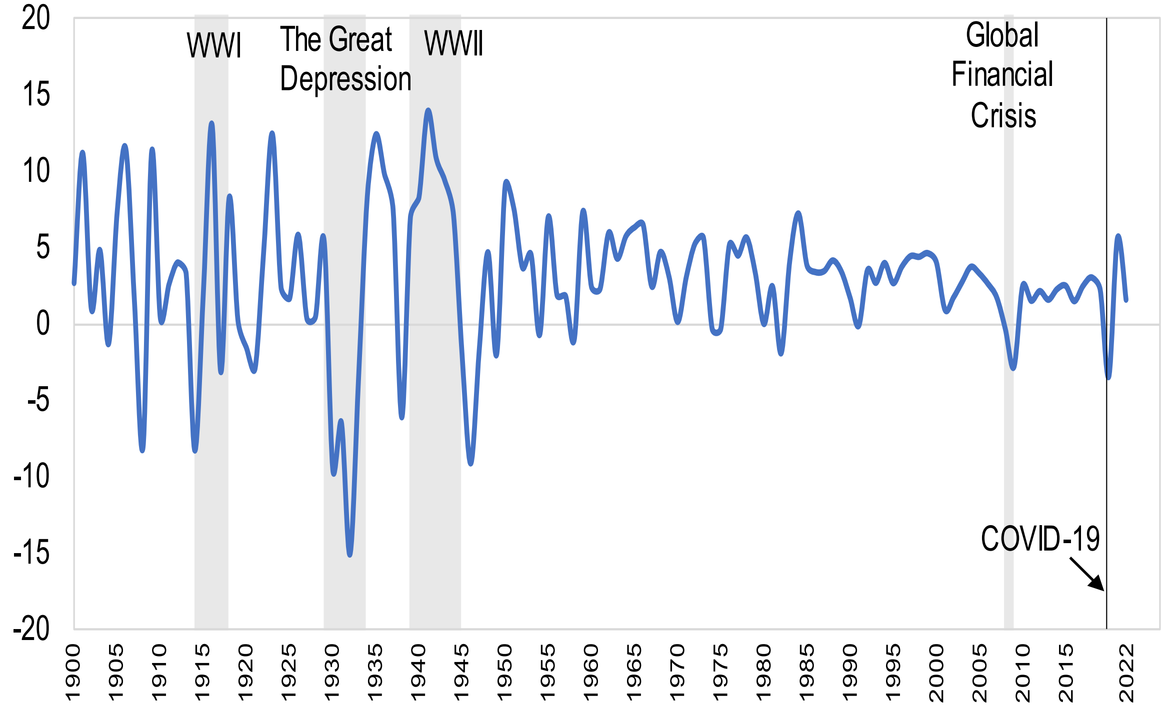


Source: Global Financial Database; Bureau of Economic Analysis; Congressional Budget Office (CBO); IMF World Economic Outlook (WEO) Database (October 2022); Bloomberg Finance LP; National Bureau of Economic Research (NBER) & IMF Staff Calculations

Note: The data are in annual frequency. The figure represents trends in the US. Long-term interest rates refer to yields on 10-year treasury securities except in some historical cases where the closest available maturity is used. The 2022 debt value is a projection from the CBO, and a BEA year-to-date value for Interest-expenses to GDP, while the 2022 long-term interest rate is a WEO projection. The long-term interest rates are an annual average. Wars and Recessions are shaded in grey. Recessions are based on NBER dating of business cycles. The WWI and WWII shaded regions are based on the global start and end years of the war, and not the years of official US participation in the wars. GFC refers to the Global Financial Crisis. Interest expense to GDP are net outlays (interest expenses less interest revenues) till 1946, due to lack of a distinguishable gross interest expense series, after which they are gross interest expenses (in percent of GDP).

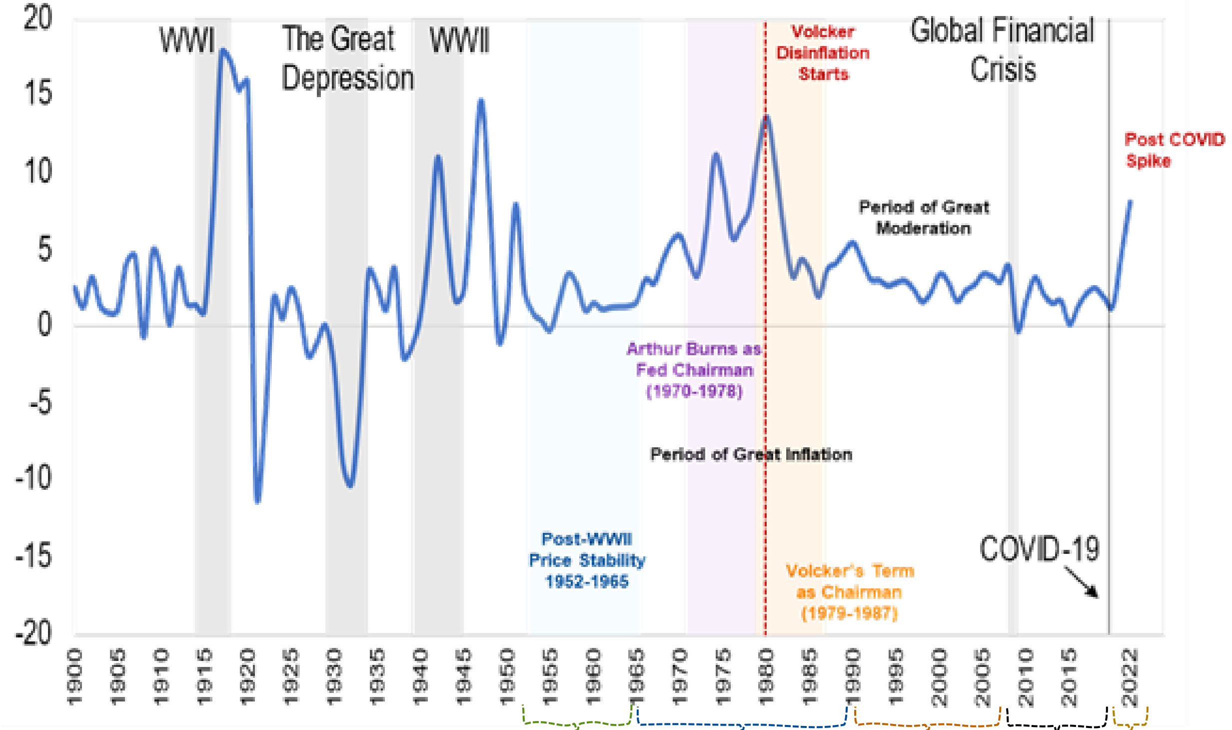
US Business Cycles and Inflation

US Real GDP Growth (1900-2022, in percent)



Standard Deviation of Real GDP Growth (1900-1951): 6.8% Standard Deviation of Real GDP Growth (1952-2022): 2.2%

US Annual Inflation (1900-2022, in percent)



