Aftershocks

An Economic Outlook for 2023

Federal Reserve Bank of Chicago Economic Outlook Seminar
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Carl Tannenbaum
Chief Economist
Northern Trust

@NT_CTannenbaum

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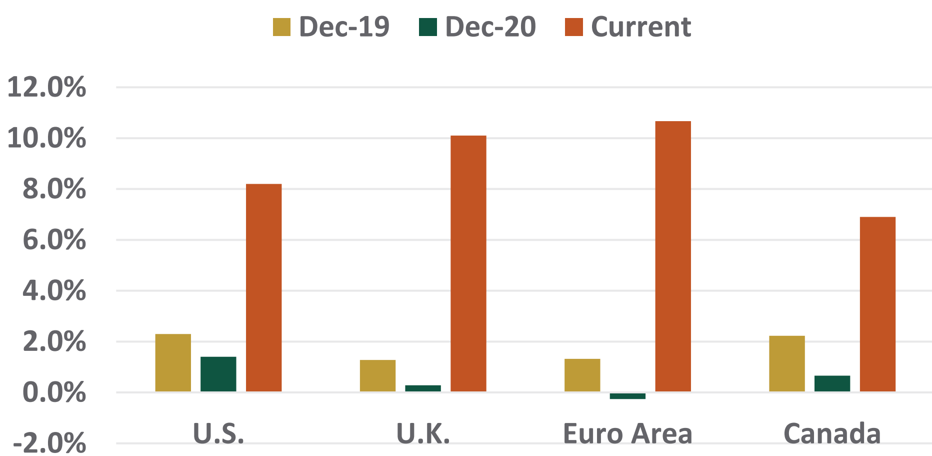
INFLATION: FROM DORMANT TO DOMINANT

Year Over Year Inflation (CPI)



Sources: Bloomberg, Haver Analytics. Data as of October 2022.

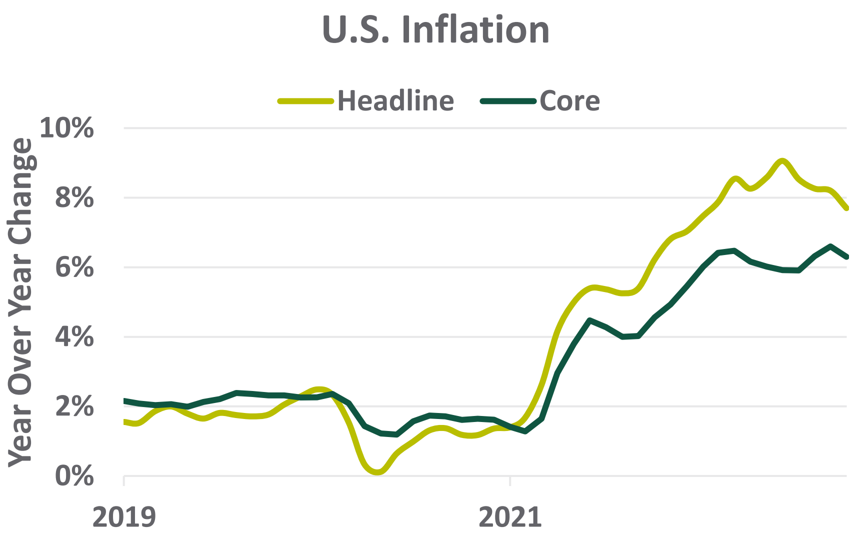
Key Messages

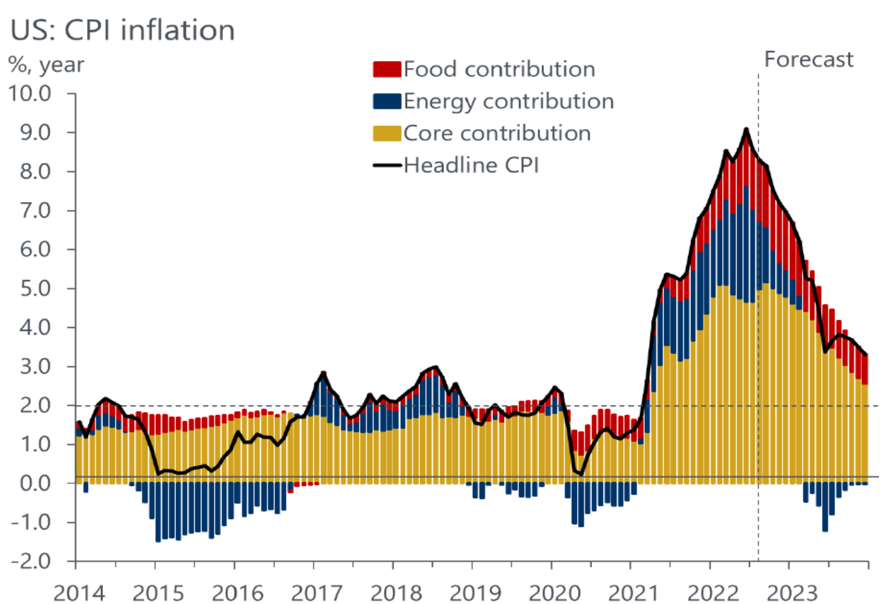
- Prior to the pandemic, Inflation was thought to be in secular decline
  - — Long periods running below to central bank targets
  - — Factors like e-commerce, technology, demographics, and global sourcing were credited for providing discipline
  - — Nervousness about anchoring expectations at too low a level
  - — Central banks changed operating models to encourage overshoots
- ➢ ***Central banks were more worried about deflation***
- Even after the pandemic recovery began, inflation forecasts were slow to react
  - — Early characterization of "transitory" proved unfortunate
  - — Was anchoring at play?
- ➢ ***Very few observers saw this coming***

WHAT EVERYONE MISSED

- Pandemic-related fiscal programs were excessive
  - Only visible in retrospect
- Supply chains have been impaired
  - Healing is evident, but will they ever be the same?
- The pandemic impaired labor supply
  - Workers have gained significant leverage
- Policy kindled a renewed housing boom
  - Shelter costs will peak soon
- The war in Ukraine added stress to energy and commodities prices
  - Some recent relief

THE OUTLOOK FOR INFLATION





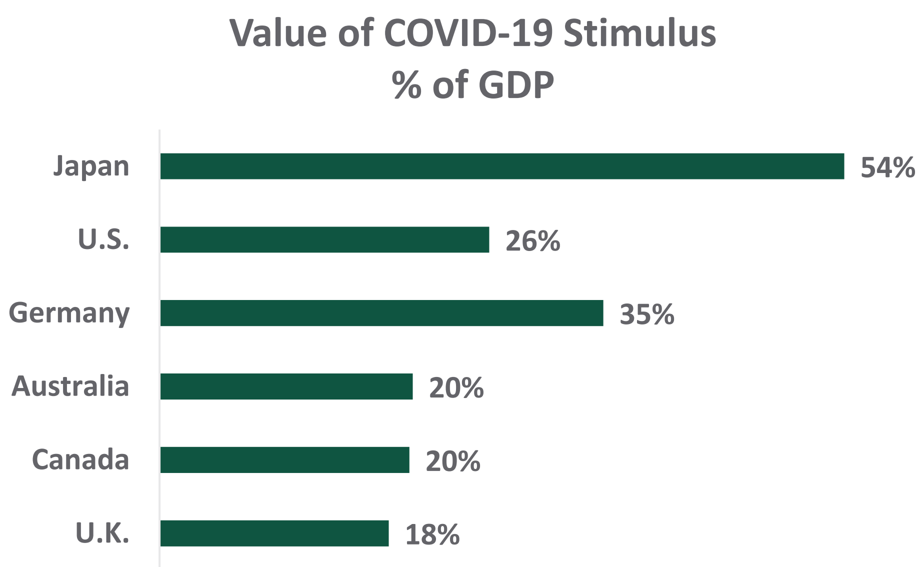
Sources: BLS, Haver Analytics, Oxford Economics. Data as of November 2022.

