RBC Global Asset Management
PH&N Institutional

Where does inflation go from here?

2023 | PH&N Investment Perspectives

For Institutional Investors

RBC

Fixed-rate pizza!

No matter how bad inflation gets, your pizza price stays the same.

Do you like pizza?
○ Yes ○ No

Do you dislike inflation?
○ Yes ○ No

Do you have a face?
○ Yes ○ No

Does your face like eating pizza?
○ Yes ○ No

GET PRE-APPROVED NOW!

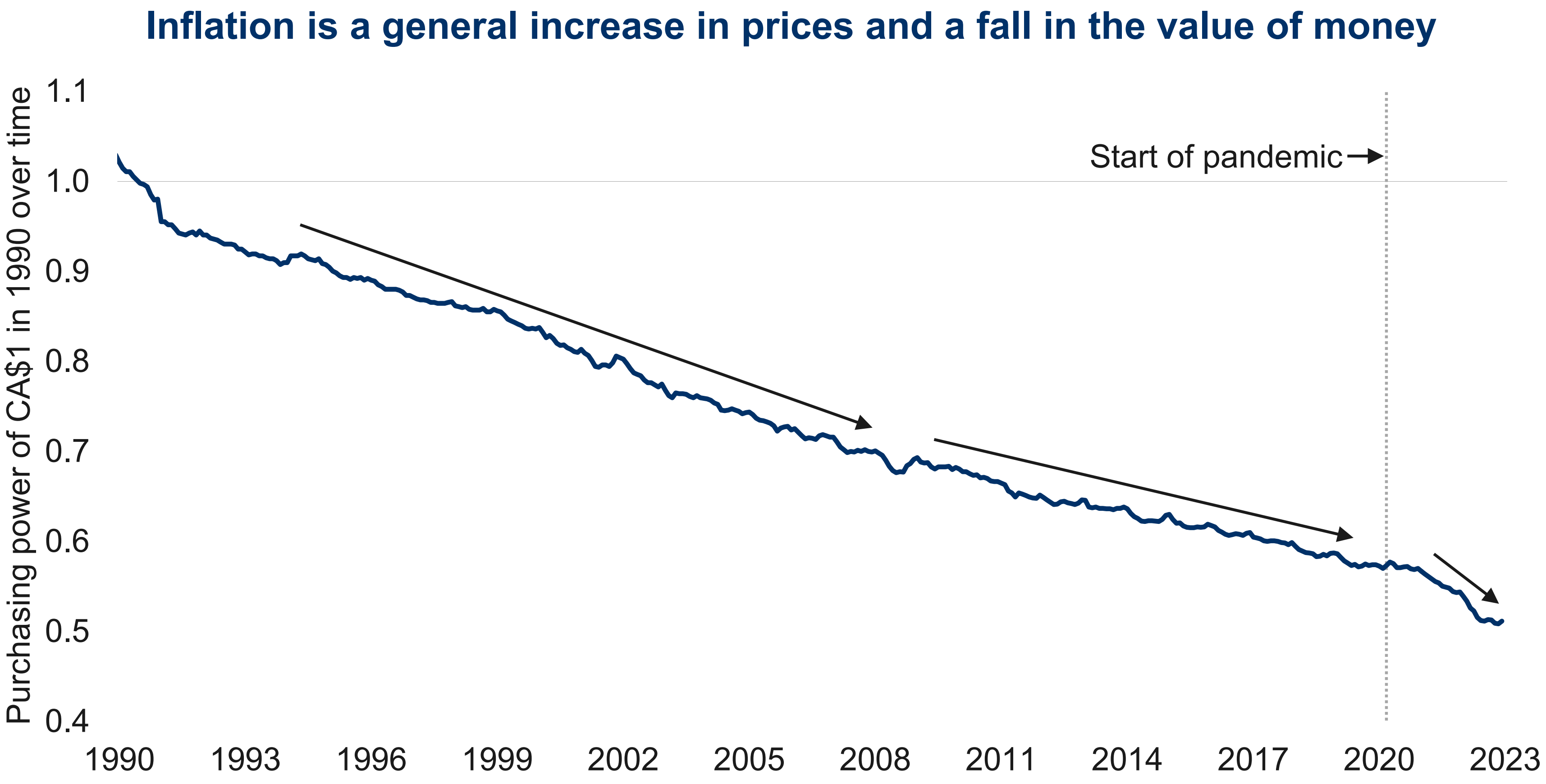
Note: As at 02/01/2023. Source: Pizza Pizza

Table of contents

In brief, most of the inflation surge should unwind, but **long-term inflation may remain slightly higher** than normal

Note: As at 02/09/2023. Source: RBC GAM

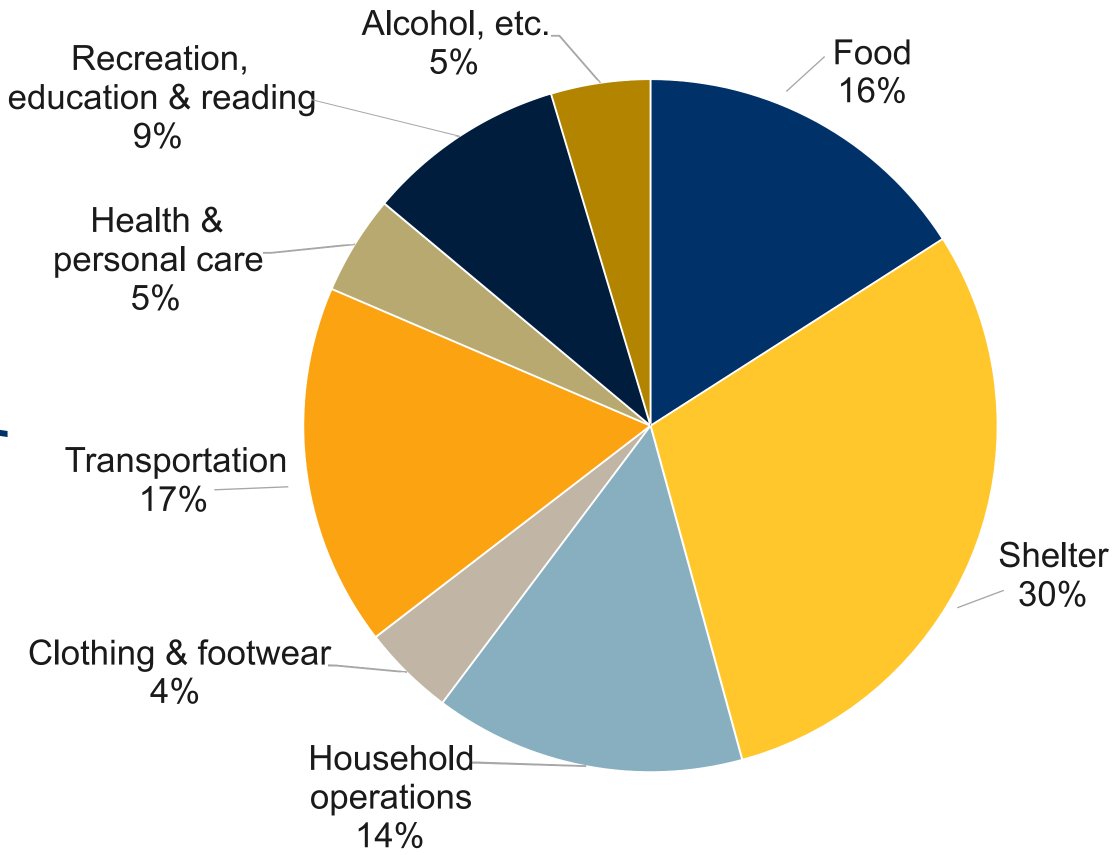
What is inflation?



Note: As of Dec 2022. Buying power over time estimated using Consumer Price Index. Source: Statistics Canada, Macrobond, RBC GAM

What’s in the Canadian price basket?

Canadian CPI weights



Key transportation inputs:

Gasoline	4.3%
Motor vehicles	6.1%

Key shelter inputs:

Rent	6.6%
Home replacement	6.4%
Home maintenance	1.8%
Mortgage interest	2.9%

Note: As at 2/15/2023. Source: Statistics Canada, Macrobond, RBC GAM

Why a 2% inflation target?

Problems with a higher target

- Inflation becomes noticeable, altering behaviour
- Economic growth is incrementally hurt
- Various distortions arise

2%

Sweet spot

- Low enough that most people can ignore it
- Low enough not to hurt the economy significantly
- 2% is well established – costly to change it
- Avoids problems with higher and lower targets

Problems with a lower target

- True inflation is already slightly lower than officially reported by CPI
- Risk of getting stuck in a deflationary spiral
- Downward wage rigidities could force more layoffs in a recession
- Monetary policy has less room to maneuver with low inflation

Note: As at 02/15/2023. Source: RBC GAM

Inflation was low and stable – but then came the recent spike

Canadian headline CPI and core CPI

Note: As of Dec 2022. Source: Statistics Canada, Macrobond, RBC GAM

Inflation spiked due to several simultaneous shocks

The big four

Commodity shock

Demand revived faster than expected

Russian sanctions

Supply chain problems

Preferences changed

Demand revived quickly

Lockdowns limited production

Monetary stimulus

Extreme rate cuts and quantitative easing

Left in place too long

Fiscal stimulus

Unprecedented government spending

Programs remained in place beyond time of acute need

Labour shortage

Demand revived quickly

Workers reluctant to return due to fear, benefits, childcare, rising wealth

Housing boom

Home prices surged due to low rates, altered dwelling preferences

New central bank mandates

Central bank mandates had become more tolerant of higher inflation

Economic conditions

Economy was overheating by late 2021

Note: As at 02/06/2023. Source: RBC GAM

Winners and losers during a temporary, unexpected burst of higher inflation

Losers	
Households	• Wage growth lags/dampened vs. burst of inflation
Certain companies	• Low pricing power (margins shrink) • Growth orientation (higher discount rate saps value)
Fixed-rate lenders	• Capital losses
Physical cash	• Real depreciation
Equity investors	• Valuation falls due to higher discount rate on future earnings
Taxable investments	• Taxes apply to nominal market returns • Higher inflation thus increases the effective tax rate
Weaker economy	• High inflation is corrosive • Central banks tighten monetary policy