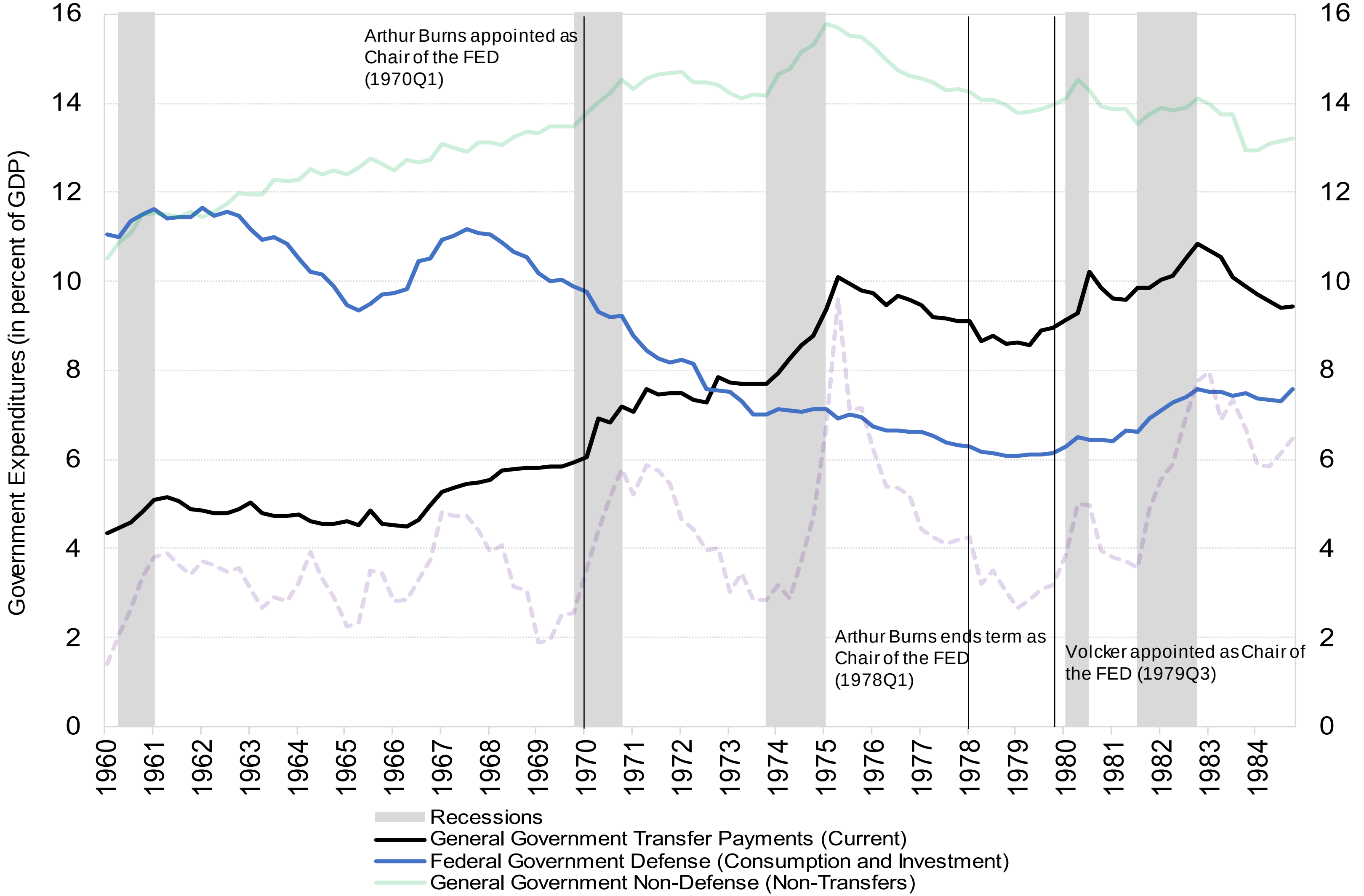
Std. Dev of Inflation (1952-1964): 1%
Std. Dev of Inflation (1965-1989): 3.1%
Std. Dev of Inflation (1990-2007): 0.9%
Std. Dev of Inflation (2008-2019): 1.1%
Std. Dev of Inflation (2020-2022): 3.4%

Standard Deviation of Inflation (1900-1951): 6.2% Standard Deviation of Inflation(1952-2022): 2.8%

Source: Global Financial Database, '*Historical Statistics of the United States*', Cambridge, Millennial Edition; IMF World Economic Outlook (WEO) Database (October 2022); Bloomberg Finance LP; National Bureau of Economic Research (NBER) and IMF Staff Calculations

Note: The data are in annual frequency. In the left chart, the 2022 value uses the World Economic Outlook projection. Wars and Recessions are shaded in grey. Recessions are based on NBER dating of business cycles. The WWI and WWII shaded regions are based on the global start and end years of the war, and not the years of official US participation in the wars. The right figure shows the annual average inflation in the United States. The 2022 value uses the World Economic Outlook projection. The average (with the standard deviation in parenthesis) Real GDP growth rate - 1900-1951: 3% (6.8%); 1952-2022: 2.9% (2.2%) and the average (with the standard deviation in parenthesis) annual inflation are – 1900-1951: 2.7% (6.2%); 1952-2022: 3,5% (2.8%); 1952-1964: 1.4% (1%); 1965-1989: 5.7% (3.1%); 1990-2007: 2.9% (0.9%); 2008-2019: 1.7% (1.1%) and 2020-2022: 4.7% (3.4%).

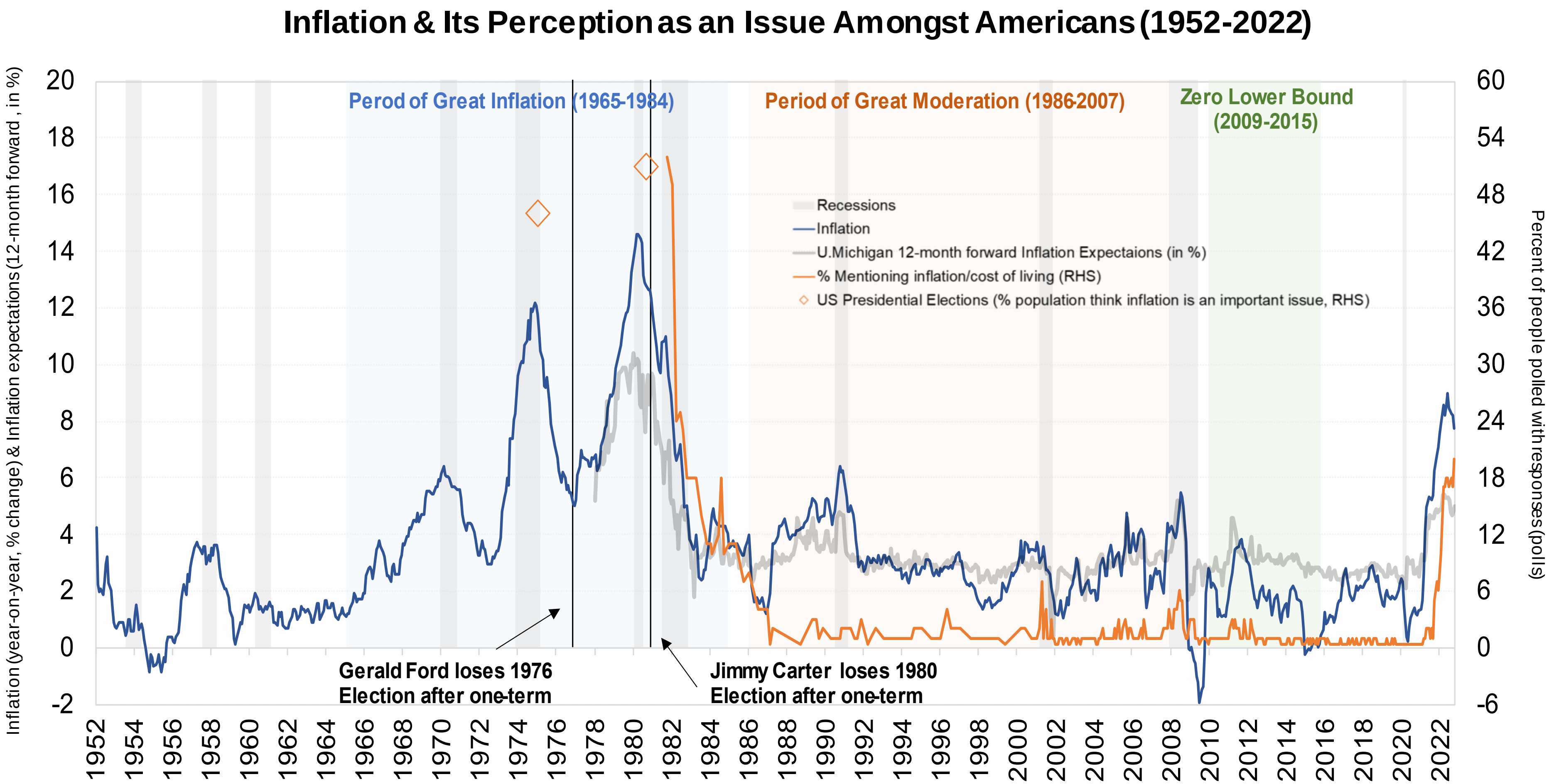
Fiscal Aggregates in the US (1960 – 1984)