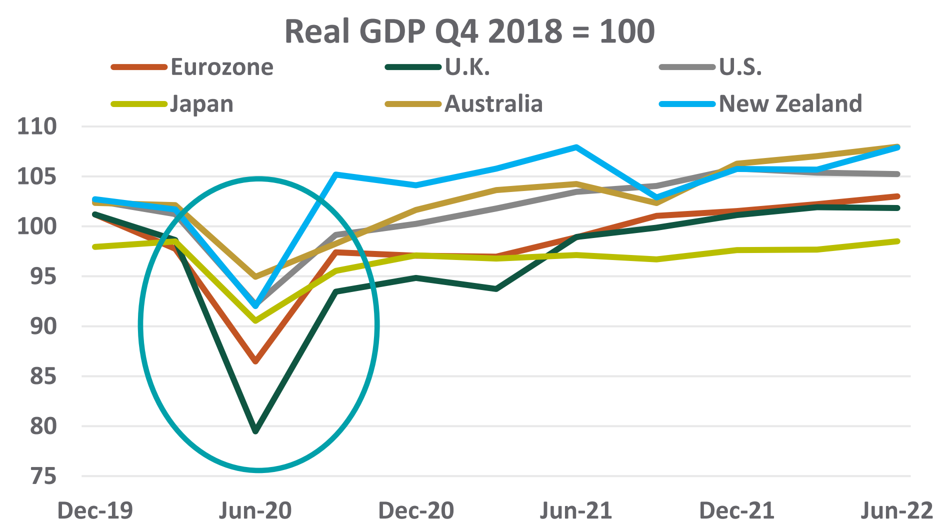
Key Messages

- Inflation is starting to turn
  - — "Headline" measure still high, but down more than 1% from its peak
  - — The "core" rate (ex food and energy) is leveling out
- We expect inflation to settle even further in the quarters ahead
  - — Bottom-up: goods, shelter, and energy prices will moderate or deflate
  - — Top-down: very slow money supply growth
  - — Firms report reduced pricing power

➢ ***Inflation could peel away more rapidly than some anticipate, but the last yards will be the most difficult***

OVERSTIMULATED





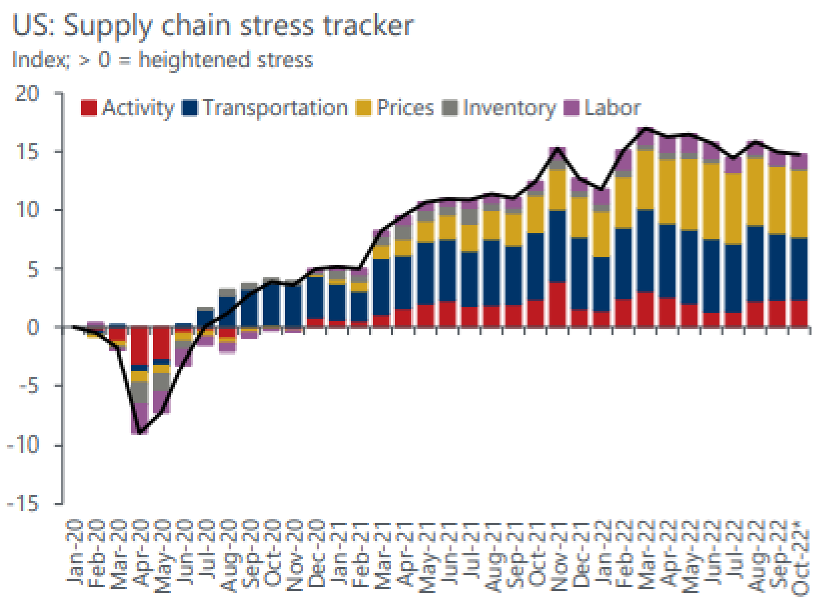
Key Messages

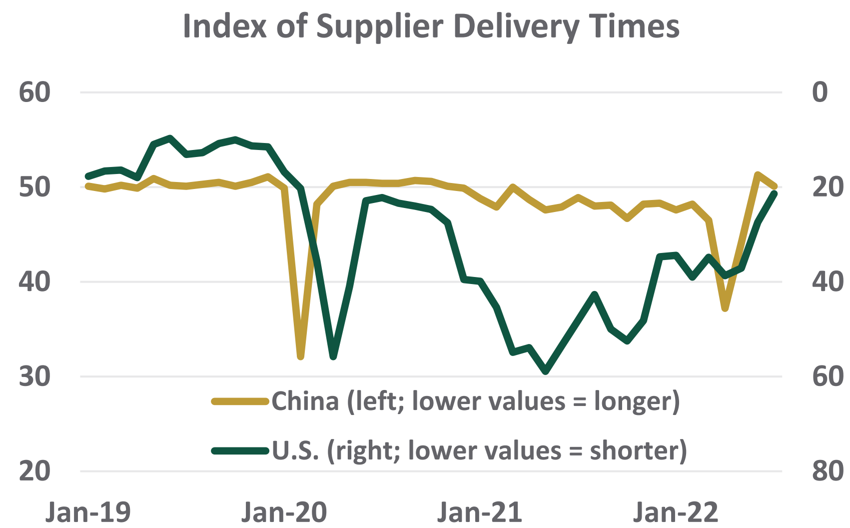
- In retrospect, pandemic-related fiscal programs were more than enough
  - — Fear of demand destruction set the tone for response
  - — During the initial months, concern centered on doing too little, not too much
  - — Programs often stressed scale and speed over intelligent design
  - — A substantial amount of GDP loss was recouped almost immediately
  - — Important amounts of stimulus remain undisbursed and unspent
- The ability to project the impact of pandemic programs on inflation was very limited
  - — Nothing comparable in the historical data

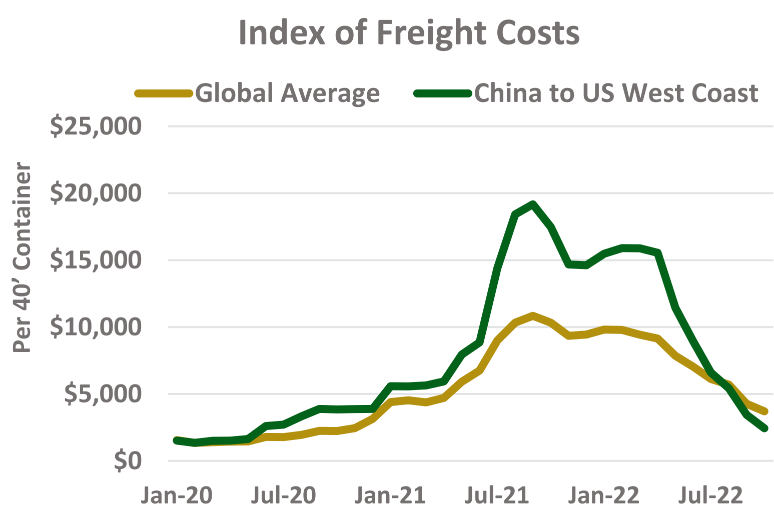
➢ ***The "fiscal impulse" has turned negative, and will stay there***

Sources: Statista, Haver Analytics. Data as of August 2022.

