

12nd CEO Forum Bradesco BBI

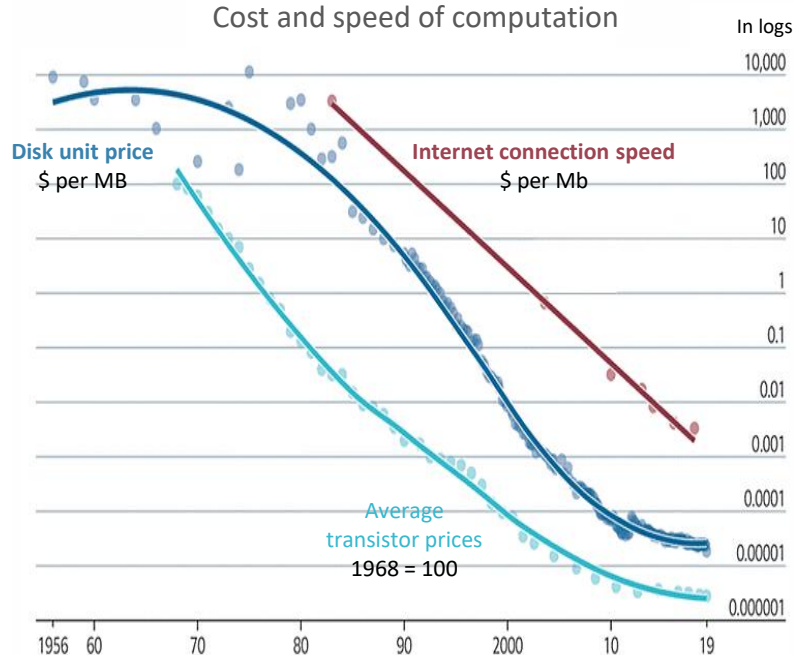
Economic Outlook and Agenda BC#

Roberto Campos Neto
Governor of Banco Central do Brasil

- Long period of stable **geopolitical environment, technology advances, globalization** and **favorable demographics** produced a “golden age” for supply chains.
 - Free markets, cooperation, and trade agreements.
 - Globalized markets served to discipline policies.
- Belief that global chains were completely adaptable, and inflation would be low for long.

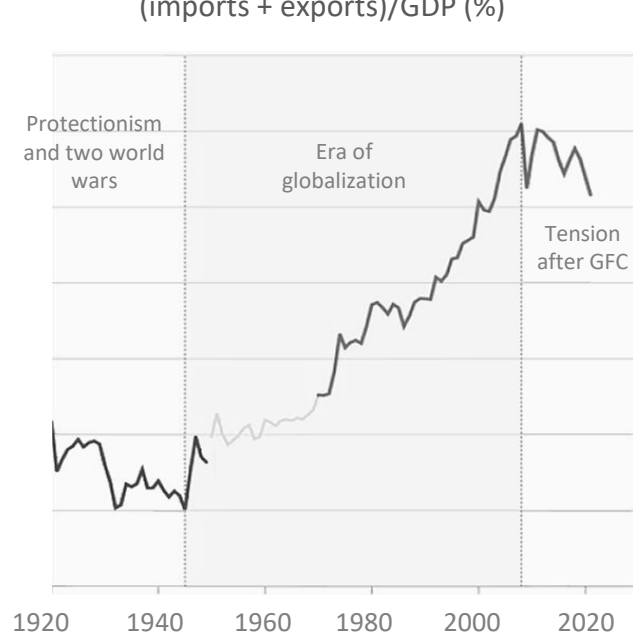
Technology advances

Cost and speed of computation



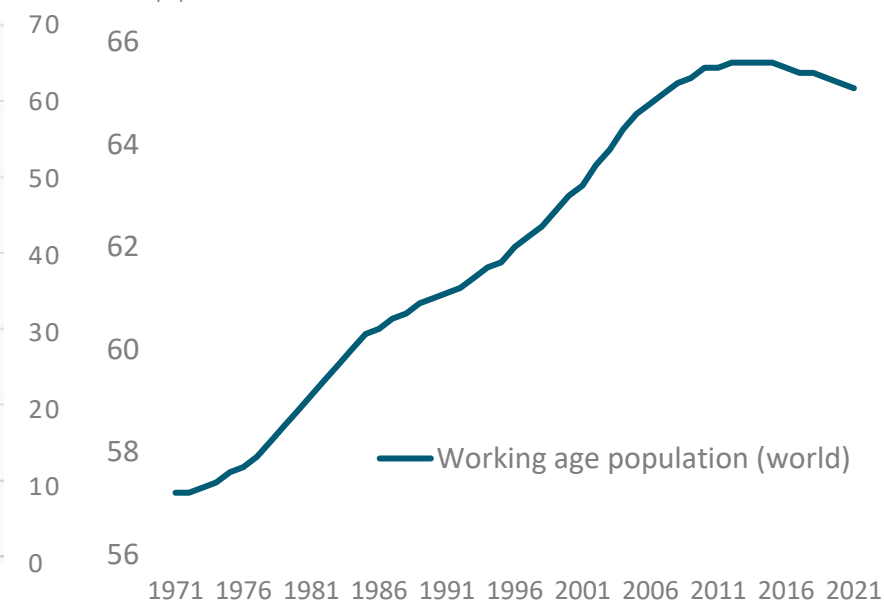
Global trade

(imports + exports)/GDP (%)



Demographic dividends

% of population



- Low productivity was a sign.
 - Governments lost appetite for difficult structural reforms.
- Low interest rates, high leverage and low bargaining power of workers compensated low productivity.

Productivity growth

Advanced economies

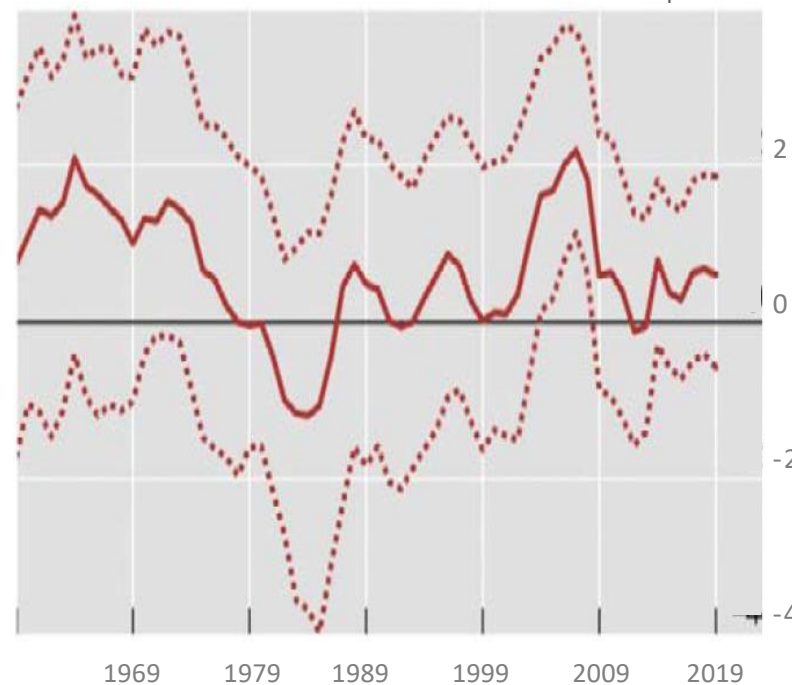
In per cent



Productivity growth

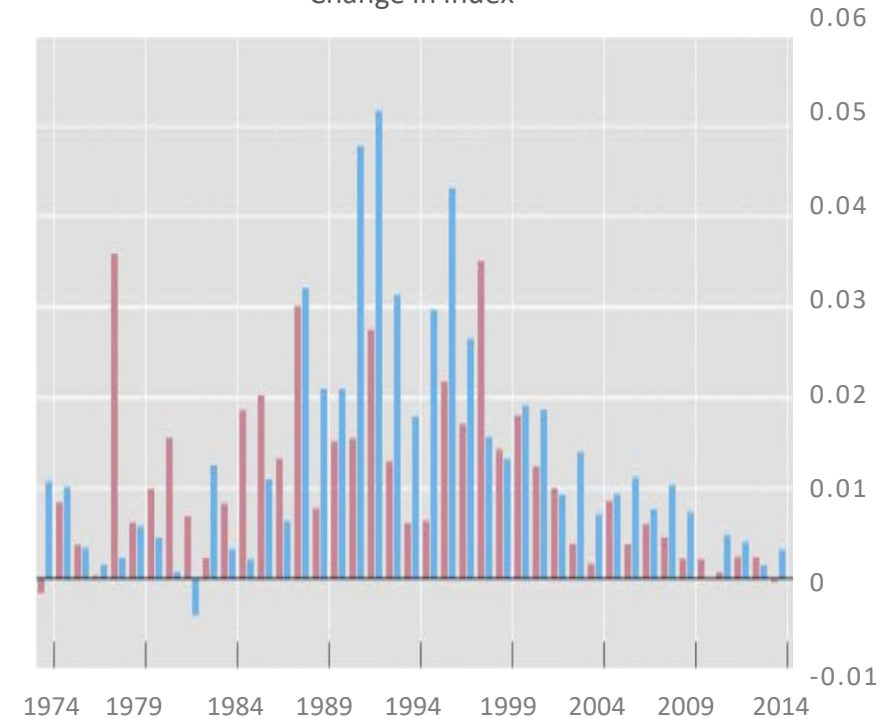
Emerging market economies

In per cent



Structural reforms

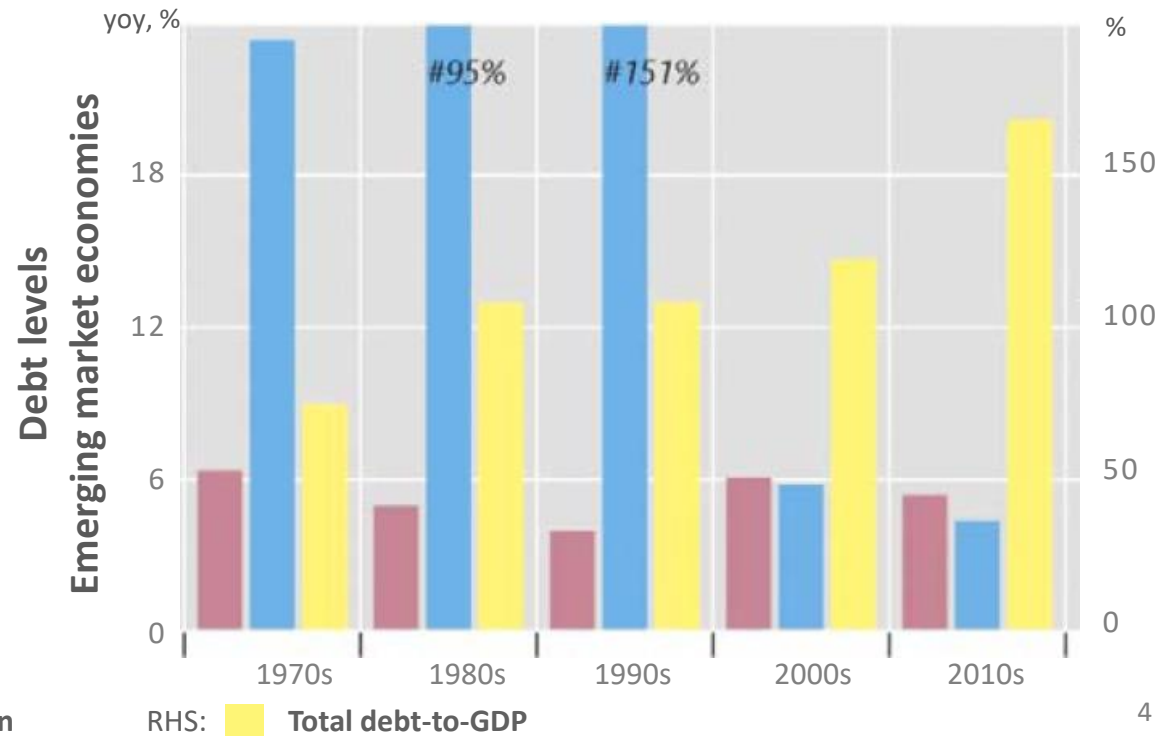
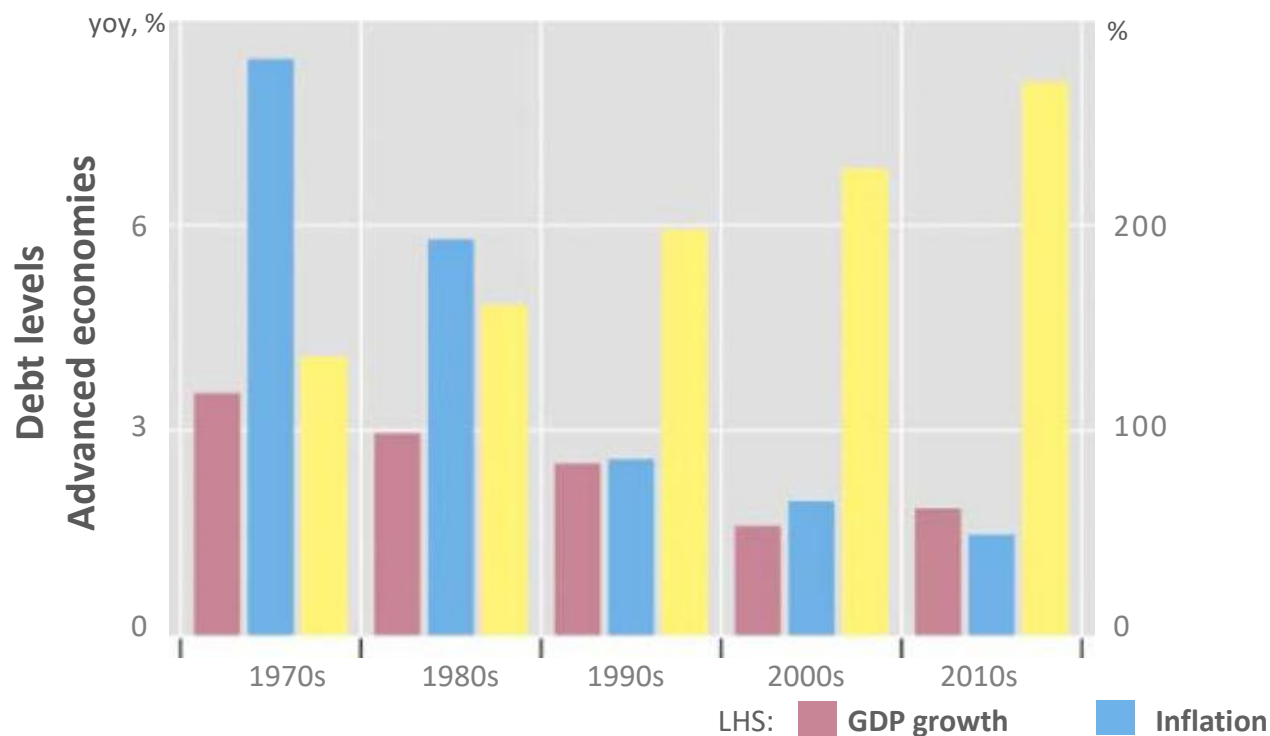
Change in index



— Median Interquartile range

■ Advanced economies ■ Emerging market economies

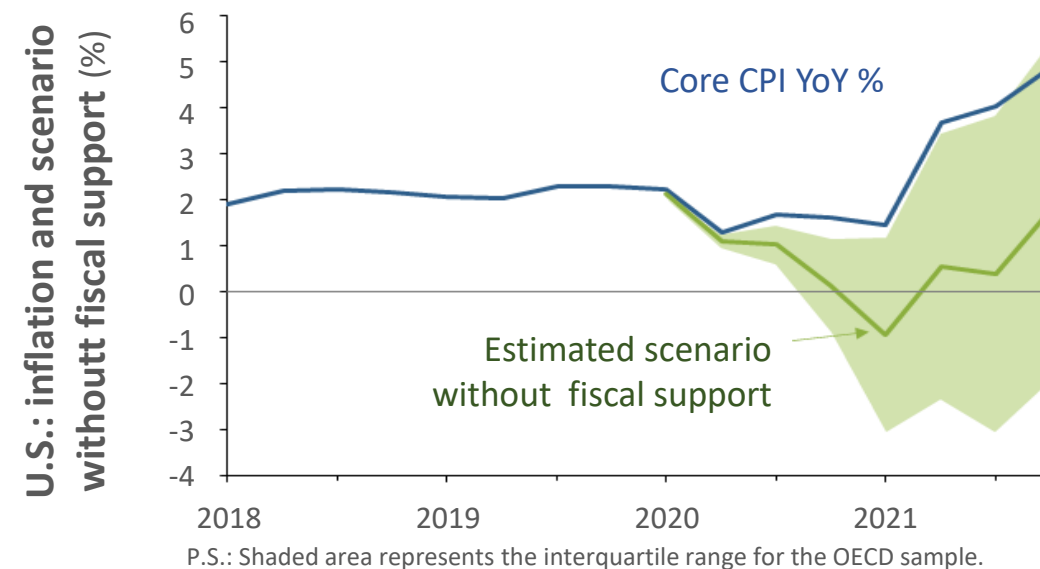
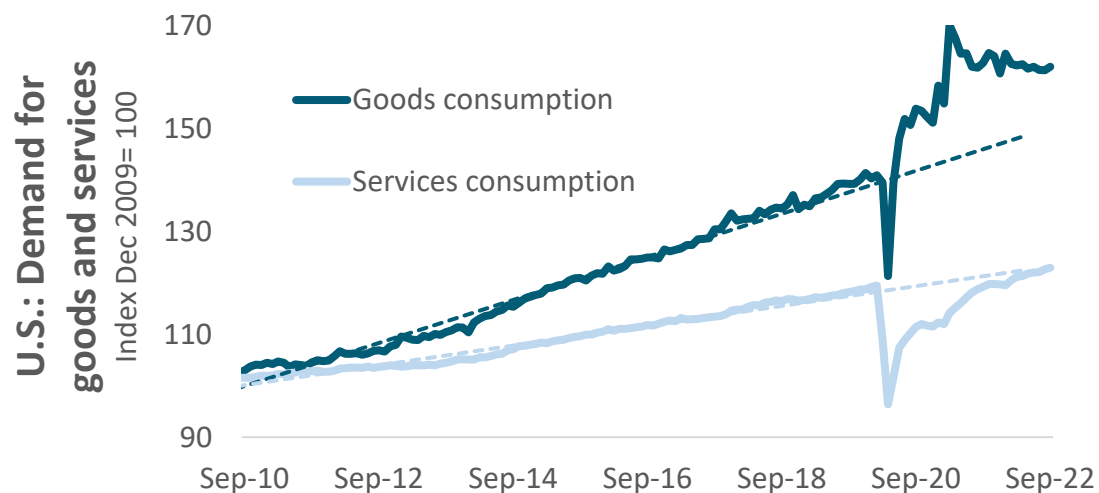
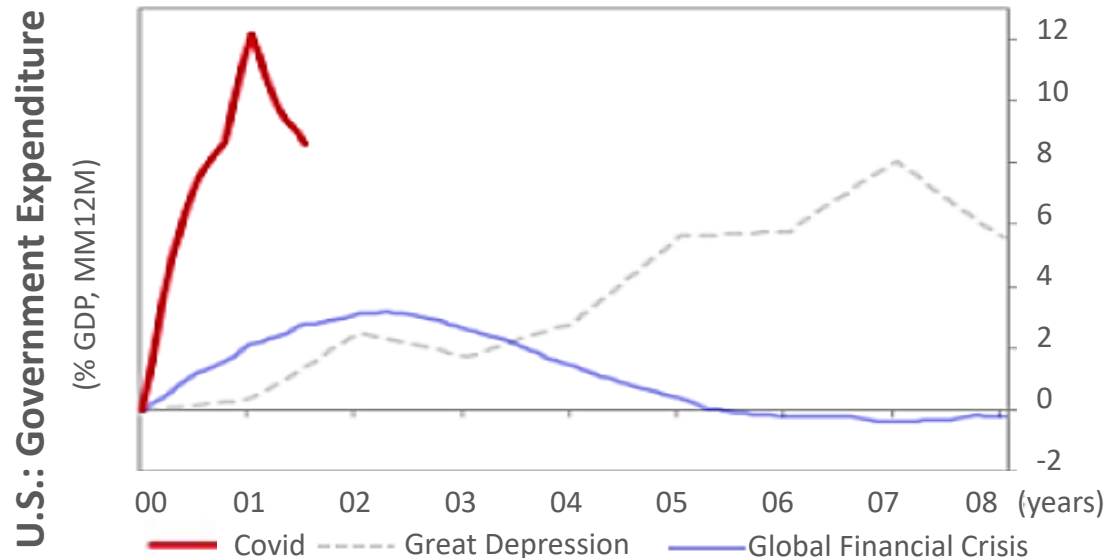
- Without growth drivers, economies had to rely on other sources of growth.
 - Expanding financial markets -> 2007-2009 crisis.
 - Technology -> productivity did not show up in metrics
- Monetary and fiscal policy were called more often to sustain the economy.
 - Policy room was eroding.
 - Debt levels climbed.



Source: Carstens, Agustín. A story of tailwinds and headwinds: aggregate supply and macroeconomic stabilization, 2022.