Source: Federal Reserve Economic Data (FRED); National Bureau of Economic Research (NBER); Bureau of Economic Analysis (BEA)/Haver Analytics; "*The COVID-19 Pandemic and Inflation: Lessons from Major U.S. Wars*", Kevin L. Kliesen and David C. Wheelock, forthcoming; IMF Staff Calculations

Note: Recessions are shaded in grey according to NBER dating of business cycles. Data are in quarterly frequency. The chart is based on the forthcoming paper by Kliesen and Wheelock. General Government Non-Defense Spending does not include transfer payments (only consumption and investment spending of the federal, state and local government). Government transfer payments include social security benefits, medical benefits, such as from Medicare or Medicaid, veterans' benefits, and unemployment insurance benefits, incurred by the general government (federal, state and local).

Salience of Inflation Over Time

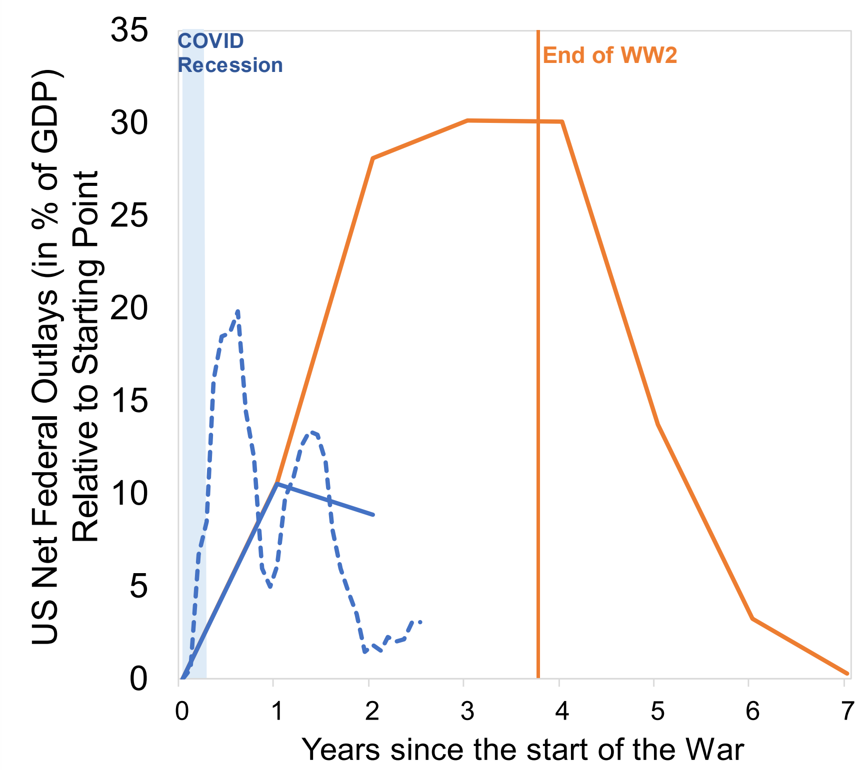


Source: Federal Reserve Economic Data (FRED); National Bureau of Economic Research (NBER); Gallup Polls Historical Data; Lydia Saad, '*Americans' Reaction to Record Inflation'*, Gallup Vault Blog, November 16, 2022, https://news.gallup.com/vault/405026/gallup-vault-americans-reaction-record-inflation.aspx; University of Michigan Survey/Haver Analytics & IMF Staff Calculations

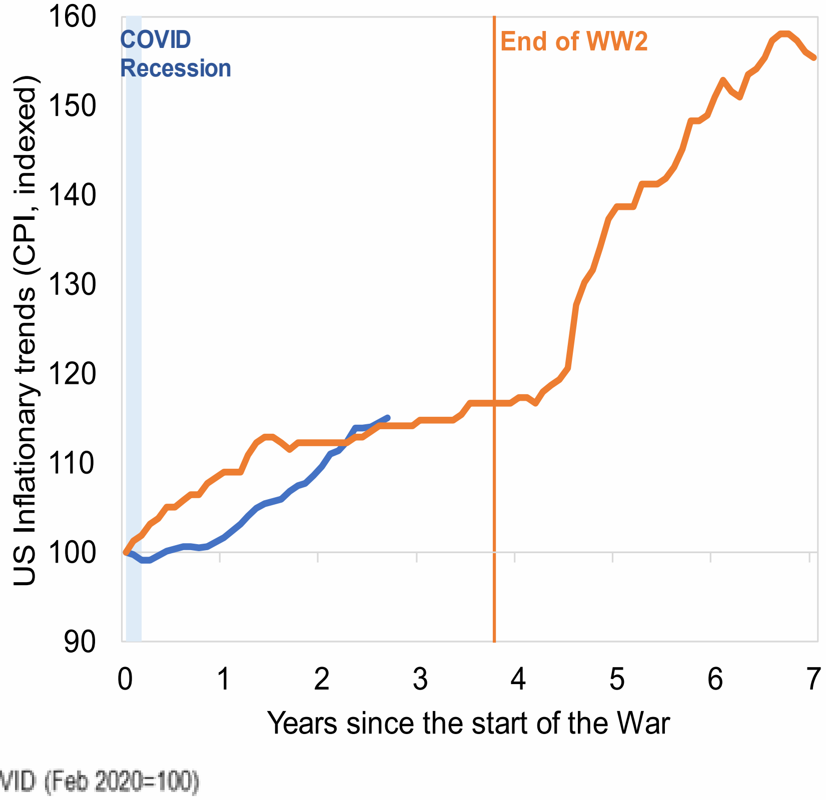
Note: Data are in monthly frequency. Inflation is based on the Consumer Price Index and is the year-on-year percent change. The diamond markers are based on a poll regarding key issues in the 1976 and 1980s election – which is different from the '*most important problem facing the country'* poll – which recorded inflation as a single issue only after October 1981 (orange line). The last datapoint is the month of October 2022.