Winners	
Certain companies	• High pricing power (margins expand) • Labour is large share of expenses (labour costs lag) • Capital-intensive business
Fiscal finances	• Gov't revenue grows faster and sooner than expenses • Earn revenue from higher effective tax rate on investments • Debt-to-GDP ratio falls due to inflation boost to denominator
Fixed-rate borrowers	• Inflation-adjusted borrowing cost falls

Neutral	
Variable-rate lenders	• Return keeps pace with inflation
Var.-rate borrowers	• Real borrowing cost doesn't actually rise
Real assets	• Appreciate in line with inflation

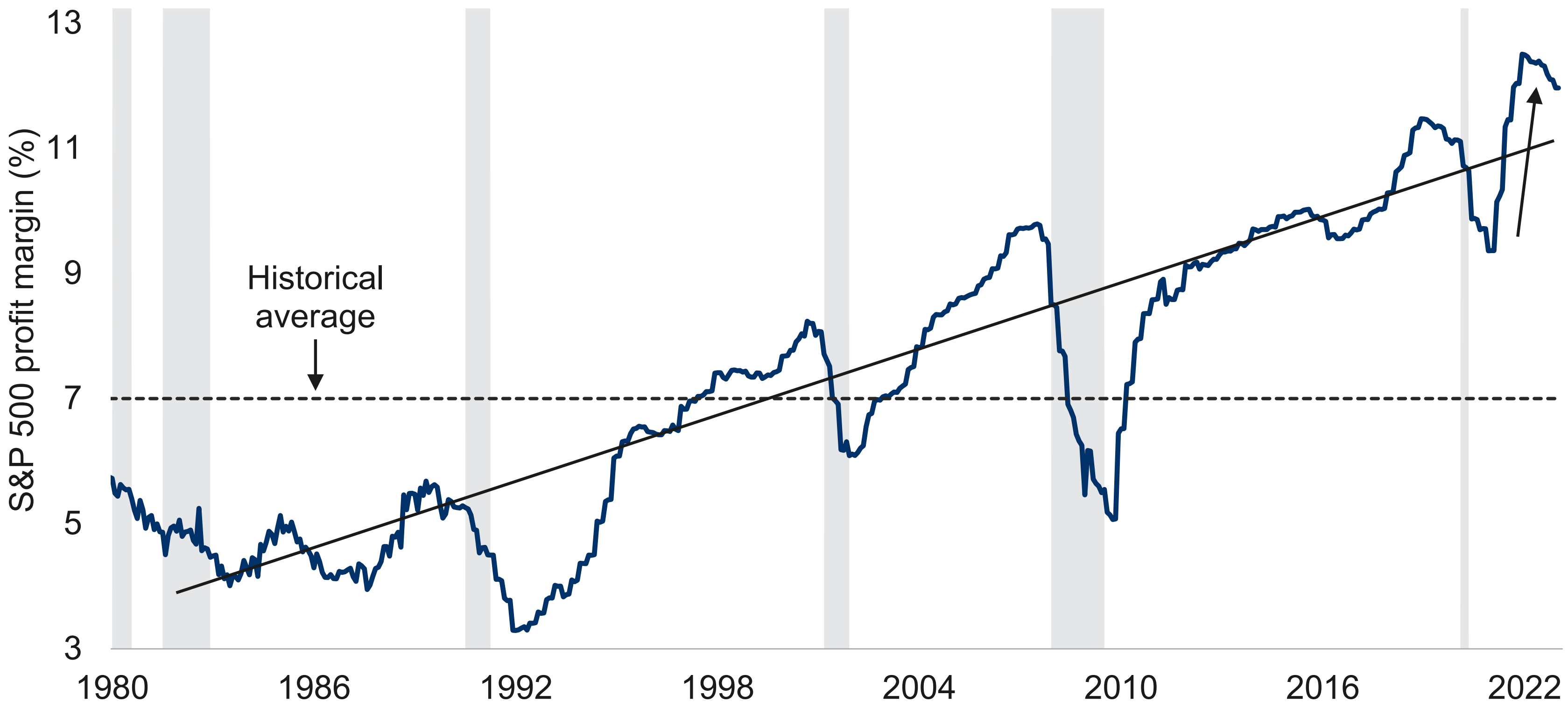
It depends	
Business contracts	• Scope for big winners and losers

Note: As at 02/09/2023. Source: RBC GAM

Companies came out ahead from higher inflation:

Margins rose

S&P 500 profit margin rose while inflation spiked

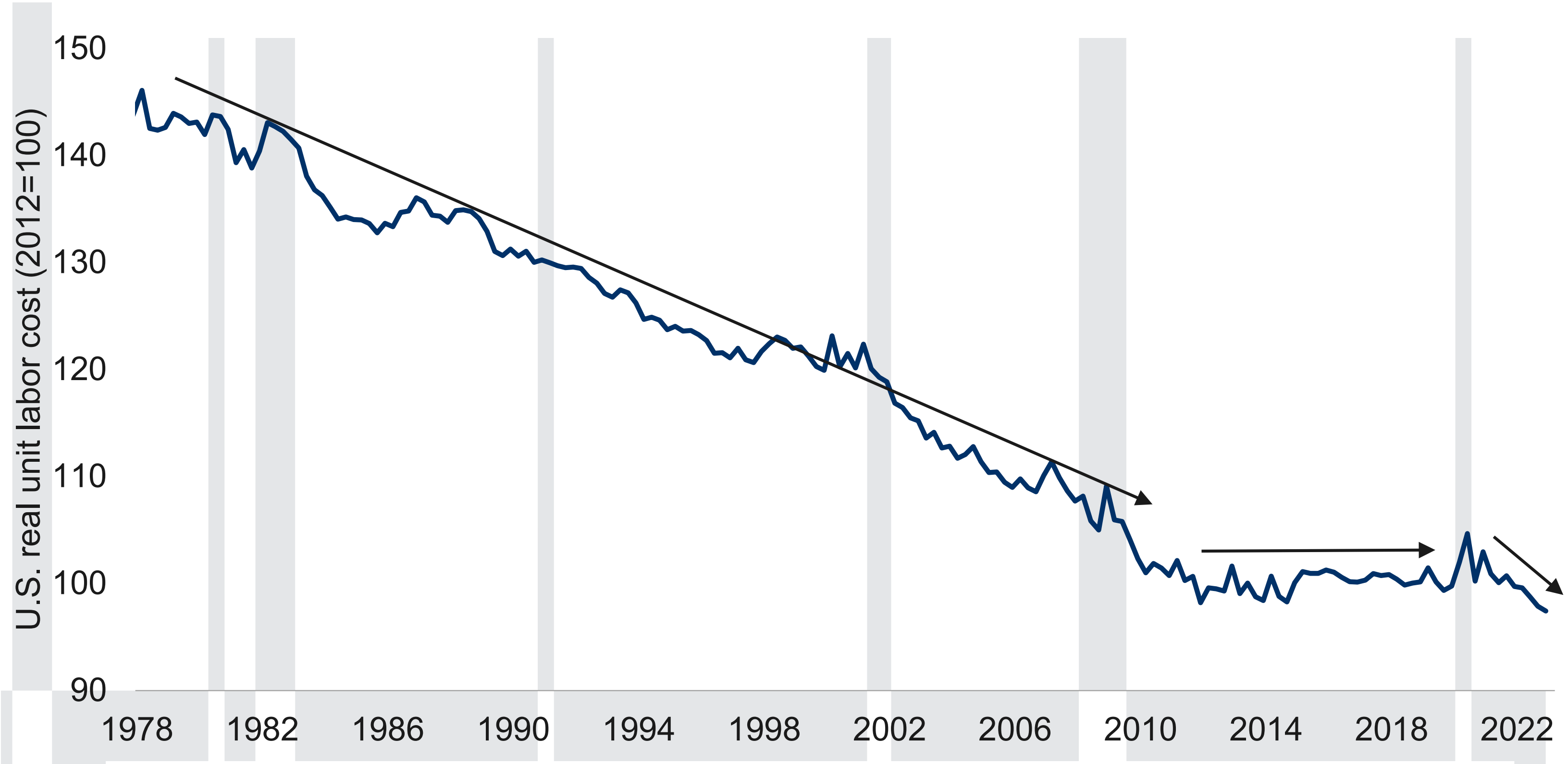


Note: As of Jan 2023. Shaded area represents recession. Source: RBC Capital Markets, Bloomberg, RBC GAM

Workers fell behind due to higher inflation:

Real wages tumbled

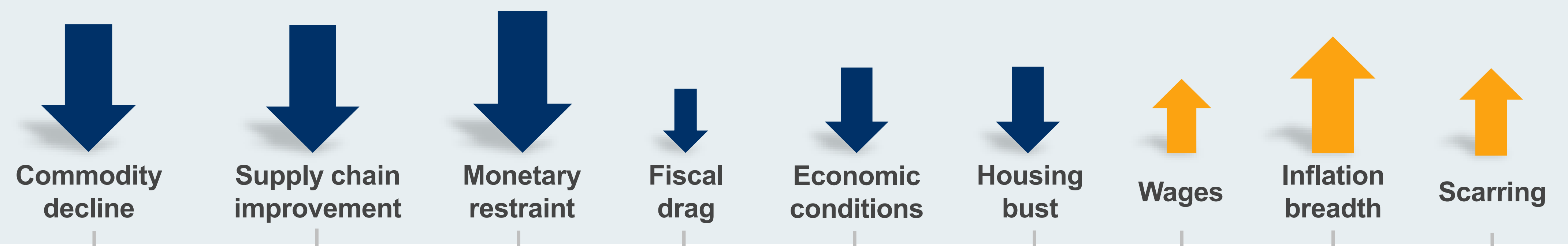
U.S. productivity-adjusted labor cost declined after initial lockdown spike



