

Advance Praise for *Inflation in Emerging and Developing Economies*

Many emerging market economies experienced a remarkable decline in inflation rates over the last two decades, after years of seemingly intractable high inflation. This is **the first book-length analysis of this remarkable achievement**, asking how it happened, what it tells us about best policy frameworks, and whether it will endure. At a time when global financial conditions pose a challenge to emerging-market currencies and monetary policies, this book is an essential guide to the road ahead. **All students of the global economy will want to read it carefully.**

Maurice Obstfeld, Economic Counsellor and Director of Research, International Monetary Fund

A remarkable resource for anyone interested in inflation in the modern world, clear and easy to follow. This book is an order of magnitude more comprehensive than anything else out there, not only in its country coverage, but in its exploration of all the major issues and debates surrounding inflation. Curiously, most of the existing academic literature has focused on advanced economies—which are also thoroughly covered here—yet there is so much to be learned from the dramatic inflation decline in emerging markets and low-income economies, including for design of advanced economy institutions. Any student, academic researcher or policy economist who wants to understand the big picture on world inflation, and when and where it might surprise in the future, will find this book fascinating.

Kenneth Rogoff, Thomas D. Cabot Professor of Public Policy and Professor of Economics, Harvard University

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Inflation in Emerging and Developing Economies: *Evolution, Drivers, and Policies*

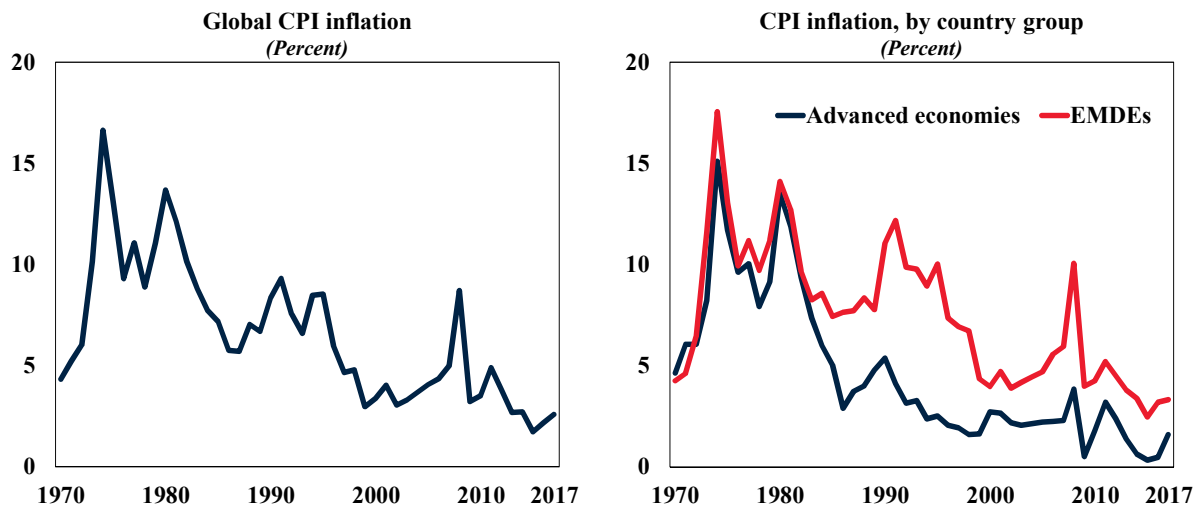
Jongrim Ha, M. Ayhan Kose, and Franziska Ohnsorge

www.worldbank.org/inflation



Evolution of Inflation - 1

Synchronized Decline across Country Groups



Source: World Bank.
 3 Left Panel. Median headline CPI (consumer price index) inflation of 152 countries. Right Panel. Median headline CPI inflation, based on 29 advanced economies and 123 EMDEs.

Why this book?

- 1 **Debate on inflation.** Explores whether global inflation could make a comeback after a prolonged period of low inflation.
- 2 **Inflation in EMDEs.** Presents the first comprehensive analysis of the evolution and drivers of inflation in EMDEs whereas previous literature mostly focuses on advanced economies.
- 3 **Cutting-edge methods.** Examines EMDE inflation using cutting-edge empirical methods that have thus far mostly been employed in studies of inflation in advanced economies.
- 4 **Database of global inflation.** Introduces a truly global database of up to 175 economies (34 advanced economies, 141 EMDEs) for 1970-2018 for multiple measures of inflation and many country characteristics.

4 * EMDEs = Emerging Market and Developing Economies

Global Database of Inflation and Country Characteristics

1 Large number of countries and long time-series starting in 1970. *A truly global database of up to 175 economies (34 advanced economies, 141 EMDEs) for 1970-2018.*

2 Multiple measures of inflation from a wide range of sources. *Six measures of inflation: four CPI measures (headline, core, food, and energy), PPI, and GDP deflator.*

3 Comprehensive database of country characteristics. *Global database of over 40 variables on macroeconomy, monetary policy and exchange rate regimes, and global integration between 1970-2018.*

All charts (with underlying series) already posted on the web; Database coming soon...

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What is in the book?

Introduction

PART A. Inflation: Global and Domestic Drivers

1. Inflation: Concepts, Evolution, and Correlates
2. Understanding Global Inflation Synchronization
3. Sources of Inflation: Global and Domestic Drivers

PART B. Inflation: Expectations and Pass-Through

4. Inflation Expectations: Review and Evidence
5. Inflation and Exchange Rate Pass-Through

PART C. Inflation: Low-Income Country Considerations

6. Inflation in Low-Income Countries
7. Poverty Impact of Food Price Shocks and Policies

A Cross-Country Database of Inflation and Country Characteristics

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Four Questions

- 1 **How has inflation evolved in EMDEs?** *Declined over time thanks to the sharp fall in global inflation, supported by cyclical and structural developments. If momentum for these developments wanes, maintaining low inflation may become as difficult as achieving it.*
- 2 **What have been the global and domestic drivers of inflation?** *A wide range of shocks... A global inflation cycle has emerged and inflation synchronization has strengthened among EMDEs over time. Global shocks have become more important over time but domestic shocks remain the main source of national inflation variation.*
- 3 **How well-anchored are EMDE inflation expectations?** *Despite becoming better-anchored since the 1990s, inflation expectations remain less well anchored in EMDEs than advanced economies. Stronger monetary frameworks and central bank independence are associated with better anchoring of expectations and lower exchange rate pass-through.*
- 4 **What are the main policy implications?** *Strong monetary policy frameworks, more central bank independence, robust exchange rate regimes and resilient fiscal policy frameworks are all necessary to achieve and maintain low and stable inflation.*