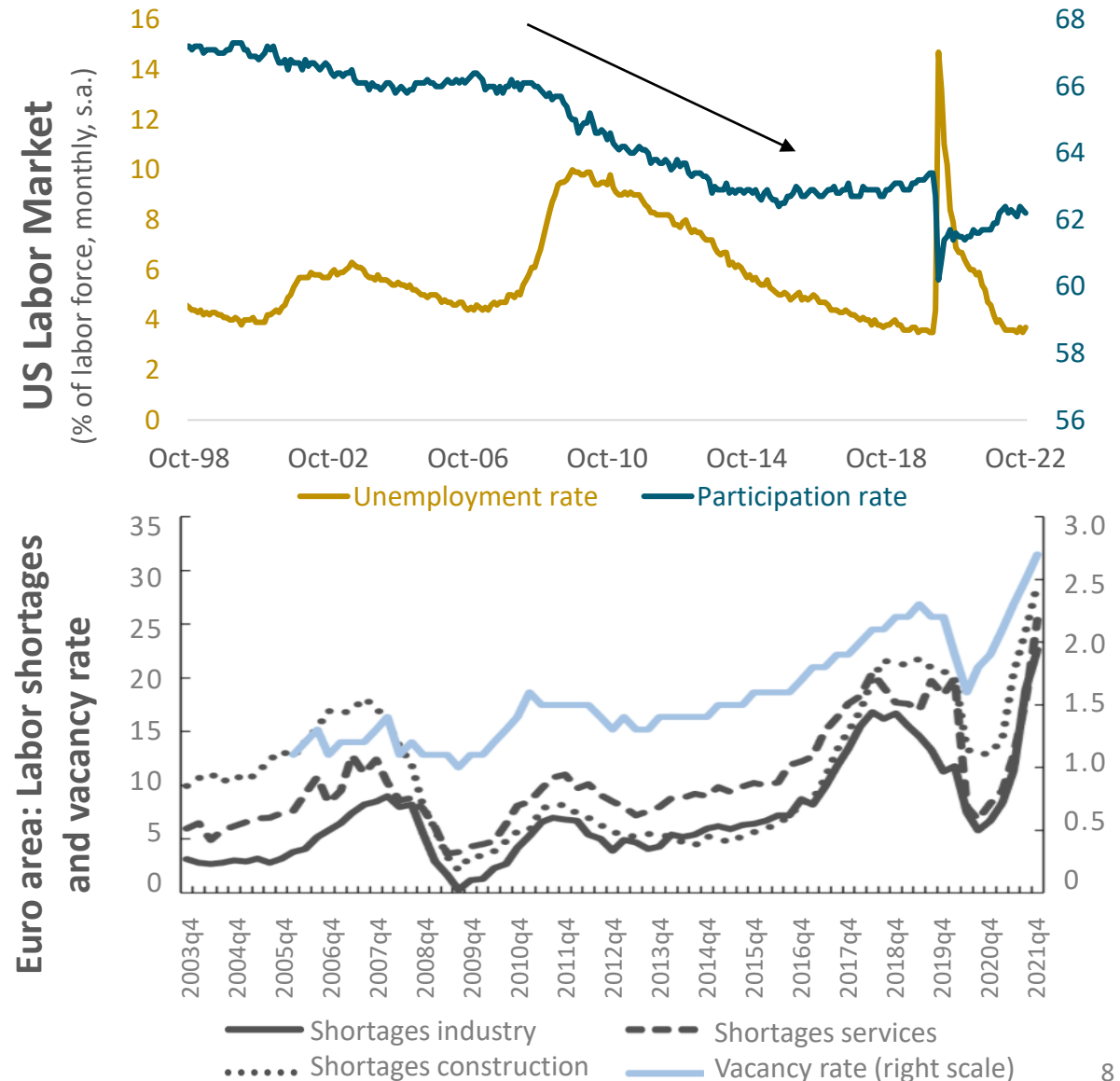
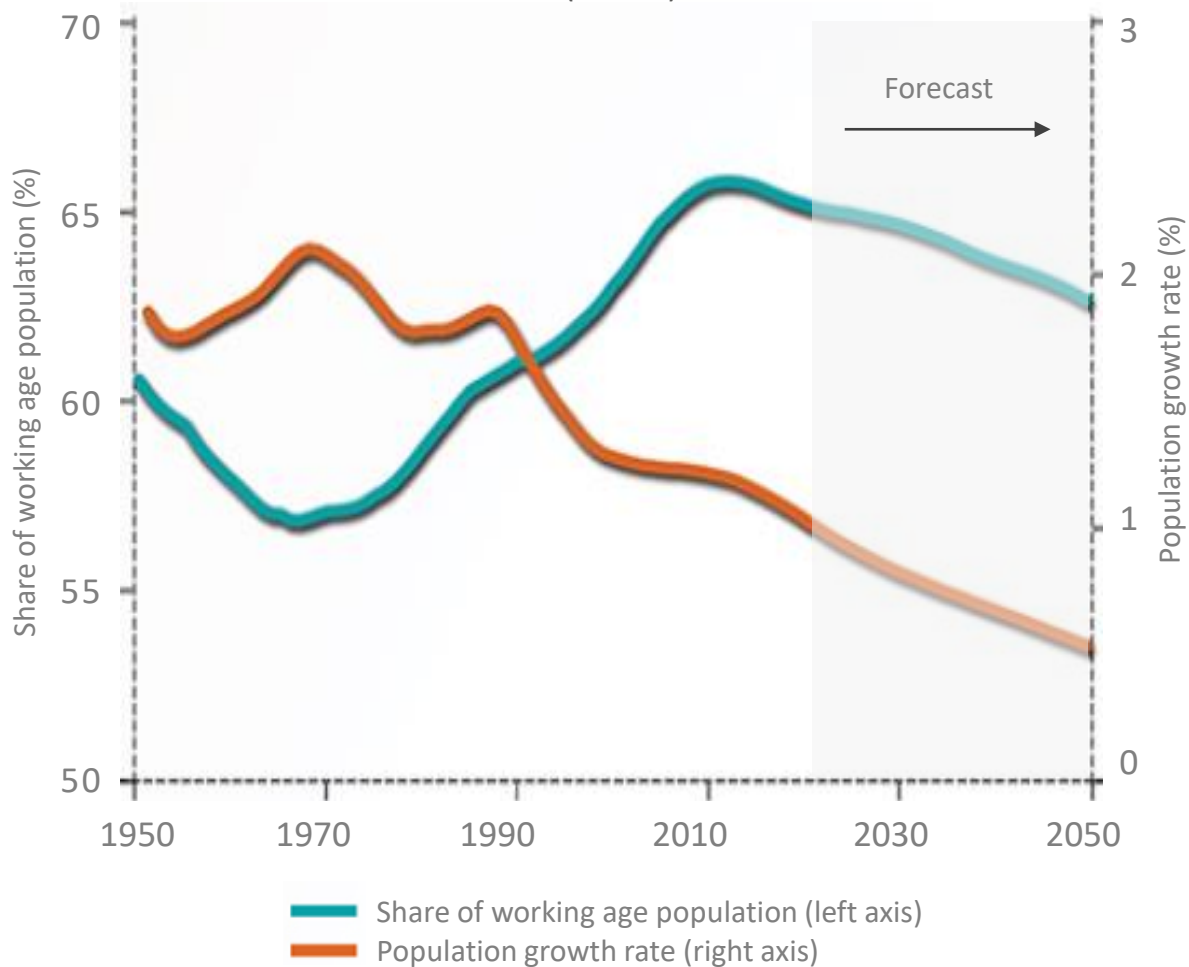
- Sequence of shocks: Covid-19 and the war in Ukraine.
 - Policy makers were not able to properly assess the effects of virus and geopolitical risks.
- The huge increase in demand coupled with other factors made adaptable supply to fail for the first time.
- The availability of aggregate supply was not there.
- The responsiveness of supply curve was grossly miscalculated.
 - This meant a lack of capacity in anticipating the increase in inflation.

Sequence of shocks: policy responses generated increases in income, supply-demand imbalances and the beginning of a rise in inflation.



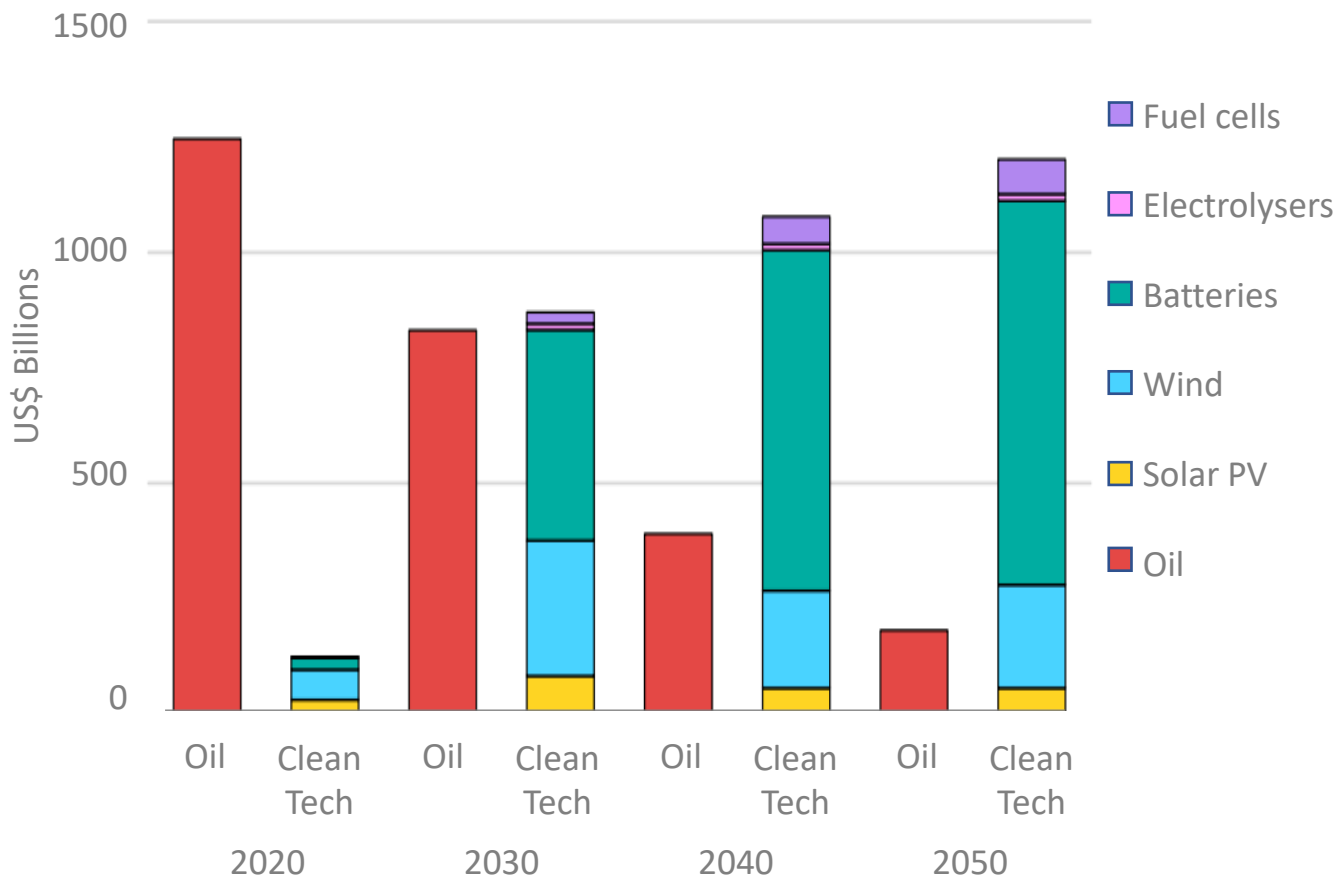
- Some factors that made supply adaptable were gone.
 - Changes were in course and accelerated.
 - Uneven distribution of benefits from globalization
 - Shift in the framework of comparative advantages
 - Headwinds in demographics and structural changes in labor supply
 - Climate change and green transition
- Inflation pressures will be more persistent.
 - The path for reducing inflation is nonlinear.

Demographic change (World)

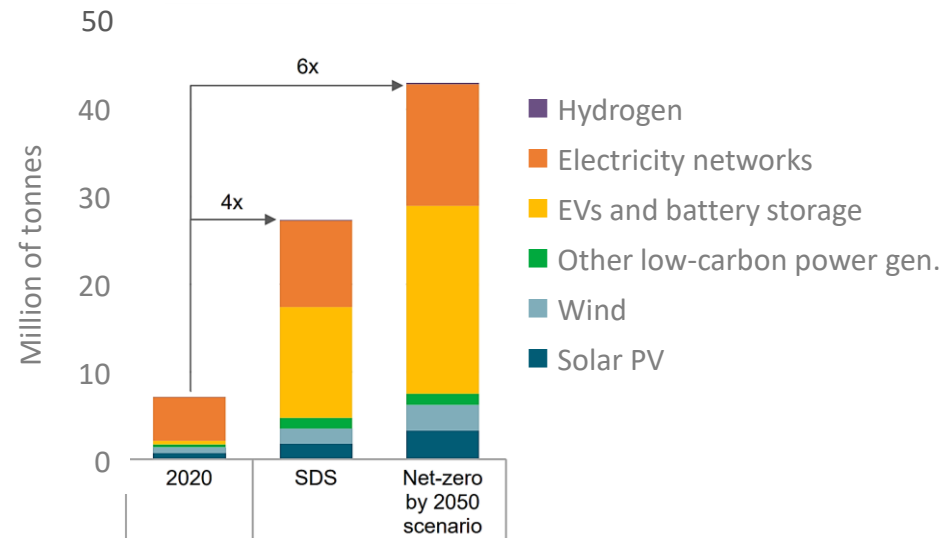


Increasing demand for materials used in clean energy. The transition for a greener economy poses important trade-offs.

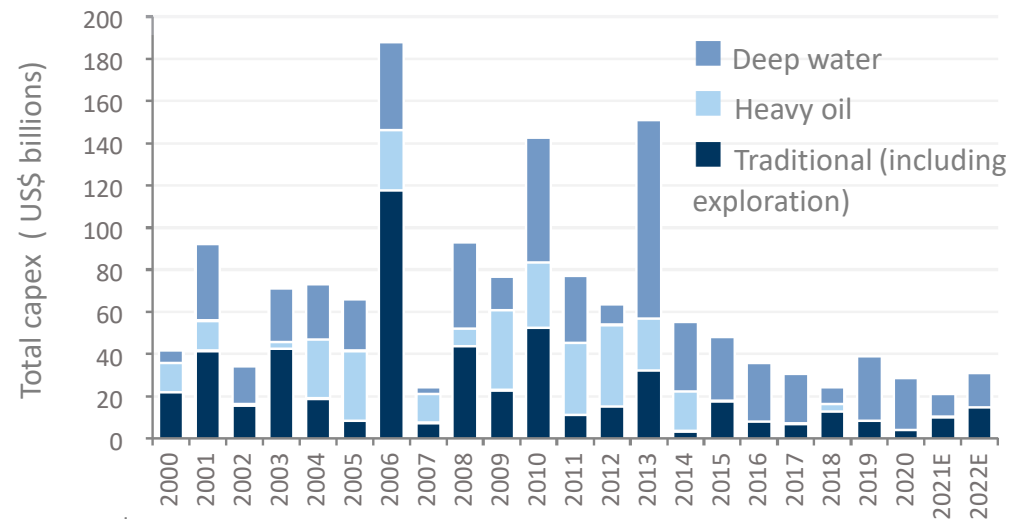
Estimated market size in the Net Zero Emissions by 2050 Scenario



Minerals demand for clean energy technologies by scenario



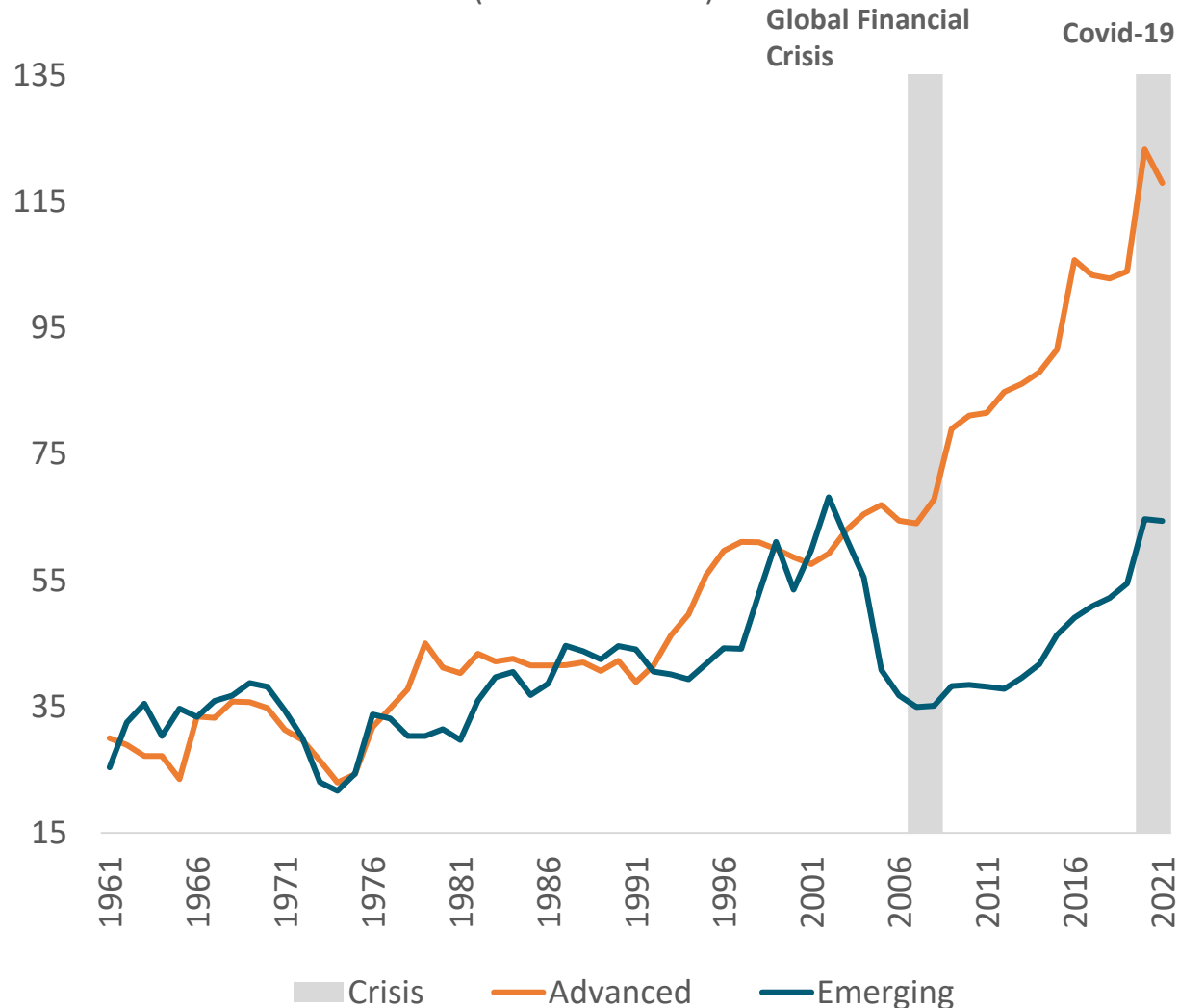
Oil projects capex



SDS = Sustainable Development Scenario, indicating what would be required in a path consistent with meeting the Paris Agreement goals.
Source: International Energy Agency (IEA), Goldman Sachs, Top Projects 2021 Report.

- We need to be cautious about inflation.
- Fiscal frameworks should have limits.
 - Demand policies need to recognize that supply is less adaptable.
 - Ensuring credibility in fiscal frameworks is crucial.
 - Structural reforms are needed to increase productivity.
- Policies to strengthen the supply side.
 - We need to sustain international cooperation.
 - Better globalization tools.

Public debt levels
(Percent of GDP)

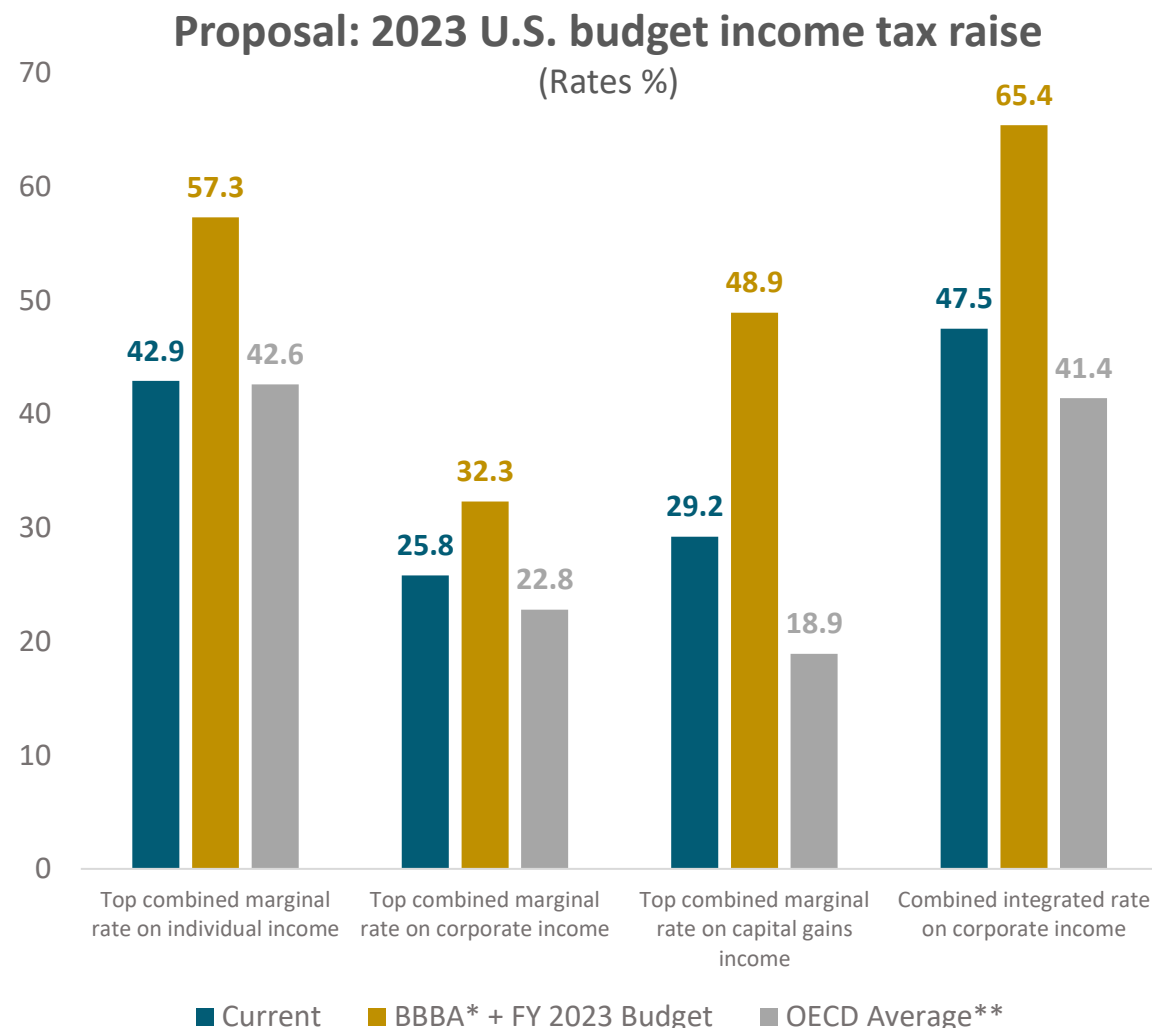


- Huge increase in debt in advanced and emerging economies.
 - Who will pay the bill?
- Proposals should avoid reducing productivity even further.
 - Example: tax on capital can put additional burden on investments.
- How much of this is in the asset prices?