SUPPLY CHAINS: SIGNS OF HEALING

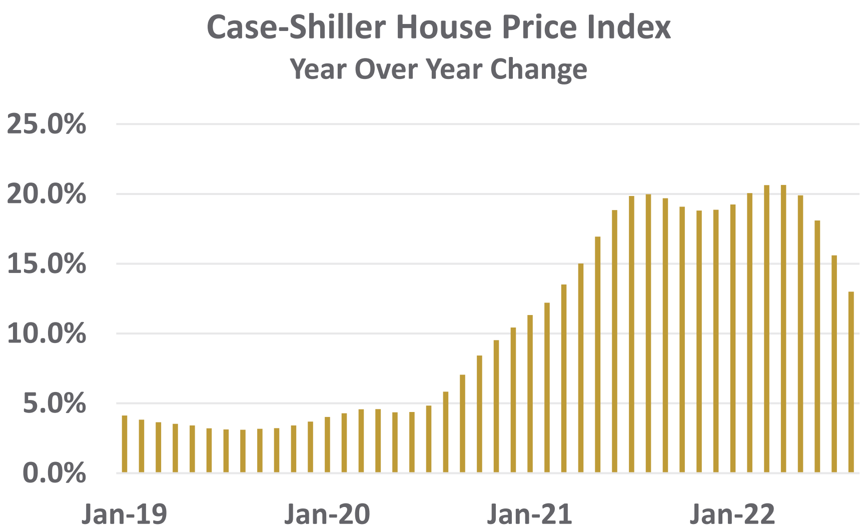


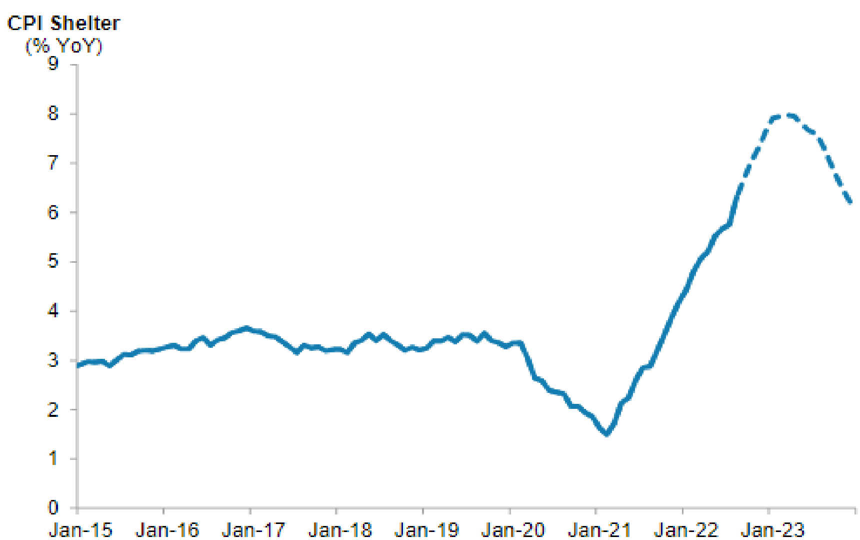




Sources: Oxford Economics, Bloomberg, Freightos, ECB. Chart data as of November 2022.

HOUSING AND INFLATION





Key Messages

- **Despite a housing recession, inflation related to housing is still rising**
  - **Home sales have fallen by about one-third since January as affordability has declined**
  - **Yet shelter, the largest component of inflation measures, has increased by 6.6% over the past year**
  - **The main reason for this is the rental cycle; most rents have yet to reflect the downturn in home values**
- **Projections suggest that the year-over-year change in shelter costs will touch 8% late this year before receding slowly**

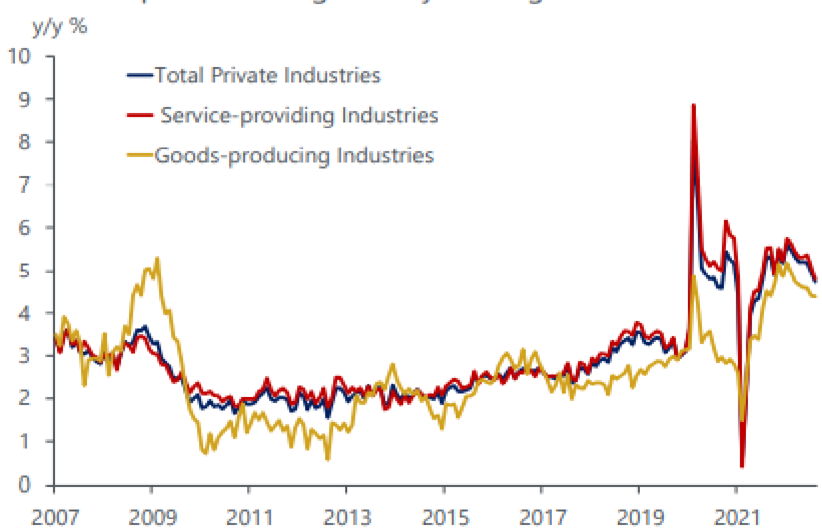
➢ ***This will eventually become a substantial contributor to disinflation***

Source: Haver Analytics, BLS, Morgan Stanley Data as of October 2022.