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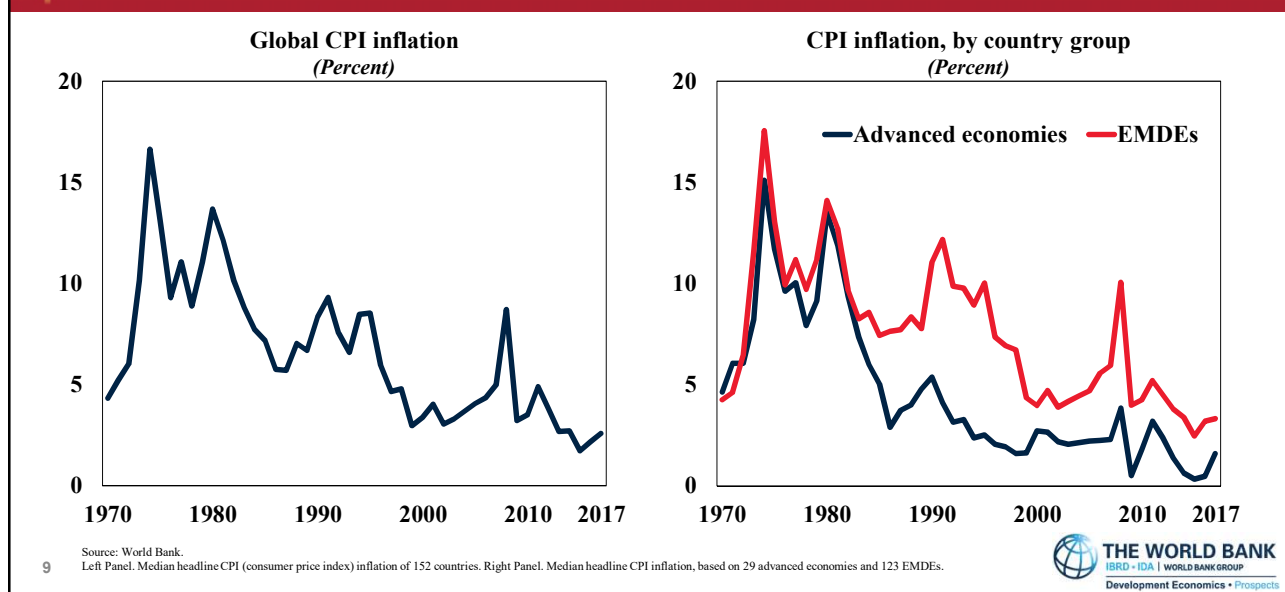
Four Questions

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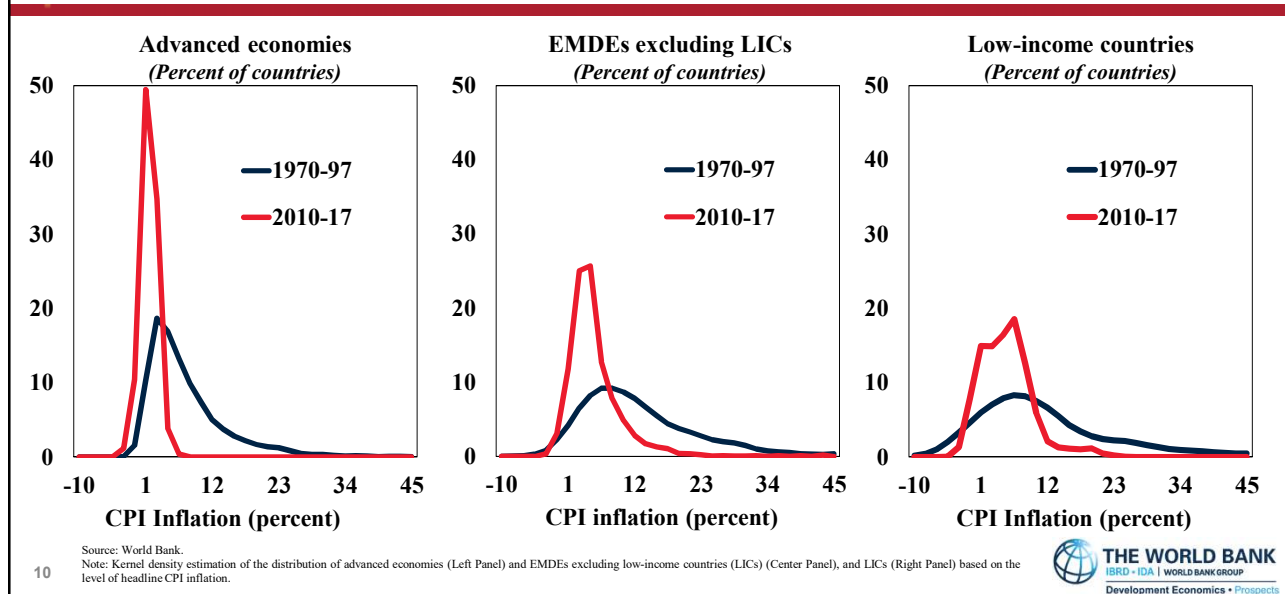
Evolution of Inflation - 1

Synchronized Decline across Country Groups



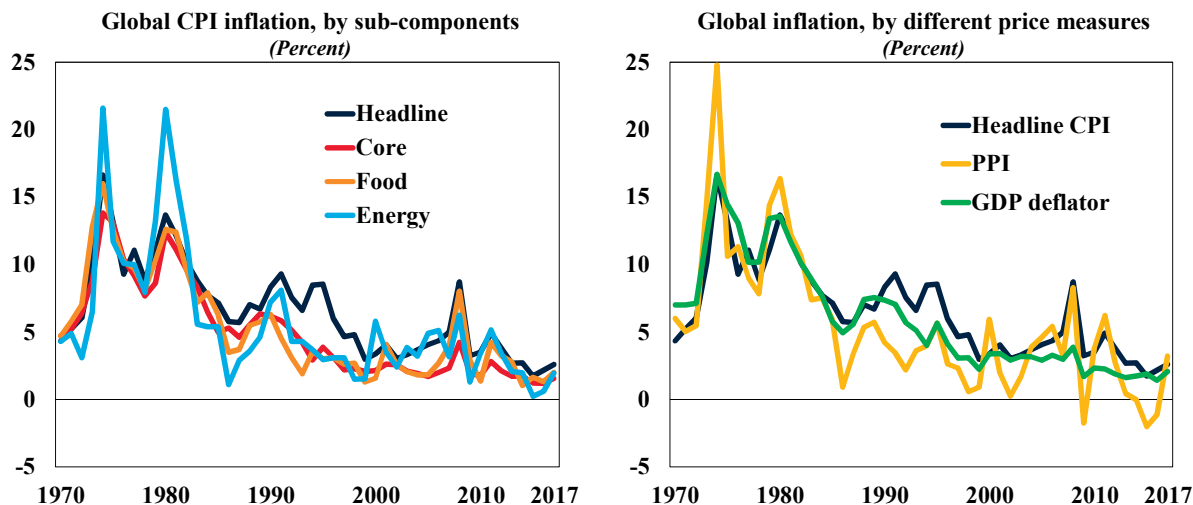
Evolution of Inflation - 2

Broad-Based Decline within Country Groups



Evolution of Inflation - 3

Broad-Based Decline across Different Measures



Source: World Bank.