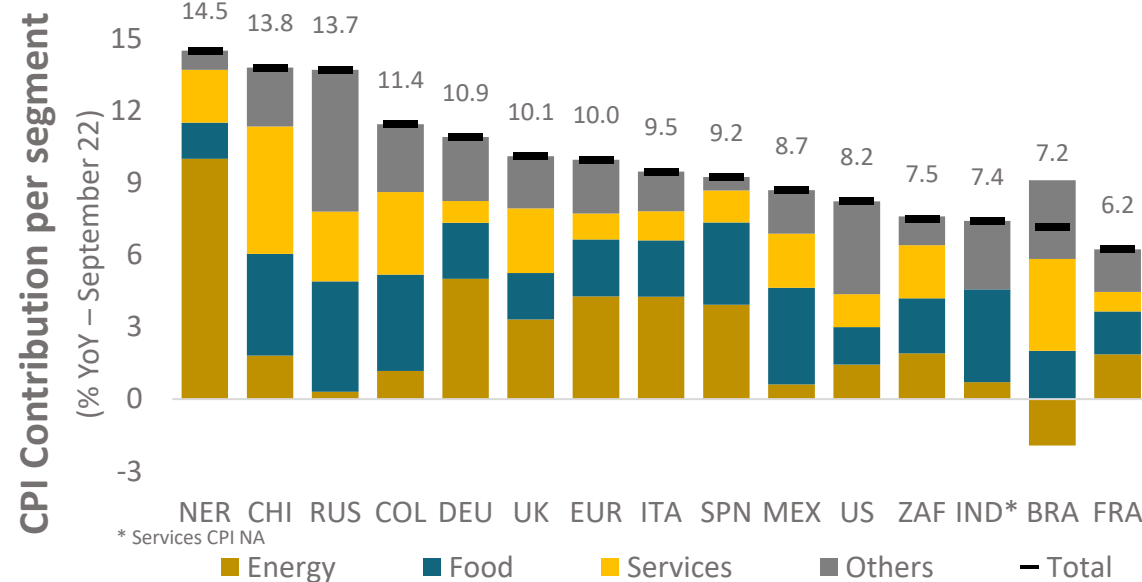
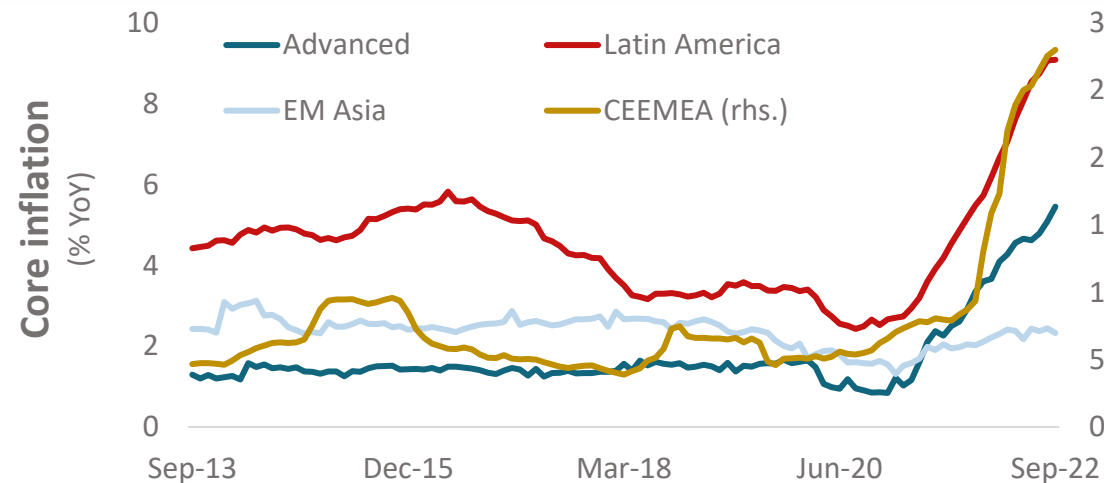
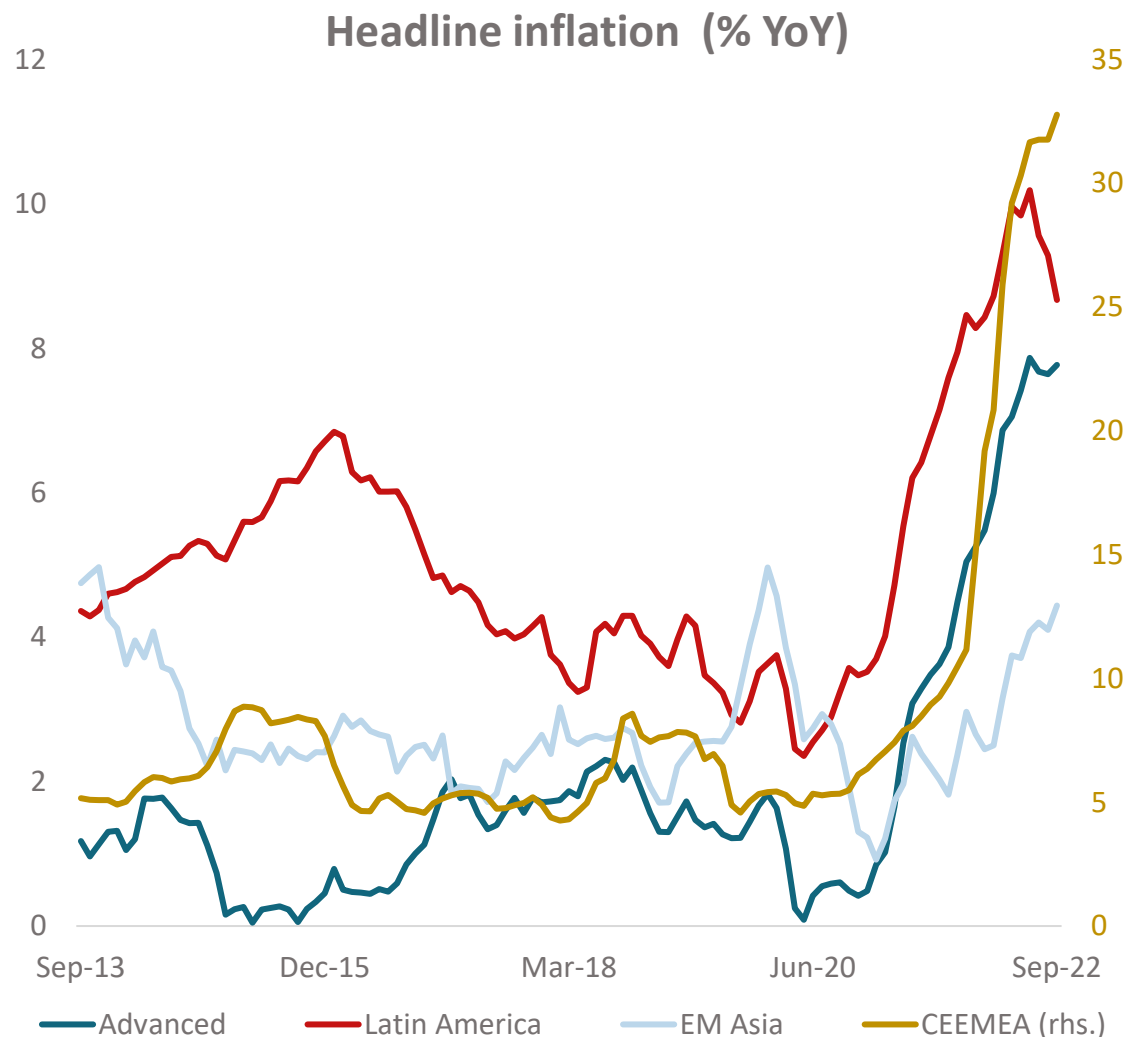
Europe: Measures to contain energy price impacts (Sep 21- Oct 22)						
Country / Policy	Reduced energy tax / VAT	Retail price regulation	Transfers to vulnerable groups	Windfall profits tax / regulation	Business support	Other
Austria	✓	✓	✓	✓	✓	✓
Belgium	✓	✓	✓	⋮	✓	✓
Bulgaria	✓	✓	✓	✓	✓	
France	✓	✓	✓	✓	✓	✓
Germany	✓	✓	✓	⋮	✓	⋮
Greece	✓		✓	⋮	✓	
Ireland	✓		✓	✓	✓	✓
Italy	✓		✓	✓	✓	
Netherlands	✓	✓	✓	⋮		
Norway	✓		✓	✓	✓	
Poland	✓	✓	✓	✓		
Portugal	✓		✓	⋮	✓	
Slovakia	✓	✓	✓	⋮		
Slovenia	✓		✓	⋮	✓	
Spain	✓	✓	✓	✓	✓	
Sweden	✓		✓			✓
UK	✓	✓	✓	✓	✓	⋮

* France, Spain and Portugal adopted wholesale price regulation too.
 ✓ - Measures already implemented
 ⋮ - Measures announced
 ⋮ - Measures discussed but no formal act to implement it has been taken yet

Sources: Bruegel, Tax Foundation



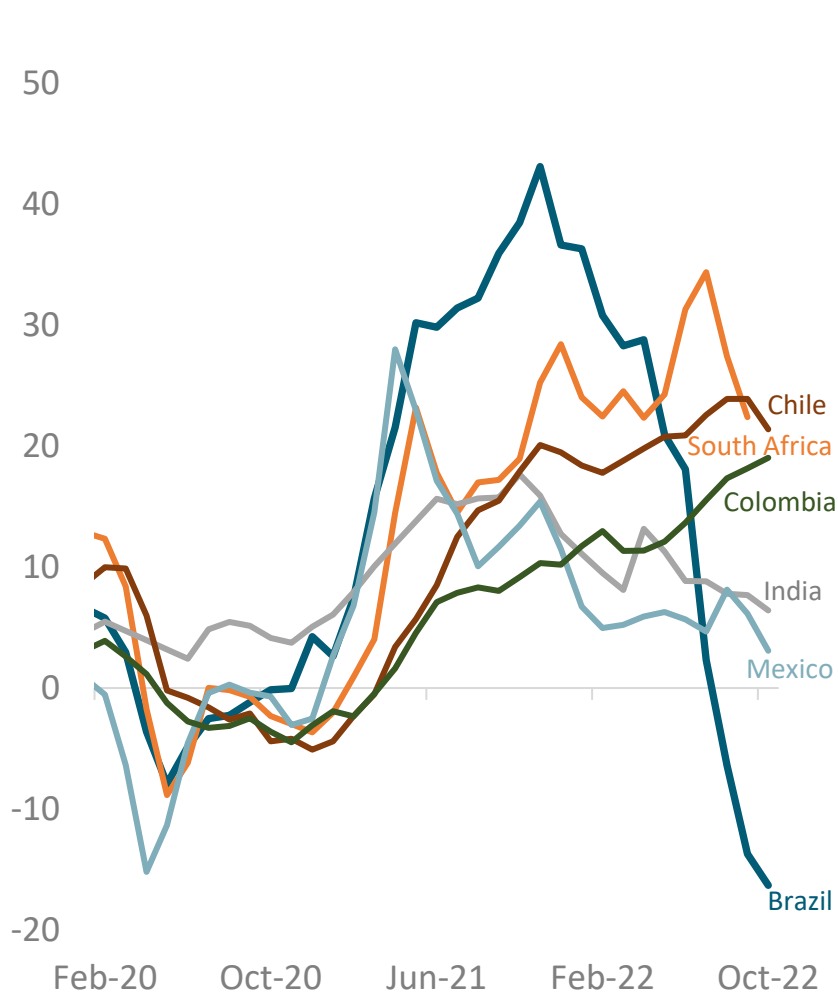
* Build Back Better Act
 ** Excluding U.S.



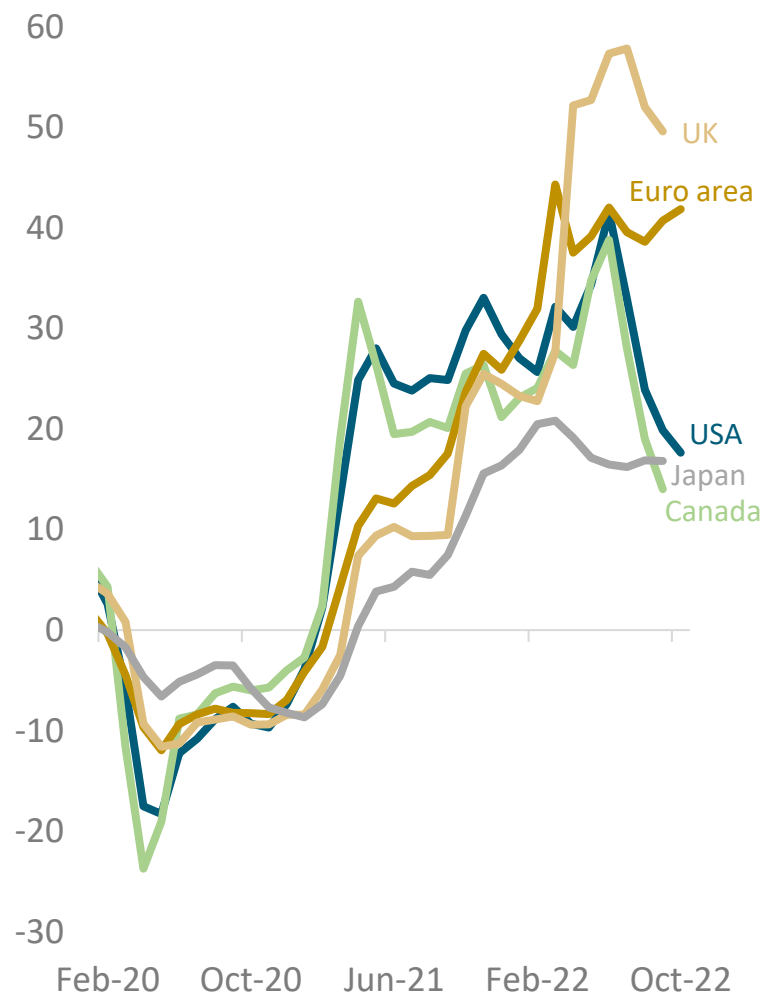
EM Asia: CN, ID, IN, KR, HK, MY, PH, SG, TW, TH; Latin America: BR, MX, CL, CO, PE; Advanced: DE, FR, UK, IT, GR, PT, IE, SP, CH, NO, SE, DK, FI, CA, US, JP, CEEMEA (Central and Eastern Europe, Middle East and Africa): ZA, TR, RU, BG, CZ, HU, PL, RO, SK.

Sources: Bloomberg, central banks and local statistical institutes.

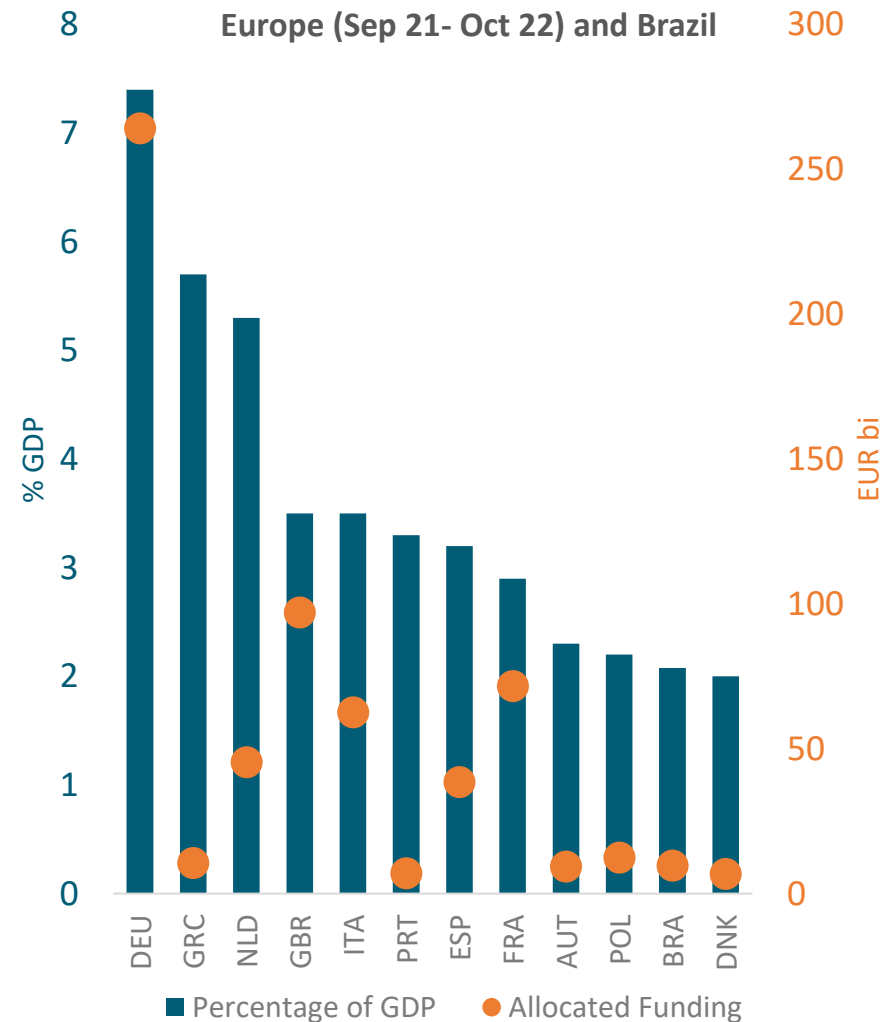
Energy CPI - Emerging countries (% YoY)



Energy CPI – Advanced countries (% YoY)