LABOR MARKETS: STILL TIGHT

US: Number of job openings per unemployed

US: Total private average hourly earnings



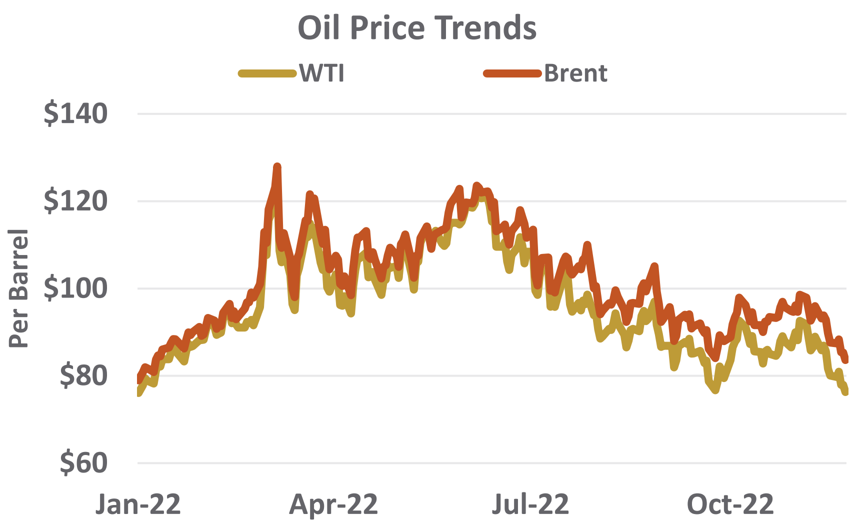
Sources: Oxford Economics, Haver Analytics. Data as of November 2022.

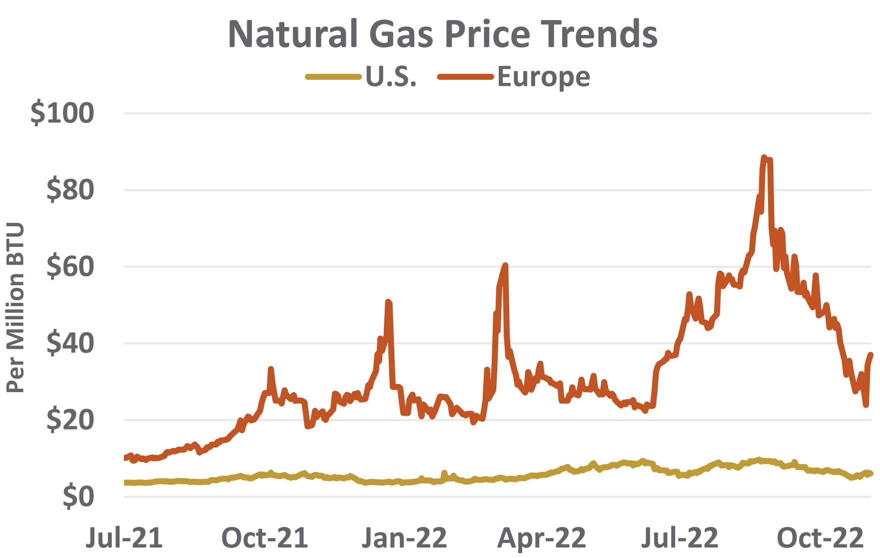
Key Messages

- **The pandemic produced an immense supply shock to labor markets**
  - **COVID: mortality and lingering limitations**
  - **Early retirements**
  - **Gaps in child and elder care**
  - **Very limited immigration**
  - **Trend towards working from anywhere**
- **Labor demand has remained robust**
  - **Monthly payroll gains have stayed strong**
  - **Openings much higher than those seeking work**
  - **Firms appear reluctant to reduce postings or staff after struggling to acquire talent**
  - **Central banks have made this a key focus**
- **Wage increases have moderated**
  - **Layoffs appear to be increasing in some sectors**
  - **Expectations of inflation have come down**

➢ ***At this point, a wage/price spiral appears unlikely***

ENERGY COSTS





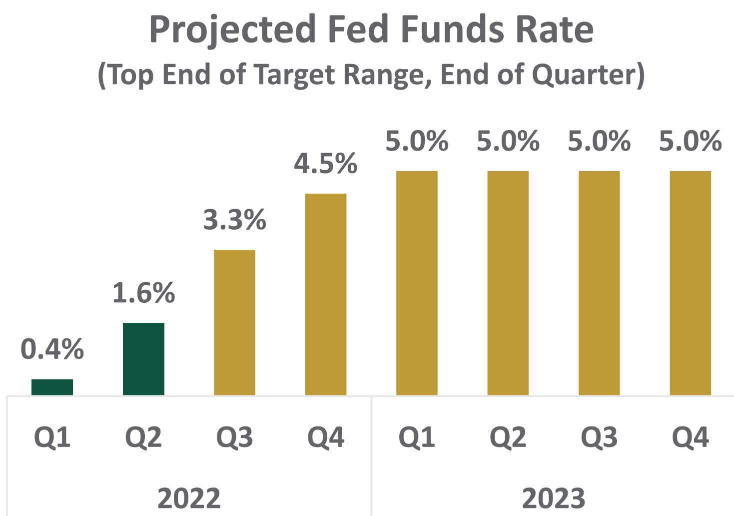
Key Messages

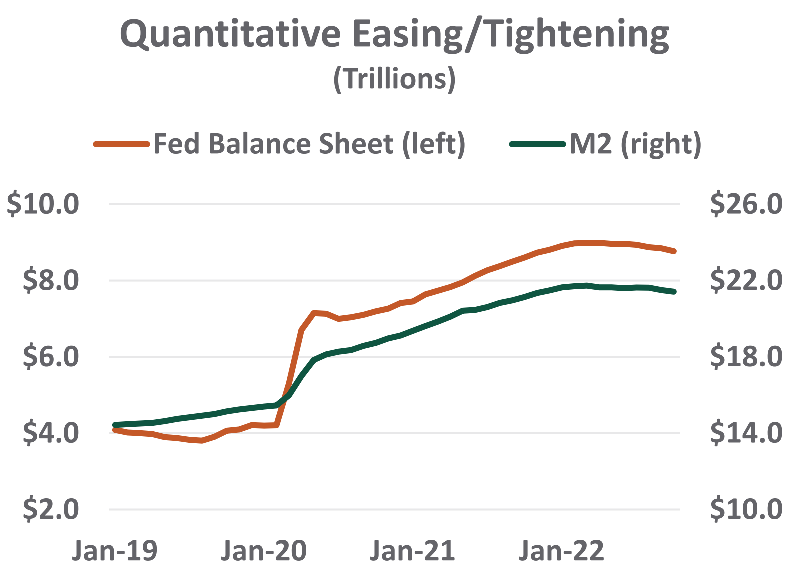
- **Traditional fossil fuels have been in shorter supply**
  - — **Russia ends gas sales to Europe**
  - — **OPEC has curtailed petroleum output**
  - — **Hydro power has also been limited by severe drought**
- **U.S. production response has been slow**
  - — **Capital flows into the industry have moderated**
  - — **Difficult to find labor**
  - — **Caps on refining capacity**
- **Nonetheless, energy prices have fallen since midyear**
  - — **Oil and U.S. natural gas prices are both down 50%; Europe has seen more substantial relief**

➢ ***Difficult to balance cost, access to supplies, and climate goals***

Source: Bloomberg. Data as of November 2022.