Note: Headline CPI (consumer price index) inflation is median of 152 countries. Left Panel. Core, food, and energy inflation is median of 47 countries. Right Panel. Inflation measured by PPI (producer price index) and GDP deflator is median of 39 countries, where data on PPI are consistently available over 1970-2017.

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Factors Associated with Disinflation during 1970-2017

1 Globalization

- Greater trade and global value chain integration can improve competition and productivity growth.
- Greater financial integration can increase central banks' anti-inflation bias.

2 Better policy frameworks

- Move to credible monetary policy frameworks and exchange rate regimes can help anchor inflation expectations.
- Greater central bank independence and transparency can improve anchoring of inflation expectations.
- Better fiscal frameworks can bolster credibility of monetary policy.

3 Other structural factors

- More flexible product and labor markets can increase competition and reduce wage rigidities.
- Population aging can dampen domestic demand growth.
- Digitalization can promote competition and productivity growth.

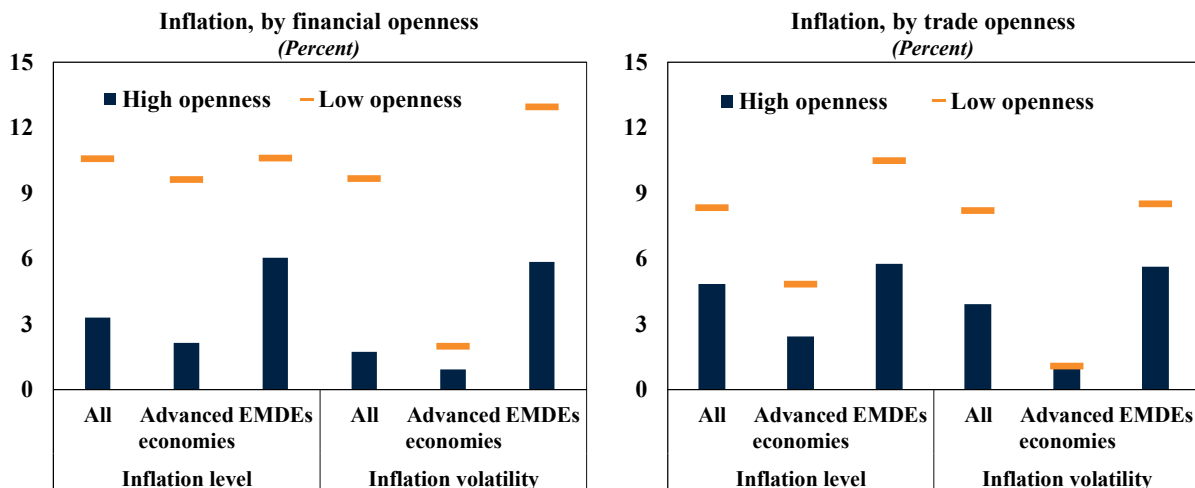
4 Multiple disinflationary shocks over past decade

- Global financial crisis; Euro Area debt crisis
- 2014-16 oil price plunge

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Factors Supporting Disinflation - 1

Globalization of Finance and Trade



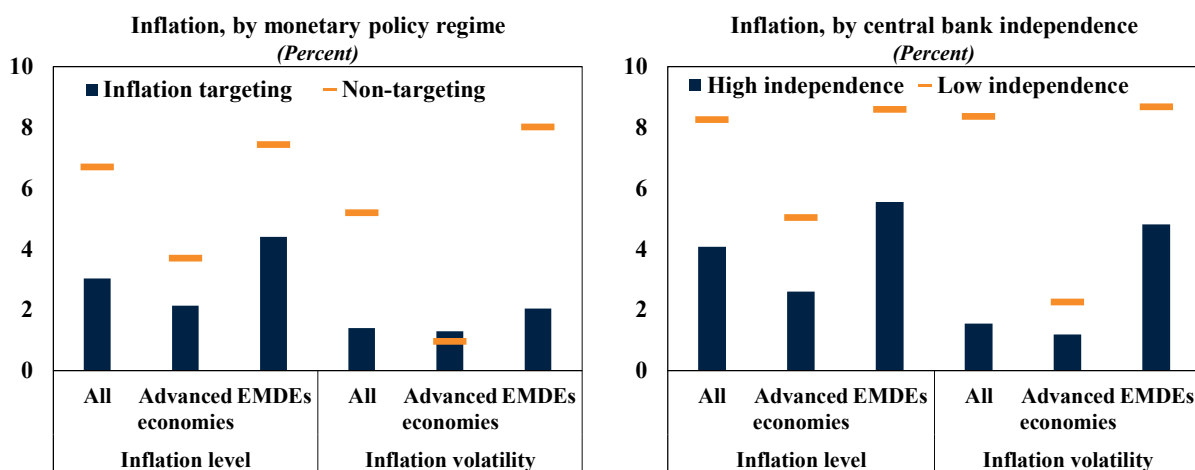
Sources: International Monetary Fund; Lane and Milesi-Ferretti (2007); World Bank.
 Note: Blue bars indicate median inflation levels or inflation volatility (defined as standard deviation of inflation) in countries with financial openness (Left Panel) and trade openness (Right Panel) in the top quartile. Orange tickers indicate median inflation levels or inflation volatility in countries in the bottom quartile. Left Panel. Financial openness is measured as the sum of foreign assets and liabilities, as a share of GDP. Right Panel. Trade openness is measured as the sum of exports and imports as a percent of GDP.



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Factors Supporting Disinflation - 2

Resilient Monetary Policy Frameworks; Central Bank Independence



Sources: Caceres, Carrière-Swallow, and Gruss (2016); Dincer and Eichengreen (2014); World Bank.
 Left Panel. Blue bars show median inflation levels or inflation volatility in countries with inflation targeting monetary policy regimes during 1970-2017. Orange tickers indicate median inflation levels or inflation volatility in countries without inflation-targeting monetary policy regimes during the same period. Inflation targeting regimes are defined as in Caceres, Carrière-Swallow, and Gruss (2016) and the IMF Annual Report on Exchange Arrangements and Exchange Restrictions. Right Panel. Blue bars show median inflation levels or inflation volatility in countries with a score of the index of central bank independence in the top quartile of the sample. Orange tickers indicate median inflation levels or inflation volatility in countries in the bottom quartile. Central bank independence is measured by the index of central bank independence and transparency, taken from Dincer and Eichengreen (2014). The index ranges from 0 (least independent and transparent) to 15 (most independent and transparent).