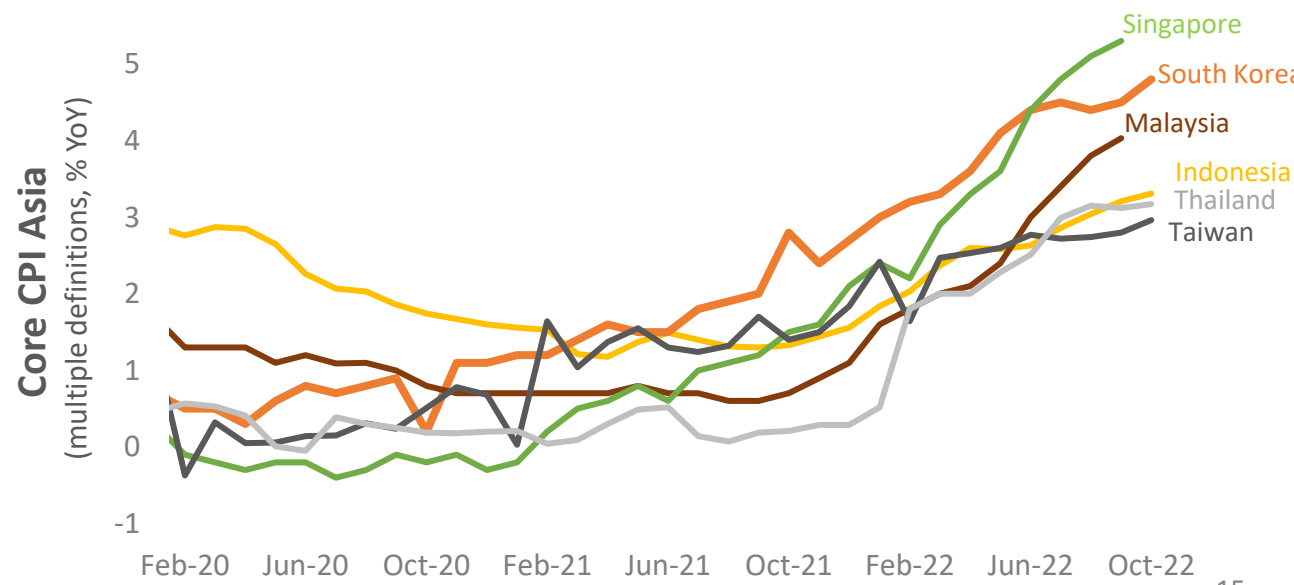
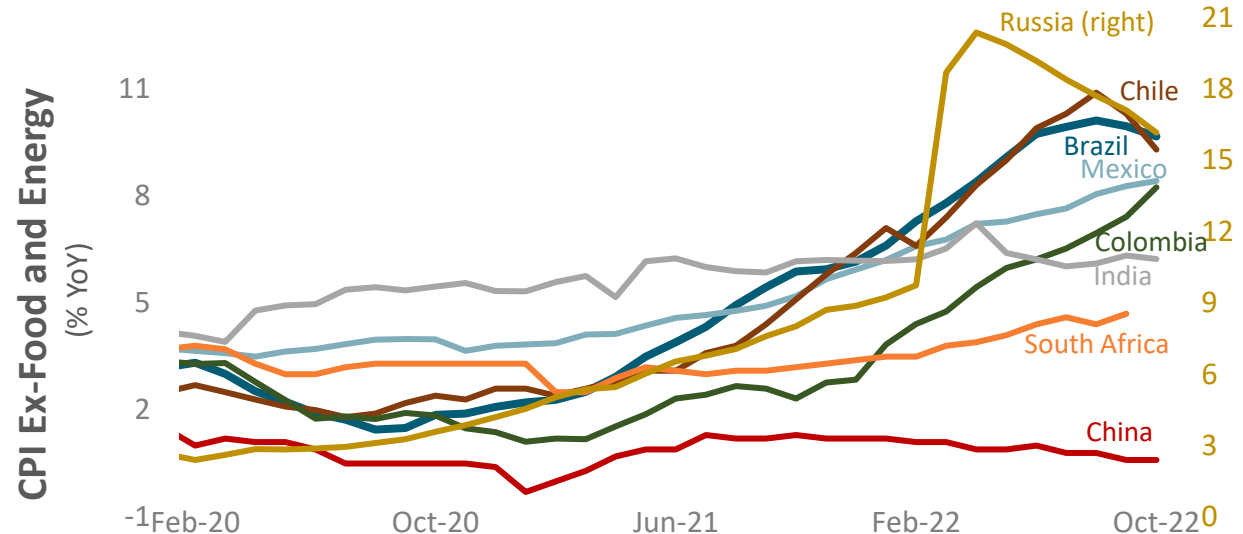
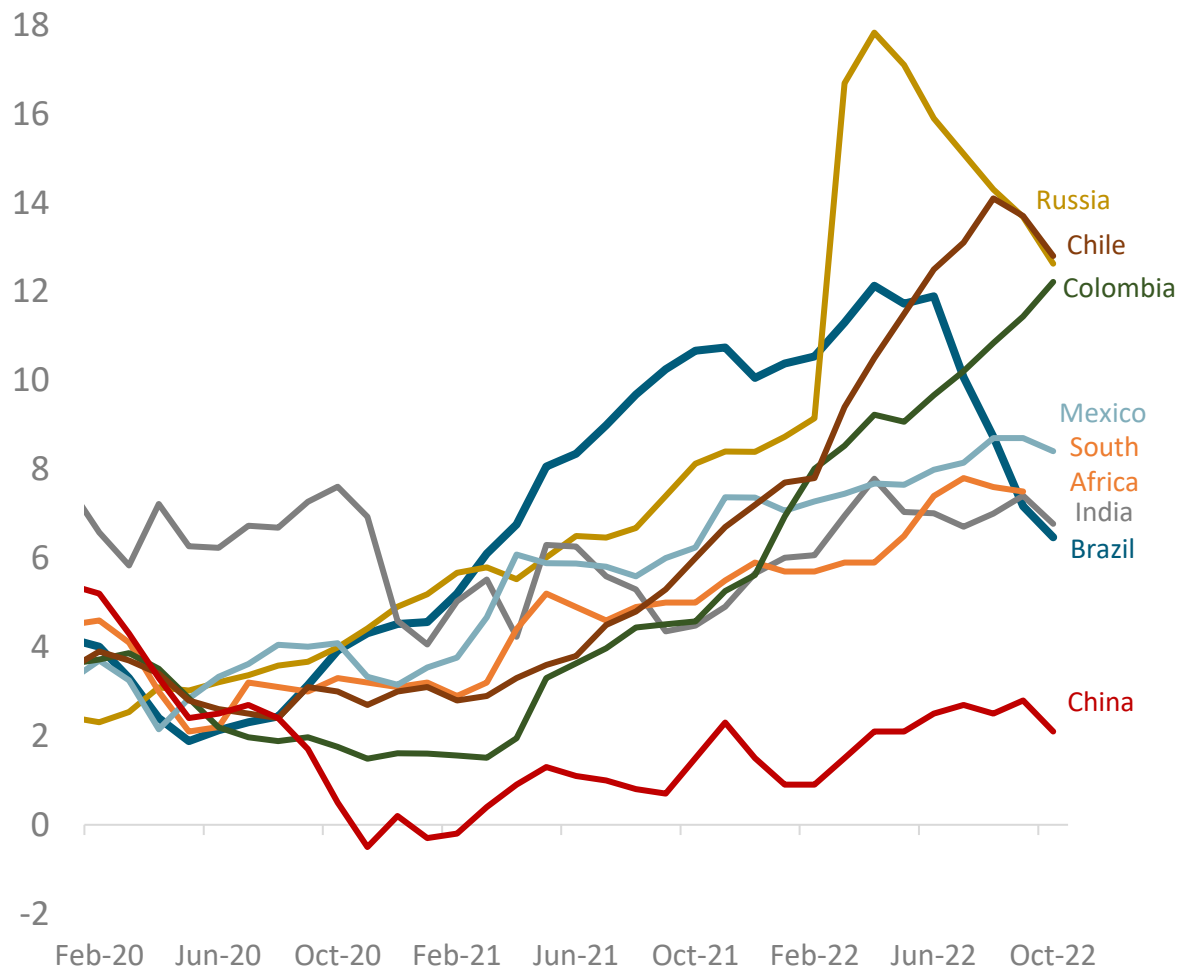
Fiscal Measures: Energy Europe (Sep 21- Oct 22) and Brazil



Sources: Bloomberg, Brazilian Institute of Geography and Statistic (IBGE), Bruegel, Central Bank of Brazil (BCB).

Ps: Numbers do not include subnational/supranational measures and loans, guarantees and bailouts of utility companies.

Headline CPI (% YoY)

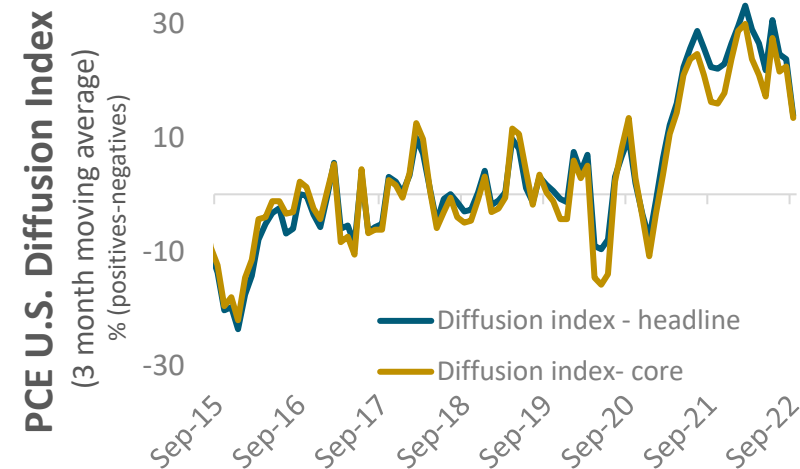
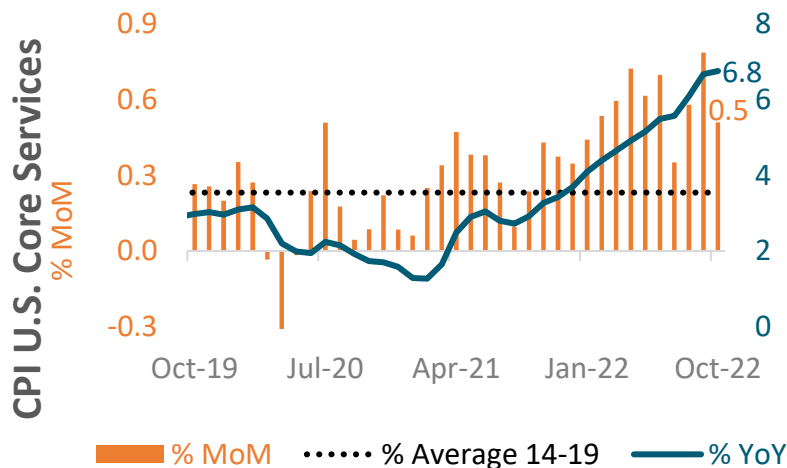
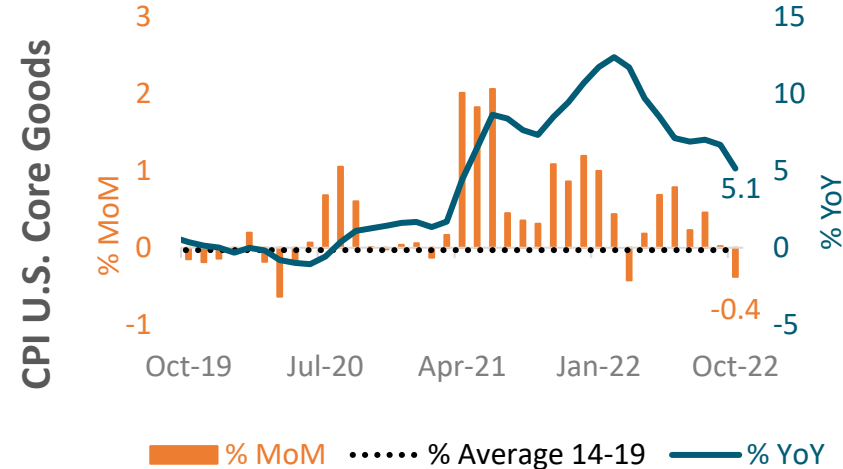
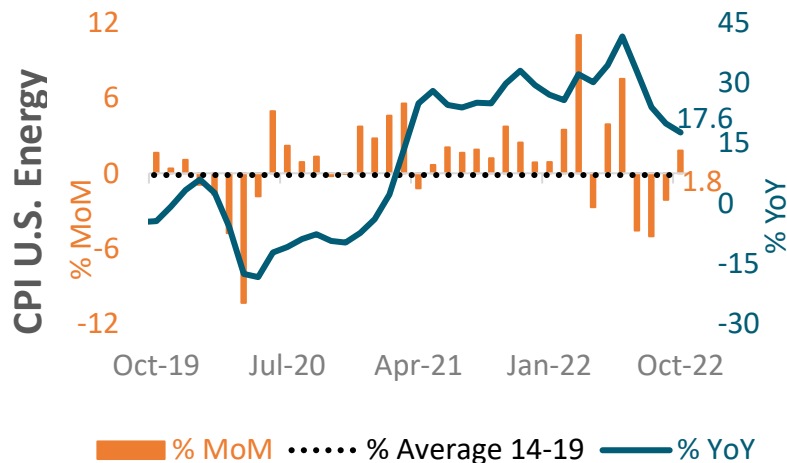
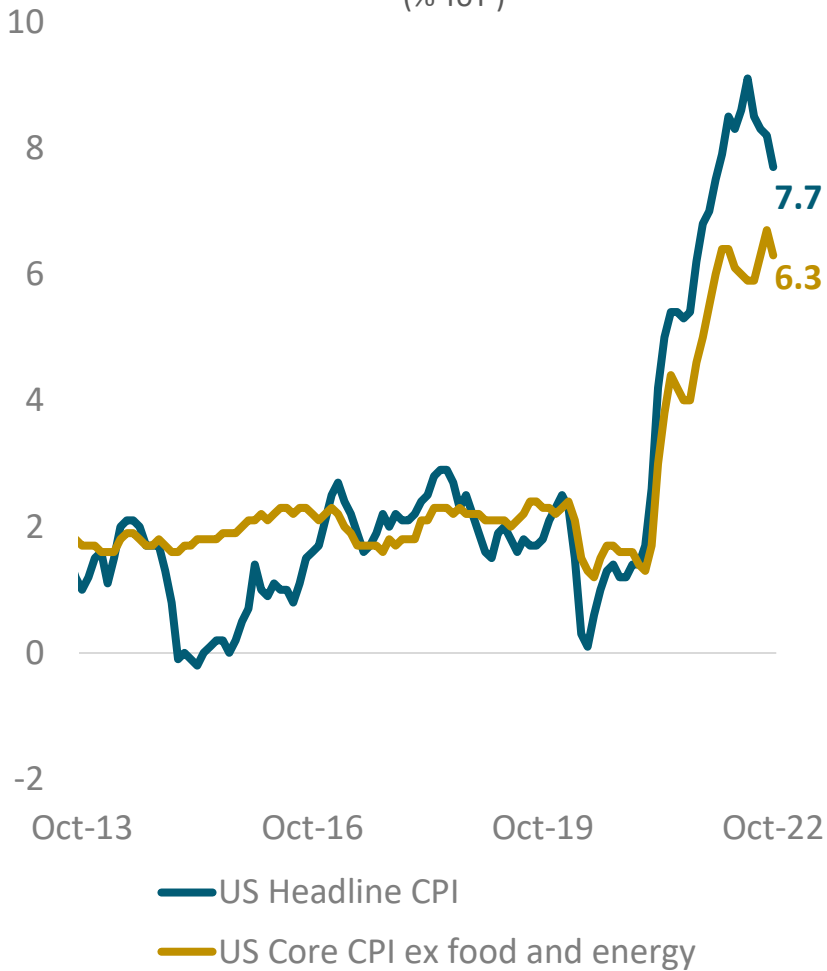


Sources: Bloomberg, IBGE, BCB.

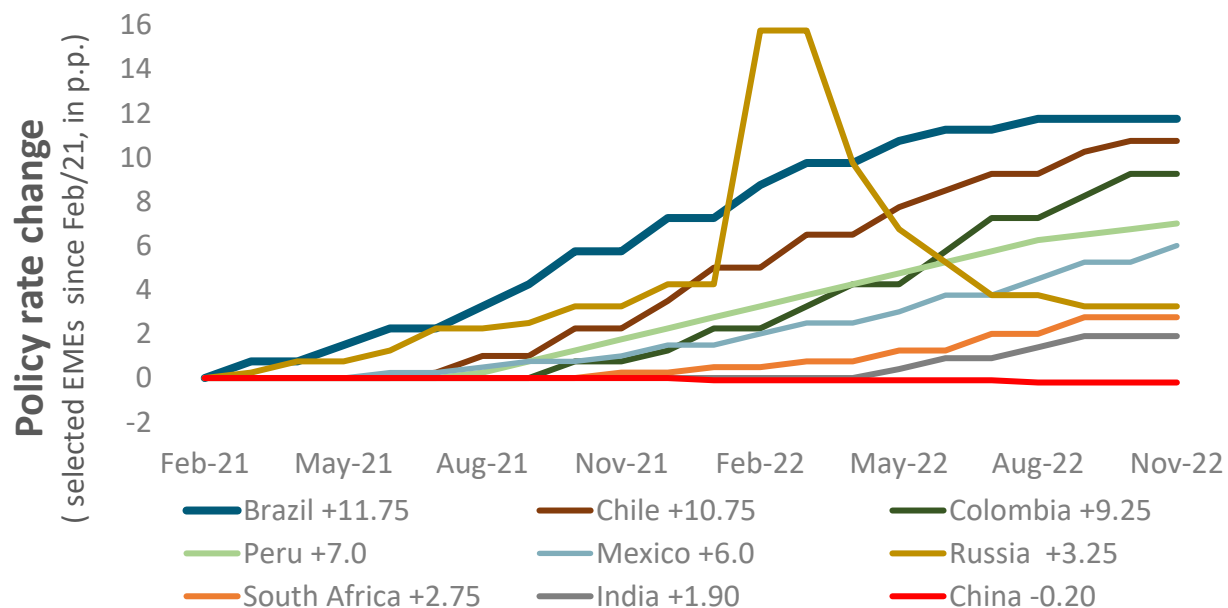
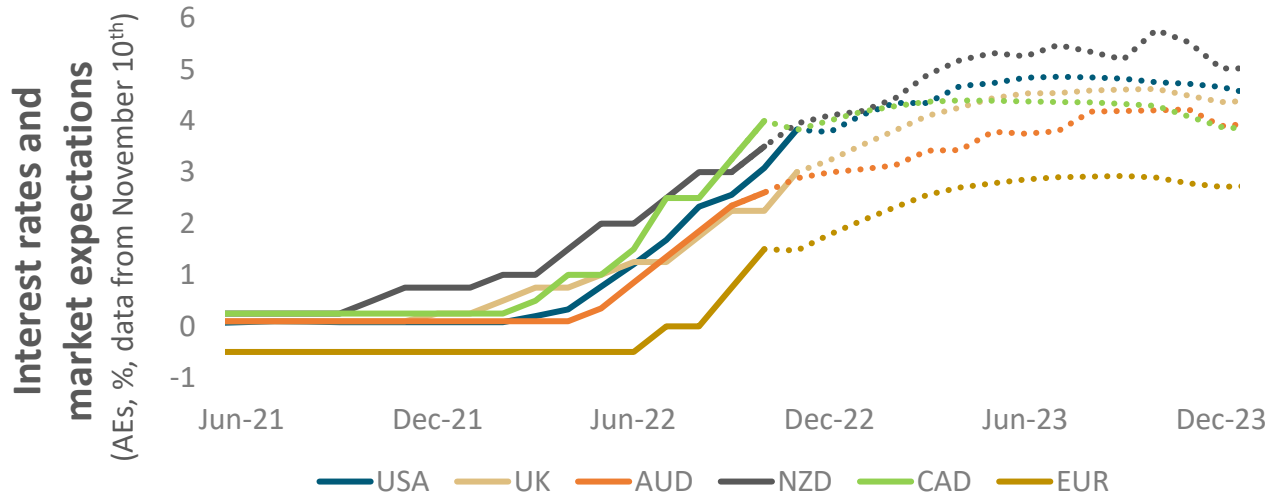
Despite the recent deceleration, inflation remains high in US. Core inflation is being pushed by services.

CPI U.S. Headline and Core

(% YoY)



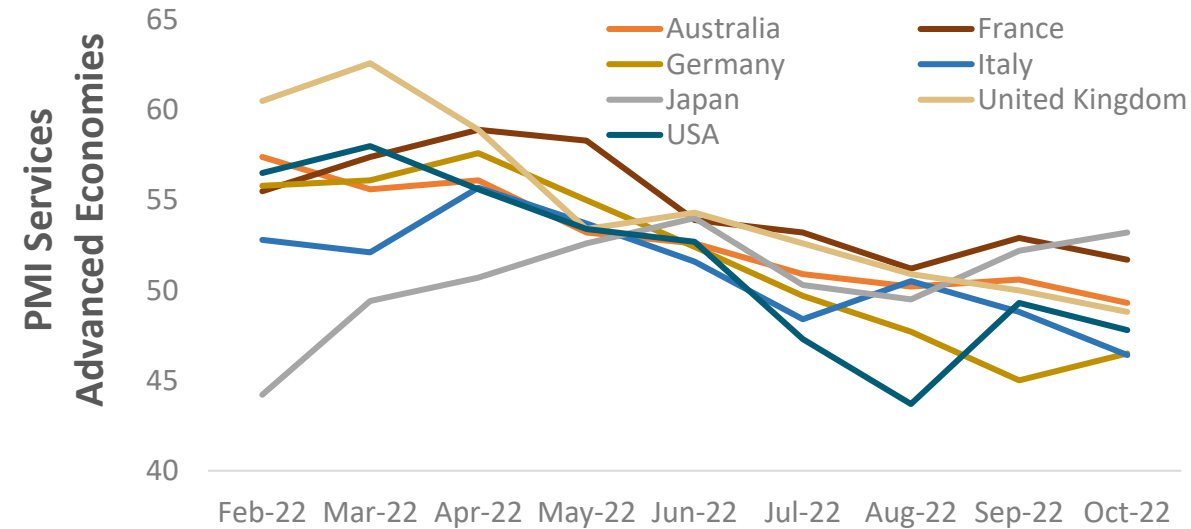
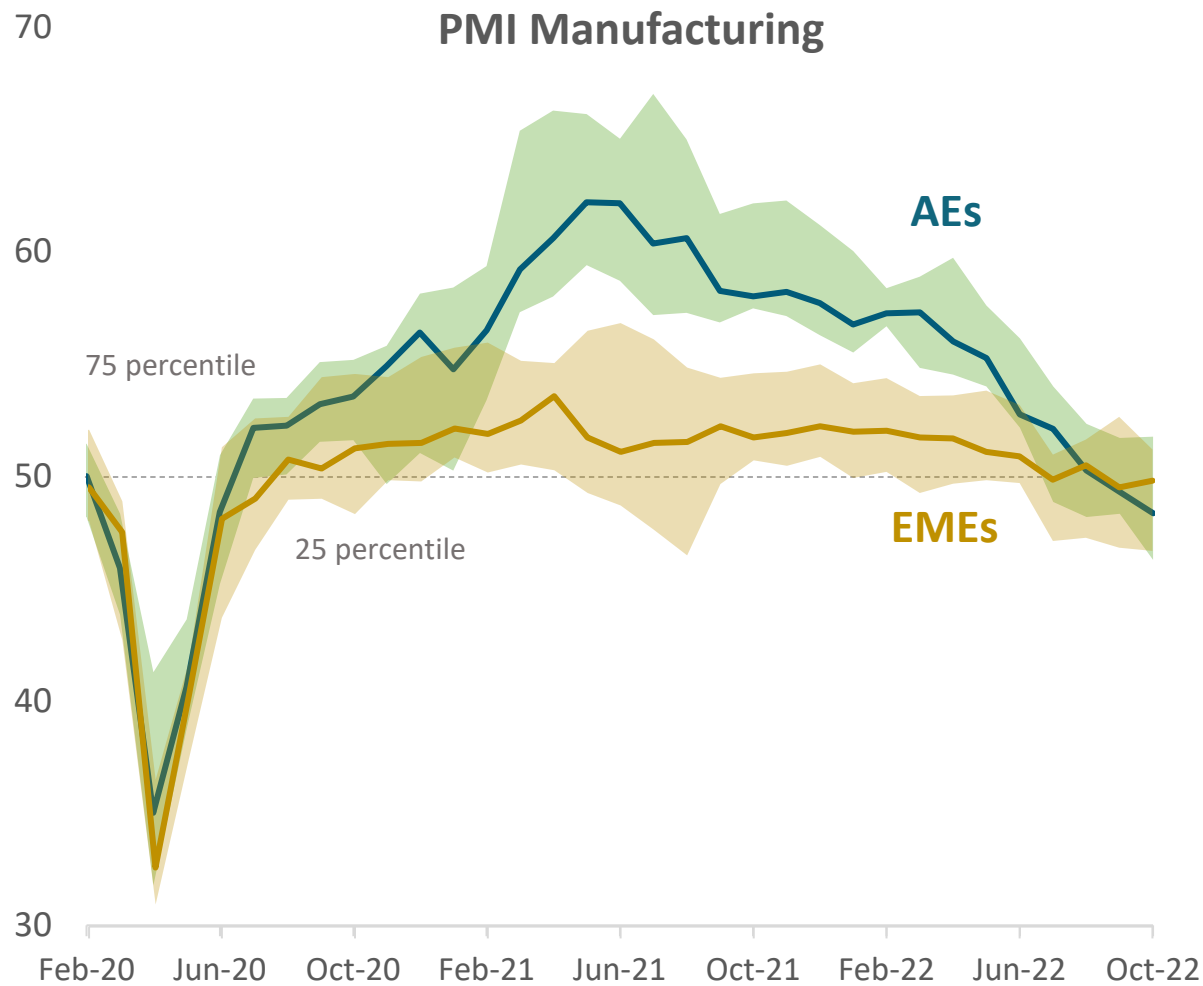
Monetary tightening in AEs and EMEs is proceeding.