TIGHTER FOR LONGER





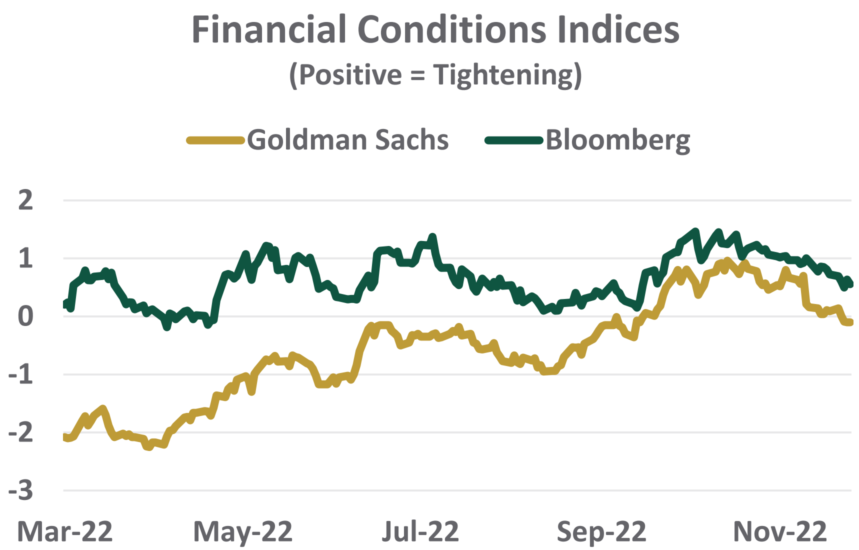
Key messages

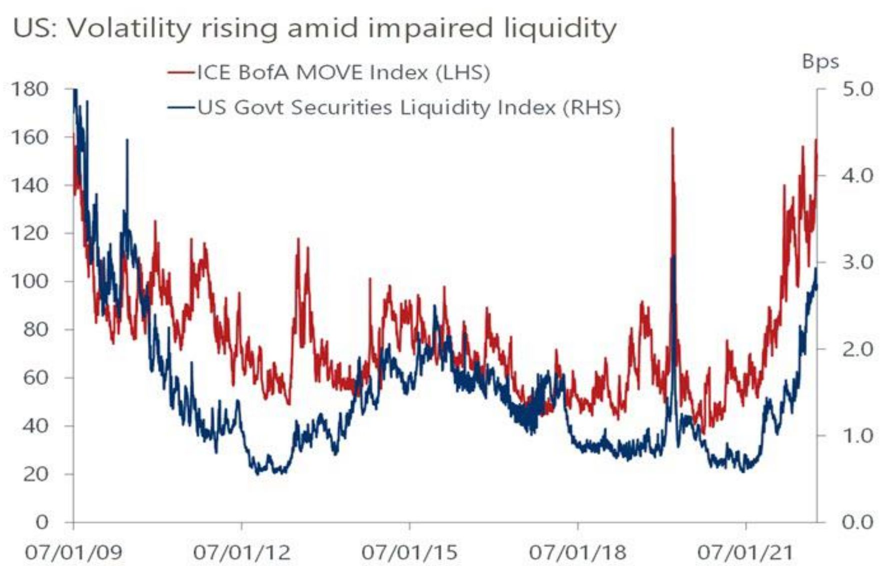
- Our latest interest rate call:
  - Hikes continue in decreasing increments through the first quarter of next year
  - Rates remain at peak for the balance of 2023 to ensure inflation has been subdued
  - Risk remains to the upside
- Fed balance sheet reductions are underway
  - Treasury securities purchased to speed pandemic relief
  - Holdings are now running off at a rate of about $1 trillion annually
  - The money supply has been shrinking for the first time in decades

➢ ***The absence of past roadmaps to follow raises the degree of difficulty for achieving a soft landing***

Sources: Northern Trust, Haver Analytics. Data as of November 2022.

WHAT THE FED WILL BE WATCHING





Sources: Bloomberg, Oxford Economics. Data as of November 2022.

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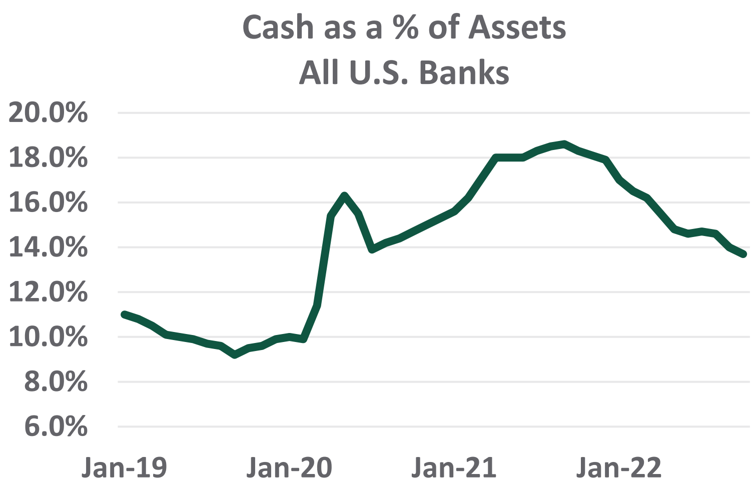
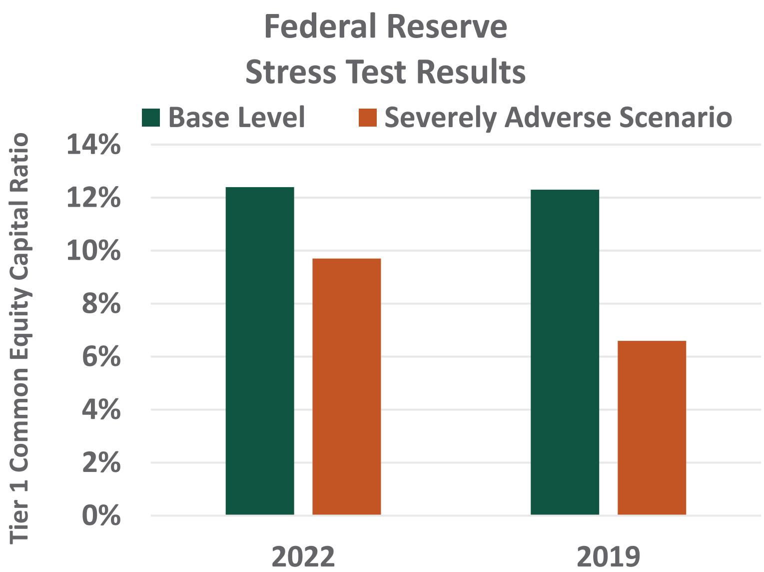
Key Messages

- **Financial conditions**
  - — **An indication of whether credit is easy or more difficult to obtain**
  - — **Composed of measures gauging bank lending standards and market conditions**
  - — **Current readings do not look overly restrictive**
    - **10% equity market recovery from bottom**
    - **Steep drop in credit spreads over the past month**
- **Market liquidity levels**
  - — **Strong demand and high volumes are marks of healthy function**
  - — **Some initial signs of friction in the Treasury market**
  - — **Potential for high volatility and wider swings in yields**

