FINANCIAL MARKETS AND ECONOMIC DEVELOPMENTS

‘FASCINOSUM ET TREMENDUM’

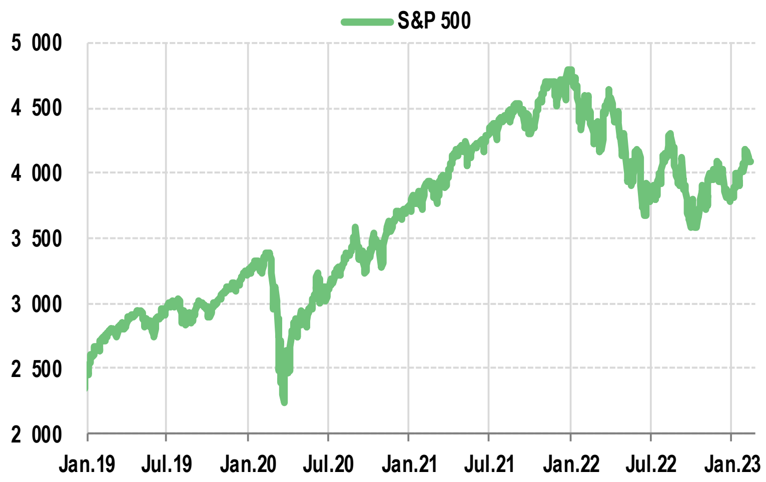
‘LOVE TO HATE’

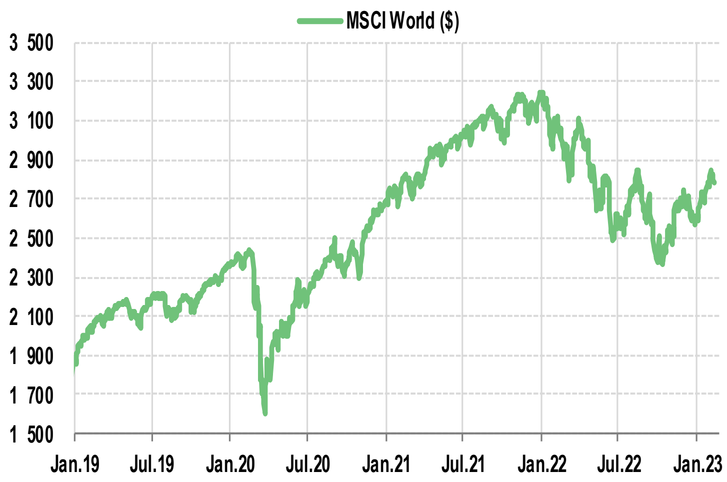
WILLIAM DE VIJLDER
Group Chief Economist
ECMI/CEPS meeting, Brussels, 16 February 2023