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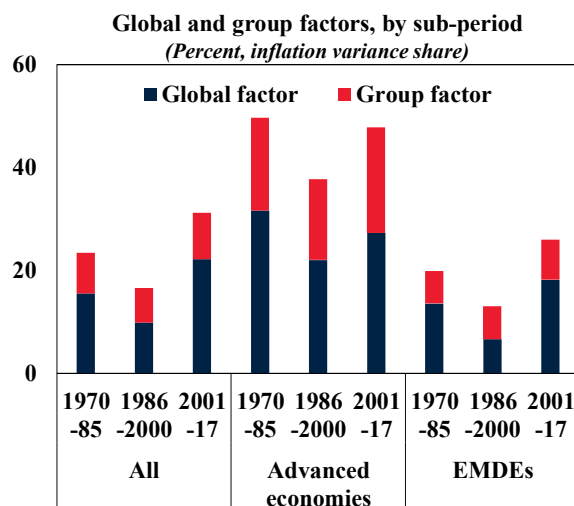
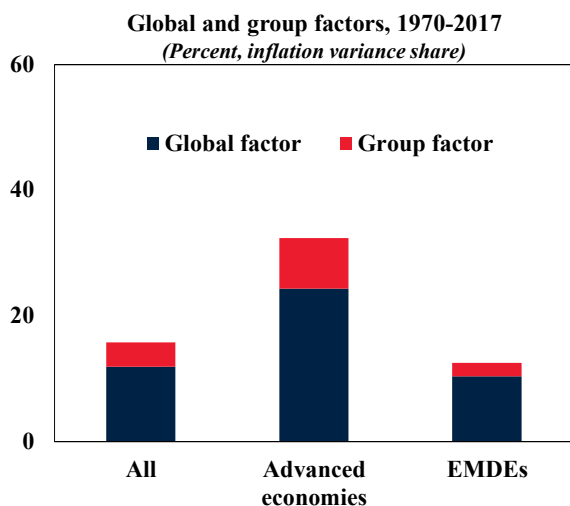
Four Questions

2 **What have been the global and domestic drivers of inflation?** *A wide range of shocks... A global inflation cycle has emerged and inflation synchronization has strengthened among EMDEs over time. Global shocks have become more important over time but domestic shocks remain the main source of national inflation variation.*

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Inflation Synchronization Over Time

Global Factor Explains a Growing Share of Inflation Variation

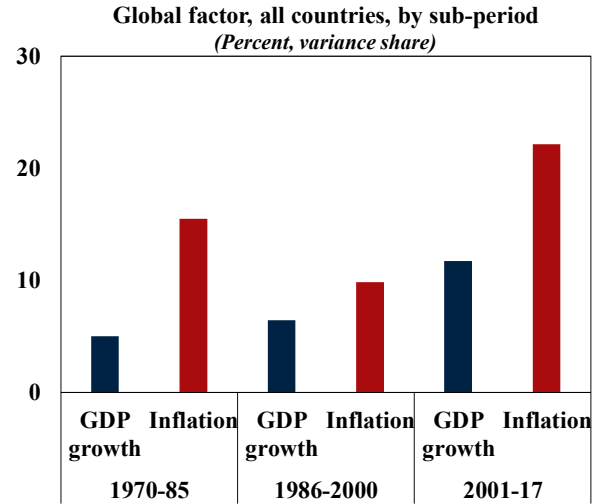
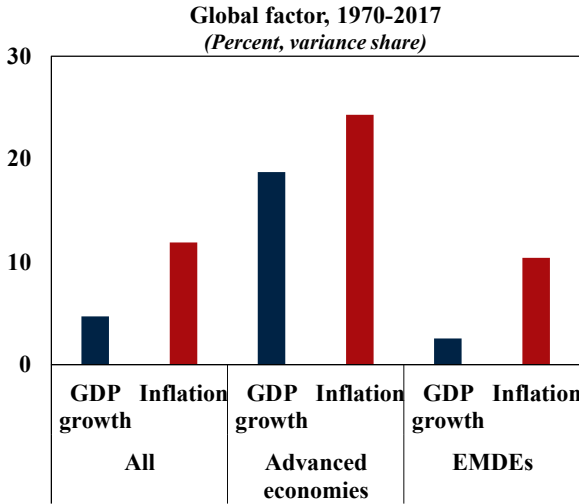


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Source: World Bank.
Note: Contributions of global and group factors to inflation variance, estimated with the baseline dynamic factor model (2-factor model with a global factor and a group factor) for the period of 1970-2017 (Left Panel) and for three sub-periods (Right Panel). Median estimates across 99 countries (25 advanced economies and 74 EMDEs including 16 low-income countries).

Inflation versus Output Synchronization

Higher Synchronization in Inflation than Output



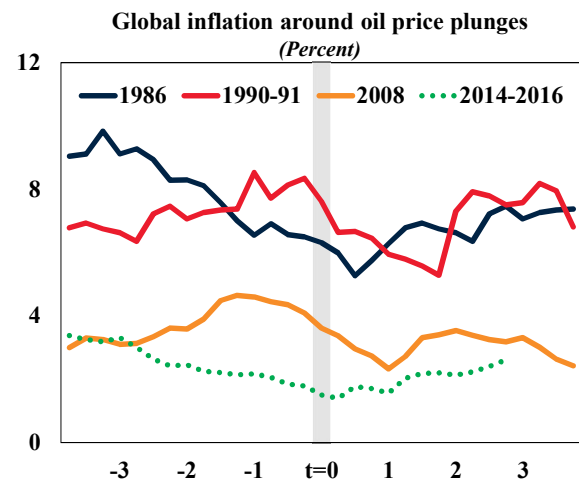
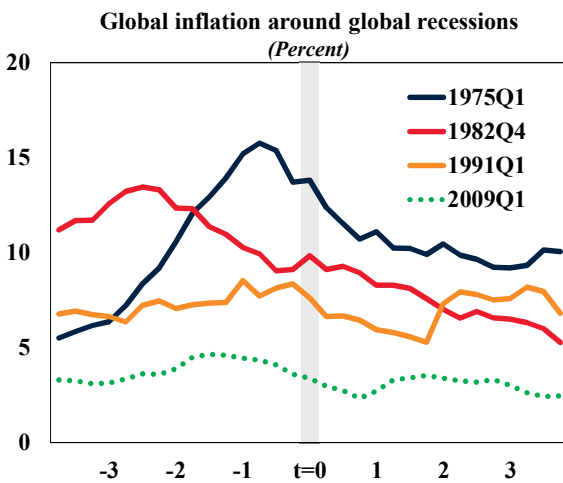
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Source: World Bank.
Note: Contribution of global factor to variance of real GDP growth and to inflation, estimated with a 2-factor dynamic factor model. Median estimates across 99 economies (25 advanced economies and 74 EMDEs, including 16 low-income countries).