Note: As of Q4 2022. Shaded area represents recession. Source: BLS, Federal Reserve Bank of St. Louis, RBC GAM

Inflation has peaked and can continue falling

The big four have all turned lower



Commodity decline

Commodities have now reversed significantly

Though unclear whether downward pressure continues

Supply chain improvement

Weaker economy cools demand

Preferences normalize

COVID lockdowns no longer limit production

Monetary restraint

Extreme monetary stimulus is now considerable restraint

Fiscal drag

Extraordinary fiscal stimulus is now gone

(Though governments are still fairly keen to spend)

Economic conditions

Economy to cool significantly

Housing bust

Home prices now falling

(Though this lands in CPI with a lag)

Wages

Wages are starting to decelerate, but may run hot for a while

Inflation breadth

Inflation was high for so long that there are second-order effects

These take longer to unwind

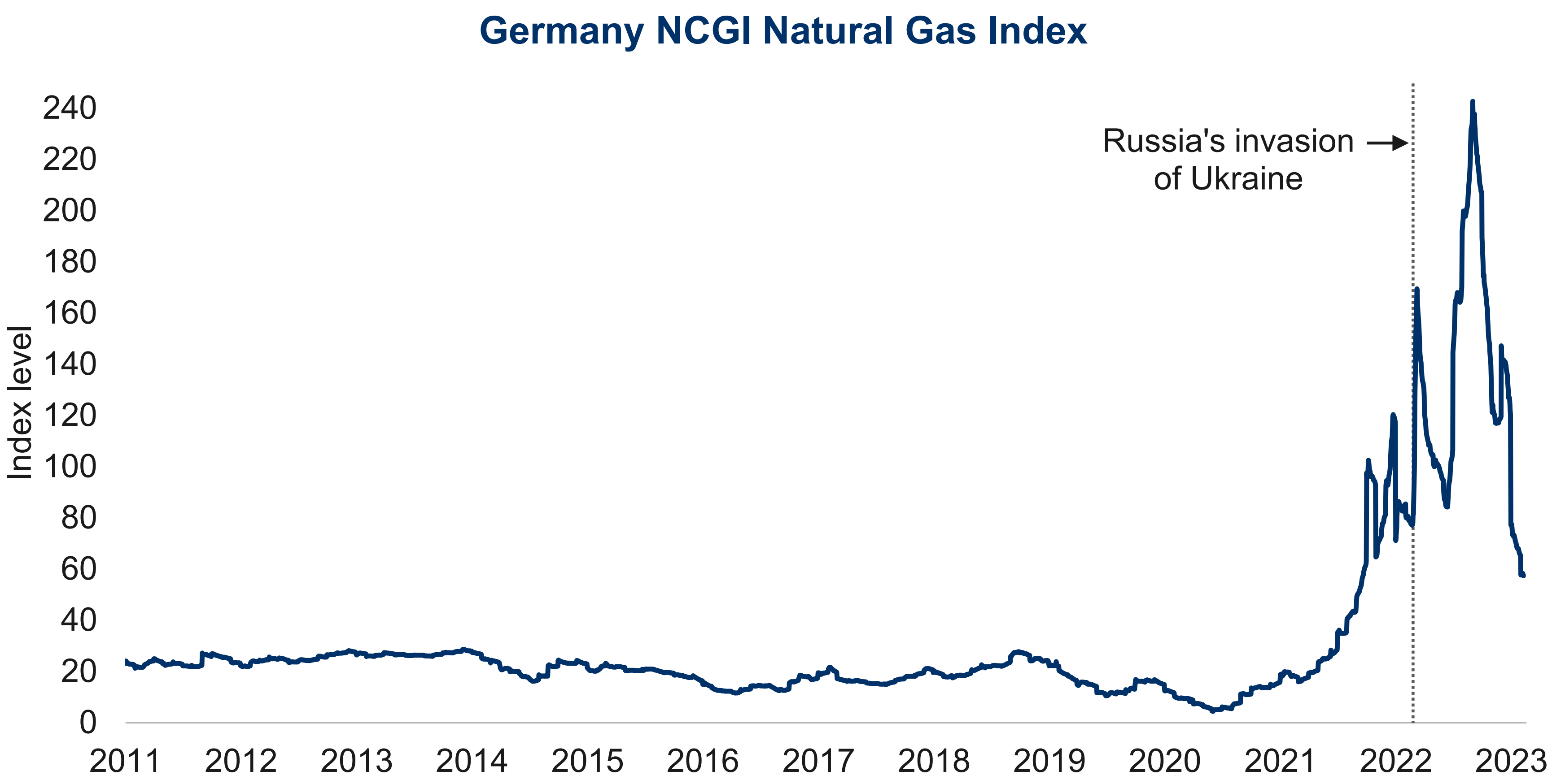
Scarring

High inflation may cause some scarring

Future inflation may thus run slightly hotter

Note: As at 02/10/2023. Source: RBC GAM

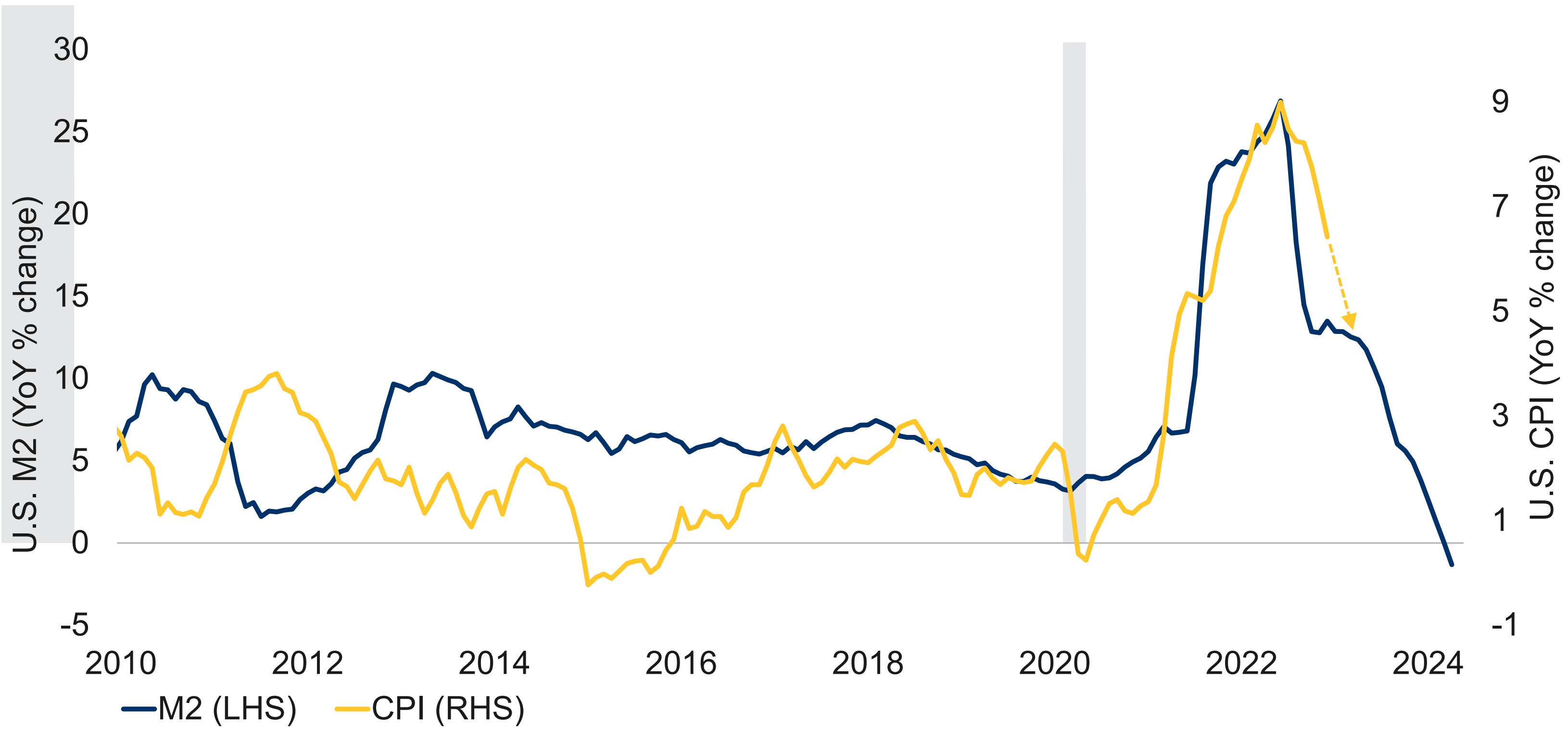
European energy prices have retreated significantly