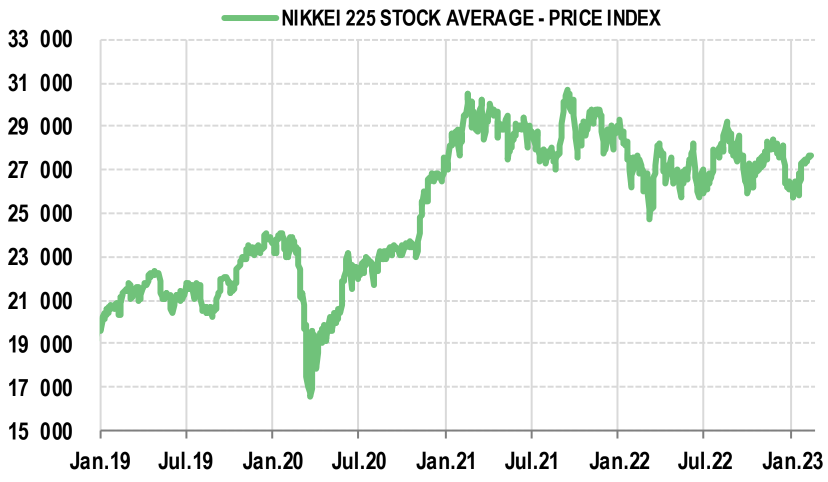
BNP PARIBAS

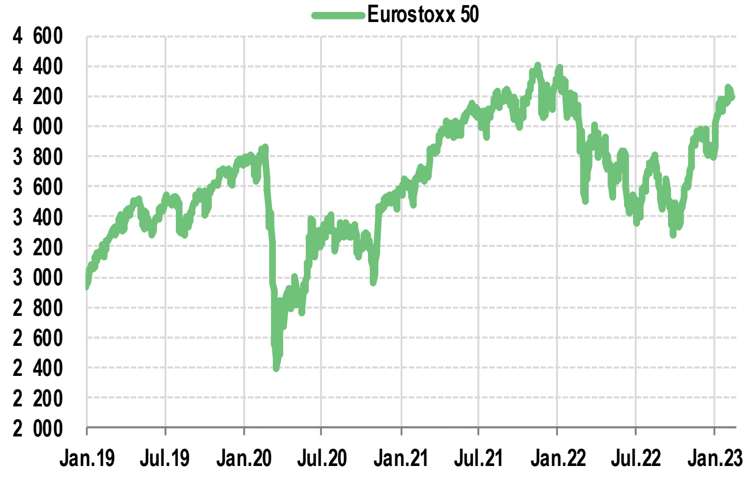
The bank for a changing world

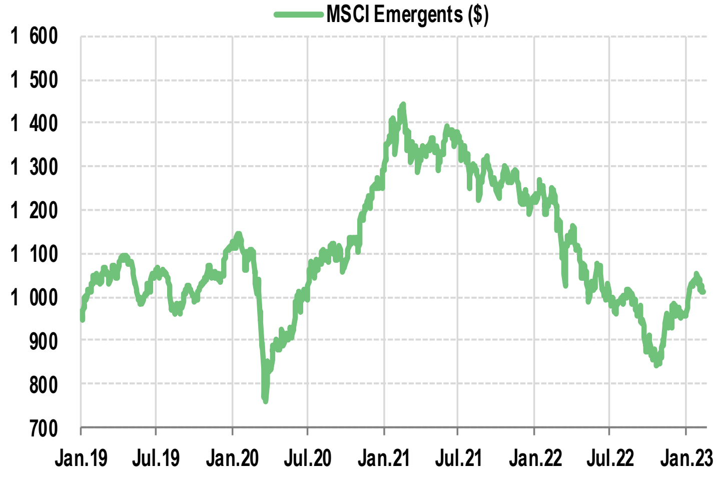
Equity markets

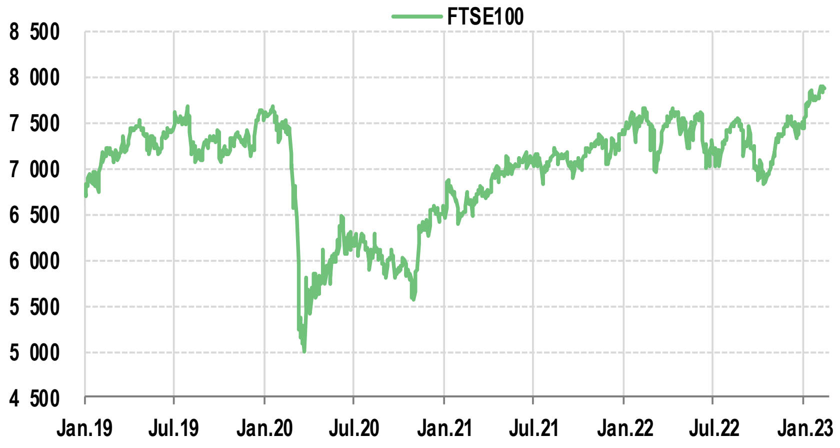






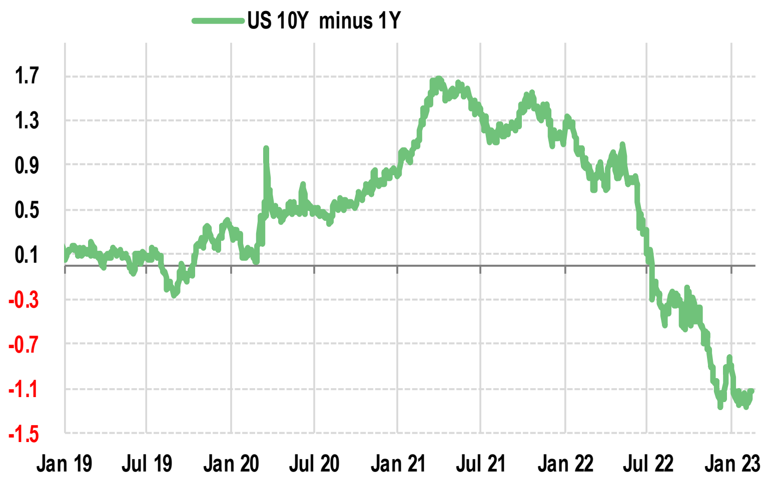


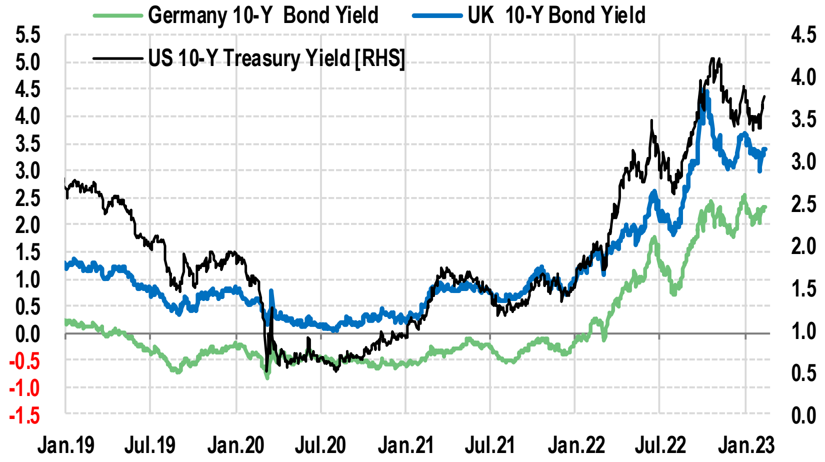


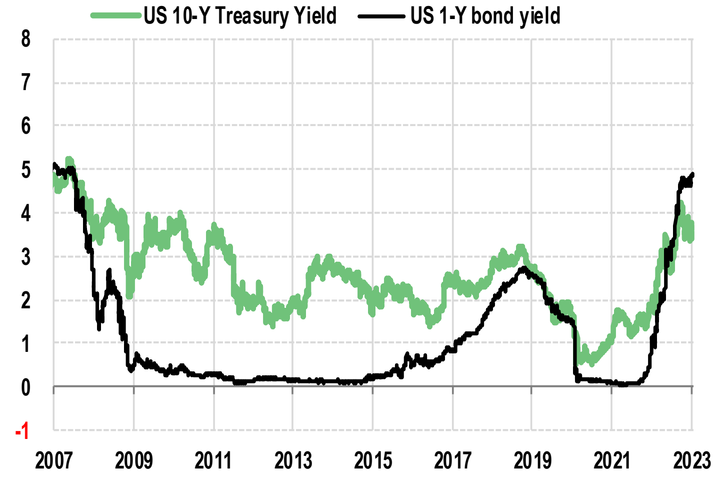


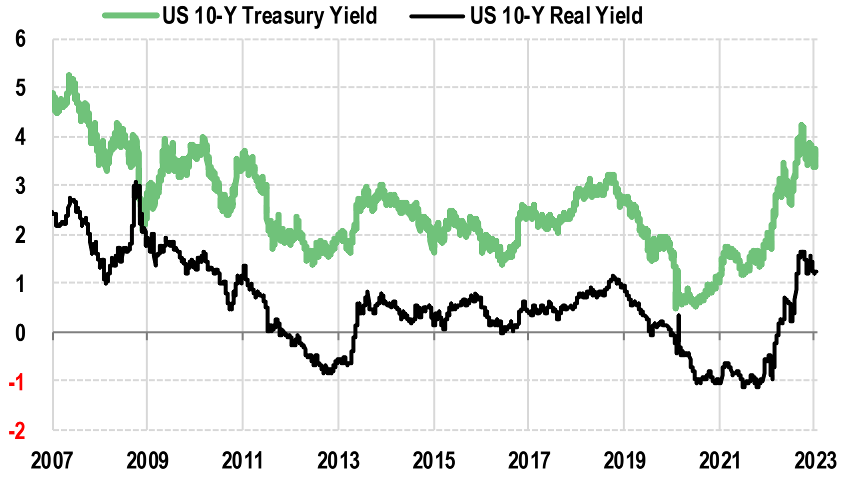