Global Inflation and Global Events

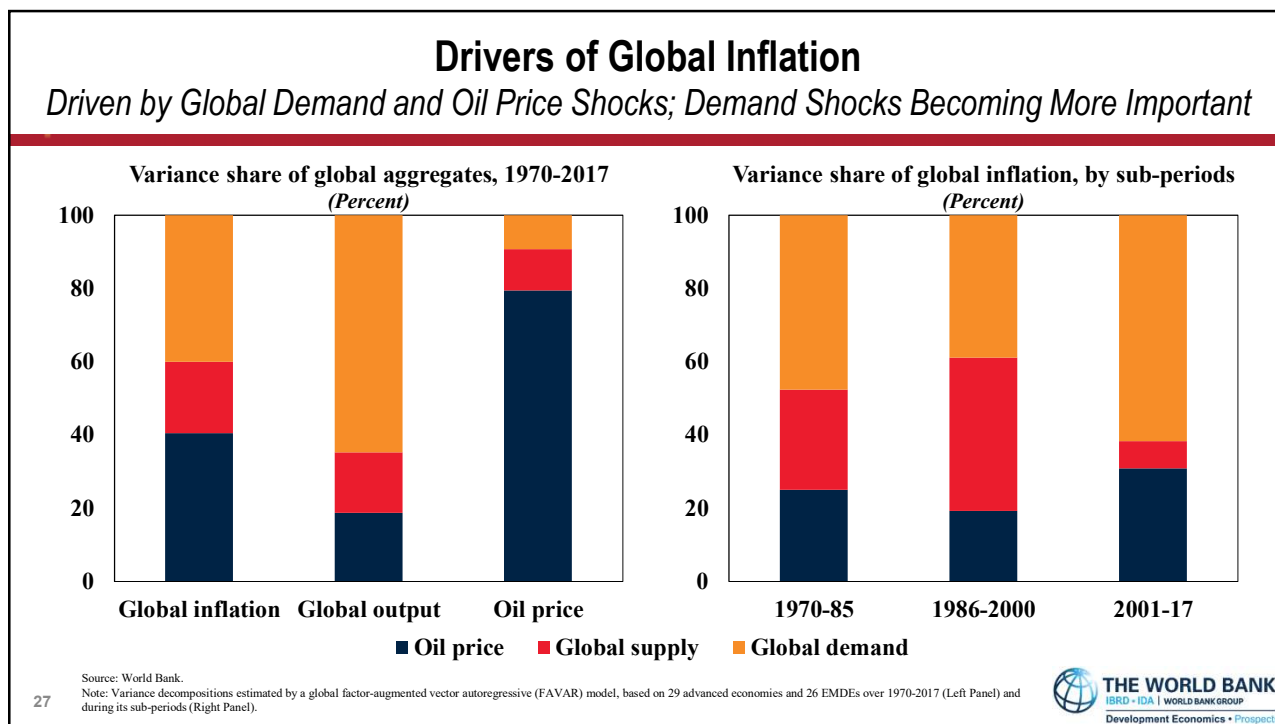
Substantial Inflation Movements around Global Events



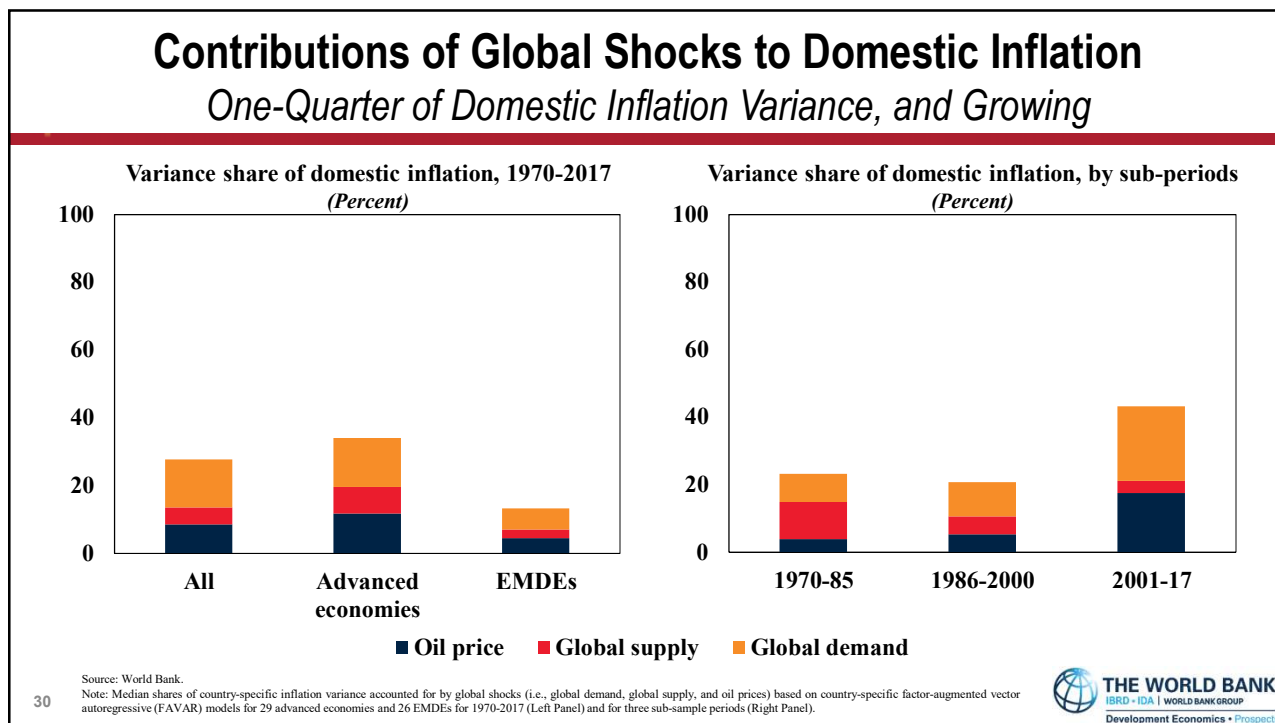
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Sources: Baffes et al. (2015); Haver Analytics; World Bank.
Note: Horizontal axis indicates years before and after the troughs of global recessions (Left Panel) or local troughs of short-term oil price cycle (Right Panel), represented as $t=0$. Global inflation is defined as median trend inflation (9-quarter moving average) across 65 countries, consisting of 25 advanced economies and 40 EMDEs. Left Panel. Troughs of global recessions are identified using global per capita GDP and the algorithm in Harding and Pagan (2002) and are consistent with the results in Kose and Terrones (2015). Right Panel. As Baffes et al. (2015) identify six oil price plunges of more than 30 percent (1986, 1990-91, 1997-98, 2001, 2008-09, and 2014-16), the figure shows the four episodes with the largest oil price plunges. Time t refers to: 1986Q1, 1991Q1, 2008Q4, and 2014Q4.