Note: As of 02/08/2023. Source: Intercontinental Exchange, Macrobond, RBC GAM

The money supply is now contracting as stimulus reverses

U.S. money supply growth has collapsed, inflation has started to descend as well



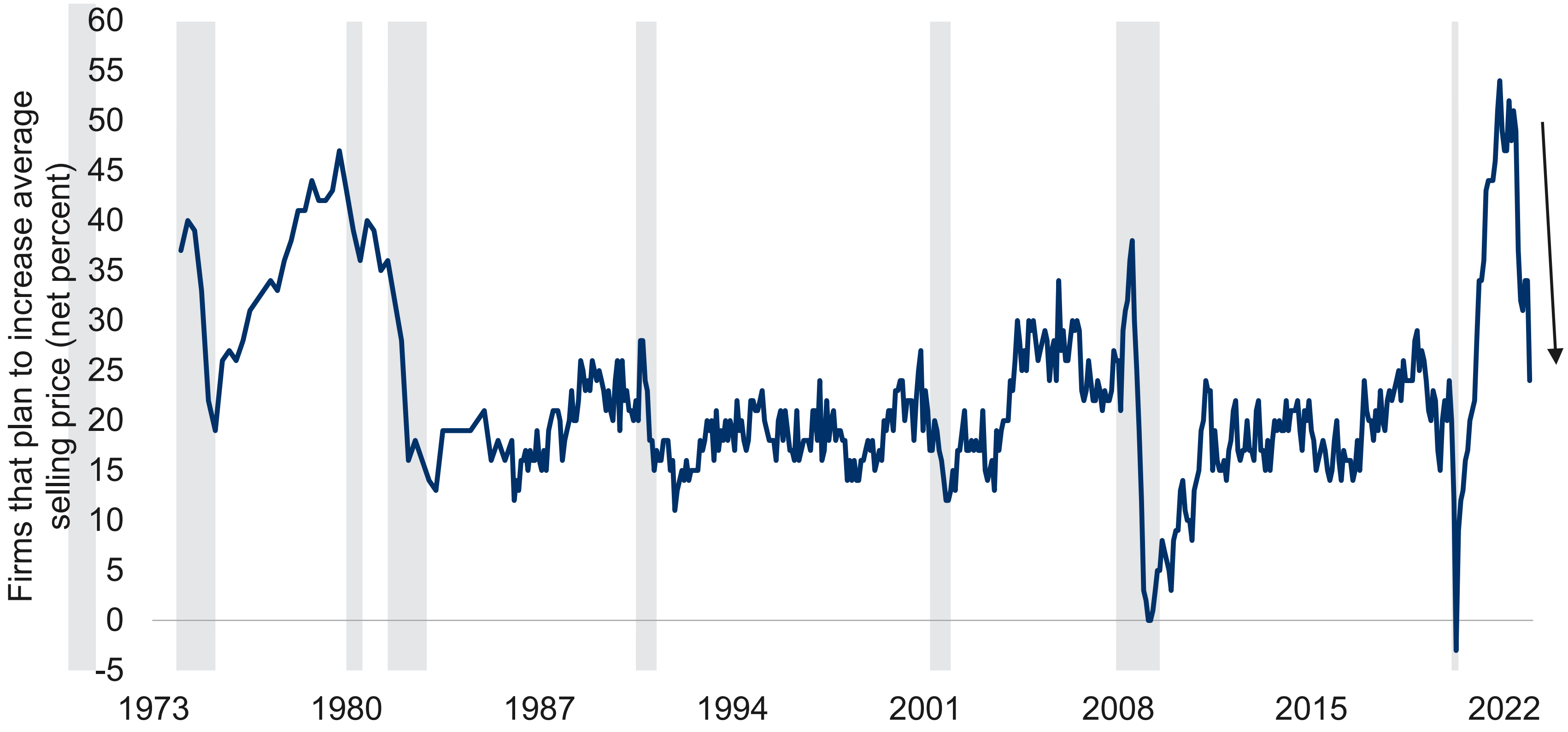
Note: As of Dec 2022. M2 year-over-year % change leads by 16 months. Shaded areas represent U.S. recessions. Source: Macrobond, RBC GAM

Supply chain getting significantly better, should continue to heal

Note: As of Jan 2023. Shaded area represents U.S. recession. Source: Gianluca Benigno, Julian di Giovanni, Jan J. J. Groen, and Adam I. Noble, "A New Barometer of Global Supply Chain Pressures," Federal Reserve Bank of New York Liberty Street Economics; Macrobond, RBC GAM

Business pricing power is fading and now almost normalized

Fraction of U.S. businesses planning to raise prices falling precipitously

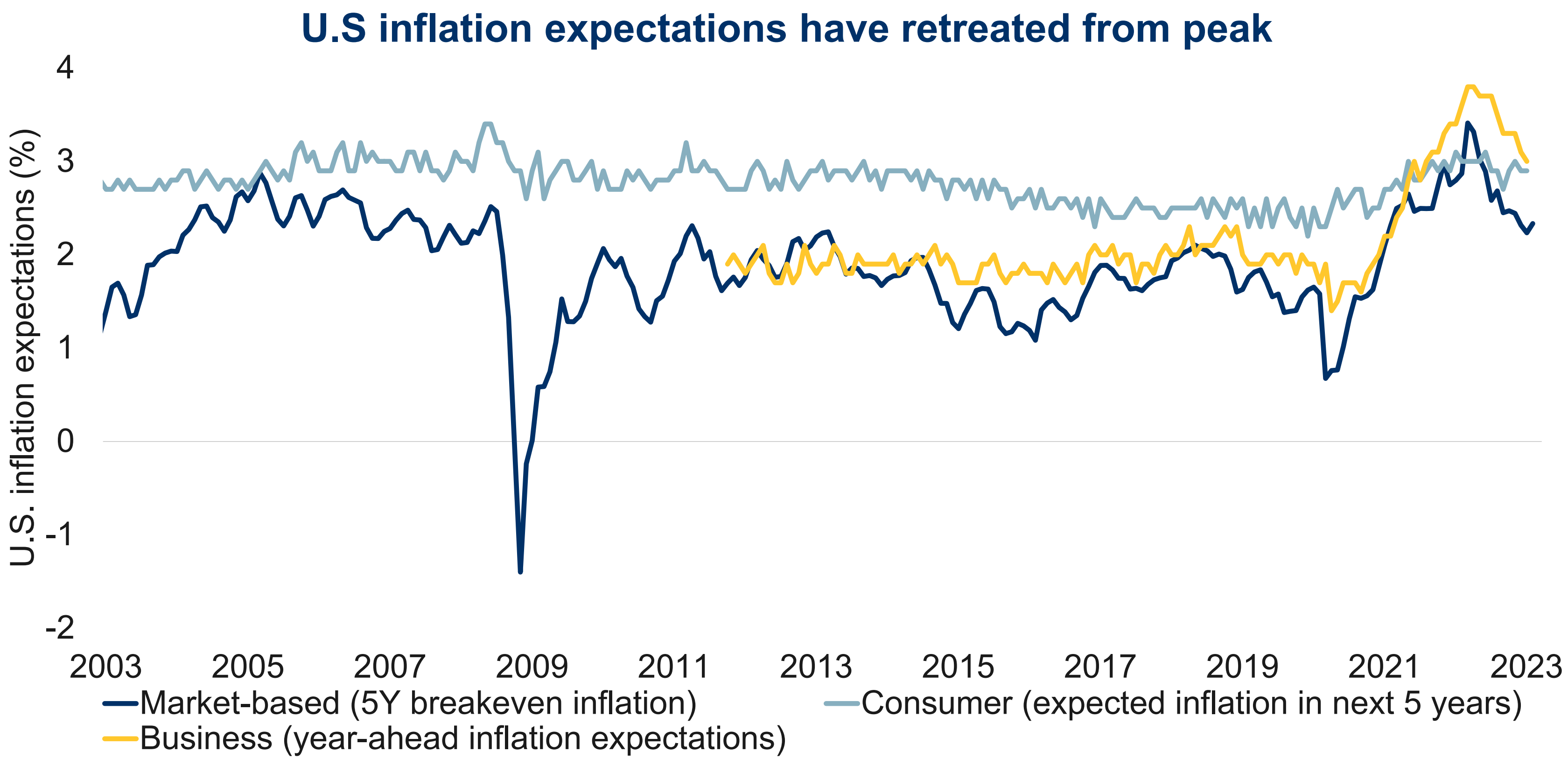


Note: As of Dec 2022. Shaded area represents recession. Source: NFIB Small Business Economic Survey, Macrobond, RBC GAM

Chinese producer prices are now falling – key input for consumer prices

Note: As of Dec 2022. Shaded area represents U.S. recession. Source: CNBS, Macrobond, RBC GAM