BANKS: WELL POSITIONED



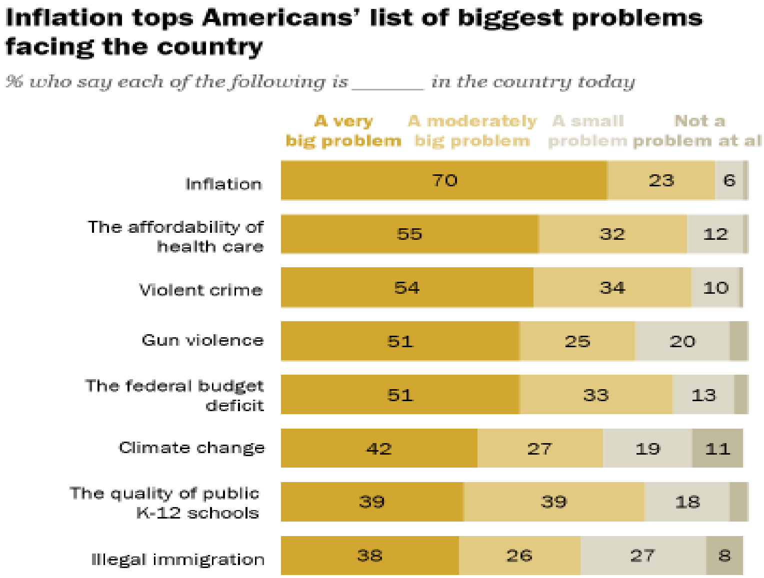


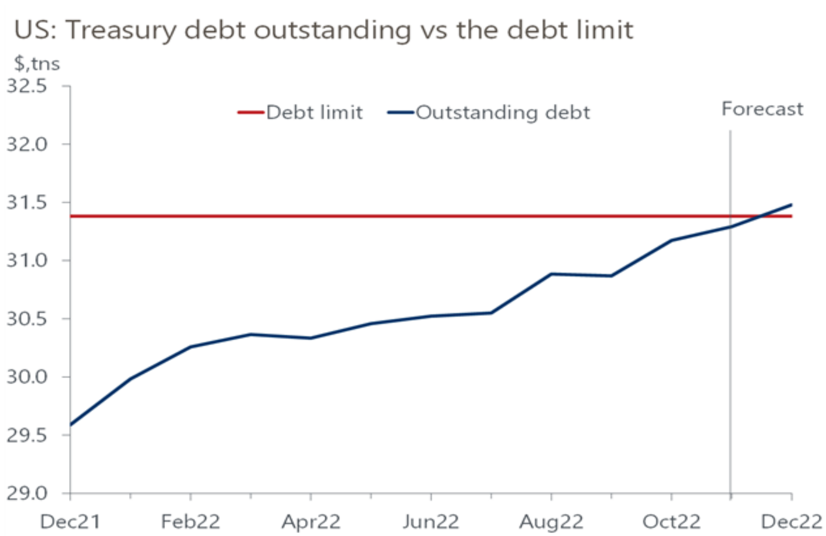
Key Messages

- **Bank earnings have generally been very strong**
  - — **Higher interest rates improve net interest margins**
  - — **Loan losses have been very, very modest**
    - **Pandemic relief programs helped**
    - **Corporations issued low cost debt**
    - **Consumer balance sheets buoyed by stimulus payments and the strong job market**
- **Banks have lots of liquidity**
  - — **Deposits have diminished, but remain elevated**
- **Bank capital is high, and positioned to survive stress**

➢ ***The banking system is unlikely to be an avenue of contagion if trouble starts***

Sources: Federal Reserve, Haver Analytics. Data as of November 2022.



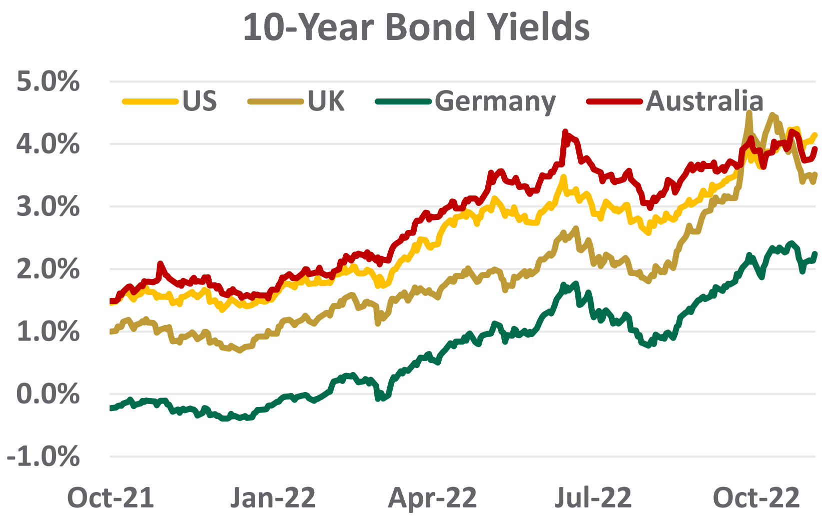


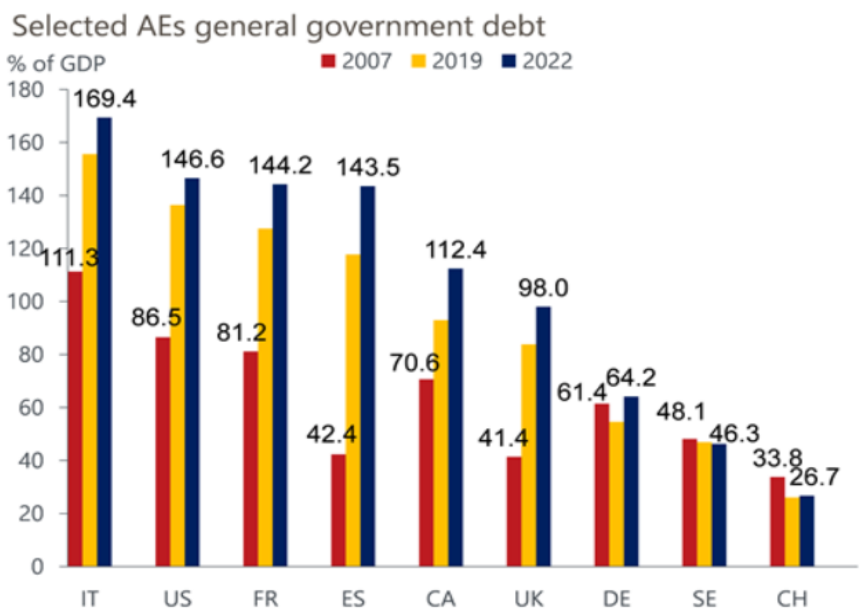
Sources: Pew Center, Oxford Economics. Data as of November 2022.