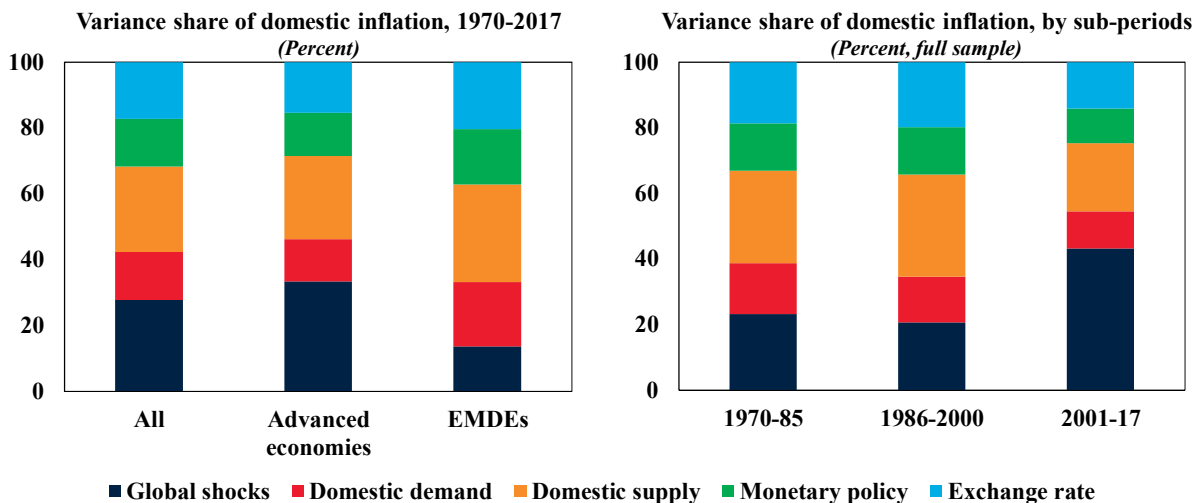
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Contributions of Domestic Shocks to Domestic Inflation

Domestic Shocks Contribute Substantially but Becoming Less Important



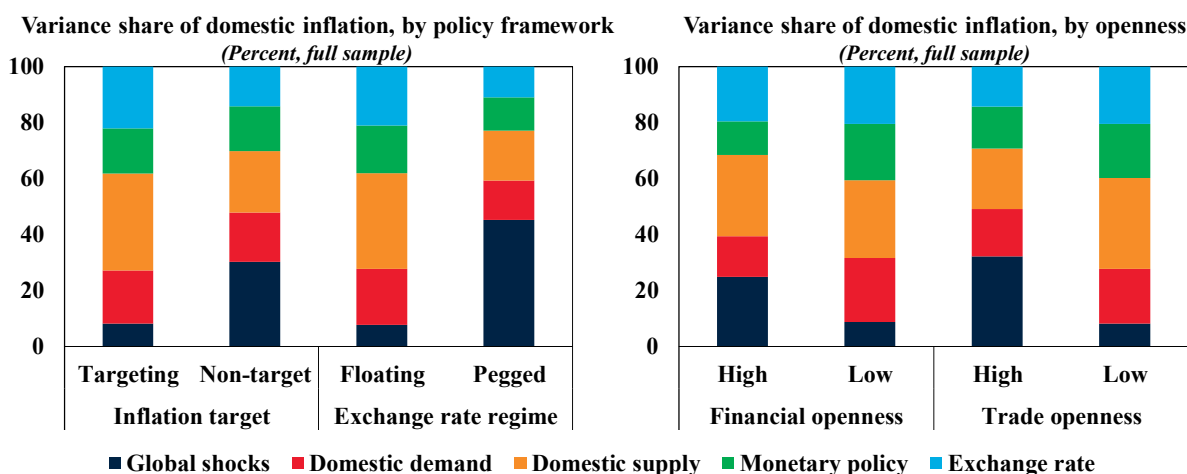
Source: World Bank.
 Note: Median shares of country-specific inflation variance accounted for by global shocks and domestic shocks (i.e., domestic demand, domestic supply, monetary policy (interest rates), and exchange rates) based on country-specific factor-augmented vector autoregressive (FAVAR) models. The models are estimated for 29 advanced economies and 26 EMDEs for 1970-2017 (Left Panel) and for three sub-sample periods (Right Panel).


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Contributions of Global and Domestic Shocks

Domestic Shocks More Important in Less Open Economies



Sources: Chinn and Ito (2006); Ilzetzki, Reinhart, and Rogoff (2017); IMF (2016); World Bank.
 Note: Median shares of country-specific inflation variance accounted for by global shocks and domestic shocks (i.e., domestic demand, domestic supply, monetary policy (interest rates), and exchange rates) based on country-specific factor-augmented vector autoregressive (FAVAR) models, estimated for 29 advanced economies and 26 EMDEs for 1970-2017. Left Panel. Inflation targeting regimes are defined as in IMF (2016). Flexible exchange rate regimes ("Floating") are defined as freely floating and managed floating exchange rate regimes (Ilzetzki, Reinhart, and Rogoff 2017), and all other regimes are defined as pegged exchange rate regimes. Right Panel. Countries with "high" and "low" financial openness are, respectively, those above and below median of the capital account openness index in Chinn and Ito (2006). Countries with "high" and "low" trade openness are defined as those with trade-to-GDP ratios above and below median, respectively.