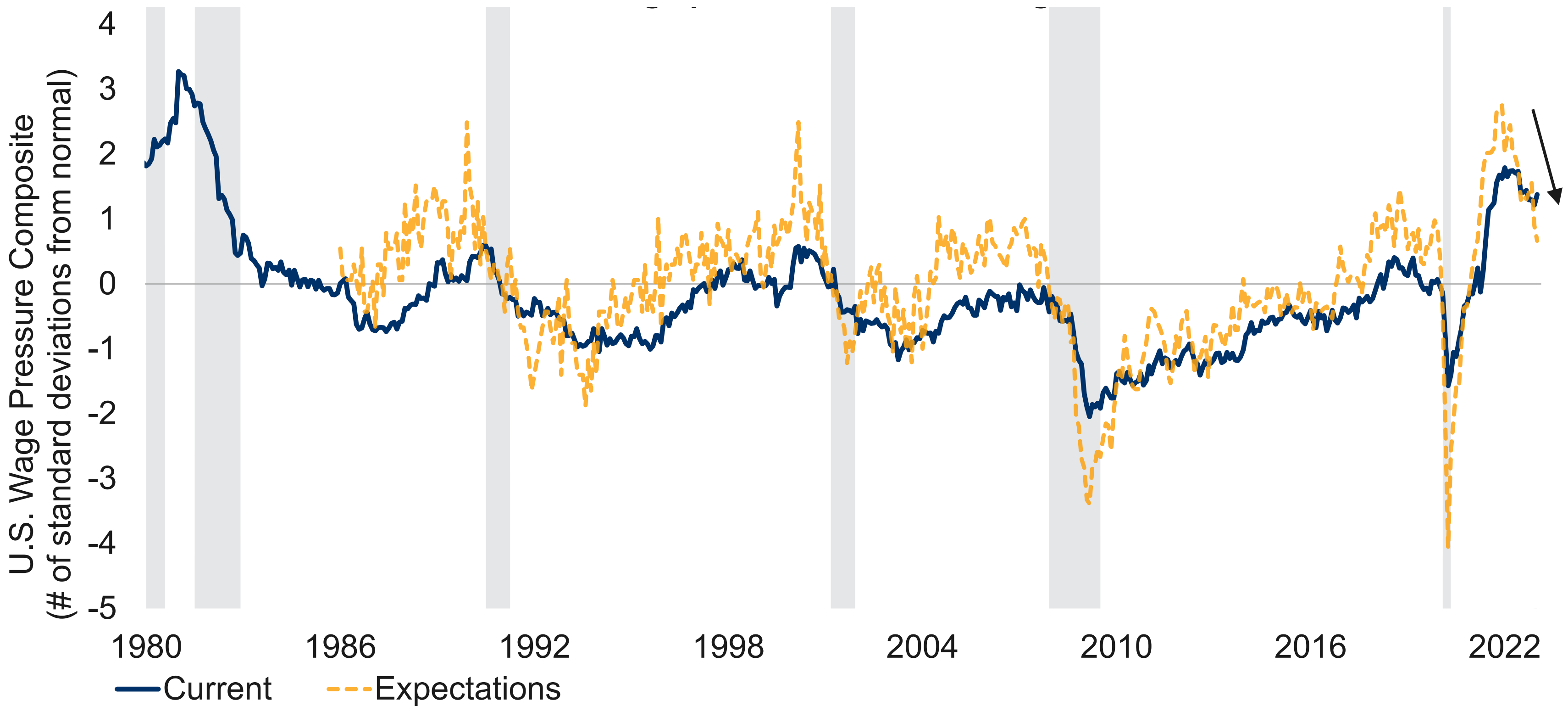
Inflation expectations never rose very far, now turning downward



Note: Market-based expectations as of 02/08/2023, survey-based consumer and business expectations as of Jan 2023. Source: Federal Reserve Bank of Atlanta, Federal Reserve Board, University of Michigan Surveys of Consumers, Haver Analytics, RBC GAM

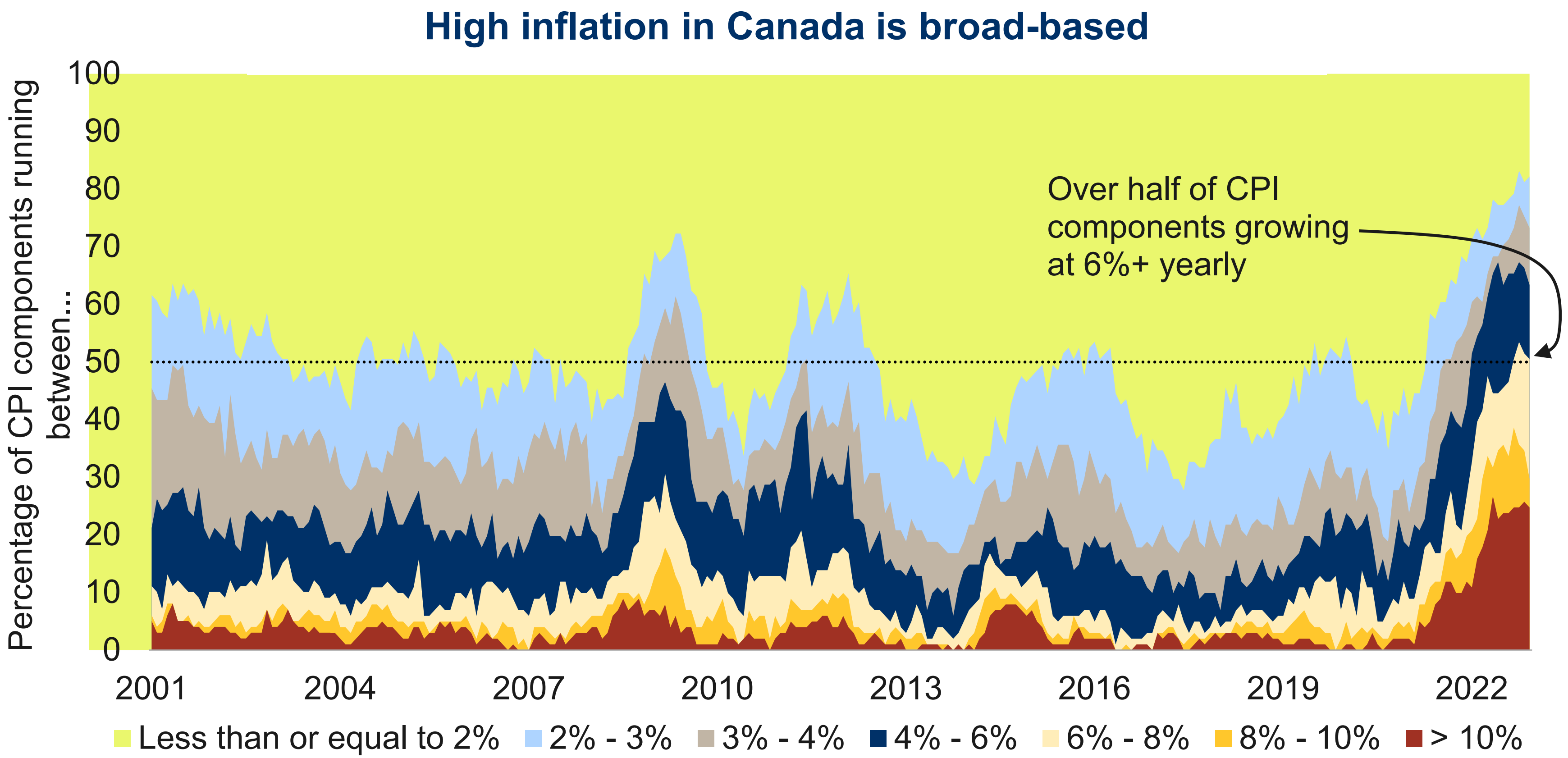
Wage pressure turning – economy needs to weaken to stabilize

Wage pressure in U.S. easing



Note: As of Jan 2023. Composites constructed using wage growth measures and business intentions to raise wages. Shaded area represents recession. Source: Macrobond, RBC GAM

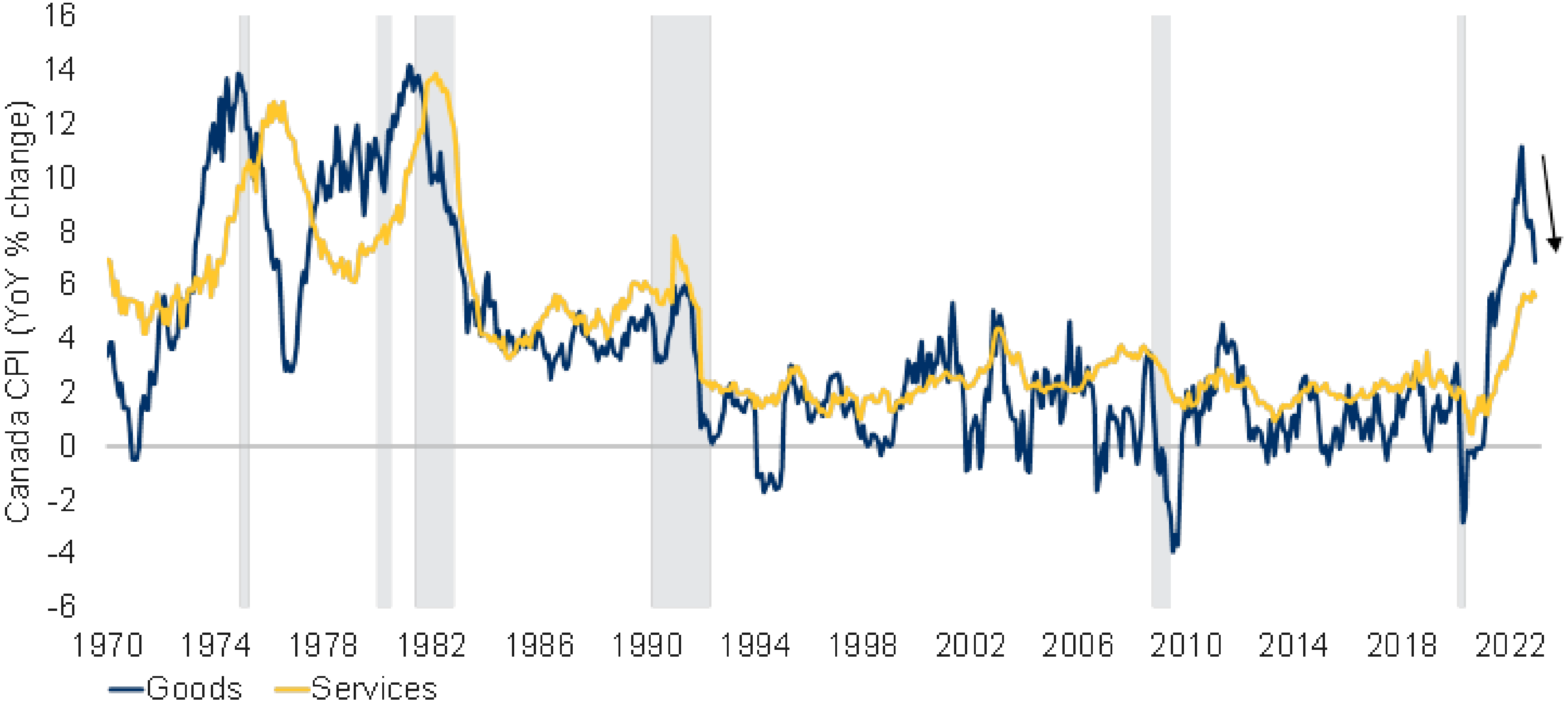
Inflation still too broad in Canada, but finally turning lower