COVID Finance as War Finance

US Federal Government Spending



US Inflation (CPI)

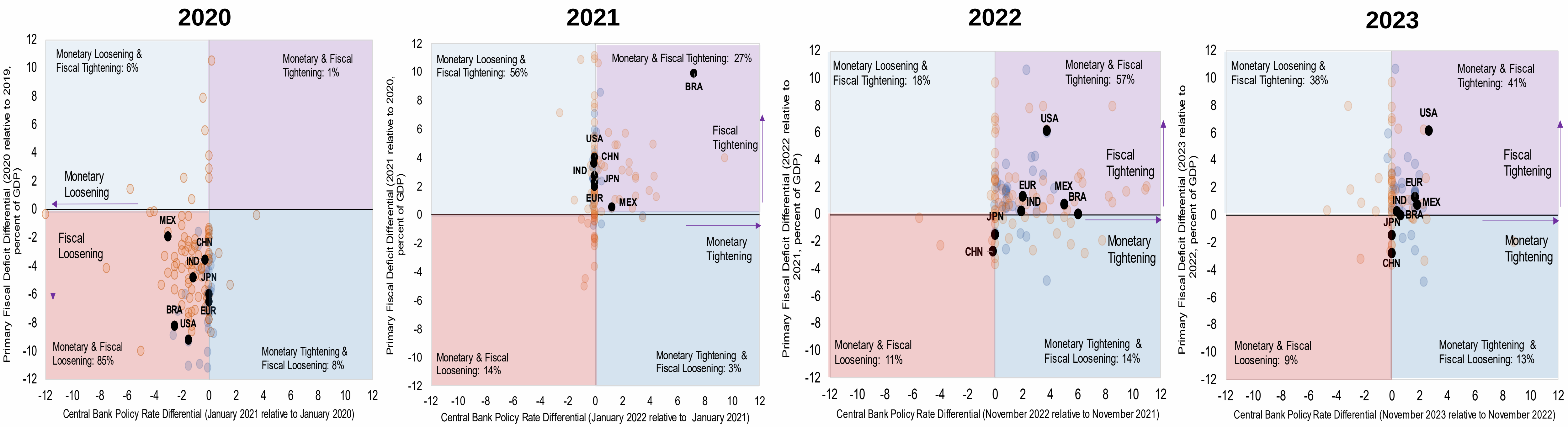


Source: Federal Reserve Economic Database (FRED); Bureau of Labor Statistics (BLS); Global Financial Database (GFD); Office of Management & Budget (OMB)/Haver Analytics; National Bureau of Economic Research (NBER) & IMF Staff Calculations based on the comparison in Hall, G. J., & Sargent, T. J. (2022). "*Three world wars: Fiscal–Monetary Consequences*".

Note: Figures represent trends in the United States. In the right figure, data are in monthly frequency. In the left chart, data is in annual frequency, with the dashed line being federal government spending for COVID in monthly frequency. Federal Net Outlays (Spending) is shown as the difference relative to federal spending at the start (point 0, which is the 12-month rolling average of federal government spending). The COVID Recession, classified based on NBER's definition of recessions, is shaded in light blue, and includes the months of February, March and April 2020. The last date for federal spending is the month of August 2022, and for inflation is the month of October 2022.

Policy Mix In Exceptional Times

Fiscal-Monetary Interactions in 2020 through 2023



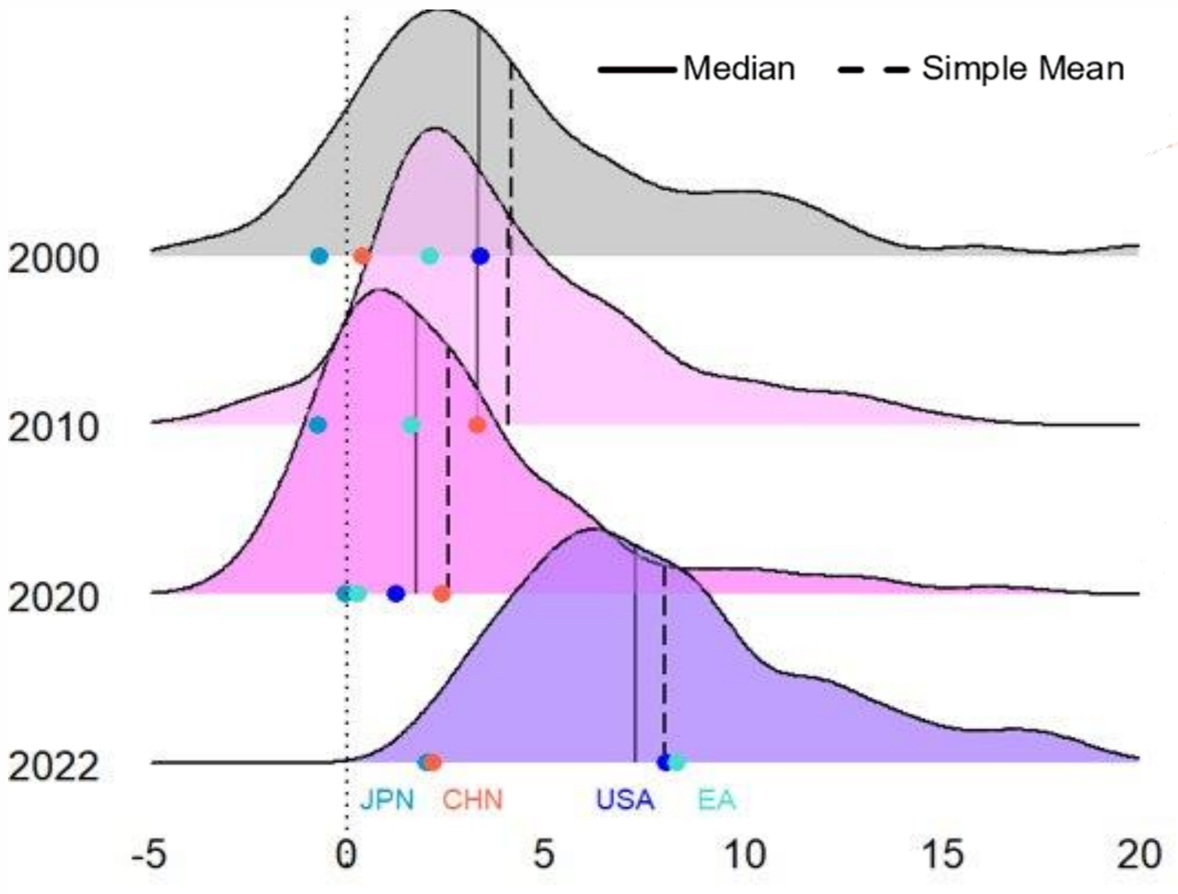
Fiscal Tightening Preceded Monetary Tightening in Most Economies

Source: IMF Fiscal Monitor (FM) & World Economic Outlook (WEO) Databases (October 2022); Consensus Economics; National Sources/ Haver Analytics & IMF Staff Calculations

Note: Countries in blue represent Advanced Economies and orange represent Emerging Market & Developing Economies (EMDEs). Aggregates are based on IMF World Economic Outlook classifications. The Euro Area is shown as a singular entity. The rightmost chart uses World Economic Outlook and Consensus Economics forecasts/expectations of interest-rate increases over 2023. Sample points with no change in policy rate (0 differential) are considered not tightening (for labeling purposes to achieve a 100% sample distribution).