Source: Refinitiv, BNP Paribas

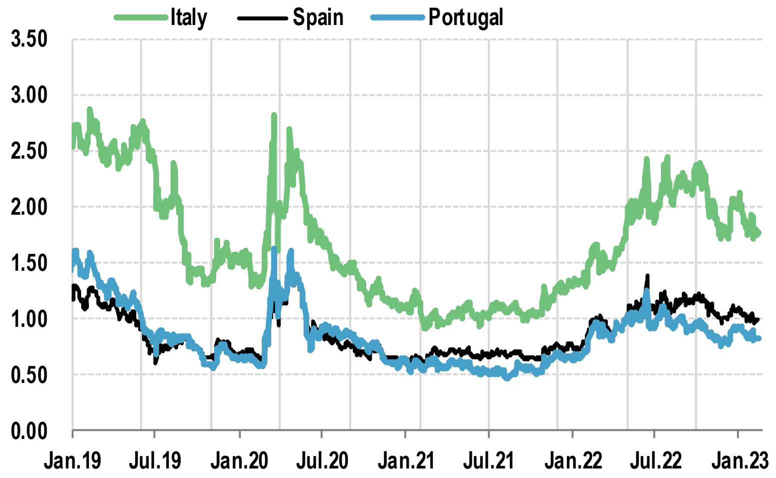
Government bond yields





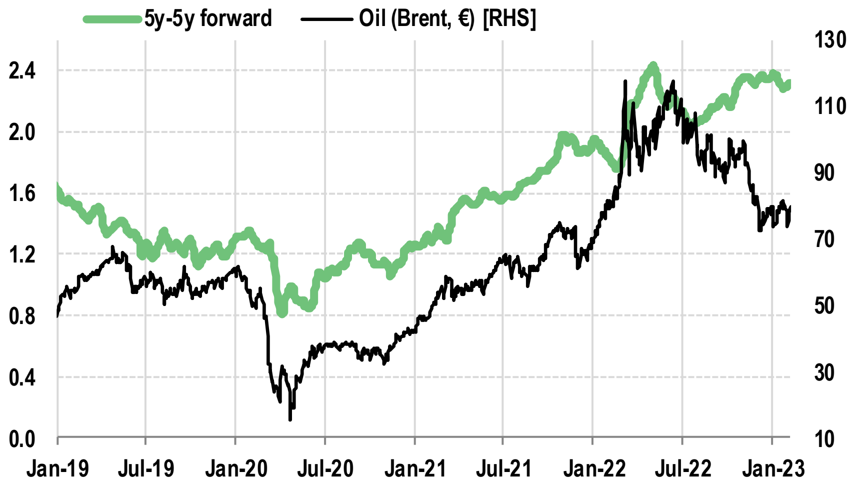


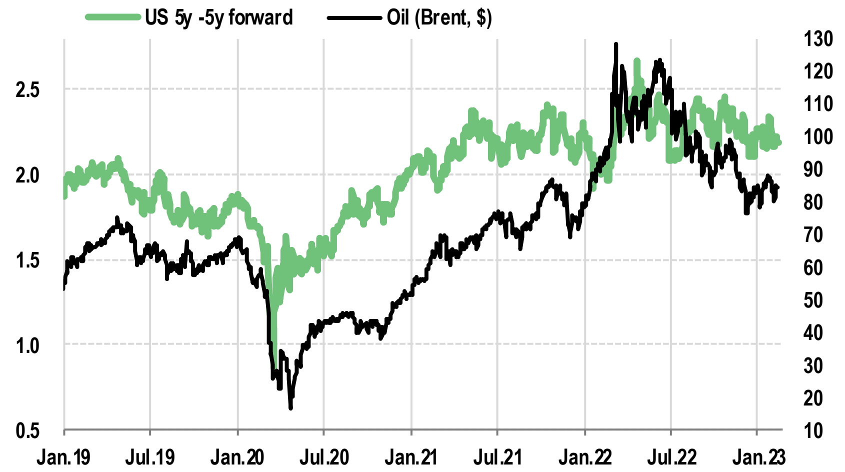


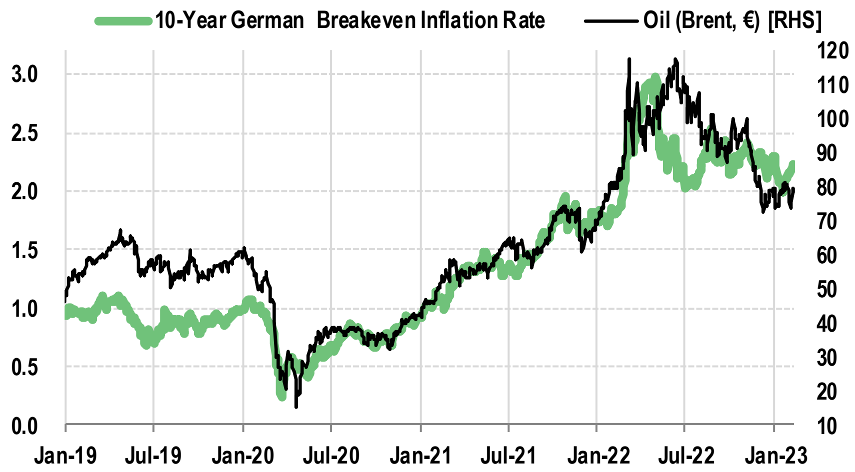


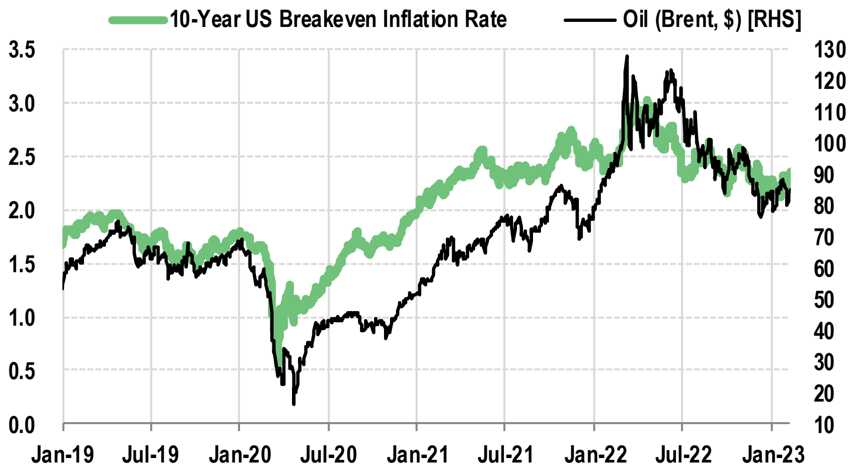
Source: Refinitiv, BNP Paribas

Market-based inflation expectations



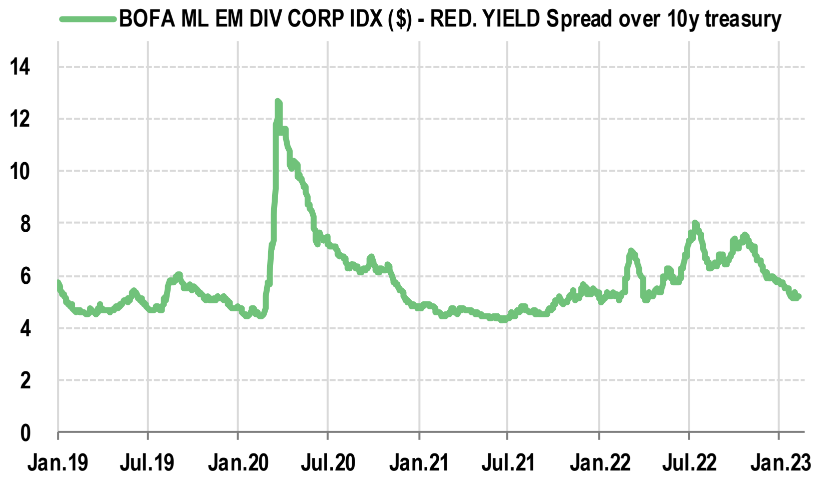