Key Messages

- Latest results (November 27):
  - — Senate: 50-49 Democratic majority (GA runoff to come)
  - — House: 220-213 Republican majority (two races undecided)
- Implications for economic policy:
  - — Additional fiscal programs unlikely
  - — Changes to tax code very unlikely (next "cliff" in 2025)
  - — Continued movement toward economic nationalism
- Some stress over the debt ceiling possible
  - — Borrowing will hit the current limit next month; potential movement during "lame duck" session
- Where gridlock is not good
  - — Social Security/Medicare solvency
  - — Immigration
  - — Energy/climate policy

FISCAL DISCOMFORT





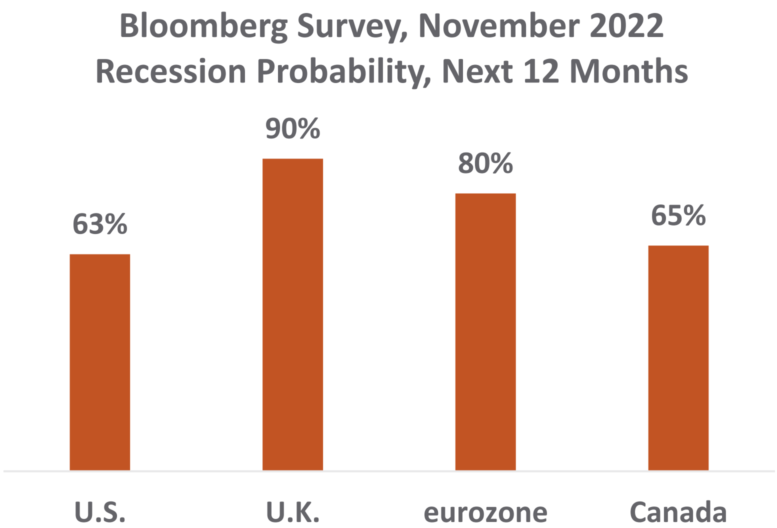
Sources: Bloomberg, Oxford Economics. Data as of November 2022.

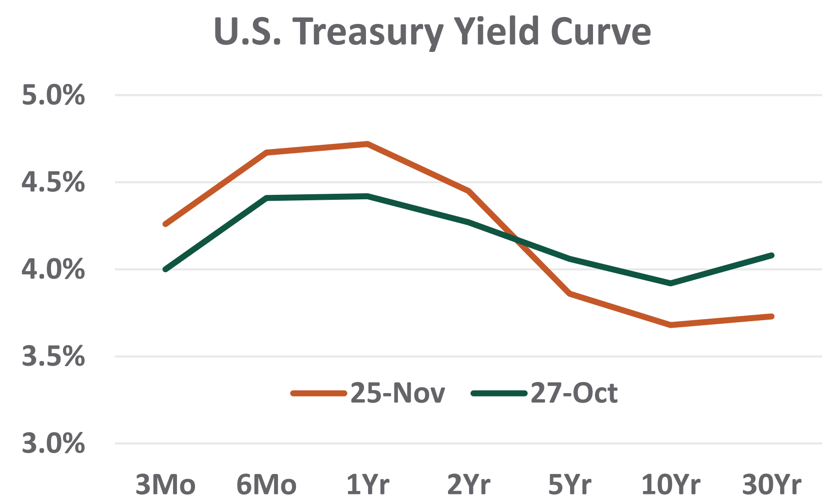
Key Messages

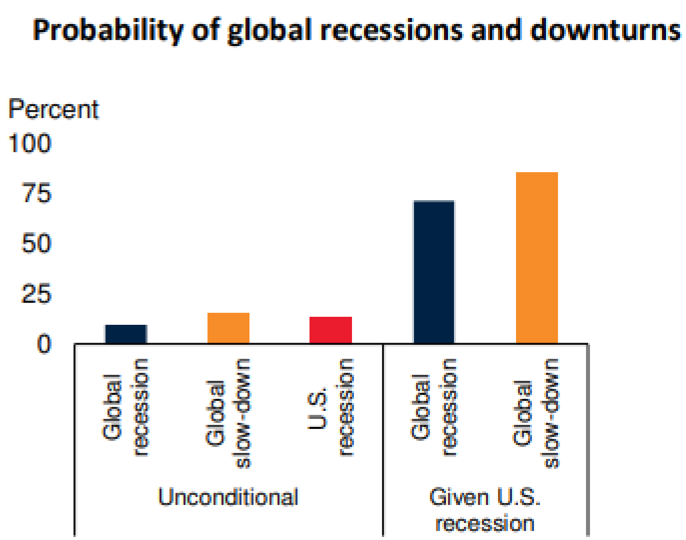
- **Central bank actions and intentions have raised bond yields substantially**
  - — **At one point last year, more than one third of developed market sovereign debt had negative yields; now, almost none of it does**
  - — **Yield curves are inverted in many places**
- **Government borrowing costs are rising rapidly**
  - — **Debt has increased immensely over the past fifteen years (and especially over the last two years)**
  - — **Much of it has been funded with short-term instruments**
  - — **Interest costs are absorbing increasing amounts of government revenue**
  - — **This may limit the amount of stimulus that can be applied if recession arrives**

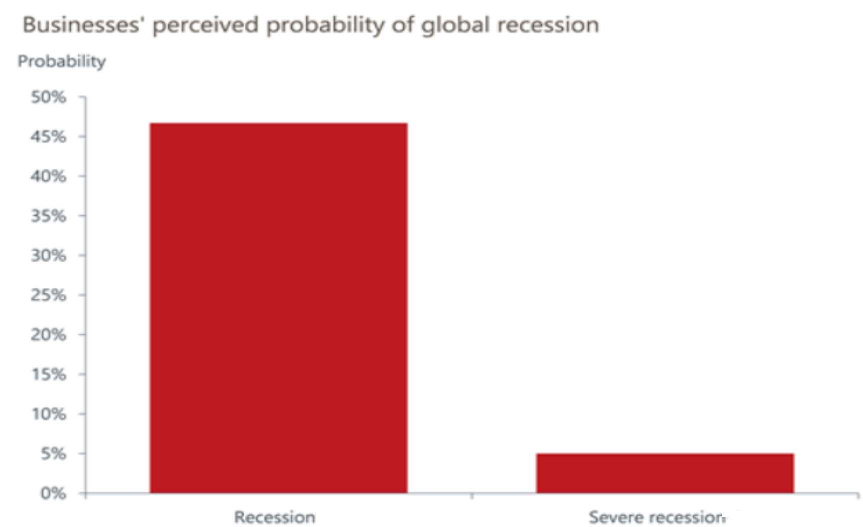
➢ ***Stress between governments and their central banks will likely increase in the years ahead***

RECESSION GAUGES









Sources: Bloomberg, World Bank, IMF, Oxford Economics. Data as of November 2022.