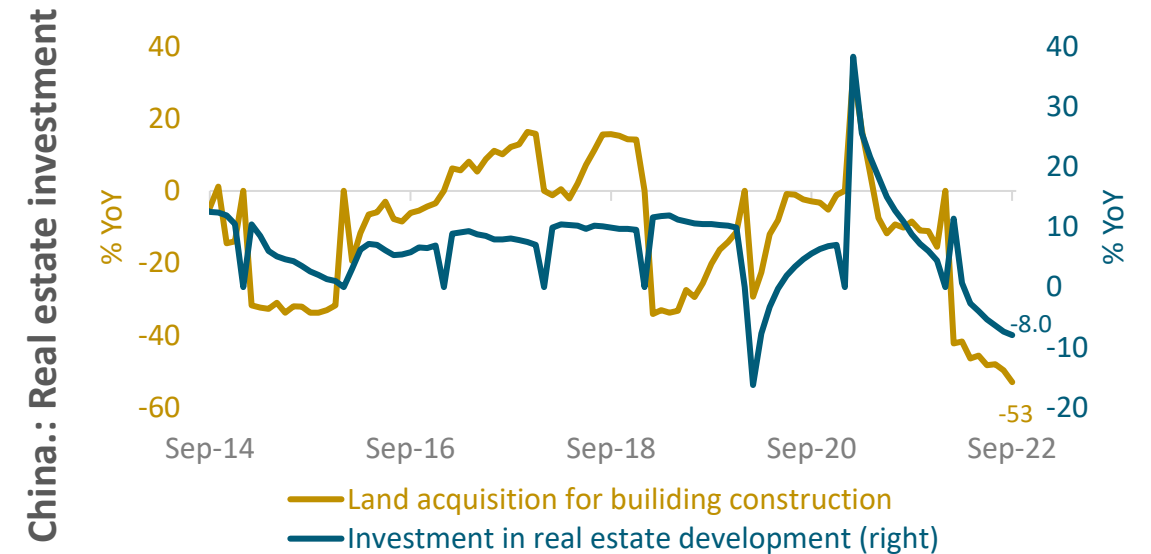
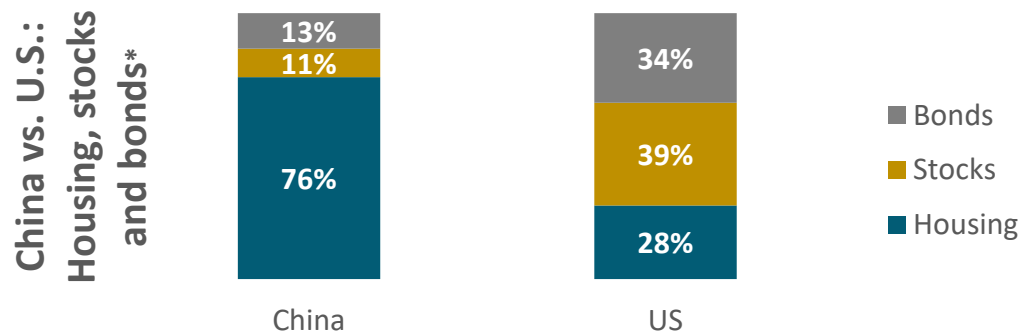
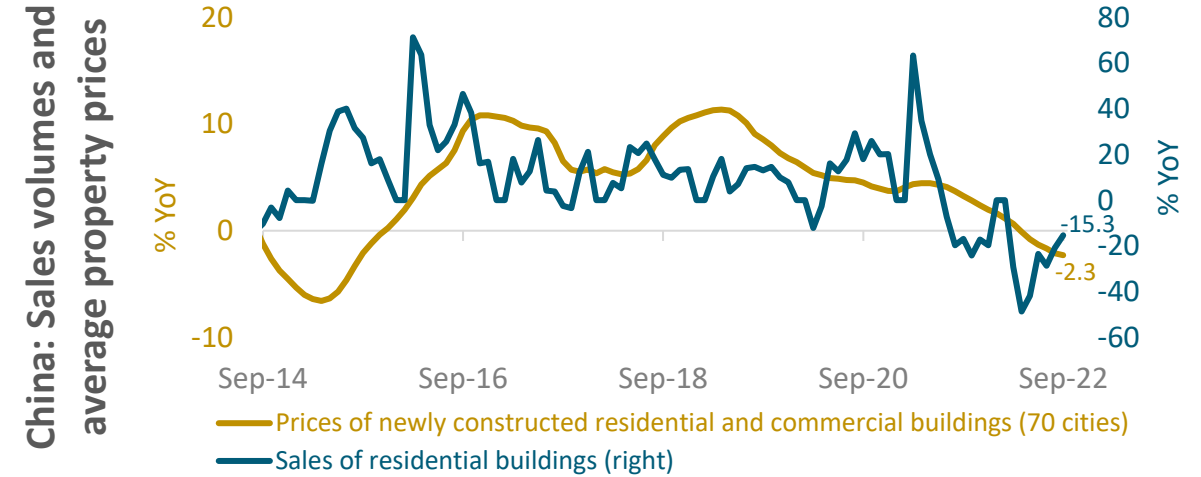
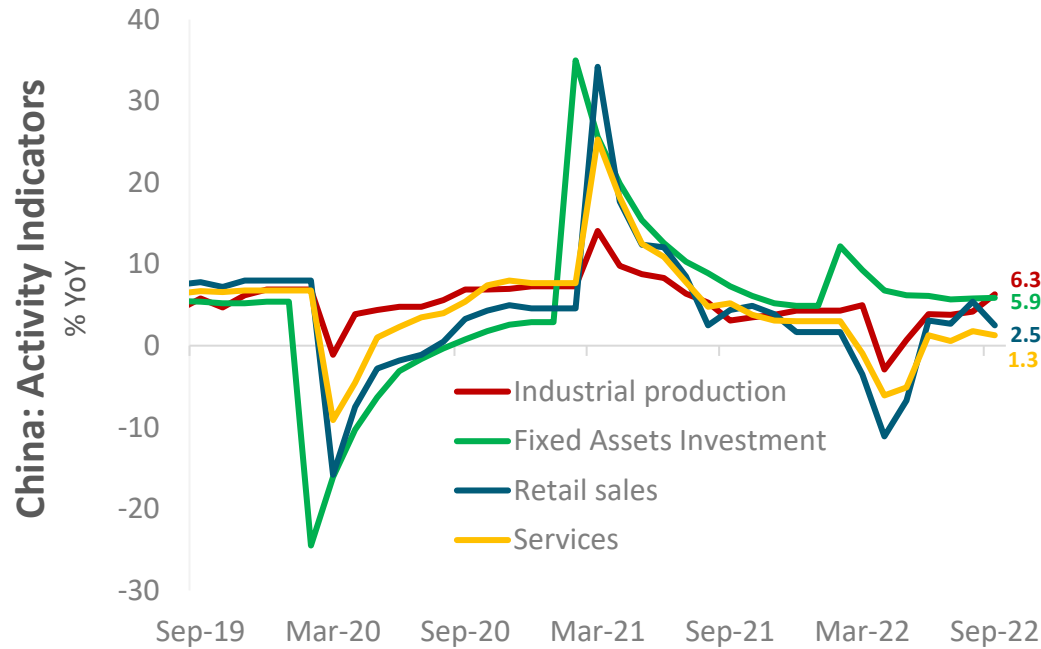
Sources: Bloomberg, Refinitiv, BCB.

MONETARY POLICY PRICING			
Country	Rate (%) <small>last decision</small>	11/11/2022	
		6M pricing b.p.	1Y pricing b.p.
AEs			
USA	3.88 ↑	+108	+76
Canada	3.75 ↑	+56	+20
Euro area	1.50 ↑	-139	-144
UK	3.00 ↑	-145	-159
Australia	2.85 ↑	+75	+81
New Zealand	3.50 ↑	+156	+138
Japan	-0.10 ⇄	+9	+20
EMEs			
Mexico	10.00 ↑	+68	-38
Chile	11.25 ↑	-214	-542
Brazil	13.75 ⇄	+66	-12
Colombia	11.00 ↑	+152	+125
Russia	7.50 ↓	+161	+126
South Africa	6.25 ↑	+91	+140
China	2.00 ↓	+23	+41
India	5.90 ↑	+73	+59
Korea	3.00 ↑	+19	+10

Signs of economic slowdown in the global economy. In the US, labor market is still tight.



Positive surprises in 3Q2022 GDP, but signs of economic slowdown in China. The real estate sector is highly relevant to GDP and to households' wealth.

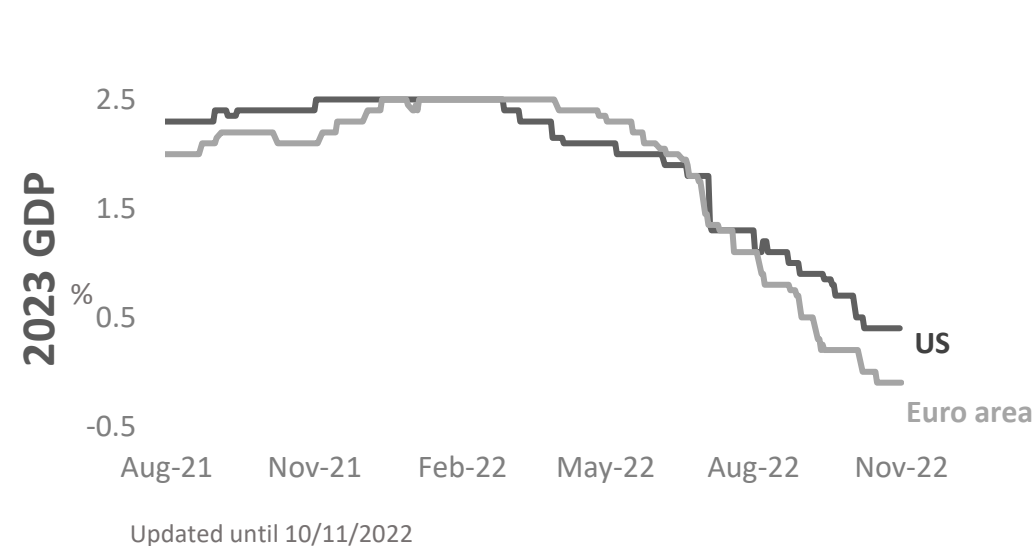
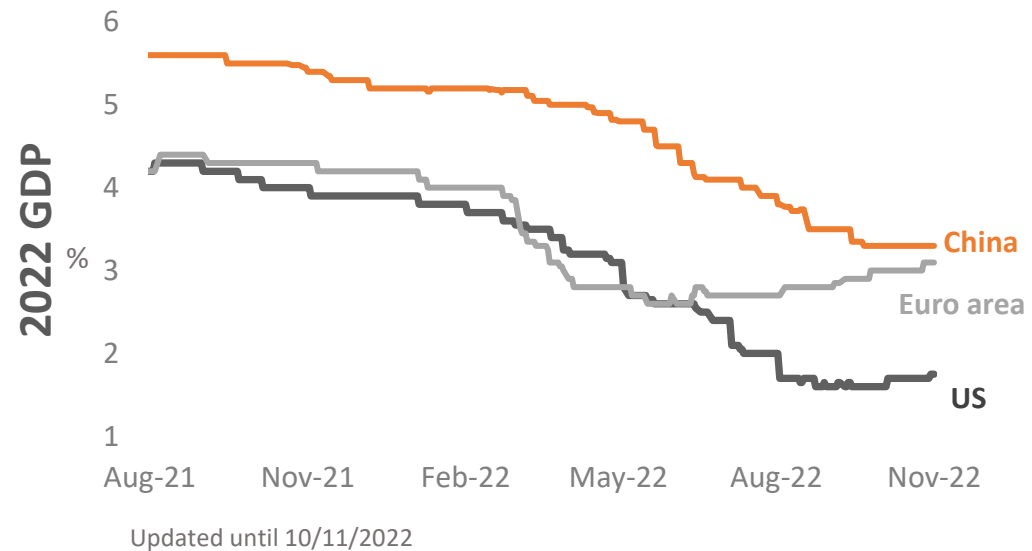
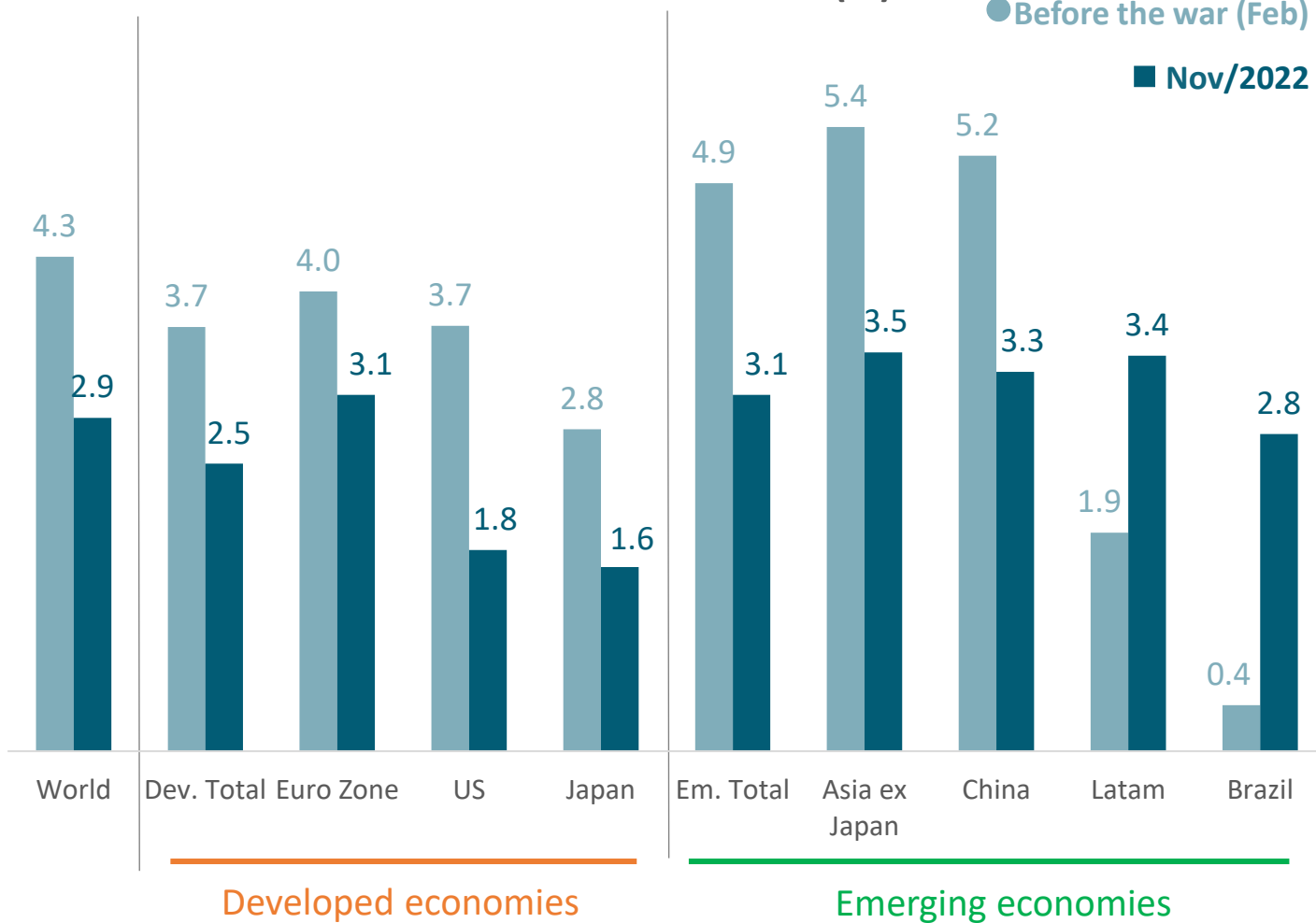


*Percentage of each group in the sum of the valuation of the three assets.

Sources: Rogoff, Kenneth, and Yuanchen Yang. 2021. "Has China's Housing Production Peaked?" China and the World Economy 21 (1): 1-31, BLS, Bloomberg.

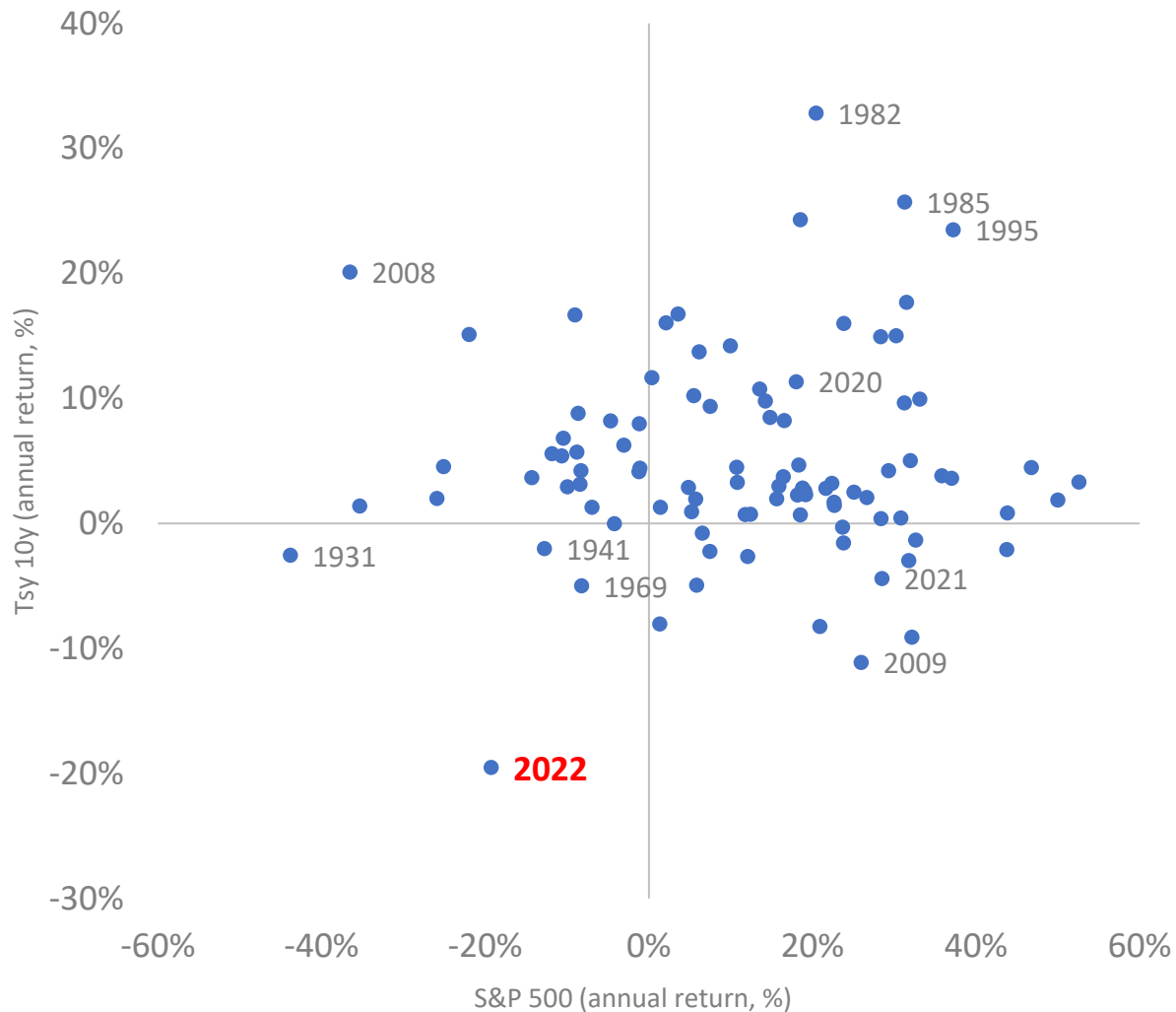
Drop in 2022 GDP forecasts. Brazil is an exception.