Note: As of Dec 2022. Share of CPI components with year-over-year % change falling within the ranges specified. Source: Haver Analytics, RBC GAM

Goods inflation is now cooperating, but still waiting on service inflation

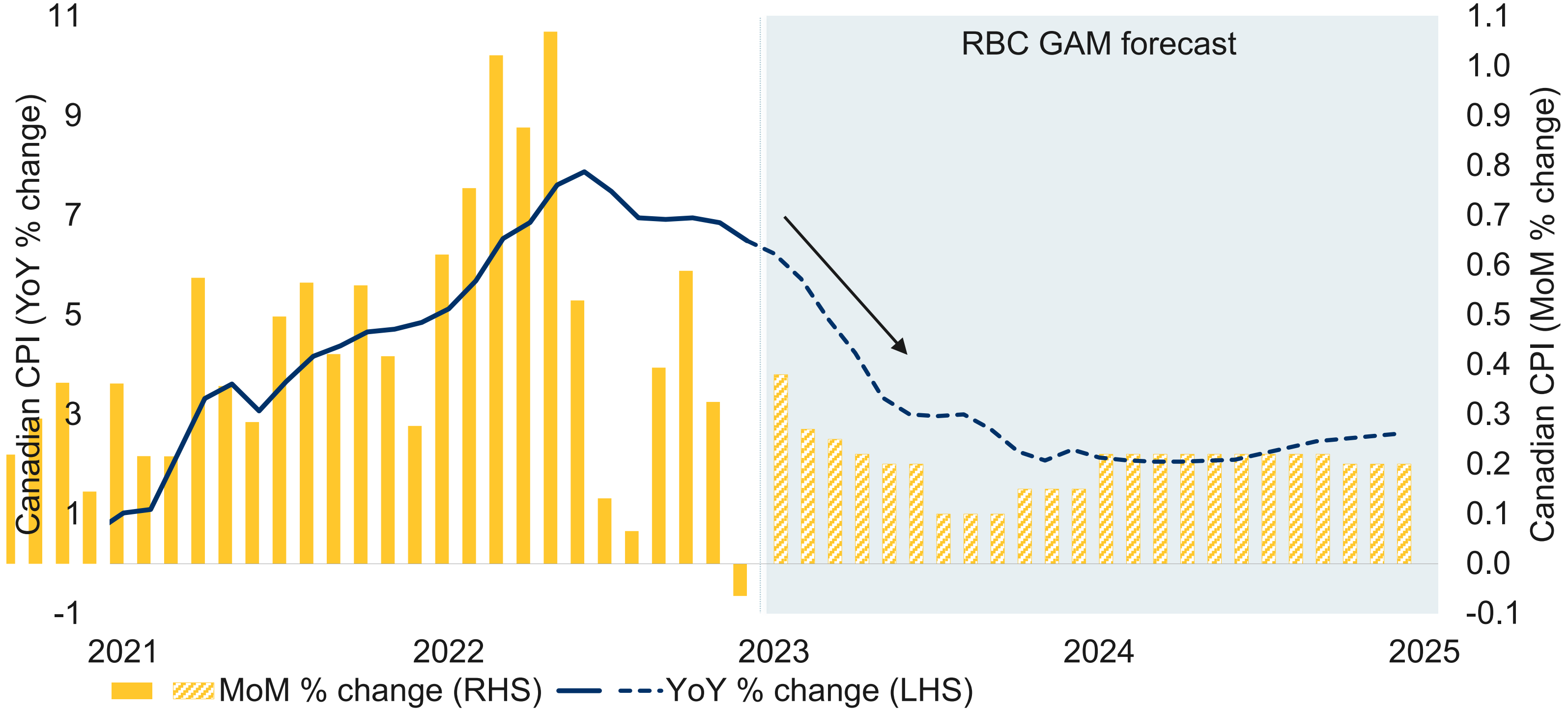
Goods inflation in Canada declining, services inflation levelling



Note: As of Dec 2022. Shaded area represents recession. Source: C.D. Howe Institute, Statistics Canada, Haver Analytics, Macrobond, RBC GAM

Inflation can continue to ease from here

Canadian inflation to decline somewhat



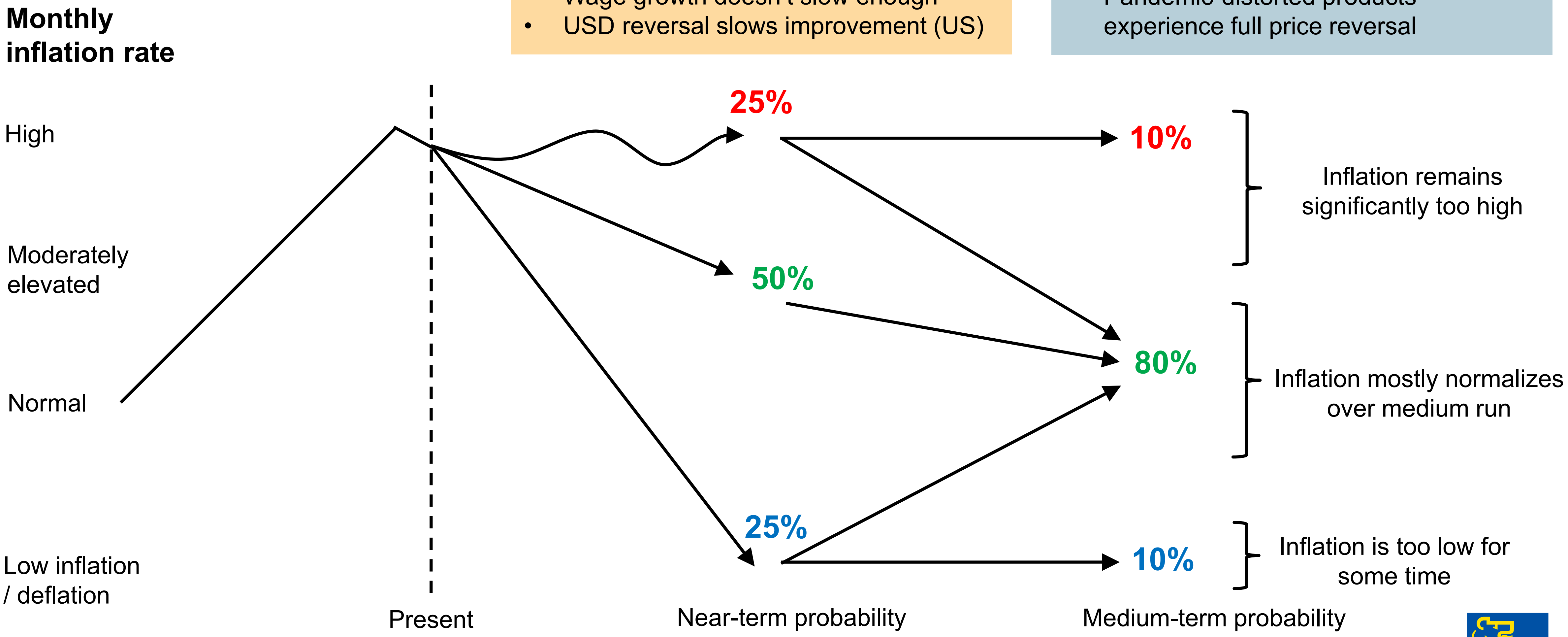
Note: Actual CPI as of Dec 2022. RBC GAM forecast as of 02/15/2023. Source: Statistics Canada, Macrobond, RBC GAM

Any forecast, projection or target where provided is indicative only and is not guaranteed in any way. PH&N Institutional accepts no liability for any failure to meet such forecast or target.

Inflation scenarios

Upside inflation risks:
- Central banks stop too soon
- China revival reignites inflation
- Intensification of war in Ukraine
- Wage growth doesn't slow enough
- USD reversal slows improvement (US)

Downside inflation risks:
- Central banks go too far
- Recession is deeper than expected
- War in Ukraine resolved
- Pandemic-distorted products experience full price reversal



Note: As at 02/07/2023. Source: RBC GAM
Any forecast, projection or target where provided is indicative only and is not guaranteed in any way. PH&N Institutional accepts no liability for any failure to meet such forecast or target.

Upside risk:

Inflation – 1970s versus today

Similarities

Problematic monetary policy
- Politicized + bad policy (wage/price controls) in 1970s
- Too much stimulus for too long today

Expansive fiscal policy
- Large deficits in both eras

Supply shock
- 1970s: OPEC embargo; crop failures
- 2020s: pandemic production outages; Ukraine war

Global economic boom
- Initial inflation exacerbated by strong growth

Differences

Worse setup in the 1970s
- Inflation was gradually rising for years beforehand
- End of gold standard and FX depreciation
- Stronger wage-price spiral dynamics then
- Greater energy and food intensity then

Central banks better positioned today
- Explicitly target inflation, more transparent
- Good credibility after three decades of success
- Learned from 1970s
- Aggressively countered high inflation after <1 year