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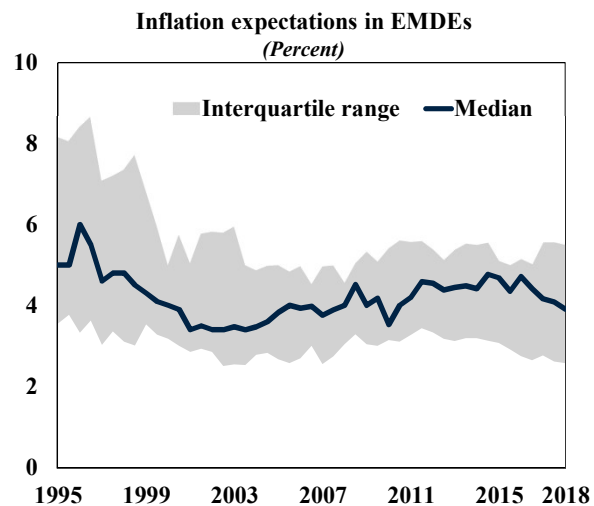
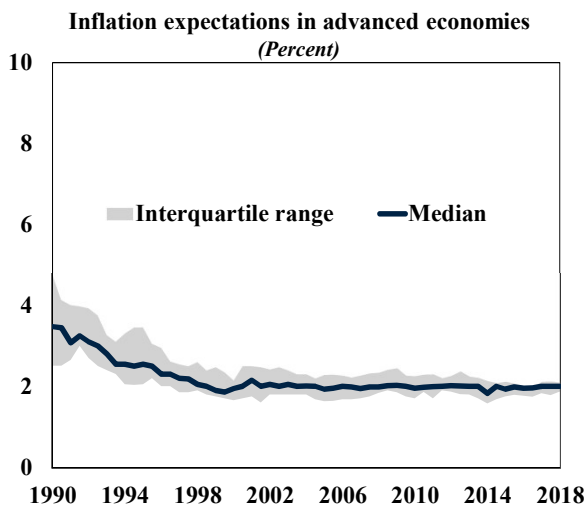
Four Questions

3 **How well-anchored are EMDE inflation expectations?** *Despite becoming better-anchored since the 1990s, inflation expectations remain less well anchored in EMDEs than advanced economies. Stronger monetary frameworks and central bank independence are associated with better anchoring of expectations and lower exchange rate pass-through.*

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Inflation Expectations

Broad-Based Decline, but Remain Higher in EMDEs

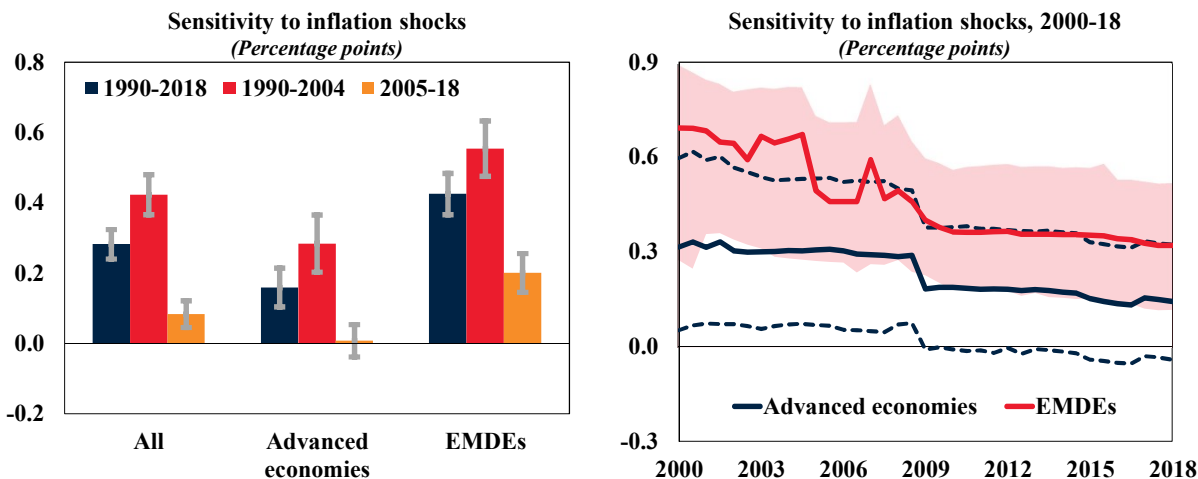


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Sources: Consensus Economics, International Monetary Fund, World Bank.
Note: Inflation expectations refer to 5-year-ahead expectations of annual inflation and measured at a bi-annual frequency. Interquartile range of the country sample. Sample includes 24 advanced economies (over 1990H1-2018H1) and 23 EMDEs (over 1995H1-2018H1).

Anchoring Inflation Expectations in EMDEs - 1

Better Anchored Now; Still Not as Well as in Advanced Economies



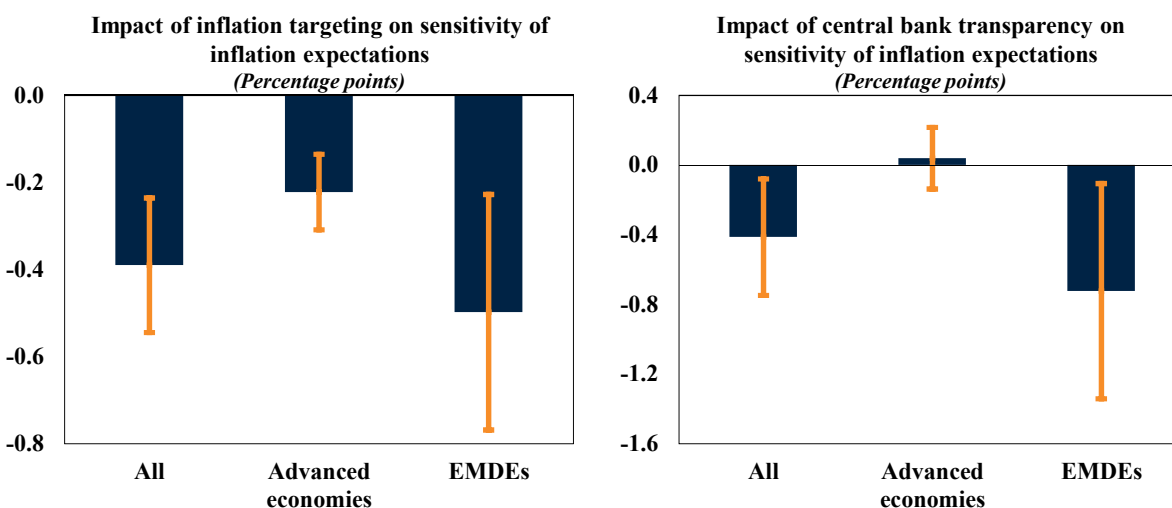
Sources: Consensus Economics, International Monetary Fund, World Bank.
 Note: Inflation shocks are defined as the difference between realized inflation and short-term inflation expectations in the previous period. Left Panel. Sensitivity is estimated using a panel regression of changes in 5-year-ahead inflation expectations on inflation shocks. Bars denote median estimates and vertical lines denote 90 percent confidence intervals. Based on 24 advanced economies and 23 EMDEs for 1990H2-2018H1. Right Panel. Time-varying sensitivity is estimated by regressing changes in 5-year-ahead inflation expectations on inflation shocks. Solid lines denote median estimates and areas between two dotted blue lines and shaded in pink indicate, respectively, medians of 68 percent confidence intervals for advanced economies and EMDEs. Sample includes 24 advanced economies (over 1995H1-2018H1) and 23 EMDEs (over 2000H1-2018H1).