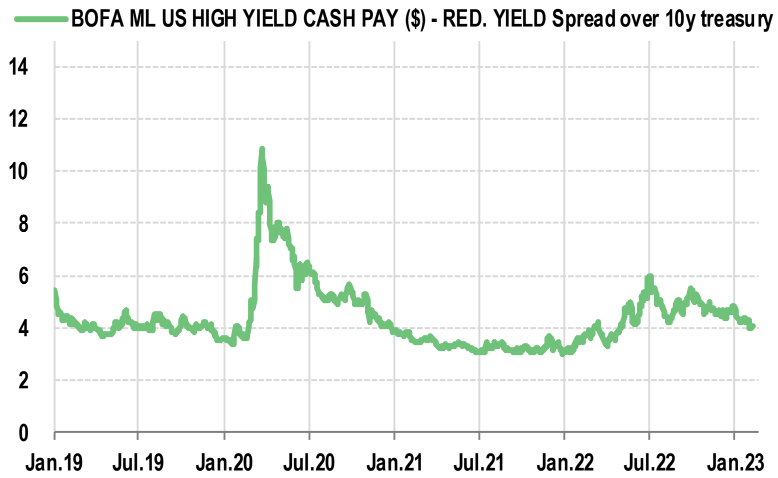




Source: Bloomberg, Refinitiv, BNP Paribas

High yield spreads





Source: Merrill Lynch, BNP Paribas

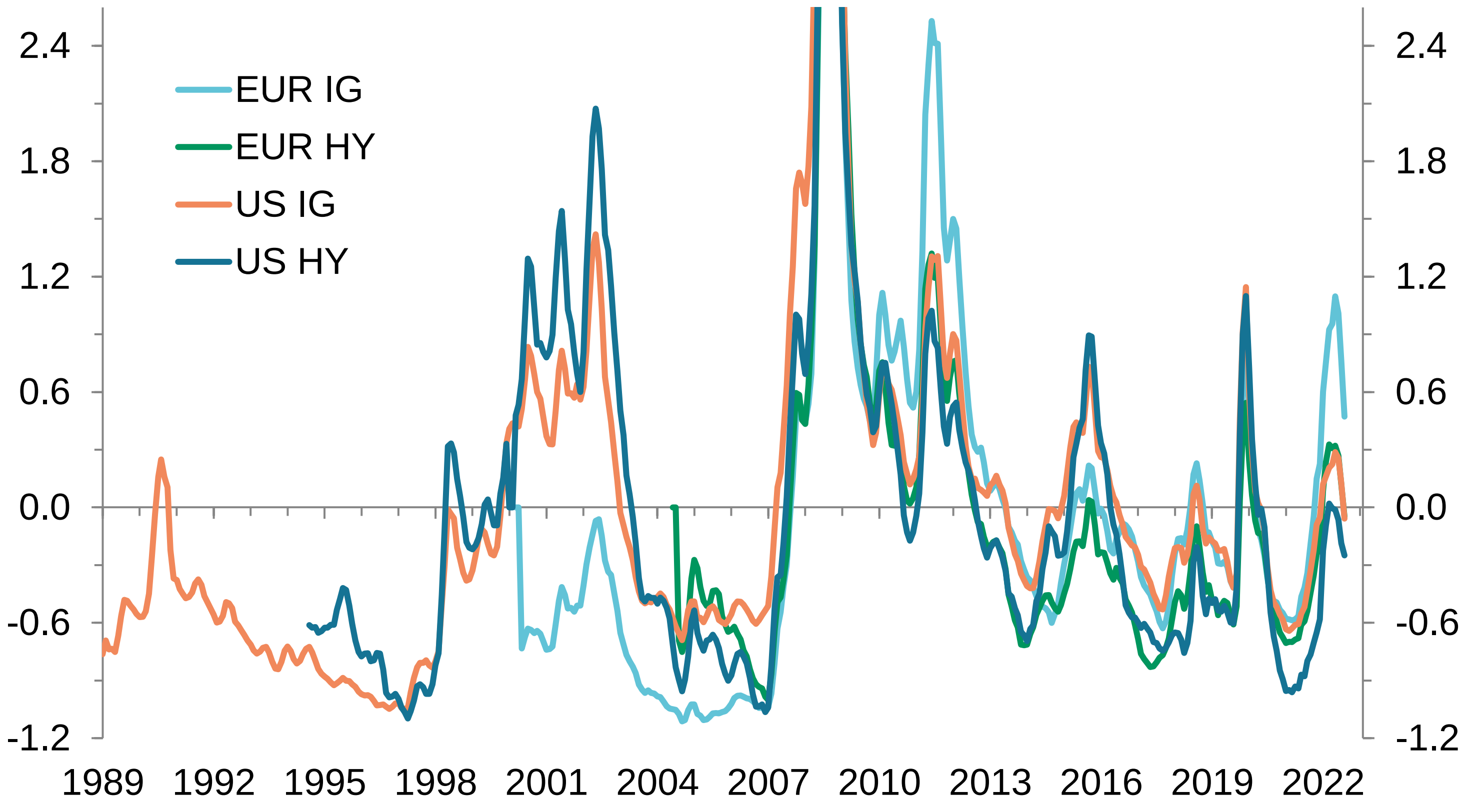
Valuation metric z-scores

Market	P/E	P/B	P/S	EV/S	P/CE	PEG	DY	EV/EBITDA
US vs Europe	2.5	2.6	1.2	0.9	1.6	2.9	0.6	1.6
United States	0.8	1.4	1.4	0.9	1.2	2.5	1.0	0.4
Russell Value	0.7	0.9	1.2	0.0	0.5	-1.5	0.7	0.6
Russell Growth	0.6	1.6	1.0	1.0	0.8	-2.5	1.1	1.0
US Small Cap	0.3	0.3	0.9	0.4	0.4	-2.1	-1.0	0.4
Developed Markets	0.0	1.0	1.5	1.5	1.0	1.0	0.8	1.2
Emerging Markets	-0.1	-0.4	0.1	-0.8	-0.1	-0.1	-1.5	0.2
Europe	-0.4	0.1	0.8	0.3	0.5	-0.5	0.6	-0.5
Japan	-0.5	-0.2	0.8	0.4	-0.2	0.0	-1.3	-0.1

P/E = Price-to-Earnings
P/B = Price-to-Book
P/S = Price-to-Sales
EV/S = Enterprise Value-to-Sales
P/CE = Price-to-Consumer Expenditures
PEG = Price/Earnings-to-growth ratio
DY = Dividend Yield
EV/EBITDA = Enterprise Value-to-Earnings before Interest, Taxes, Depreciation & Amortization

Data as at 14 February 2023. Sources: IBES, Bloomberg, BNP Paribas Asset Management.

US and Europe credit spreads z-scores



Data as at 14 February 2023. Note: Option Adjusted Spread. Sources: Bloomberg, BNP Paribas Asset Management.