2022 GDP Forecasts (%)

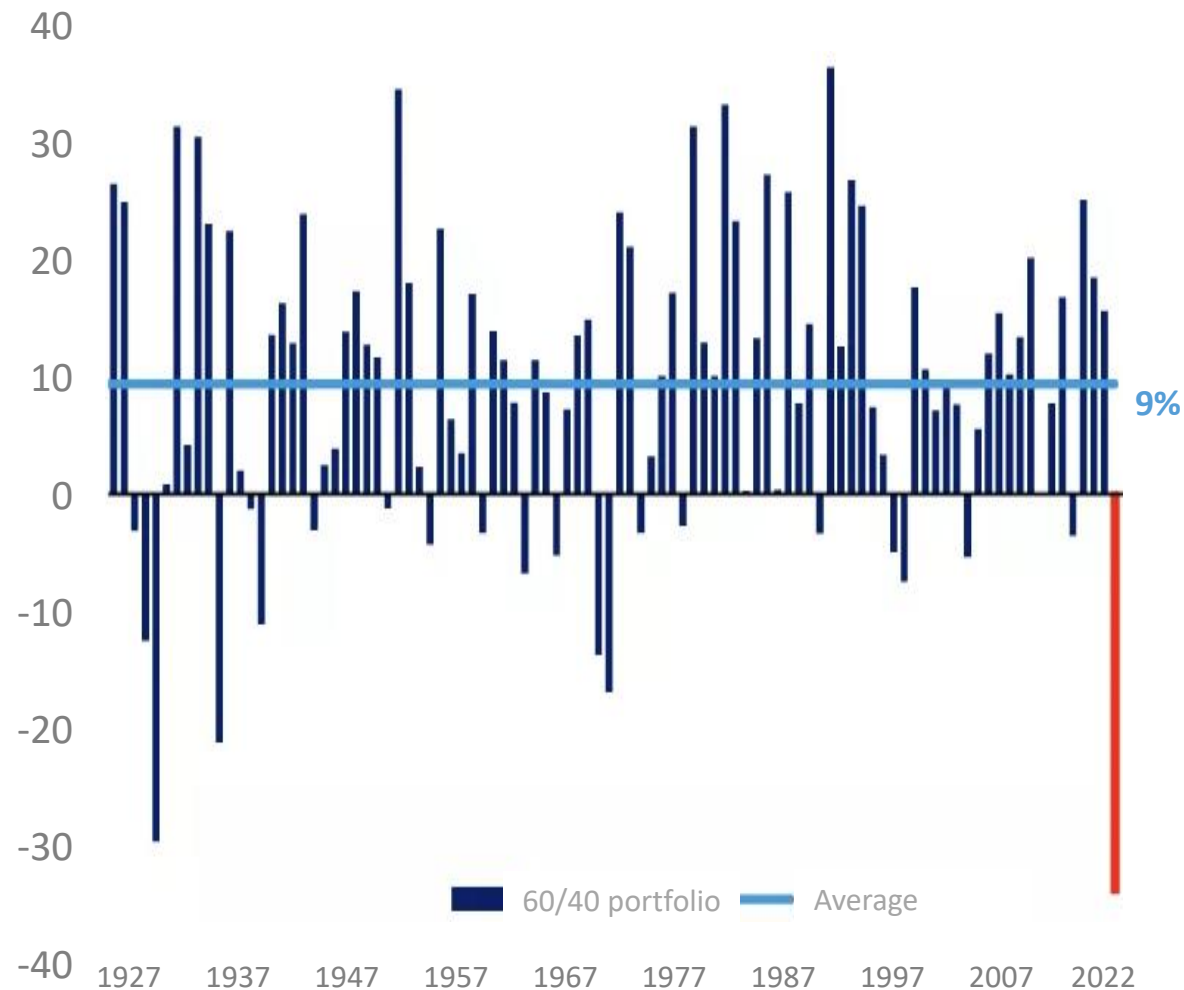


Source: Bloomberg and BCB Focus Report (median of the last 5 days)

Stocks vs. bonds
(1926-2022)

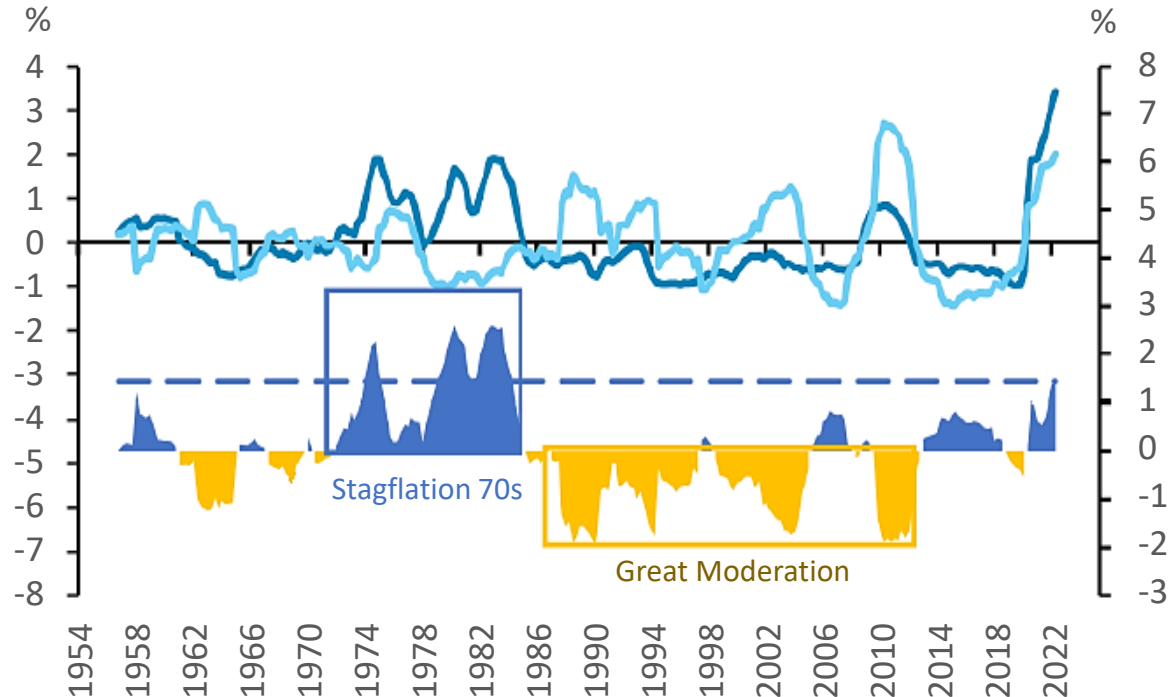


Annual 60/40 portfolio performance



Sources: Barclays, BBG.

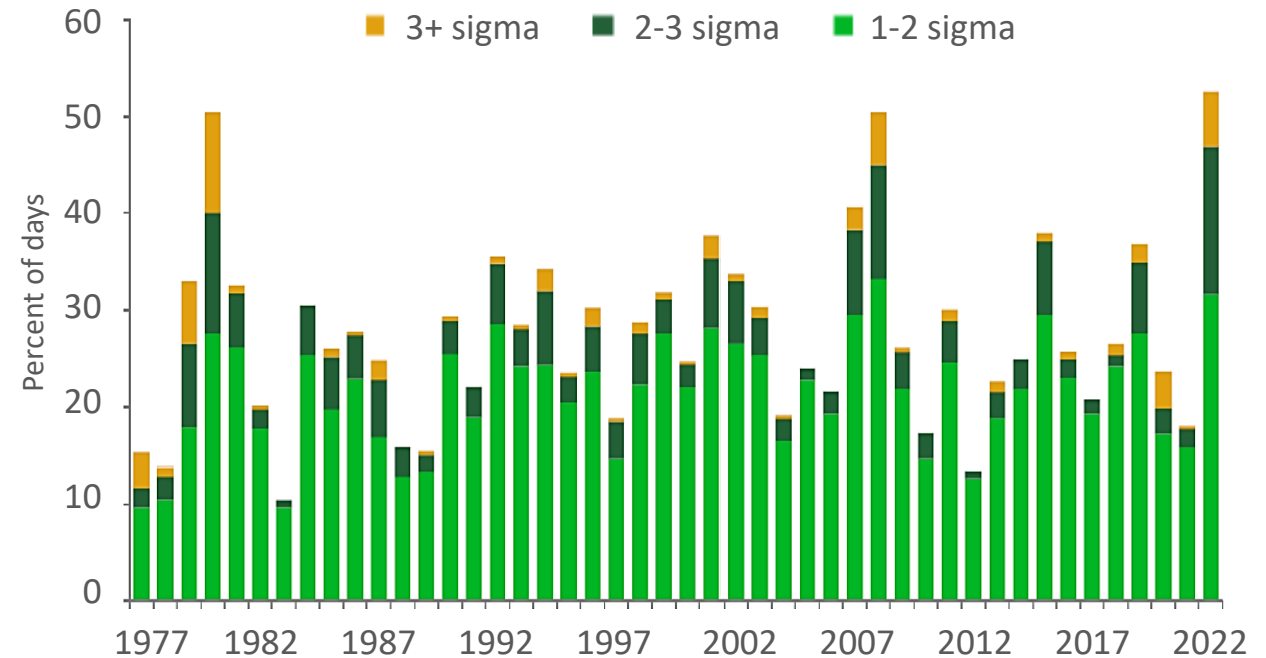
Macro volatility x Equity fundamentals volatility



■ Equity fundamentals vol. dominates (rhs) — GDP + Inflation vol. (Macro vol.)
■ Macro vol. dominates (lhs) — S&P Earnings + Multiples volatility
— (Equity fundamentals vol.)

Obs.: Quarterly data. Macro vol. = average z-score of GDP CQoQ + CPI YoY volatility
 Equity fundamentals vol. = average z-score of trailing realized earnings + PE ratio.
 Volatility is calculated using a rolling 3years window.

Treasuries volatility

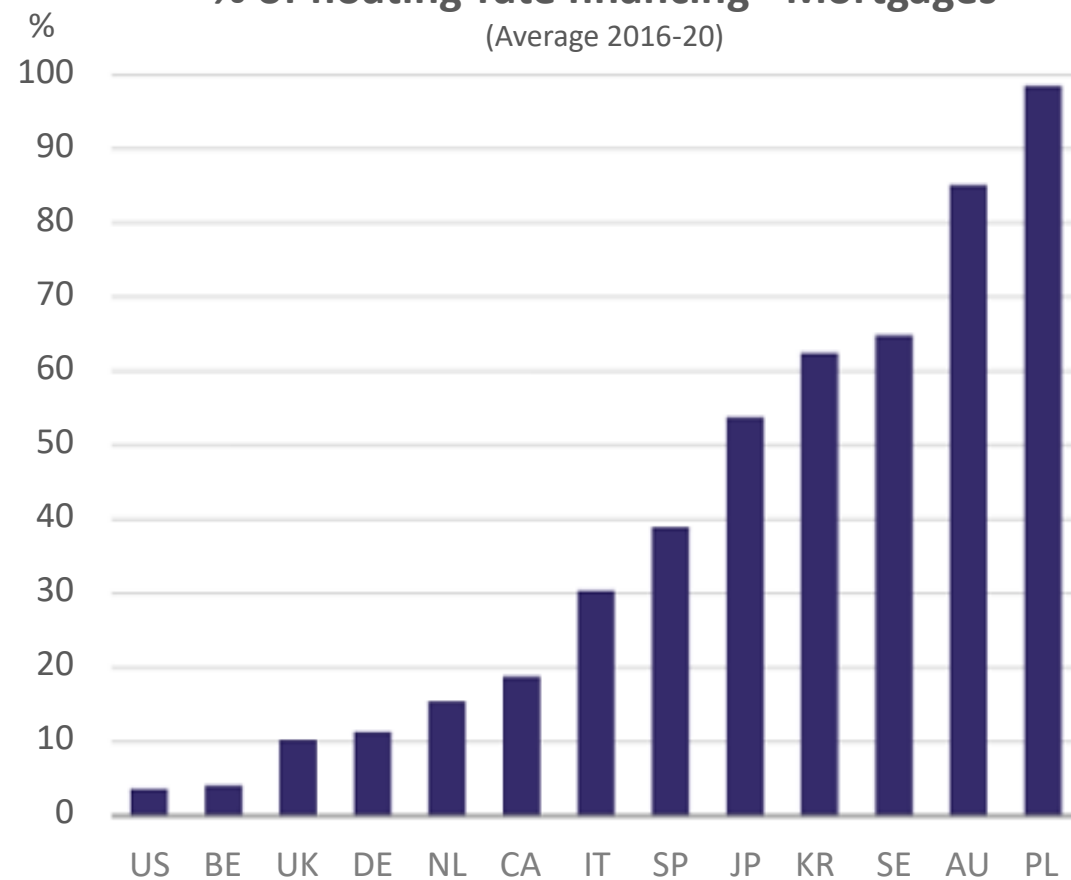


Obs.: Sigma refers to standard deviation of daily changes in 10y Treasury yields over a rolling 24-months period. 2022 data is year-to-date.

U.S. Mortgage rates 30y



% of floating-rate financing - Mortgages (Average 2016-20)

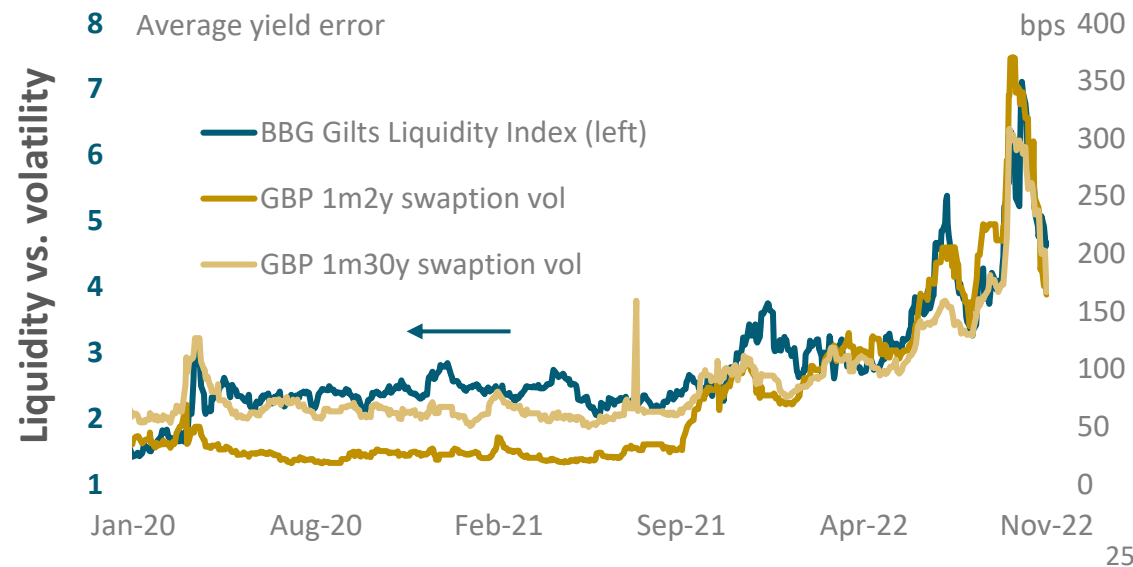


Market reaction in UK is a clear sign for policy makers.

Government interest payments
(share of GDP)



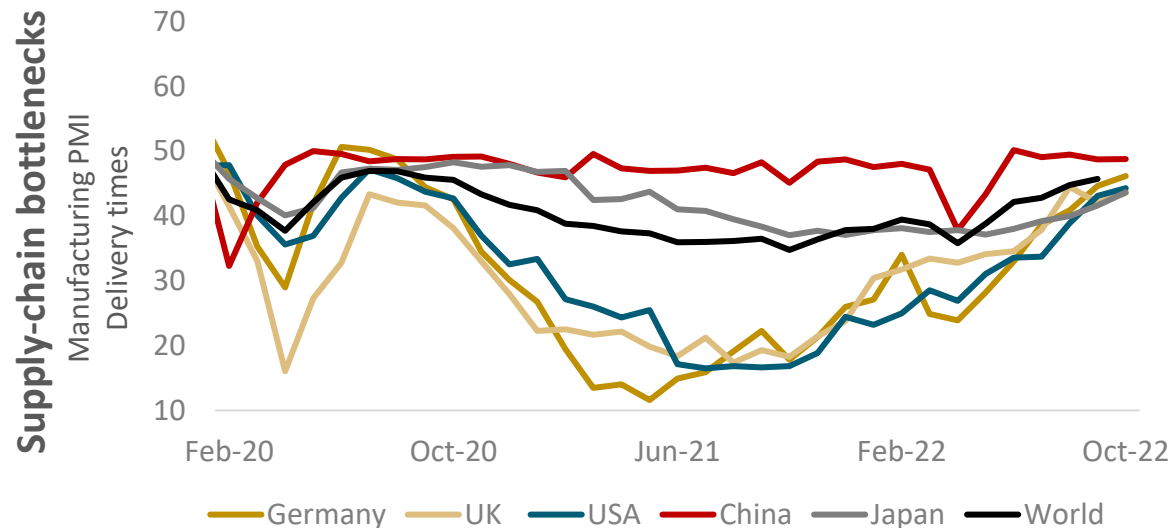
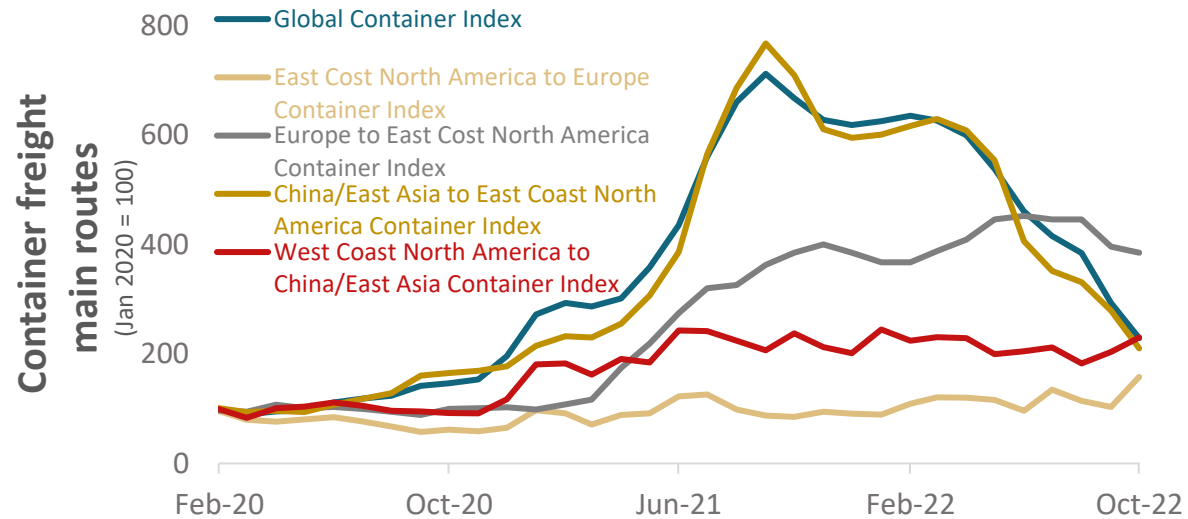
Sources: Gavekal, Bloomberg



Some relief in existing sectoral bottlenecks: freights and delivery times.

Supply Pressures on Inflation

2021 2022
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr Mai Jun Jul Aug Sep Oct



Tension between China and Taiwan increases uncertainty and harms long-run investment decisions, which are essential for the stability of supply.

Semiconductors Index*

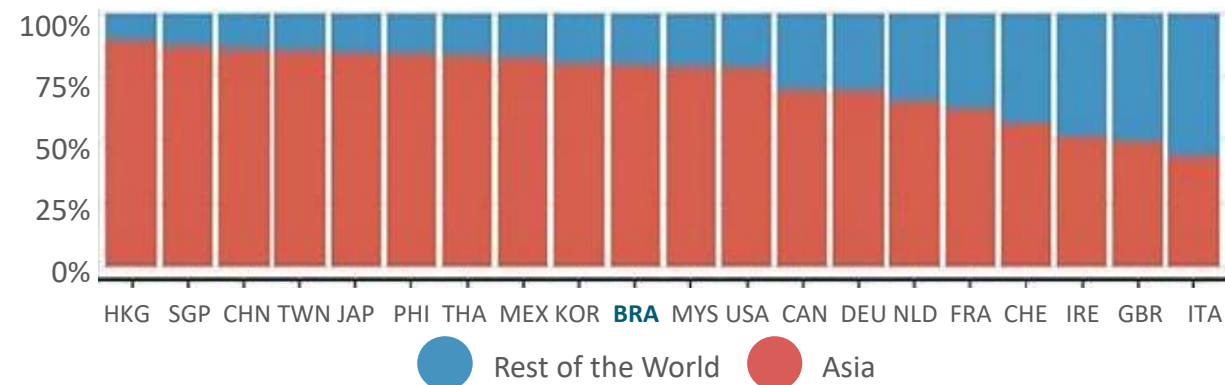
(Dec 1993 = 100)



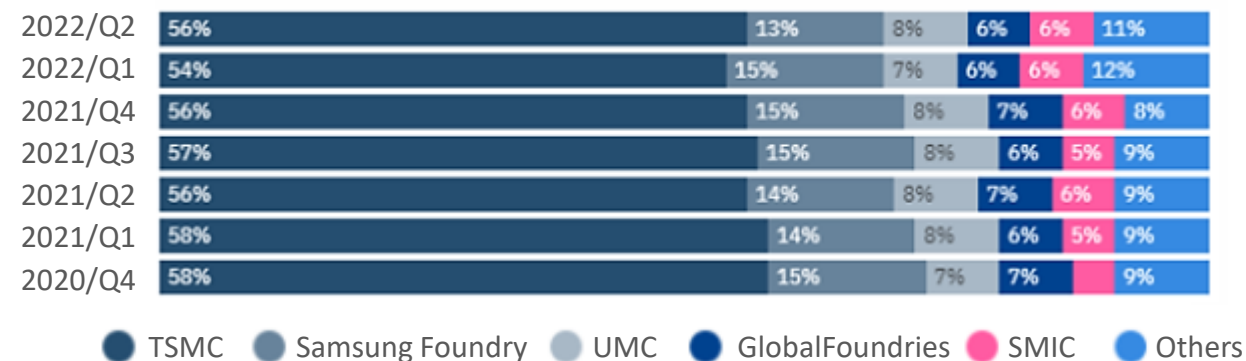
*Philadelphia Stock Exchange Semiconductor Index