Global Inflation

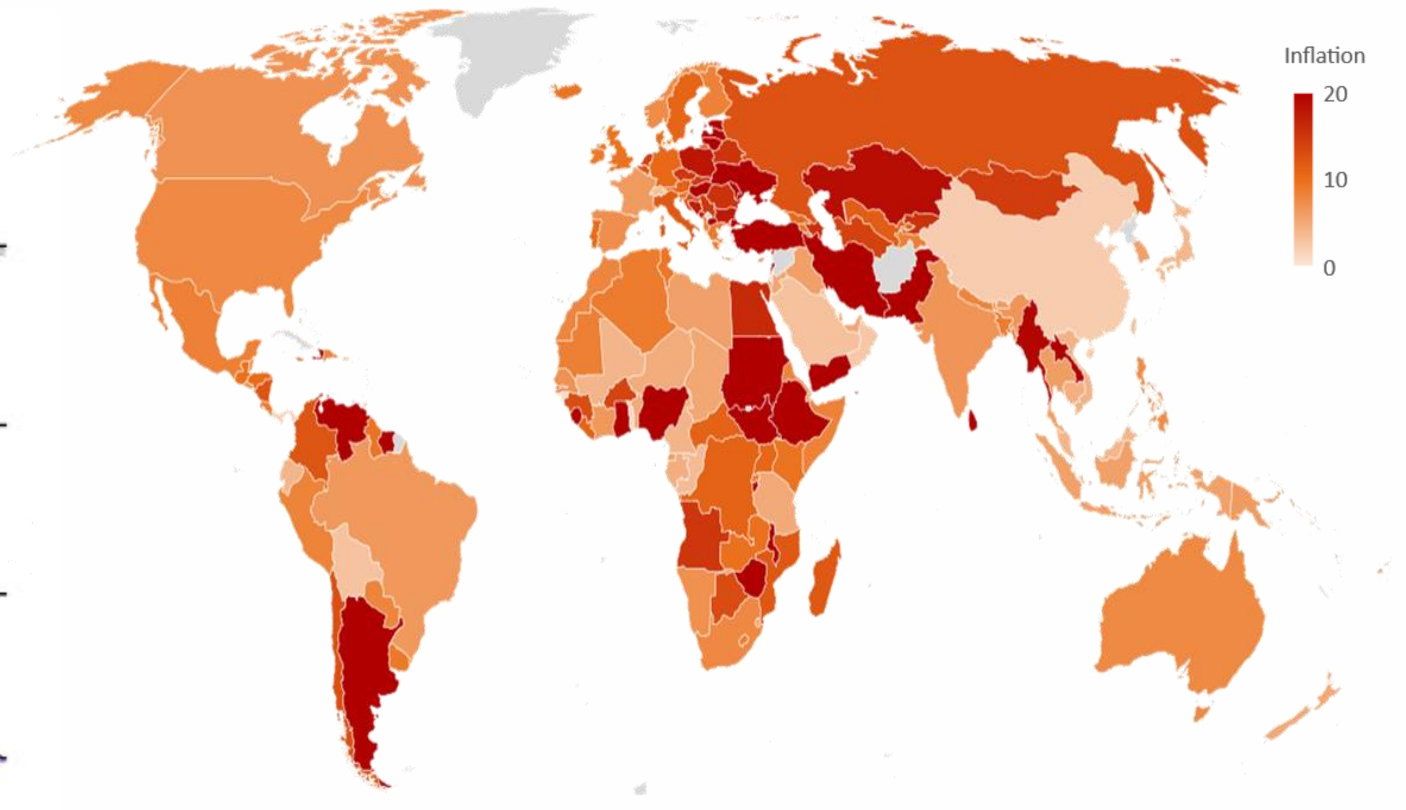
Inflation in the World: Distribution Over Time



Source: IMF World Economic Outlook (WEO) Database (October 2022) & IMF Staff Calculations

Note: The figure shows the annual average inflation over time. The 2022 value is a WEO estimate.

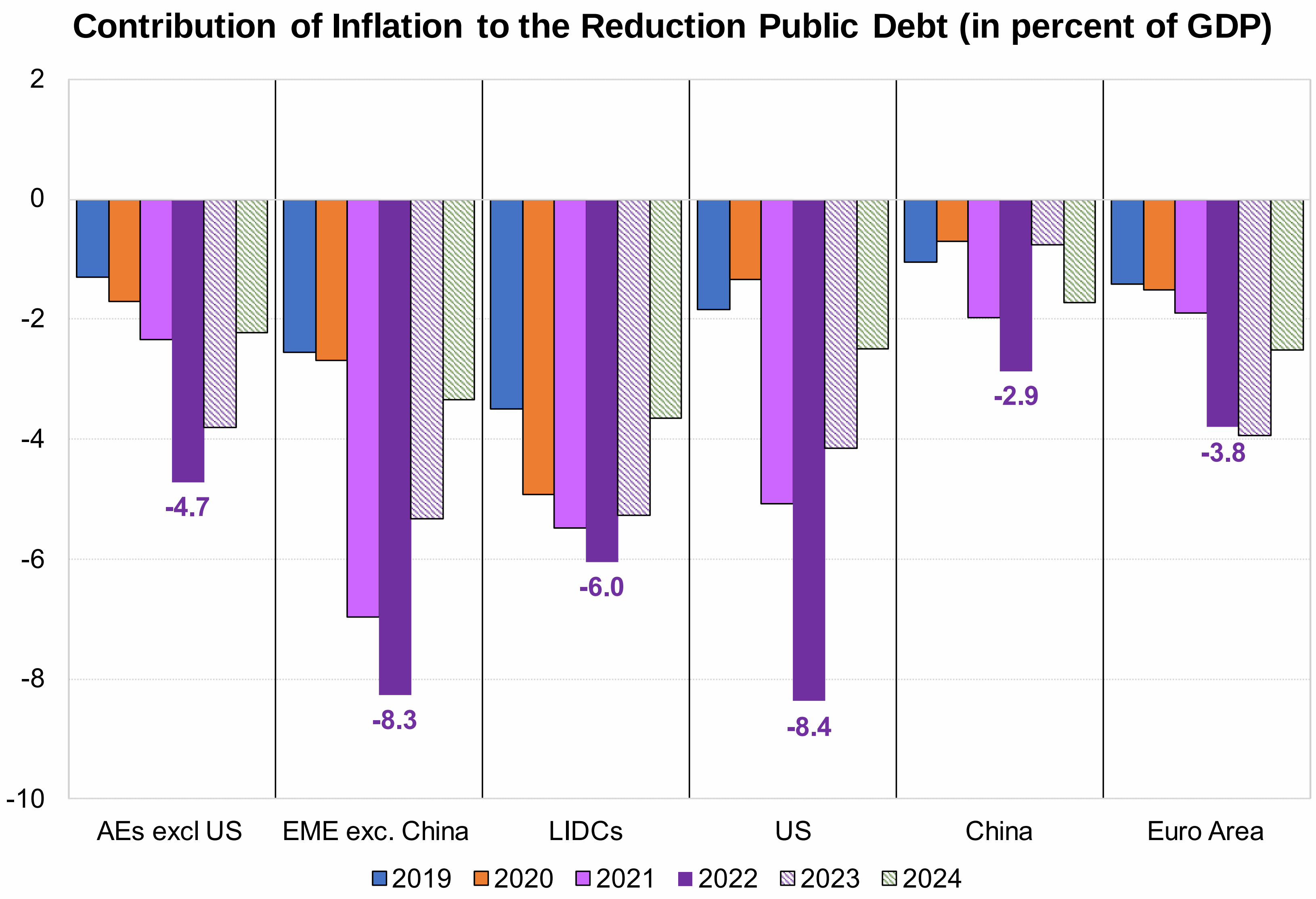
Inflation in the World



Source: National Sources/Haver Analytics; IMF World Economic Outlook (WEO) Database (October 2022) & IMF Staff Calculations

Note: The map shows the most recent annual inflation (year-on-year percent change in CPI or HICP for EU countries) for the months of October 2022 or September 2022 for countries where data for October 2022 is currently unavailable, or the projected end of year (2022) inflation estimates from the World Economic Outlook Database.