‘It ain't over till it's over’ (Yogi Berra)

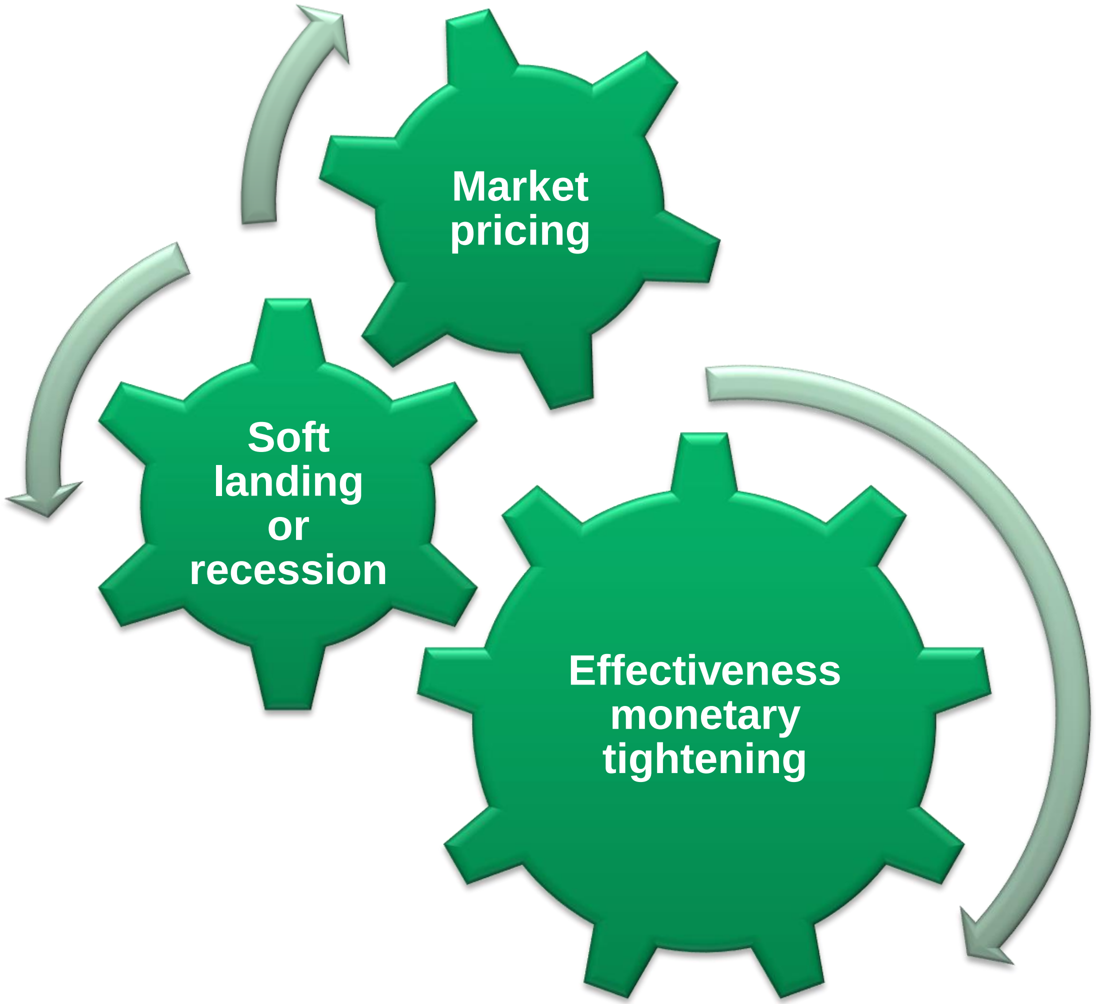
It =

1. the expansion phase of the business cycle
2. the monetary tightening cycle
3. the risk-on environment

When will 2 (monetary tightening cycle) be over?

When Fed is convinced that without further action inflation will converge to target.

What this means for 1 and 3 depends on the data.



Analysing inflation in pre-Covid times: Phillips curve

$$(2) \quad \hat{\pi}_t^{core} = \underset{(4.1)}{0.40}\,\overline{\pi}_t^{e} + \underset{(3.9)}{0.36}\,\pi_{t-1}^{core} + \underset{(2.6)}{0.23}\,\pi_{t-2}^{core} - \underset{(2.2)}{0.07}(u_t - u_t^{nru}) + \underset{(3.7)}{0.54}\,rpim_t \quad SE = 0.49 \quad \overline{R}^2 = 0.70$$

Expected inflation (long term)