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Determinants of Anchoring Inflation Expectations

Lower Sensitivity with Inflation-Targeting Regime and Higher Central Bank Transparency



Sources: Consensus Economics; Dincer and Eichengreen (2014); International Monetary Fund, World Bank.
 Note: Bars represent coefficients in panel regressions of 47 countries (including 24 advanced economies and 23 EMDEs), based on annual data over 1995-2016. Vertical lines denote 90 percent confidence intervals. Left Panel. Inflation targeting is a dummy variable taking a value of one in countries with an inflation-targeting framework. Right Panel. Central bank transparency is measured by the index of central bank independence and transparency in Dincer and Eichengreen (2014), which ranges from 0 (least independent and transparent) to 15 (most independent and transparent).



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Four Questions

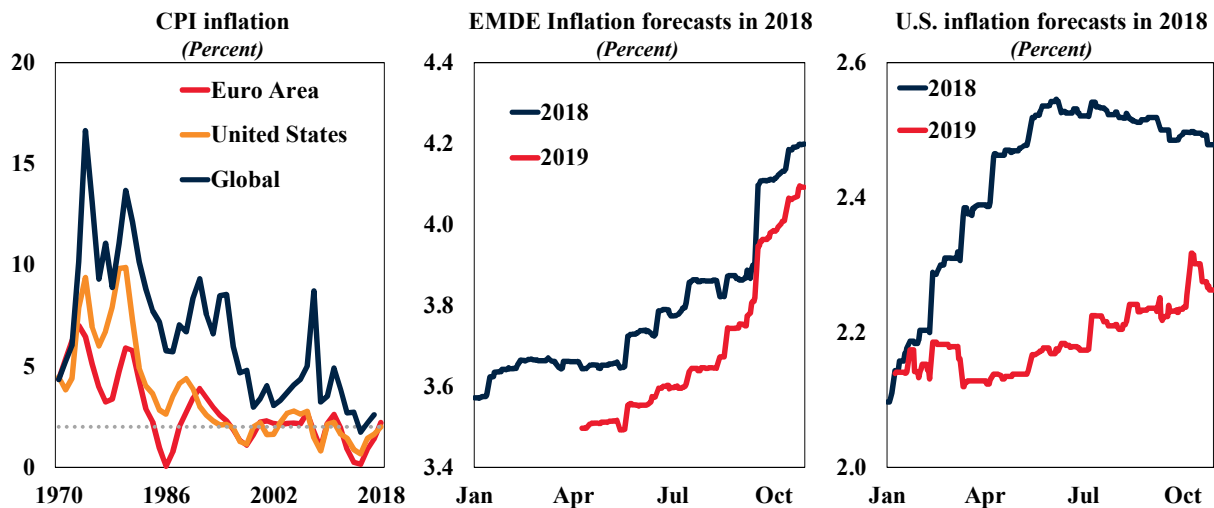
4 **What are the main policy implications?** Strong monetary policy frameworks, more central bank independence, robust exchange rate regimes and resilient fiscal policy frameworks are all necessary to achieve and maintain low and stable inflation.

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Low Inflation in EMDEs: Miracle or Mirage? - 1

Rising Advanced-Economy Inflation amid Trade Tensions



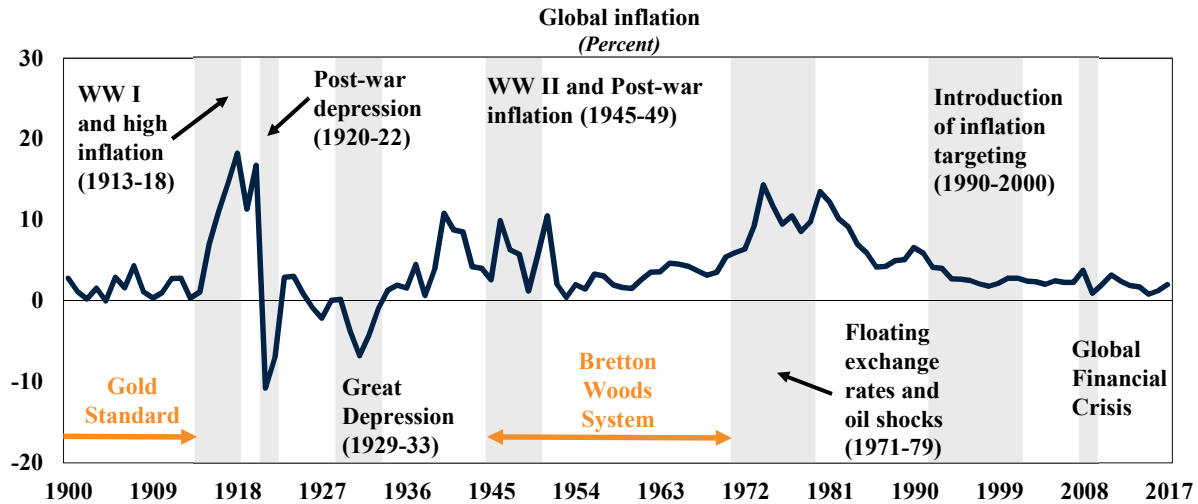
Sources: Consensus Economics, Haver Analytics, World Bank.
 Left Panel. Global inflation defined as median of 152 countries. Dotted grey line indicates 2 percent. Center and Right Panels. Consensus forecasts of inflation, as surveyed in respective days of 2018 on the horizontal axis. Last observation is October 29, 2018. Center Panel. Average inflation forecast based on 27 EMDEs for which data of consensus forecasts are available, weighted by current GDP in U.S. dollars for 2018.

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Low Inflation in EMDEs: Miracle or Mirage? - 2

Past Periods of Low Inflation Did Not Last



43 Source: World Bank.
Note: Median of annual average inflation and inflation volatility in 24 countries where data are available across the full period.

Policy Implications

Learning to Live with the Global Inflation Cycle

1 Establish more resilient monetary policy frameworks

- Greater central bank transparency and independence
- Credible monetary policy frameworks, including inflation targeting
- Robust exchange rate regime

2 Build resilience to changes in global inflation

- Active use of countercyclical policies
- Establishing a fiscal environment resilient enough to effectively contribute to macroeconomic stabilization
- Ensuring stability of financial system
- Considering coordinated monetary policy action to respond to undesirably low or high global inflation

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Thank You!

Questions & Comments

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- The 2014–16 Oil Price Collapse in Retrospect: Sources and Implications – April 2018
- The Global Costs of Protectionism – December 2017