Inflation & Public Finances

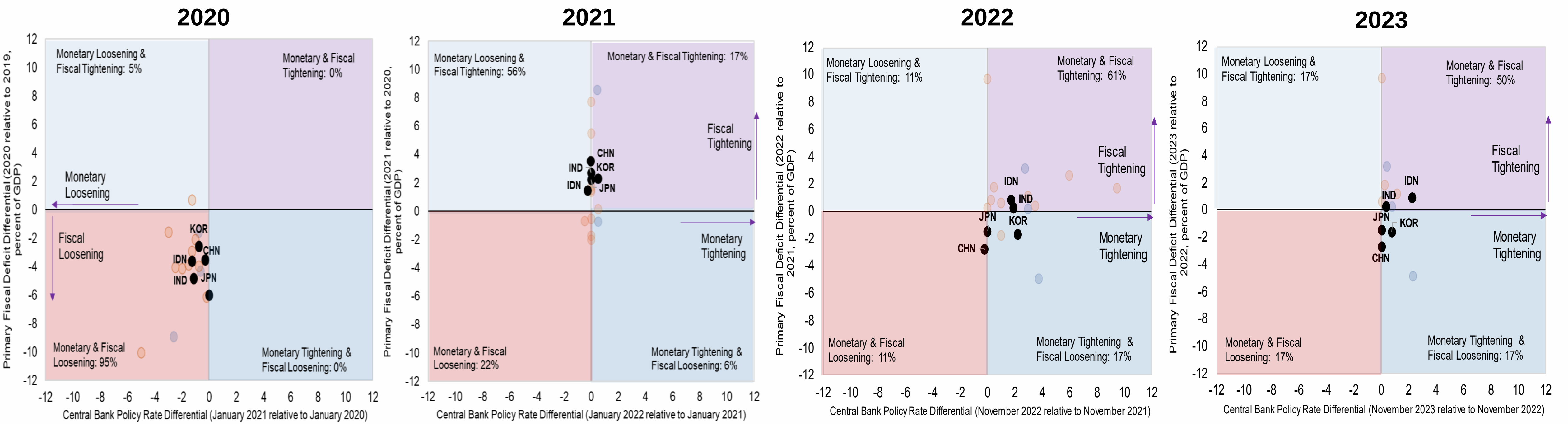


Source: IMF World Economic Outlook Database (October 2022) & IMF Staff Calculations

Note: The figure uses the change in the GDP deflator to calculate the contribution of inflation to the reduction in public debt. The 2022 value is a WEO estimate. The 2023 and 2024 values are WEO projections.

Policy Mix in Asia-Pacific

Fiscal-Monetary Interactions in 2020 through 2023



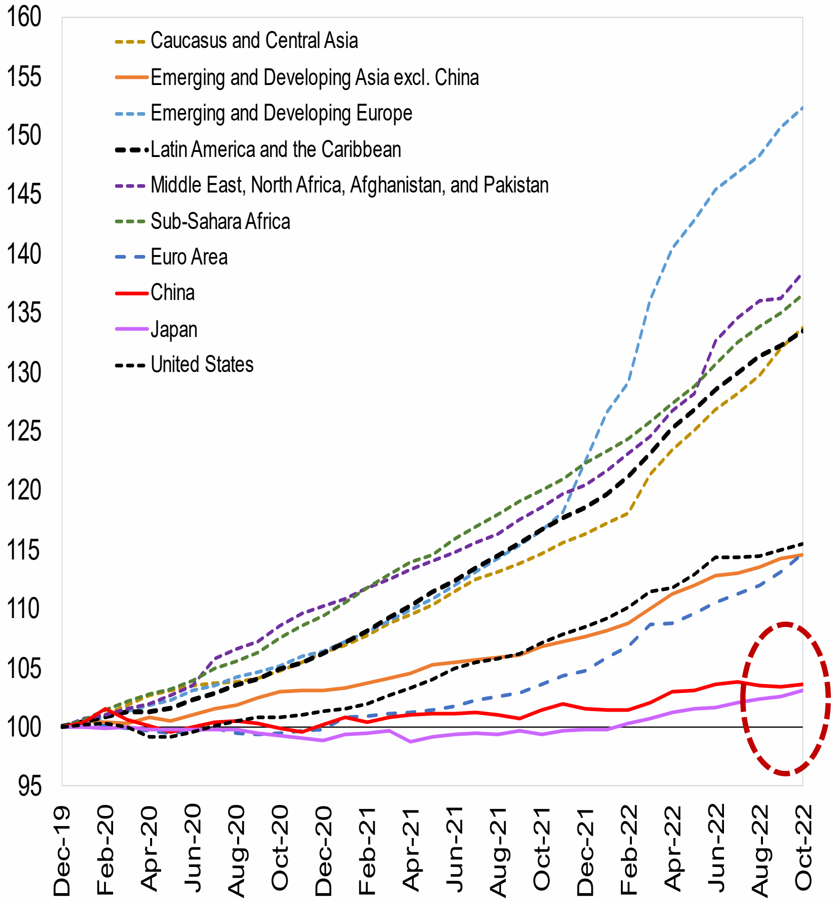
Fiscal Tightening Preceded Monetary Tightening in Most Economies

Source: IMF Fiscal Monitor (FM) & World Economic Outlook (WEO) Databases (October 2022); Consensus Economics; National Sources/ Haver Analytics & IMF Staff Calculations

Note: Countries in blue represent Advanced Economies and orange represent Emerging Market & Developing Economies (EMDEs). Aggregates are based on IMF World Economic Outlook classifications. The rightmost chart uses World Economic Outlook and Consensus Economics forecasts/expectations of interest-rate increases over 2023. Sample points with no change in policy rate (0 differential) are considered not tightening (for labeling purposes to achieve a 100% sample distribution). The figure only shows countries in the Asia-Pacific region, as defined by the IMF regional classifications.

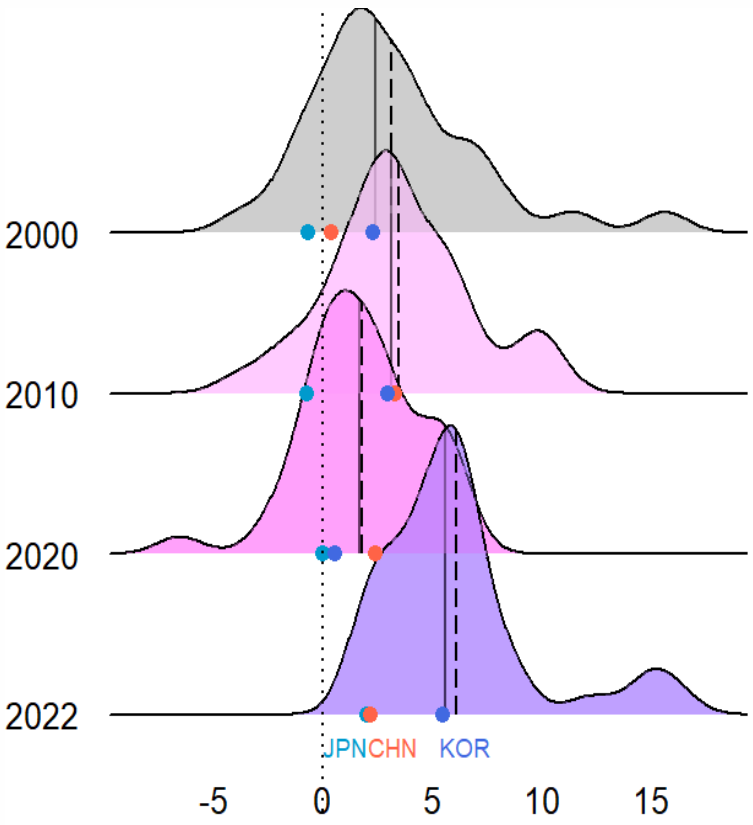
China and Japan Have (Relatively) Low Inflation

Weighted Average Price Index (Dec 2019=100, Dec 2019-Oct 2022)