LOOKING AHEAD

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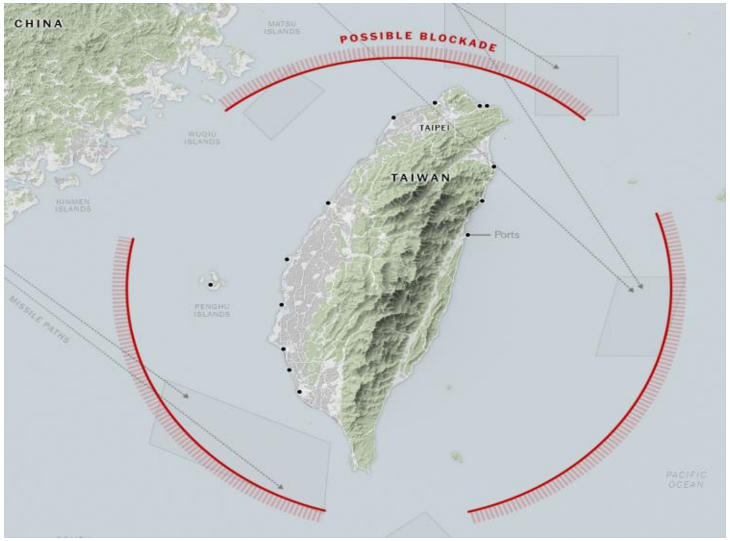
A KEY ECONOMIC THEME: TAIL (EVENT) TROUBLE



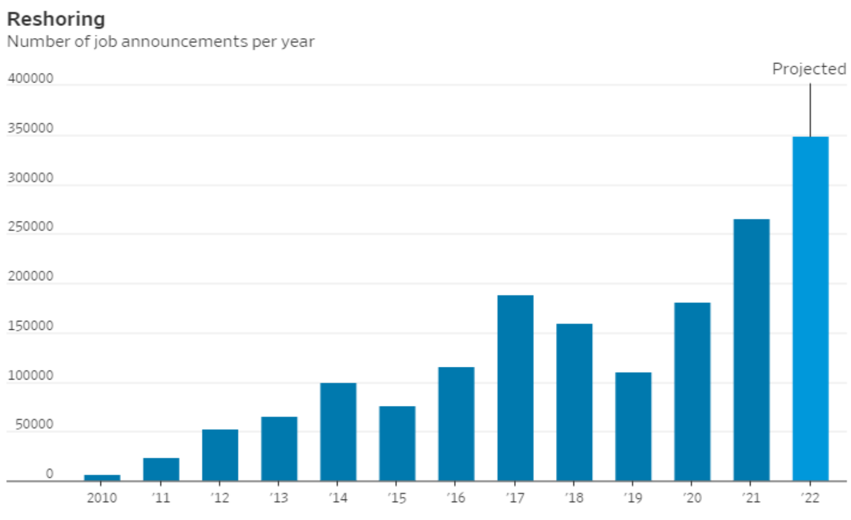
Sources: New York Times, The Economist.

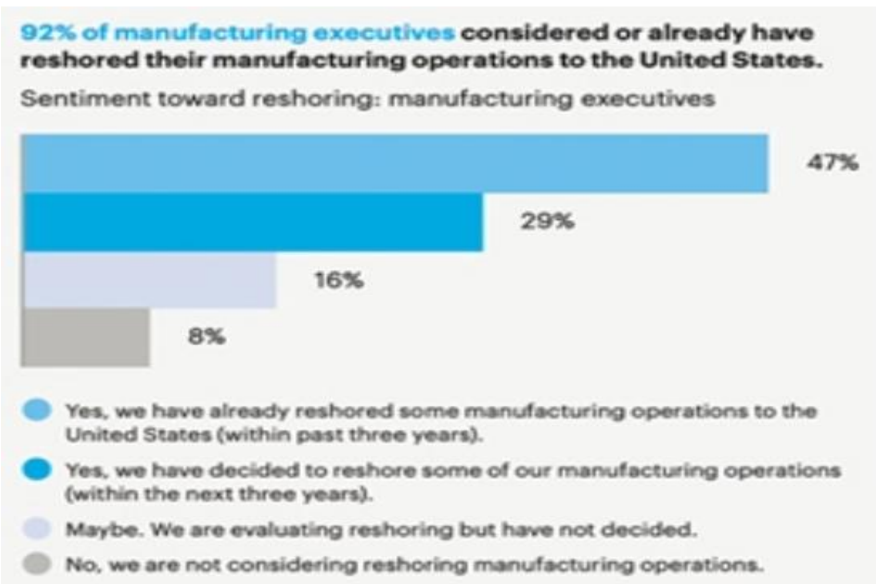
Key Messages

- **The geopolitical environment has become much more volatile in the last year**
  - **Russian invasion of Ukraine; stress surrounding Taiwan**
  - **Instability in a range of markets (potentially including the U.S. and the U.K.)**
  - **Potential for direct impacts on Northern Trust operations, partners**
  - **Potential for indirect impacts on markets**
- **"Weaponizing" the financial system**
  - **Pen vs. sword: sanctions being used to deter or counteract kinetic activity**
  - **Restrictions on holdings, transactions, and counterparties may become more numerous in the years ahead**
- **The trend towards de-globalization**
  - **Countries have become uncomfortable with international connections (supply chains, financial systems)**
  - **Increasing emphasis on partitioning, less coordination on financial regulation**
  - **Increased difficulty/cost of doing business across a range of jurisdictions**

➢ ***Keys: Preparedness and resilience***

A KEY ECONOMIC THEME: GOING THEIR OWN WAY





Sources: Reshoring Initiative, Wall Street Journal, Kearney. Chart data as of August 2022.

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Key Messages

- Countries and companies are reconsidering their supply chains
  - Geopolitical frictions have created uncertainty around supply
  - Pandemic interruptions revealed uncomfortable levels of reliance on imports
  - Pushback against internationalism has gained currency
  - Resiliency is being given comparable billing to efficiency
  - Climate considerations and carbon charges make it less desirable to source over long distances
- This will not be a sudden, nor an easy process

➢ ***Potentially significant influence on growth and inflation***

BIOGRAPHY

Carl R. Tannenbaum
Chief Economist
Northern Trust

Carl Tannenbaum is the Chief Economist for The Northern Trust. In this role, Mr. Tannenbaum briefs clients and colleagues on the economy and business conditions, prepares the bank's official economic outlook and participates in forecast surveys. Mr. Tannenbaum publishes weekly commentaries and is frequently interviewed by media outlets such as The Wall Street Journal, Bloomberg, and Reuters.

Mr. Tannenbaum was the recipient of the 2021 Lawrence Klein Award, granted by the Blue Chip Economic Consensus to the contributor with the best forecasting record over the prior four years.

Mr. Tannenbaum is also responsible for the analytics and modeling group within Northern Trust's risk management division, and he monitors the strategic risks facing the organization. He is a member of the bank's capital committee, its investment policy committee, and the asset/liability management committee.

Prior to joining Northern Trust, Mr. Tannenbaum spent four years at the Federal Reserve, where he led the risk section. He was deeply involved in the central bank's response to the 2008 financial crisis, helped to create and conduct its stress testing program, and advised senior Federal Reserve leaders on developments in banking and the financial markets.

Mr. Tannenbaum began his career in banking at LaSalle Bank/ABN AMRO, a global banking organization with $1 trillion in total assets. He served for more than 20 years there as the organization's Chief Economist and Head of Balance Sheet Management.

Mr. Tannenbaum is the current Chairman of the International Conference of Commercial Bank Economists and a past Chairman of the National Association for Business Economics, the Conference of Business Economists, the American Bankers Association's Economic Advisory Committee, and the North American Asset/Liability Management Association.

Mr. Tannenbaum holds an M.B.A. and a B.A. in finance and economics from the University of Chicago.

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@NT_CTannenbaum