Dependence on imported semiconductors

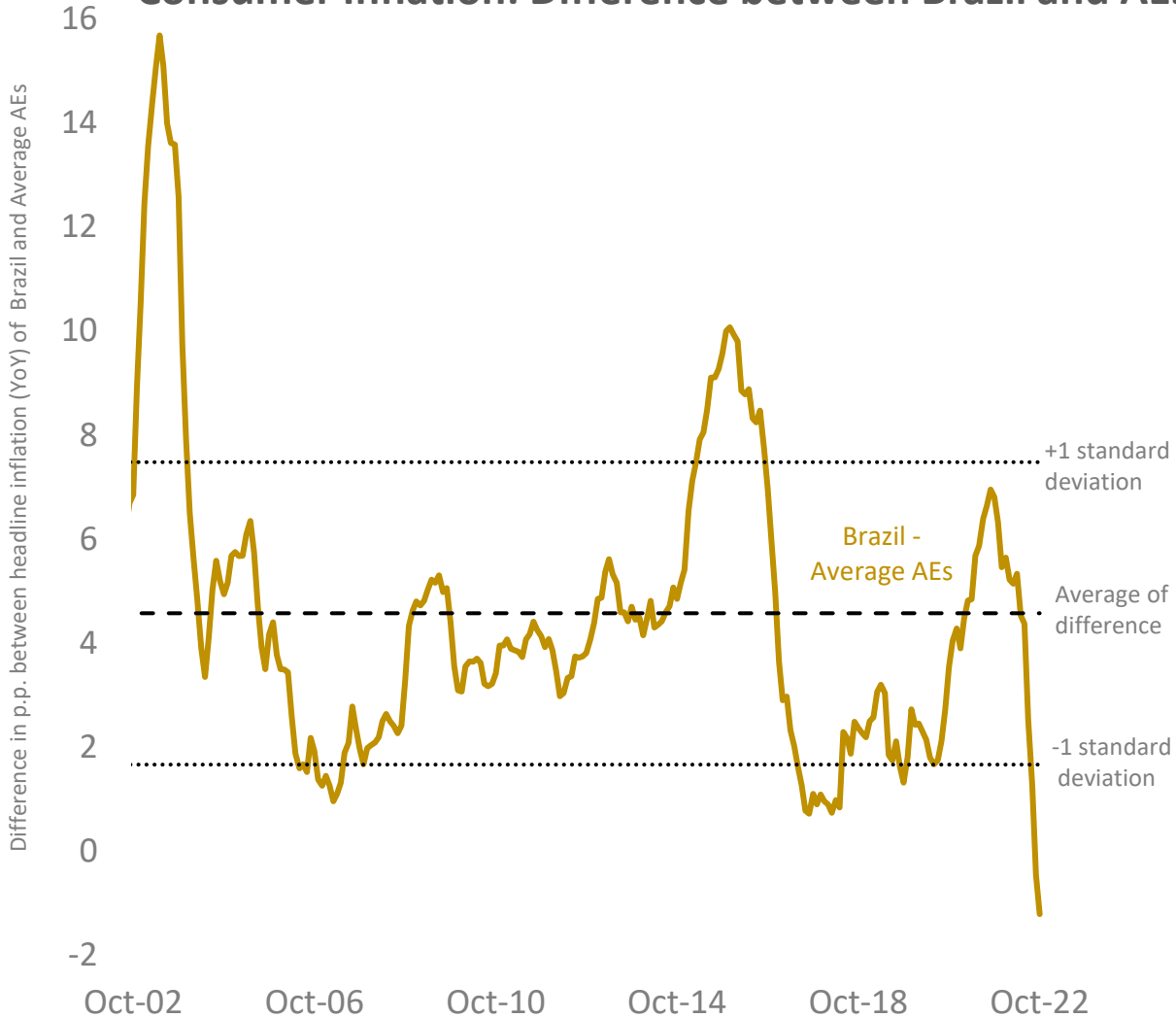
(seven selected segments of industry)



Semiconductors Manufacturing: Market Share

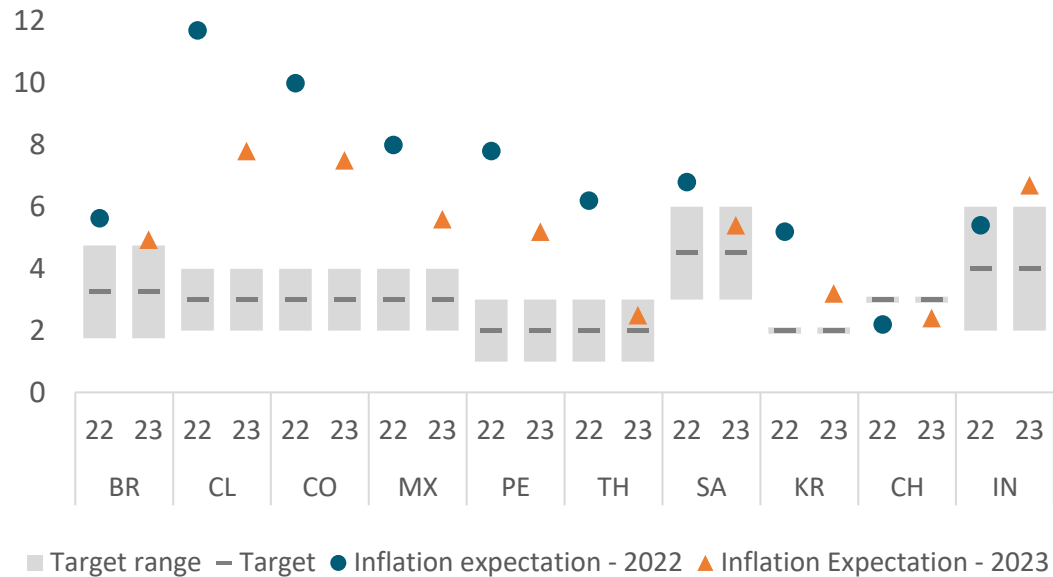


Consumer Inflation: Difference between Brazil and AEs

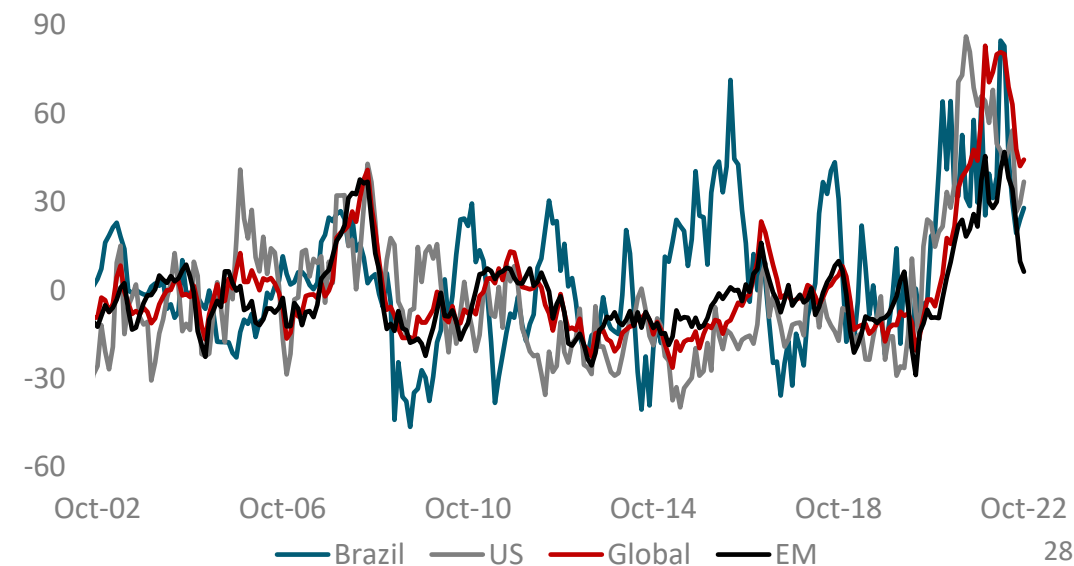


Sources: Bloomberg, Citibank, BCB (Focus Report).

EMEs: Inflation expectations 2022 e 2023 vs. target



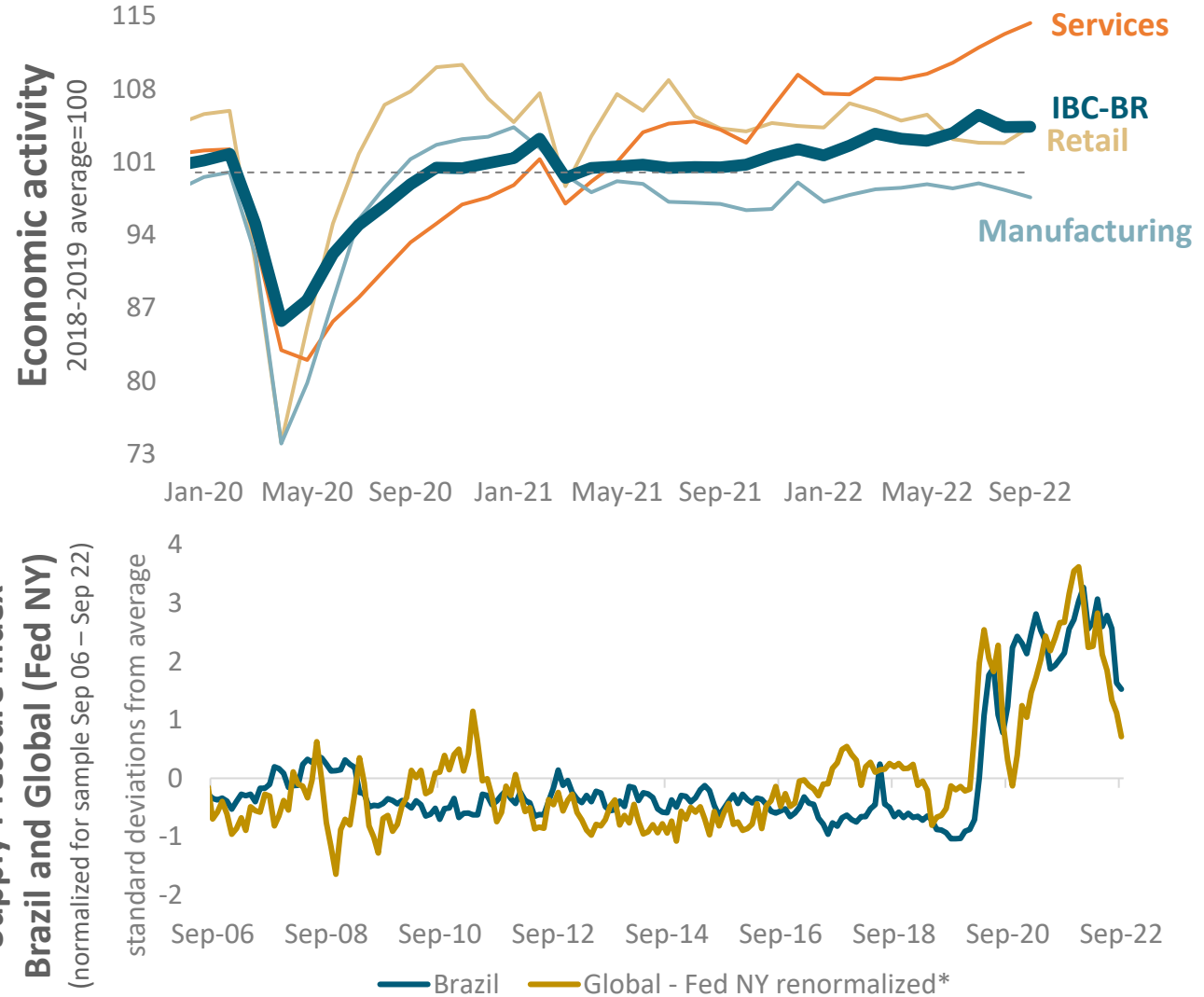
Inflation Surprise Index



250th Copom Meeting – October 2022

- Considering the assessed scenarios, the balance of risks, and the broad array of available information, the Copom decided to maintain the Selic rate at 13.75% p.a.
- The Committee judges that this decision reflects the uncertainty around its scenarios for prospective inflation, an even higher-than-usual variance in the balance of risks, and is consistent with the strategy for inflation convergence to a level around its target throughout the relevant horizon for monetary policy, which includes 2023 and 2024.
- The Committee will remain vigilant, assessing if the strategy of maintaining the Selic rate for a sufficiently long period will be enough to ensure the convergence of inflation.
- The Committee emphasizes that it will persist until the disinflationary process consolidates and inflation expectations anchor around its targets.
- The Committee reinforces that future monetary policy steps can be adjusted and will not hesitate to resume the tightening cycle if the disinflationary process does not proceed as expected.

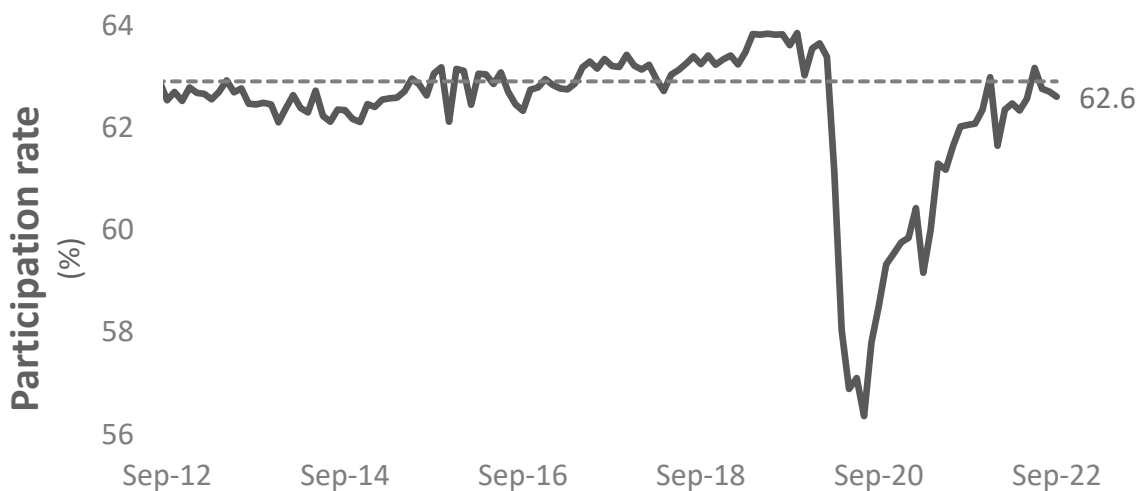
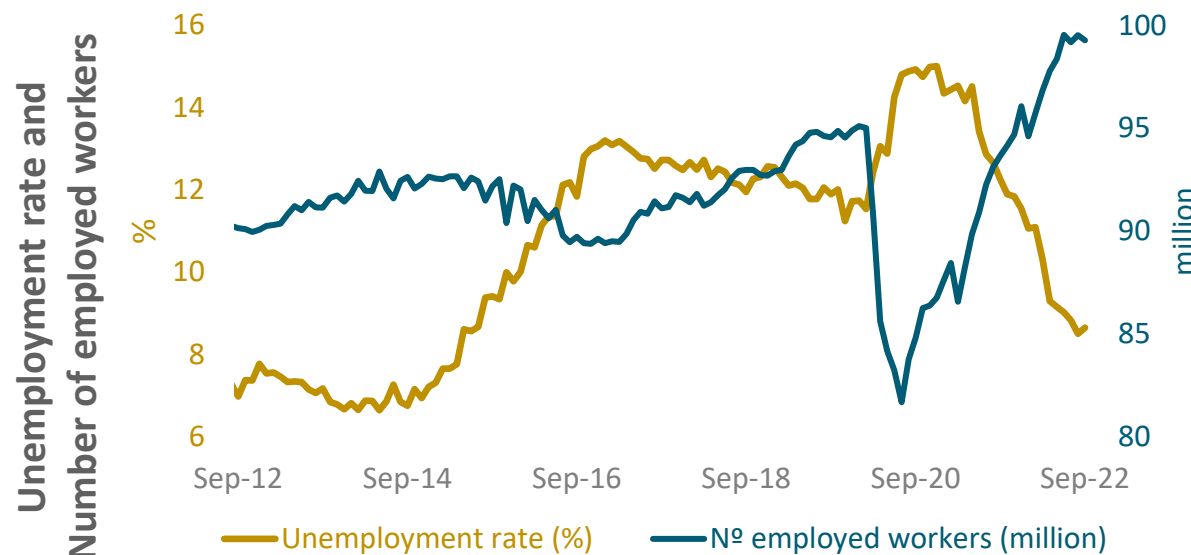
Improvements in market forecasts for GDP now gradually slower.



Sources: Focus Report (median of the last 5 days) BCB, IMF, IBGE, Fed NY.

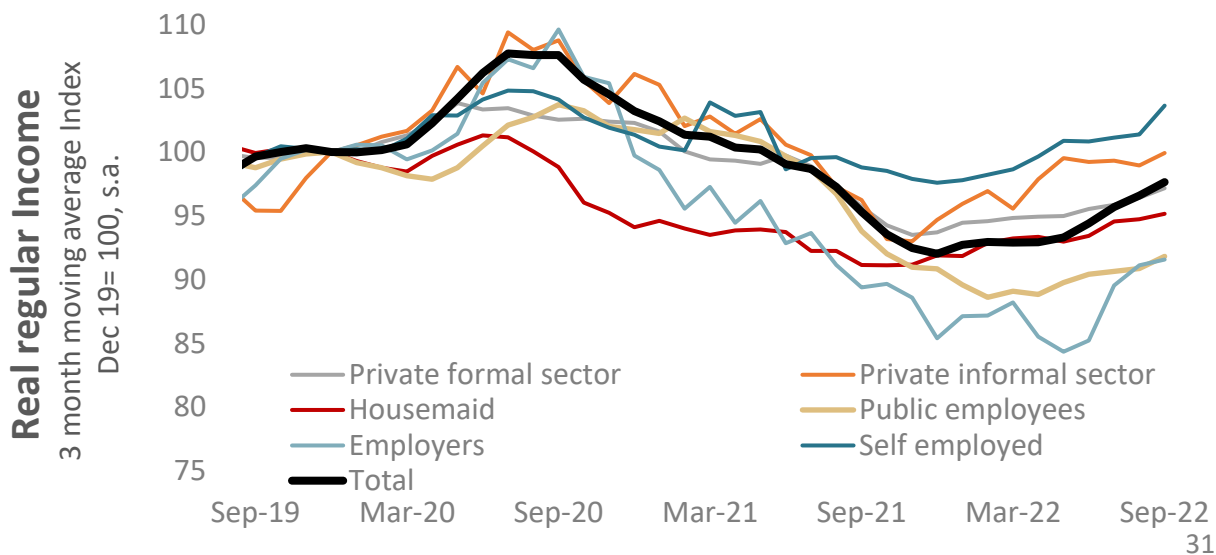
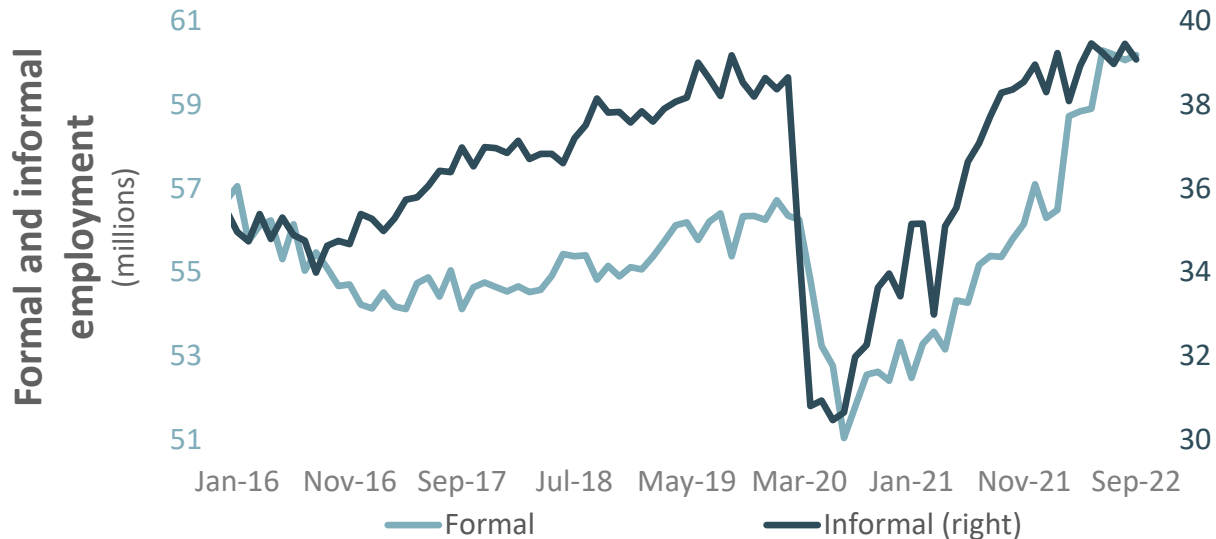
* The Fed series was normalized again to have a mean of 0 and standard deviation of 1 in the Brazilian index sample.

Consistent improvement in the labor market.



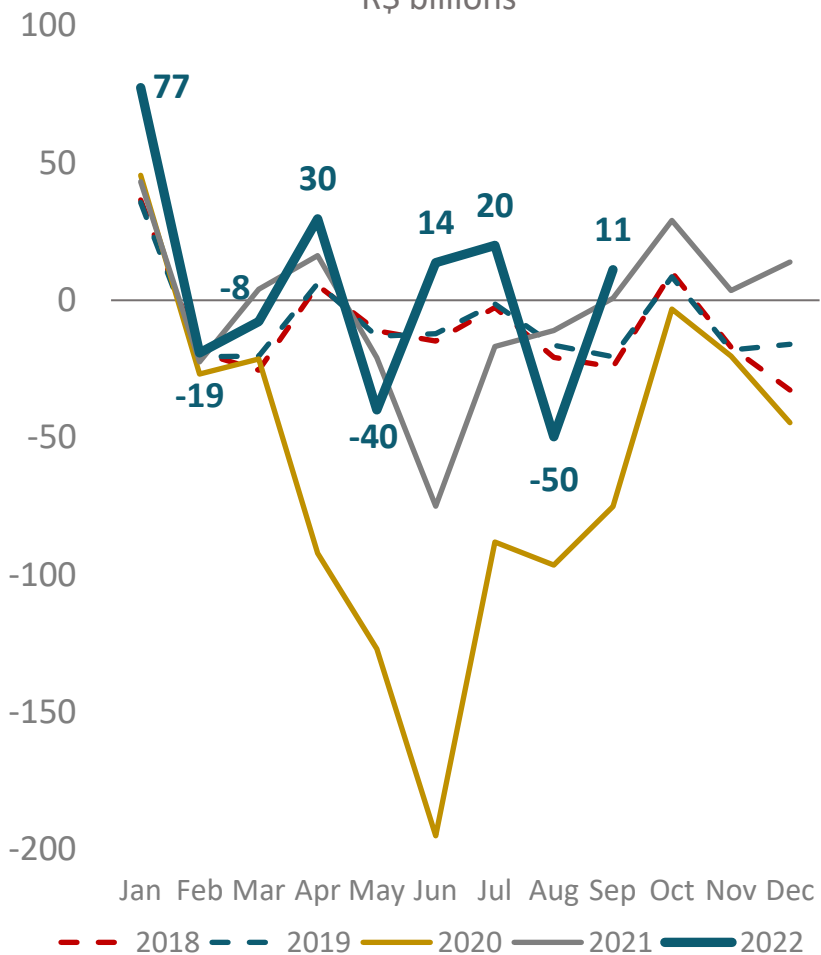
*Dashed line equals to 62.9, the average participation rate from August 2012 to February 2020.