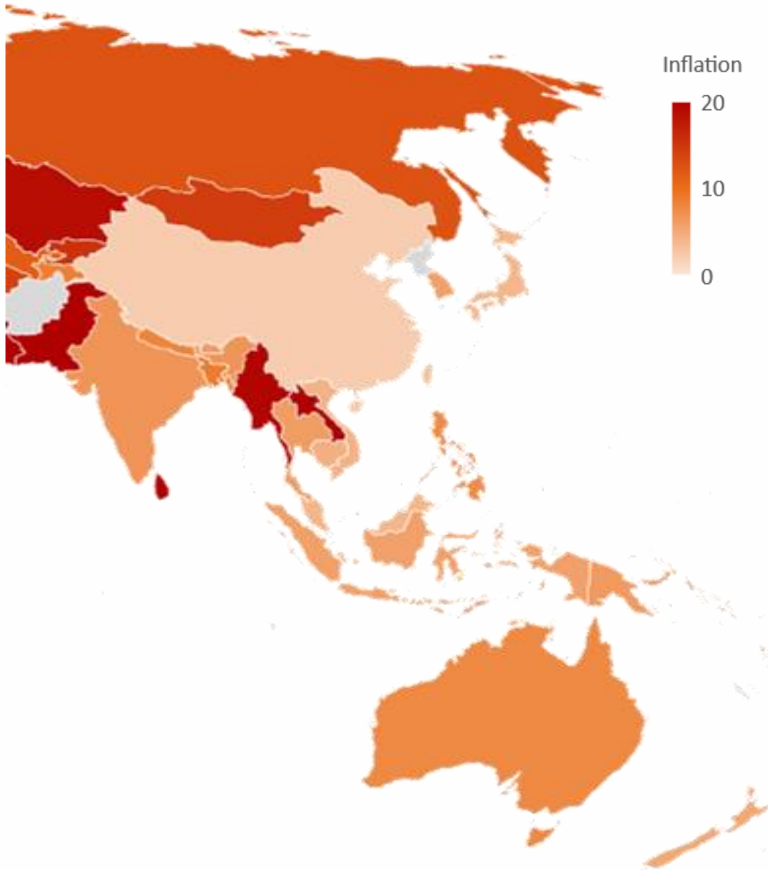
Source: National Authorities/Haver Analytics.
Note: Venezuela is excluded from calculations for LATAM.

Inflation in Asia-Pacific Economies: Distribution Over Time



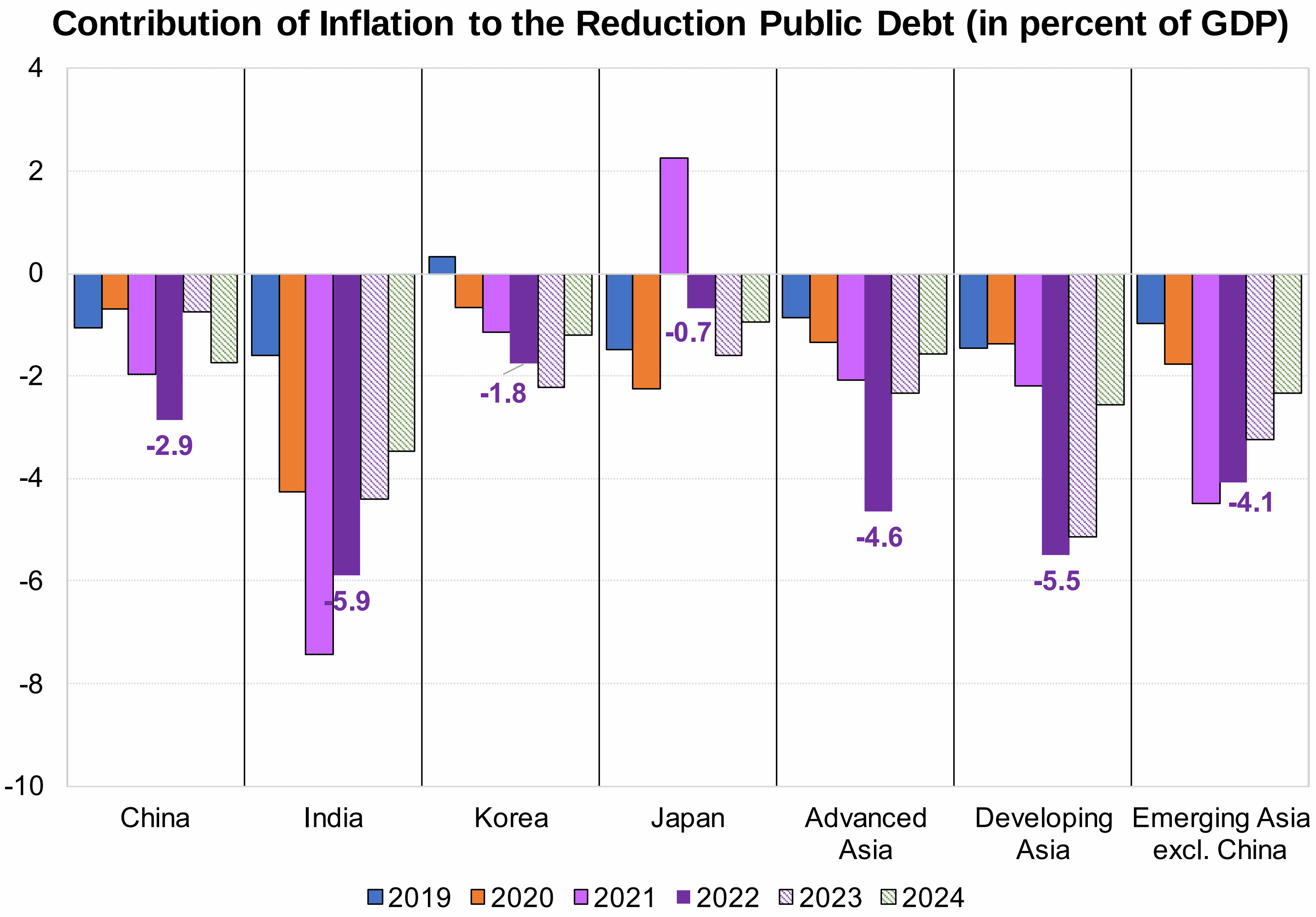
Source: IMF World Economic Outlook (WEO) Database (October 2022)
Note: The figure shows the annual average inflation over time. The 2022 value is a WEO Estimate.

Inflation Across Asia Pacific



Source: National Sources/Haver Analytics; IMF World Economic Outlook Database (October 2022) & IMF Staff Calculations
Note: The map shows the most recent annual inflation (year-on-year percent change in CPI or HICP for EU countries) for the months of October 2022, or September 2022 for countries where data for October 2022 is currently unavailable, or the projected end of year inflation estimates from the World Economic Outlook Database.