Very different demographics

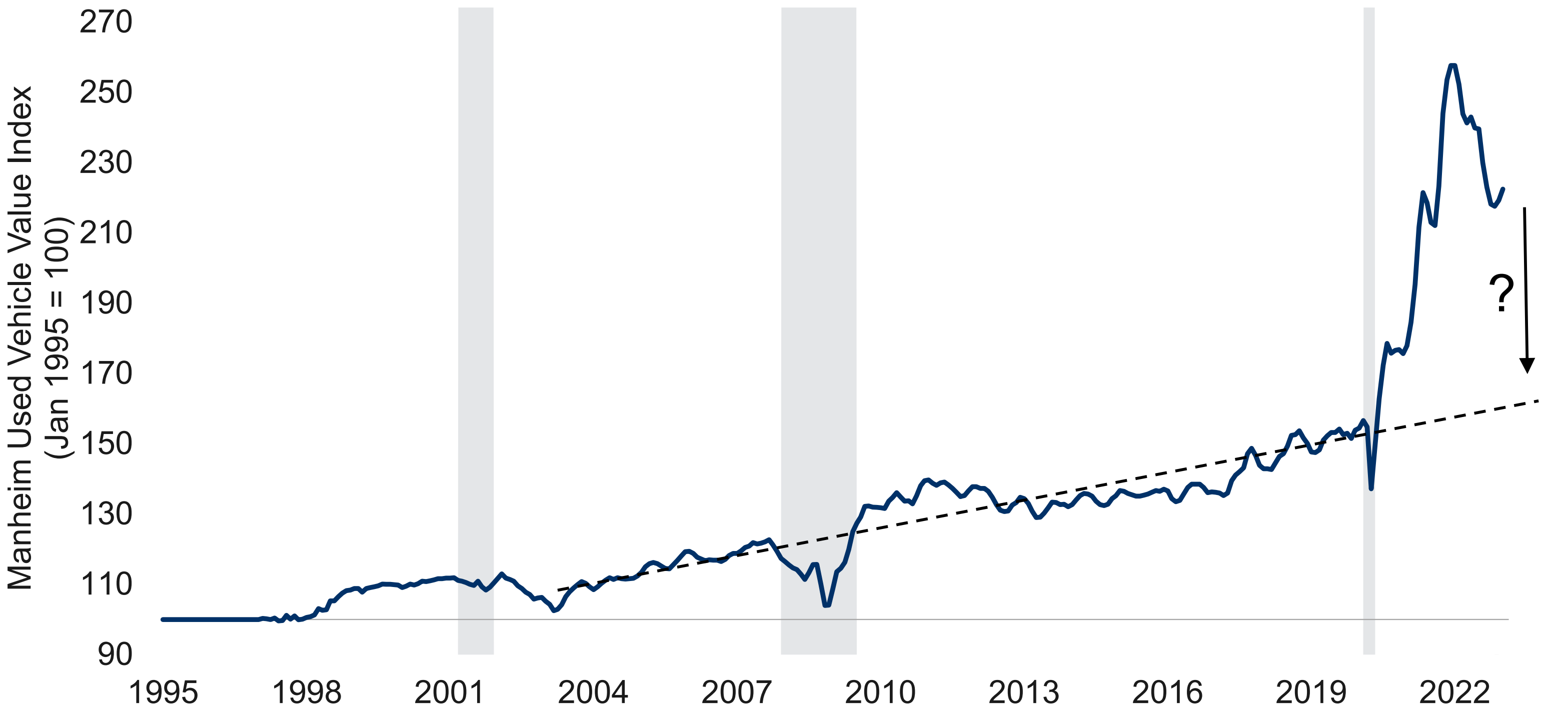
Conclusion: Inflation is less likely to become structural this time, though there is a risk

Note: As at 02/15/2023. Source: Arthur Burns 1979 speech "The Anguish of Central Banking," RBC GAM.

Downside risk:

Deflation (versus disinflation) is likely for some products

Wholesale used car prices retreating from peak, but still elevated



Note: As of Jan 2023. Shaded area represents recession. Source: Manheim Consulting, Macrobond, RBC GAM

Expect outright deflation in products most affected by:

- Supply chain problems
- Commodity shock
- And other products whose price rose well above the overall inflation rate

But don't expect a full unwind of the overall CPI overshoot:

- Periods of high inflation are not usually followed by offsetting deflation
- Higher wages and breadth of inflation lock in much of recent price increases

Note: As at 02/09/2023. Source: RBC GAM

Long-run inflation may run a little higher than 2%

Tug of war

Demographics

Slower population growth and aging are deflationary

Japan is the classic example

Sector effects
Tech, Health, Education

Tech change is a deflationary force

Health and education inflation has structurally declined

Faster productivity growth

We expect incrementally faster productivity growth in future decades

This is usually deflationary

Maturing EM

As emerging-market economies become richer, their inflation slows

Scarring

The recent bout of high inflation may cause long-term scarring

Climate change

Climate change is slightly inflationary via several channels

Workers > Business

Workers are gaining clout while businesses are losing it

This could add to inflation

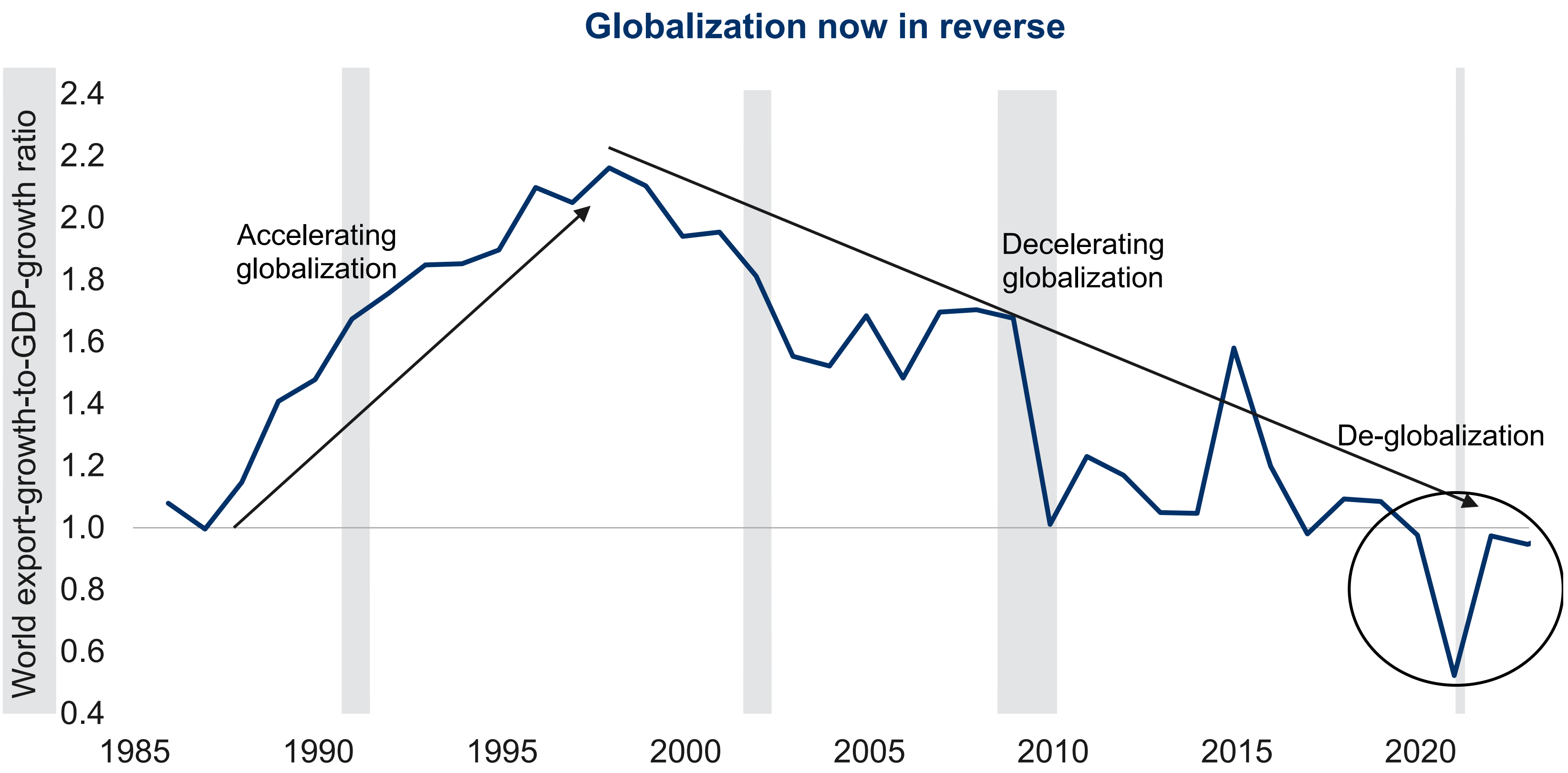
De-globalization

De-globalization is now underway

It is inflationary, though less than commonly imagined

Note: As at 02/15/2023. Source: RBC GAM

Globalization shifts into reverse = more inflation, moderate impact



Note: Ratio of 5-year growth of real export of goods and services to that of real GDP. Ratios for 2022 and after based on OECD forecast. Shaded area represents U.S. recession. Source: OECD, Haver Analytics, RBC GAM

Fewer tailwinds:

- World already highly integrated
- Tariffs already low
- Declining comparative advantage:
    - Rising int'l homogeneity
    - Shrinking wage differentials
    - Rising automation

New headwinds:

- Frictions between big nations
- On-shoring, friend-shoring, focus on supply chain resilience
- Weaponization of USD and SWIFT financial transfers
- Rising domestic subsidies and industrial policies, carbon tax on imported goods

Note: As at 02/09/2023. Source: RBC GAM

Long-term theme: Workers > Businesses = more inflation?

Businesses won for decades

- Favourable corporate tax trends
- Rising firm concentration
- Rising globalization
- Rising automation
- Declining unionization
- Abundant supply of labour

= Rising margins / Sluggish wages / Low inflation

VS

Workers could fare better in future

- Governments becoming more sympathetic to workers
- Trend toward higher minimum wages
- Expanded social safety net during pandemic
- Rising unionization
- Labour shortages:
  - Acute cyclical shortfall during pandemic
  - Retiring baby boomers in future
- De-globalization reduces international labour competition
- Global minimum 15% corporate tax rate
- Anti-trust efforts expanding significantly
- (Though automation still rising)

= Flat profit margins / Faster wages / More inflation?