Source: IBGE, seasonally adjusted by the BCB.



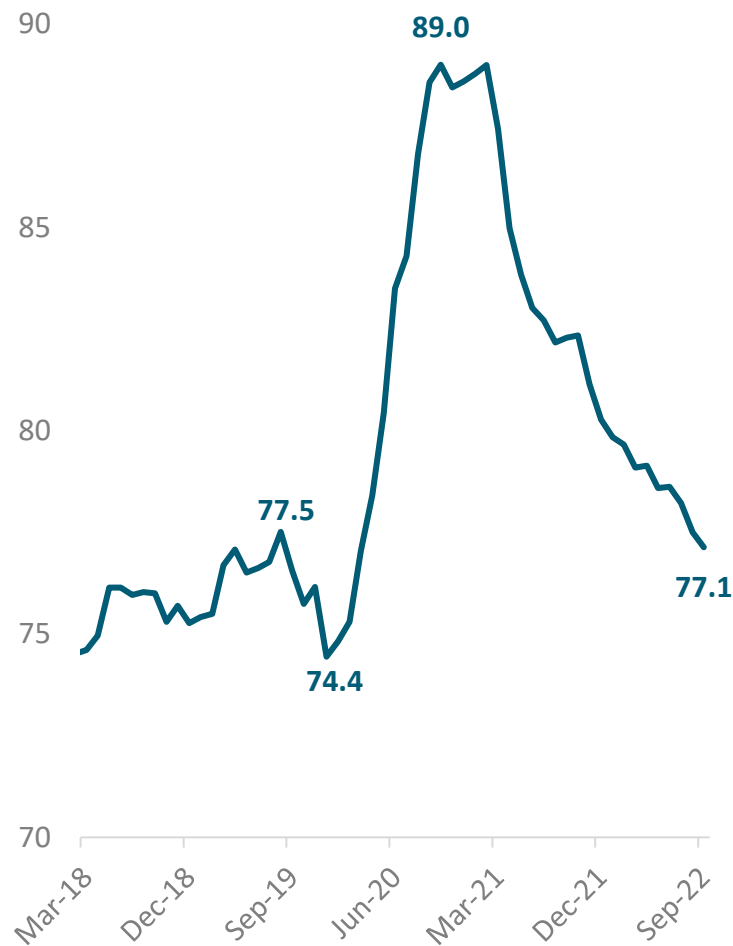
Central Government Primary Result

R\$ billions



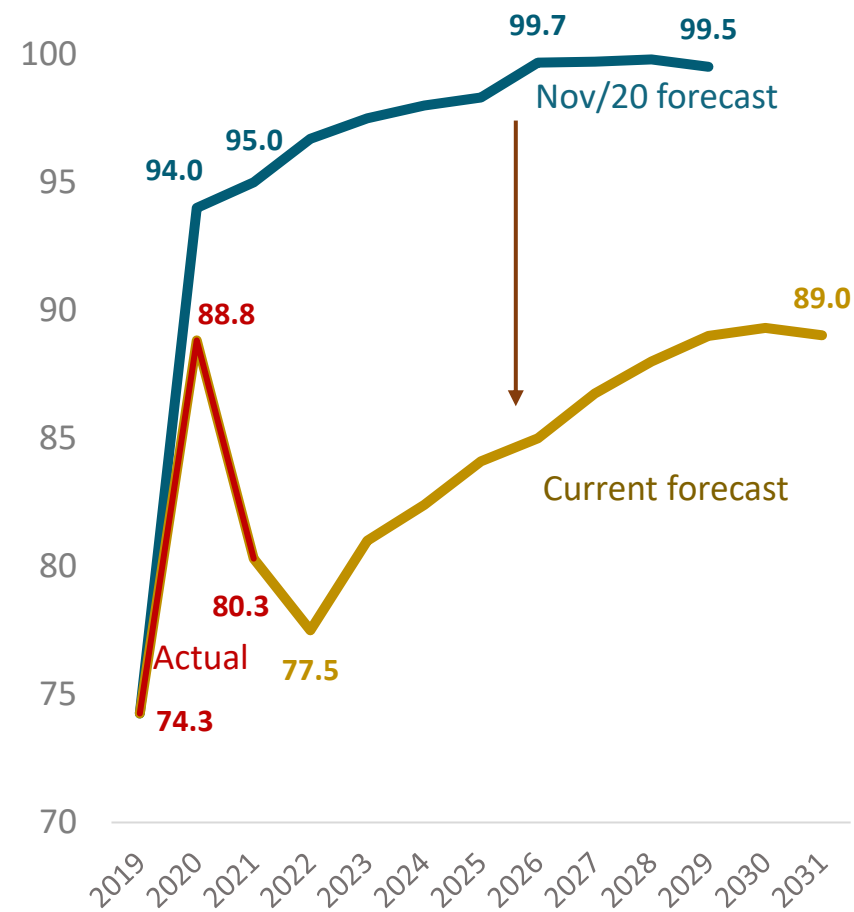
General Government Gross Debt

% GDP



Evolution of GGGD/GDP forecast

(several years, Focus* median %)

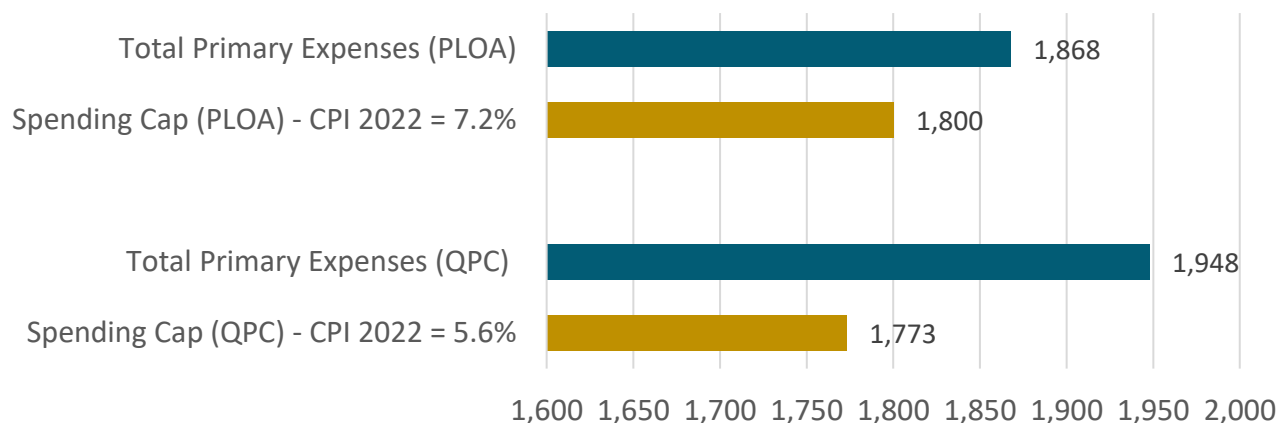


* Updated until 11/04/2022

- Pre-MPC survey of market participants (QPC) suggests that analysts expected extra-cap expenditures of around BRL 100 billion.*
- The Constitutional Amendment proposal under discussion brings BRL 175 billion in extra-cap expenditures.
- The forecast for the central government primary deficit in 2023 would increase from 0.8% to around 1.5% of GDP.
- The increase in public debt between 2022 and 2023 – from 77.7% to 81.9% of GDP – would be even larger.

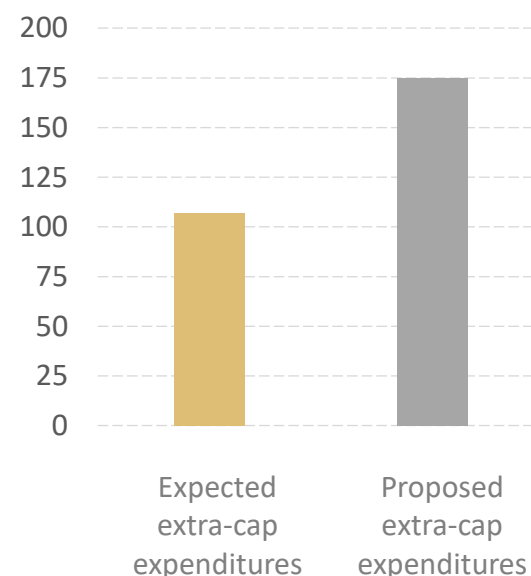
Spending Cap and Government Expenditures for 2023

(in BRL billion)



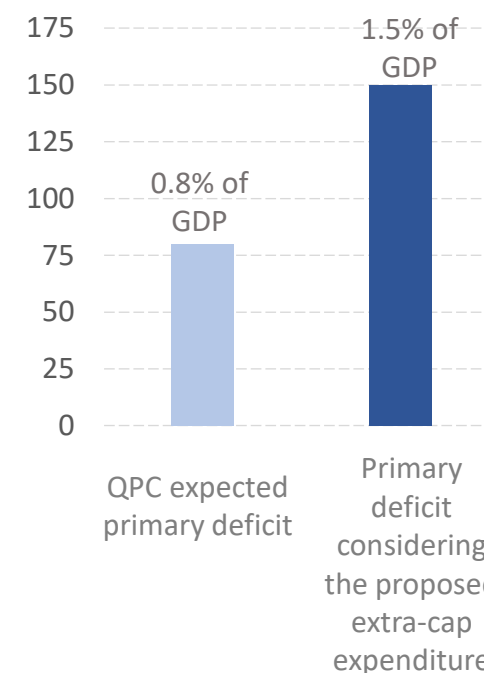
Extra-Cap Expenditures for 2023

(in BRL billion)



Expected primary deficit for 2023

(in BRL billion)



*The difference in forecasts for the total amount of primary expenditures in 2023 in QPC and PLOA is around BRL 80 billion. In addition, the difference in the assumption for inflation implies that the spending cap is BRL 27 billion lower in QPC, compared to PLOA. Therefore, the expected total amount of extra-cap expenditure in QPC is around BRL 107 billion.

Modernization of exchange rate legislation

- The new law approved establishes:
 - A modern, compact, and safe legal framework for the FX market.
- Objectives:
 - Simplify the FX legislation and improve the business environment in Brazil.
 - Ease the connections with payment systems of other countries.
- BCB launched public consultations on new rules.



What is happening in the digital world



- People look for a digital representation of value
- Assets are becoming encrypted
- Distributed ledgers allow assets to be verifiable and transferable, with divisibility

So, what is the real debate?

- Are we moving towards a tokenized economy?
- Tokenizing assets for negotiation is the main transformation
- To extract value from an asset in its digital form
 - Art, pictures, properties, ideas and even money

Metaverse

W6C9A6L26

Even virtual reality is being monetized



It's only the beginning!

If the tokenization thesis holds true, then the 21st Century may see the creation of regulated, global, token-based, multi-asset networks*

* The Regulated Internet of Value, Citi's Digital Policy, Strategy and Advisory, Jun/21.



Technologic Agenda

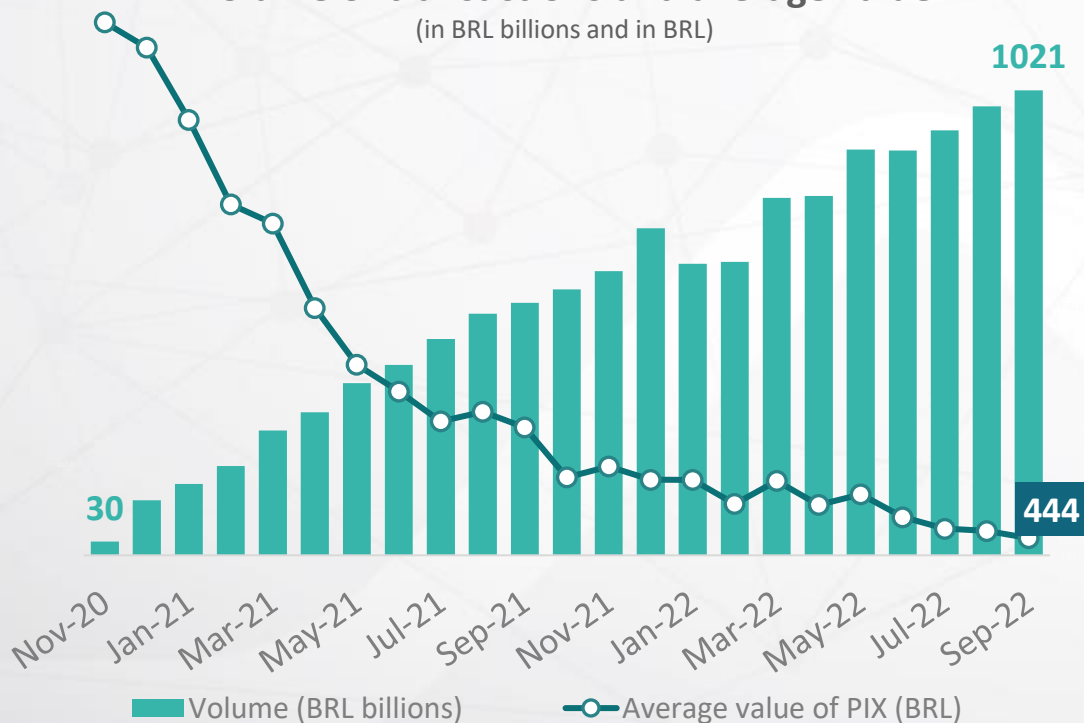
Pix gains space and becomes popular



Pix keys
(in millions)
Total : 523.2 mi
in October/2022

Volume of transactions and average value

(in BRL billions and in BRL)



Features already in use

- Payment initiator (initial operations)
- Instant Payment Account Remuneration

Products/Features 2022-2023

- Direct Debit
- Non-Priority Settlement
- Electronic bill payment (standardized file specification)

Products under design

- Pix Internacional (cross-border payments)
- Offline payments
- Pix Garantido/Crédito
- International cooperation
 - Colombia, Uruguay

Future

Agenda in evolution

openfinance



- Implementation will be gradual

Goals:

- To promote **competition, efficiency and data safety**
- Proper **balanced conditions** between existing financial institutions and new players

Open Finance in numbers:

- **Over 12** million customer data sharing consents.
- Average of **over 350 million** API calls (phase 2) in the last weeks.
- **Over 8 billion** API calls (phase 2).
- **Over 800** participating institutions (phases 2 and 3).



Digital Brazilian Real



Focus

Use cases

- DeFi protocols
- DvP, PvP
- IoT

Infrastructure

- Interoperability, Scalability
- Programmability, Privacy
- Accessibility, usability

Next step

Pilot projects



Real Digital



Selected proponents

Aave

Banco Santander Brasil

Febraban

Giesecke + Devrient

Itaú Unibanco, B3 and R3

Mercado Bitcoin, Bitrust and CPqD

Tecban and Capital

VERT, Digital Assets and Oliver Wyman

Visa do Brasil, ConsenSys and Microsoft

Use cases

DeFi – Liquidity pool

DvP – Real assets

DvP – Tokenized securities

Dual offline

PvP – Brazil and Colombia

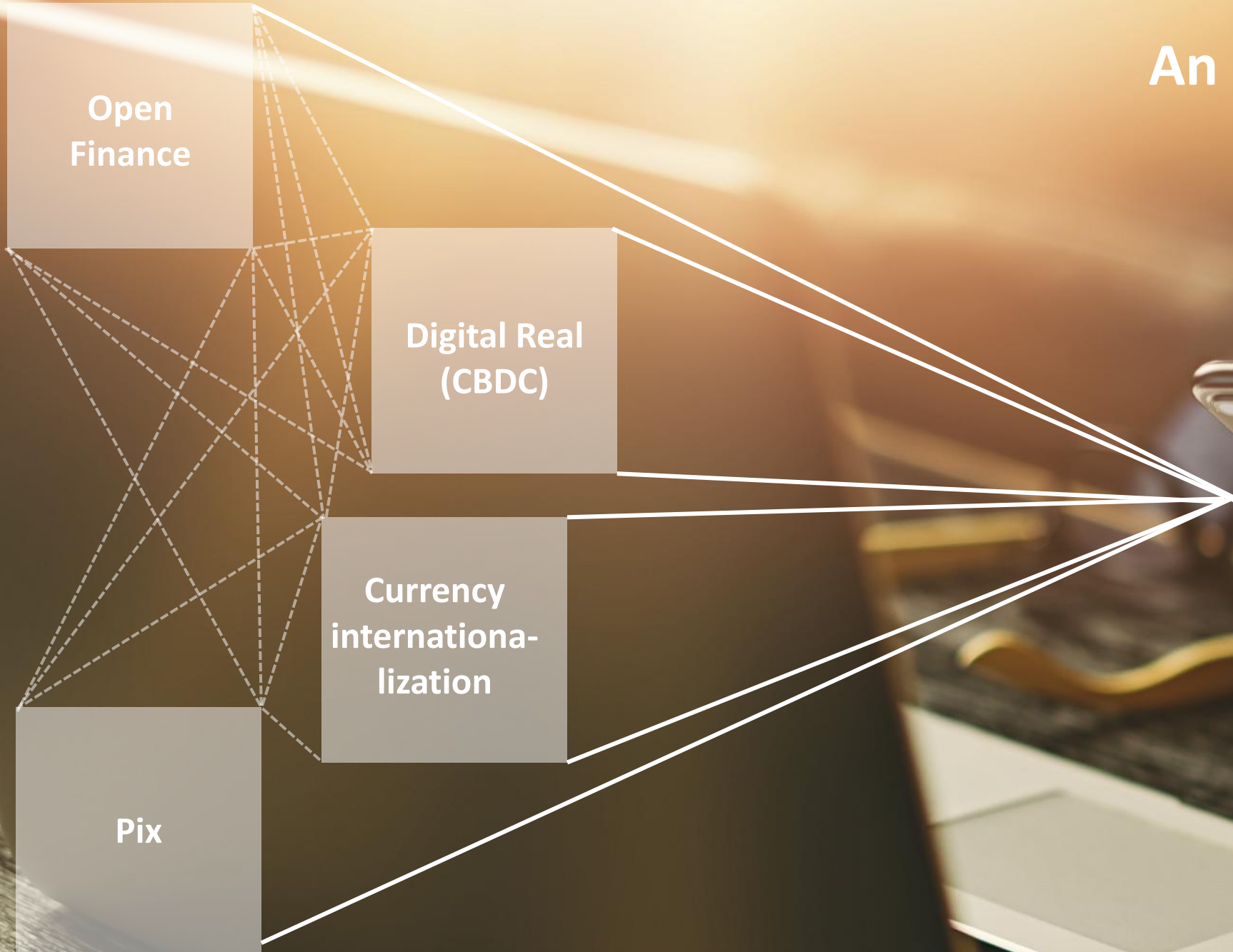
DvP – Digital assets (crypto)

IoT – Smart lockers/e-commerce logistics

Programmable money – funding for rural activity

Defi – funding for SMEs

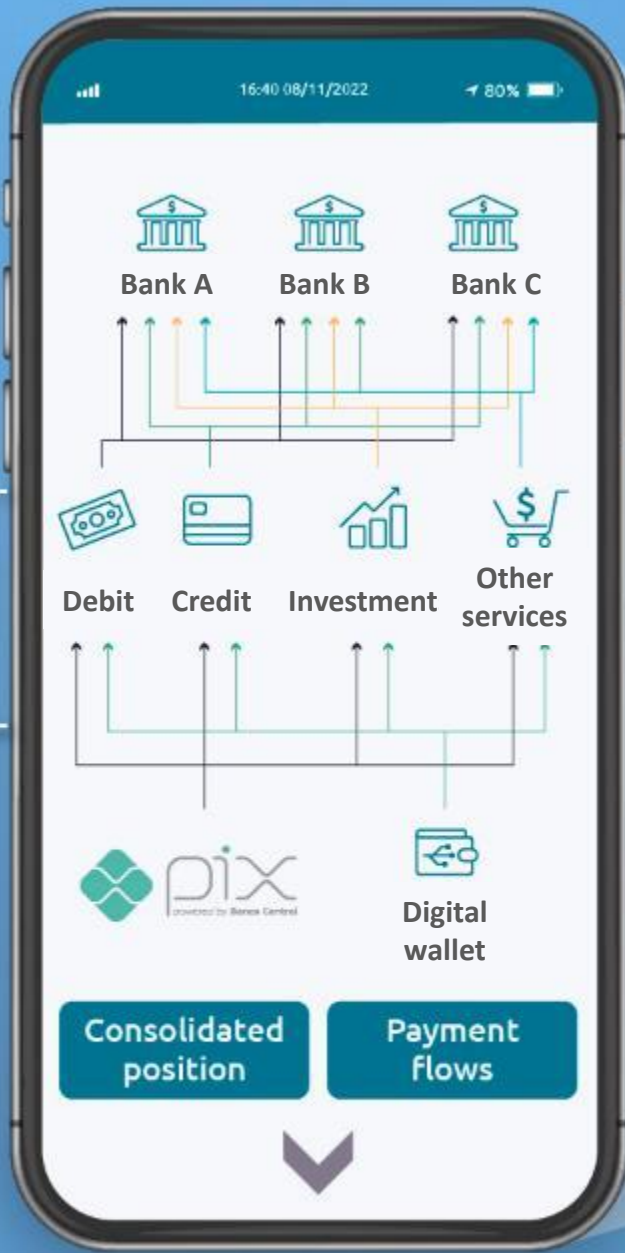
An integrated agenda



Financial services aggregator: an example

Offline

Online



Data wallet





BC# Sustainability

Measures:

- BCB's S&E Responsibility
- Partnerships
- Policies
- Supervision
- Regulation

Thank You!

Roberto Campos Neto
Governor of Banco Central do Brasil
November 15, 2022



**BANCO CENTRAL
DO BRASIL**