Inflation & Public Finances in Asia-Pacific

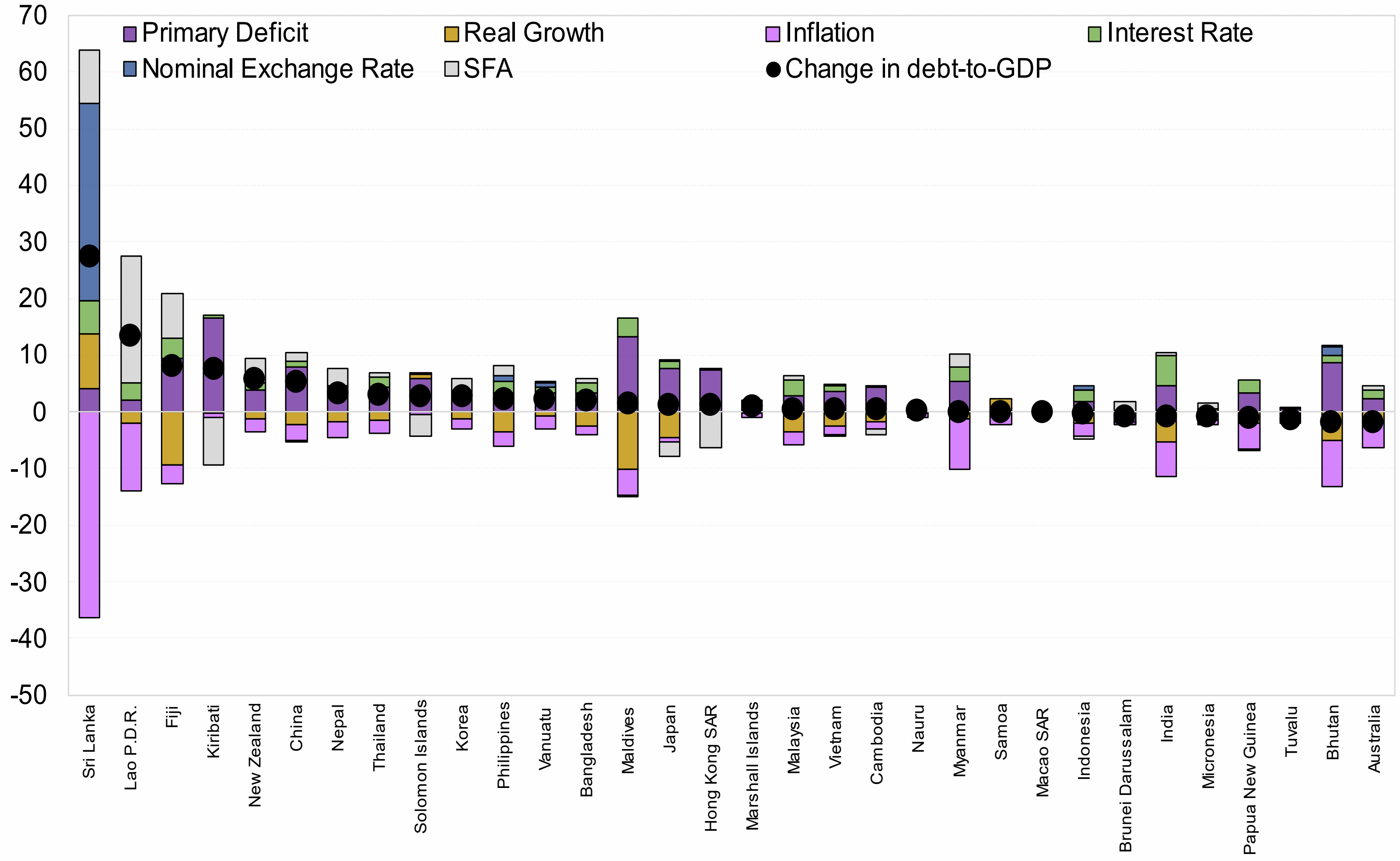


Source: IMF World Economic Outlook Database (October 2022) & IMF Staff Calculations

Note: The figure uses the change in the GDP deflator to calculate the contribution of inflation to the reduction in public debt. The 2022 value is a WEO estimate. The 2023 and 2024 values are WEO projections.

Decomposition of the Change in Public Debt-to-GDP (2021-22)

Decomposition of Public Debt Changes in The Asia-Pacific Region in 2022 (in percent of GDP)

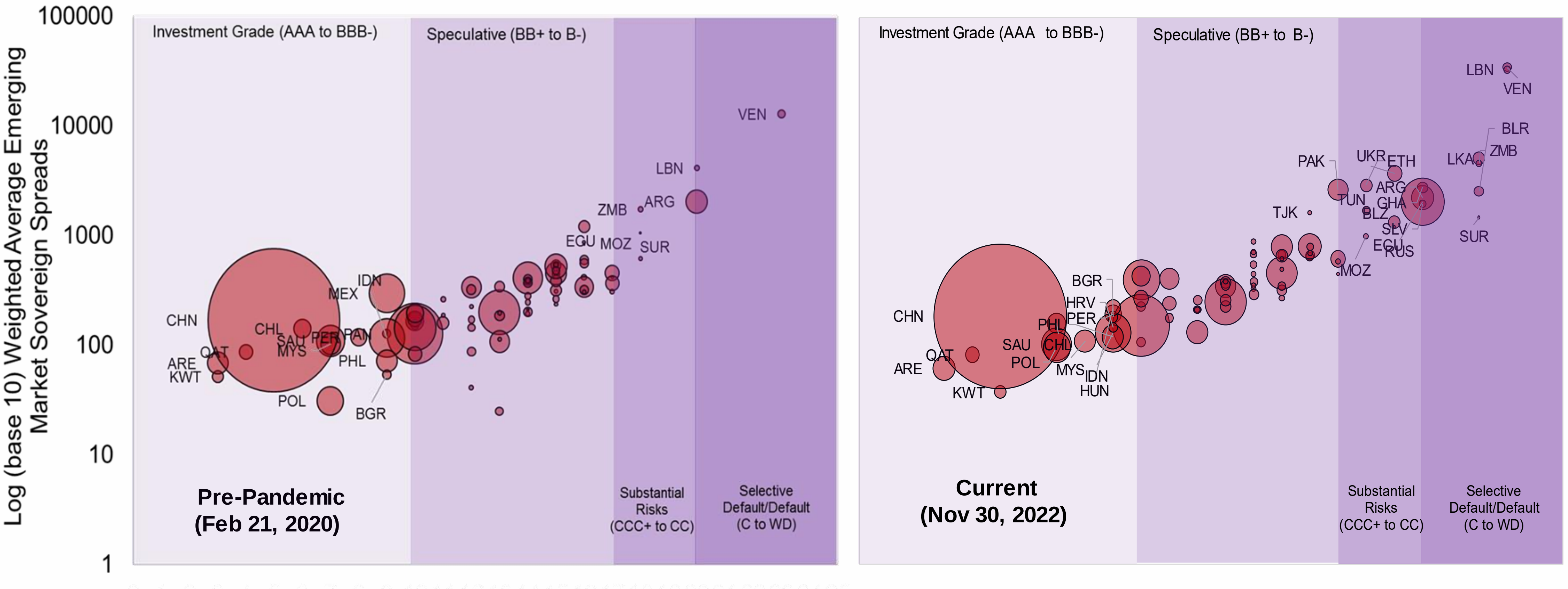


Source: IMF World Economic Outlook (WEO) Database (October 2022) & IMF Staff Calculations

Note: The figure uses estimated values for 2022 from the WEO. The black dots show the change in the debt-to-gdp ratio from 2021-2022 as estimated by WEO. Stacked bars in yellow show the contribution of growth to the change in debt, bars in green show the contribution of interest, bars in pink show the contribution of inflation (equivalent to the purple bars in slide 12), the blue stacked bars are the effect of the exchange rate differential on valuation of foreign currency denominated debt (not accounting for net issuances) while columns in grey are the residual (stock-flow adjustment).

Debt Vulnerabilities on the Rise

Comparison of Debt Vulnerabilities:
EMDEs Spreads & Ratings (Pre-Pandemic and Current)



Source: JP Morgan EMBI Sovereign Spreads, Bloomberg Finance, Moody's Ratings, S&P Sovereign Ratings, Fitch Ratings & IMF Staff Calculations

Note: The figures use the JP Morgan EMBI Sovereign Spreads and supplement with data prepared using Bloomberg using a similar criteria. Coverage for the Spreads and Ratings figures span across 63 EMEs and 16 LIDCs. The figures use the Log (base 10) scale on the vertical axis, representing weighted average sovereign spreads on Eurobonds. Bubble sizes represent the country's gross domestic product, in USD, current prices at market exchange rates. Labels are only shown for Investment Grade, Substantial Risks or Selective Default/Default categories or countries with spreads over a 1000 bp (in Distress). The credit ratings are the lowest end of month credit ratings on the previous month across all three major credit agencies (S&P, Moody's & Fitch). The Ratings classification are standardized to the Fitch Rating hierarchy nomenclature. The figures here includes 79 EMDEs of which: 17 are low-credit risk (22% of sample, 65% of the EMDEs GDP); 39 are performing (49% of sample, 16% of the EMDEs sample GDP); 6 are stressed (8% of sample, 2% of the EMDEs GDP) and 17 are distressed (22% of sample, 8% of the EMDEs sample GDP). In cumulative, 23 EMDEs (30% of sample, 11% of the EMDEs GDP) are considered stressed or distressed. The figure uses the JP Morgan EMBIG Sovereign index for classification to allow for the inclusion of India and Venezuela. Data as of November 30, 2022.