Note: As at 02/15/2023. Source: RBC GAM

Climate change:
More upward pressures than downward ones

More inflation

- **Carbon tax**
  - Higher price on carbon-intensive goods
  - Higher transportation costs bleed into many products
- **Costly to scrap stranded assets, invest in new assets**
  - Shifting where food is grown
  - Shifting from fossil fuels to green energy
- **More natural disasters**
  - Expensive to rebuild / insure against
  - Supply chain shocks

Less inflation

- Weaker economy usually means lower inflation

Note: As at 02/15/2023. Source: RBC GAM

Winners and losers if inflation is permanently higher

Losers	
Households	• Wage growth lags/dampened vs. burst of inflation
Certain companies	• Low pricing power (margins shrink) • Growth orientation (higher discount rate saps value)
Fixed-rate lenders	• Capital losses
Physical cash	• Real depreciation
Equity investors	• Valuation falls due to higher discount rate on future earnings
Taxable investments	• Taxes apply to nominal market returns • Higher inflation thus increases the effective tax rate
Weaker economy	• High inflation is corrosive • Central banks tighten monetary policy

Winners	
Certain companies	• High pricing power (margins expand) • Labour is large share of expenses (labour costs lag) • Capital-intensive business
Fiscal finances	• Gov't revenue grows faster and sooner than expenses • Earn revenue from higher effective tax rate on investments • Debt-to-GDP ratio falls due to inflation boost to denominator
Fixed-rate borrowers	• Inflation-adjusted borrowing cost falls

Neutral	
Variable-rate lenders	• Return keeps pace with inflation
Var.-rate borrowers	• Real borrowing cost doesn't actually rise
Real assets	• Appreciate in line with inflation

It depends	
Business contracts	• Scope for big winners and losers

Note: As at 02/15/2023. Source: RBC GAM

Conclusion

- Purchasing power is being significantly eroded by high inflation
- Inflation should decline and mostly normalize over the coming year
- However, there is considerable uncertainty around the short-term outlook
- A new set of structural forces may permit slightly more inflation than normal over the long run
- Surprisingly, the consequences of permanently higher inflation are fairly small when compared to a temporary bout of high inflation
- Nevertheless, higher inflation has more negatives than positives from an economic and investment standpoint

Note: As at 02/15/2023. Source: RBC GAM

Appendix

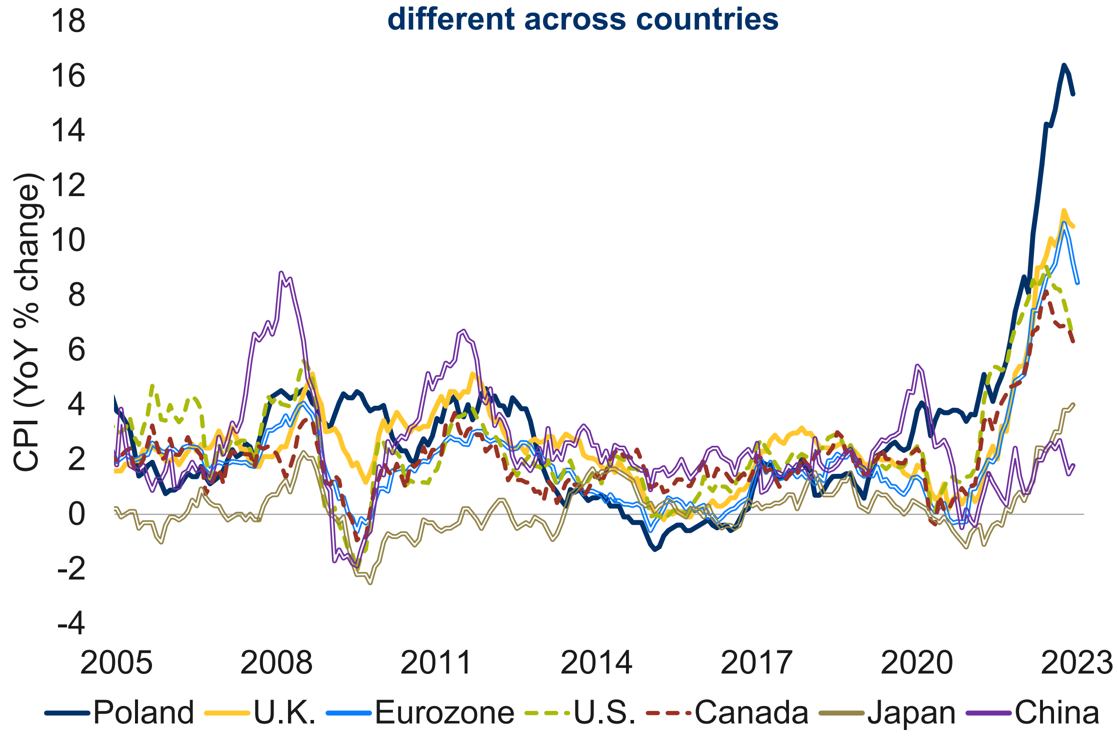
Our approach to inflation forecasting is pragmatic rather than ideological

Monetarist inflation model	Keynesian model	Momentum model	Expectations model	Idiosyncratic forces
• **Idea: Money supply determines inflation** • Plenty of money printed by central banks • Plenty of money spent by fiscal authorities • Therefore more inflation • But these forces have now turned	• **Idea: Overheating economy increases inflation** • Strong demand during pandemic recovery raised inflation • Now, slowing growth can lower inflation	• **Idea: go with the flow** • Don't bet against rising inflation after it started rising • Now, don't bet against falling inflation now that it is falling	• **Idea: Expectations can be self-fulfilling** • Inflation expectations rose in recent years, but not to the point of suggesting ultra-high inflation would be permanent • Now, expectations are settling back down	• **Idea: Idiosyncratic forces don't fit into main inflation models** • Distortions from supply chains, altered pattern of demand, Russian energy added to inflation • These are now unwinding • Long-term idiosyncratic forces include climate change, de-globalization, demographics
Critique: Monetarist model failed entirely around global financial crisis	*Critique: Link between economy and inflation was feeble in recent decades*	*Critique: Performs poorly at turning points*	*Critique: Expectations are only loosely connected to near-term inflation*	

Note: As at 02/09/2023. Source: RBC GAM

Understanding international variations in inflation

Inflation surged globally but experience has been different across countries



Note: Eurozone as of Jan 2023, all other countries as of Dec 2022. Source: Macrobond, RBC GAM

Inflation driver	PL	UK	EZ	US	CA	JP	CN
Monetary stimulus							
Fiscal stimulus							
Supply chain							
Econ. overheating							
Baseline inflation							
CPI well anchored							
Staple-heavy CPI							
FX impact							
Russian sanctions							
Brexit							

Note: As at 02/07/2023. Source: RBC GAM

Will central banks increase their inflation target? Probably not

Superficial allure

- Easier for central banks to get inflation back to target
- Reduces the risk of getting stuck in deflation / at the zero lower bound
- New structural forces make it harder to hold inflation down to just 2%

Arguments against

- Horrible timing: would further damage central bank credibility
- Higher inflation creates undesirable economic distortions
- The act of changing the inflation target would create big winners and losers
- A key argument for a higher inflation target – to minimize the threat of deflation – is hardly relevant at the moment
- Pundits always argue for changing the inflation target during crises – but it rarely seems advisable later

Bottom line: major central banks are unlikely to raise their inflation targets, (though they will be more focused on inflation than in recent decades)

Note: As at 02/09/2023. Source: RBC GAM

Disclosure

This presentation is intended for institutional investors only.

This document has been provided by PH&N Institutional for information purposes only and may not be reproduced, distributed or published without the written consent of PH&N Institutional. It is not intended to provide professional advice and should not be relied upon in that regard. Any securities information provided in this presentation is confidential and for illustration purposes only to demonstrate the investment management process of the investment team(s), and is not a recommendation to buy or sell any specific security.

PH&N Institutional takes reasonable steps to provide up-to-date, accurate and reliable information, and believes the information to be so when printed. PH&N Institutional reserves the right at any time and without notice to change, amend or cease publication of the information.

Information obtained from third parties is believed to be reliable, but no representation or warranty, express or implied, is made by PH&N Institutional, its affiliates or any other person as to its accuracy, completeness or correctness. We assume no responsibility for any errors or omissions in such information.

This information is not intended to be an offer or solicitation to buy or sell securities or to participate in or subscribe for any service. No securities are being offered, except pursuant and subject to the respective offering documents and subscription materials, which shall be provided to qualified investors. This document is for general information only and is not, nor does it purport to be, a complete description of an investment in any RBC, PH&N or BlueBay funds. If there is an inconsistency between this document and the respective offering documents, the provisions of the respective offering documents shall prevail.

The amount of risk associated with any particular investment depends largely on the investor's own circumstances. Investors should consult their professional advisors/consultants regarding the suitability of the investment solutions mentioned in this presentation.

This document may contain forward-looking statements about general economic factors which are not guarantees of future performance. Forward-looking statements involve inherent risk and uncertainties, so it is possible that predictions, forecasts, projections and other forward-looking statements will not be achieved. We caution you not to place undue reliance on these statements as a number of important factors could cause actual events or results to differ materially from those expressed or implied in any forward-looking statement. All opinions in forward-looking statements are subject to change without notice and are provided in good faith but without legal responsibility.

PH&N Institutional is the institutional business division of RBC Global Asset Management Inc. (RBC GAM Inc.). RBC GAM Inc. is the manager and principal portfolio adviser of the Phillips, Hager & North (PH&N) investment funds and RBC investment funds.

RBC Global Asset Management is the asset management division of Royal Bank of Canada (RBC) which includes RBC GAM Inc., RBC Global Asset Management (U.S.) Inc., RBC Global Asset Management (UK) Limited, RBC Global Asset Management (Asia) Limited, and BlueBay Asset Management LLP, which are separate, but affiliated subsidiaries of RBC.