Core PCE previous year

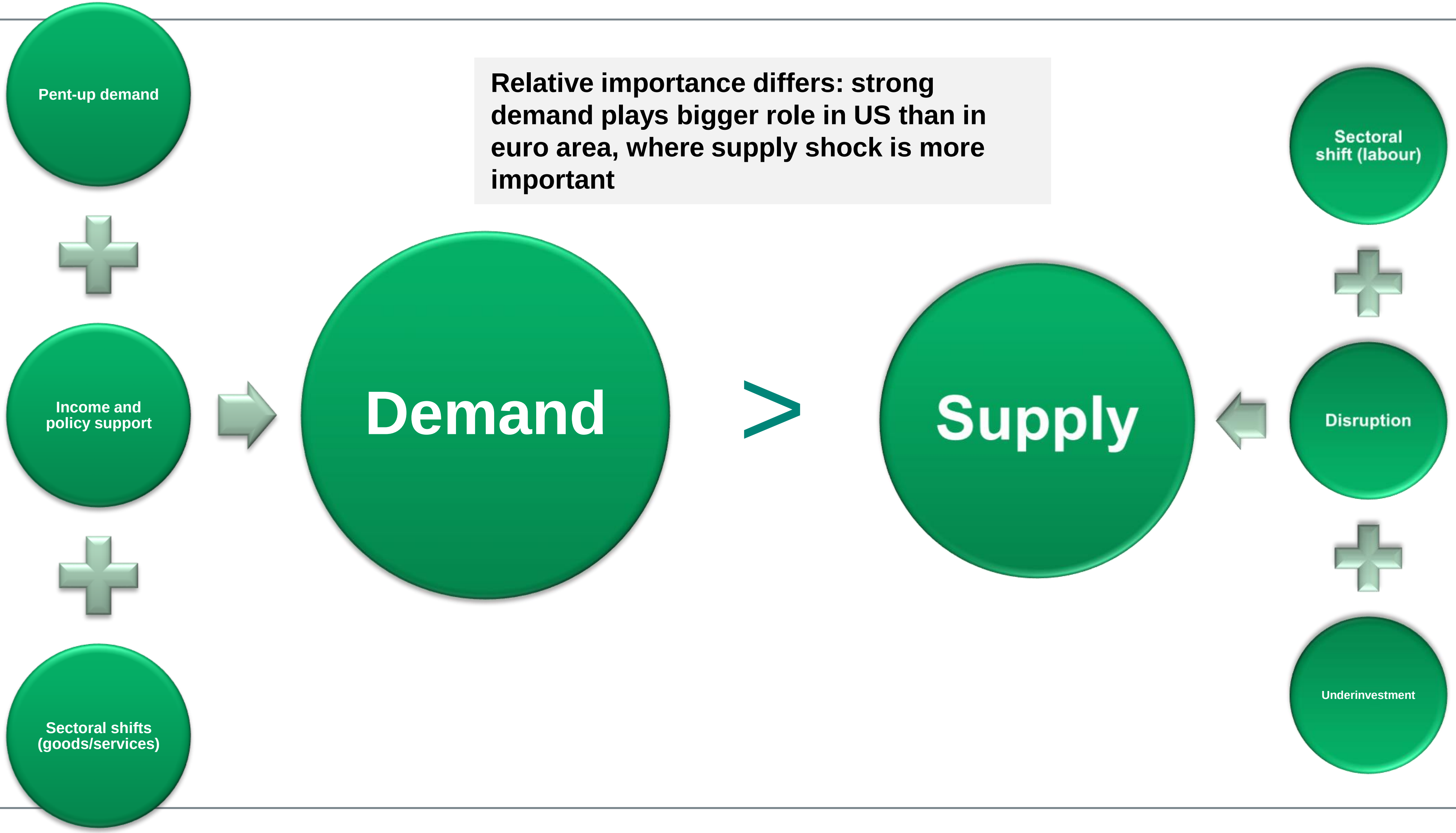
Unemployment gap (difference from NAIRU)

Ratio import prices to domestic prices

Source: The Death of the Phillips Curve?, Anthony Murphy, Federal Reserve Bank of Dallas, January 2018

The framework since Covid-19: elevated inflation - demand and supply factors

Relative importance differs: strong demand plays bigger role in US than in euro area, where supply shock is more important



Macro has become micro

Euro area: drivers of selling price expectations

REGRESSION RESULTS FOR SELLING PRICE EXPECTATIONS
ESTIMATION PERIOD: 1998 - 2022

Variable *Dependent Variable: Selling Price Expectations*	Coefficient	t-Stat
Order book	0.1751	7.5620
PMI Input Prices (-1)	0.6126	20.5349
Brent in euro (m/m)	0.0795	2.6774
C	-27.2721	-14.1029
R2	0.8162	

TABLE 1

SOURCE: S&P GLOBAL (MARKIT), EUROPEAN COMMISSION, BNP PARIBAS

Euro area selling price expectations: observed versus estimated

SELLING PRICE EXPECTATIONS: ESTIMATED VERSUS OBSERVED

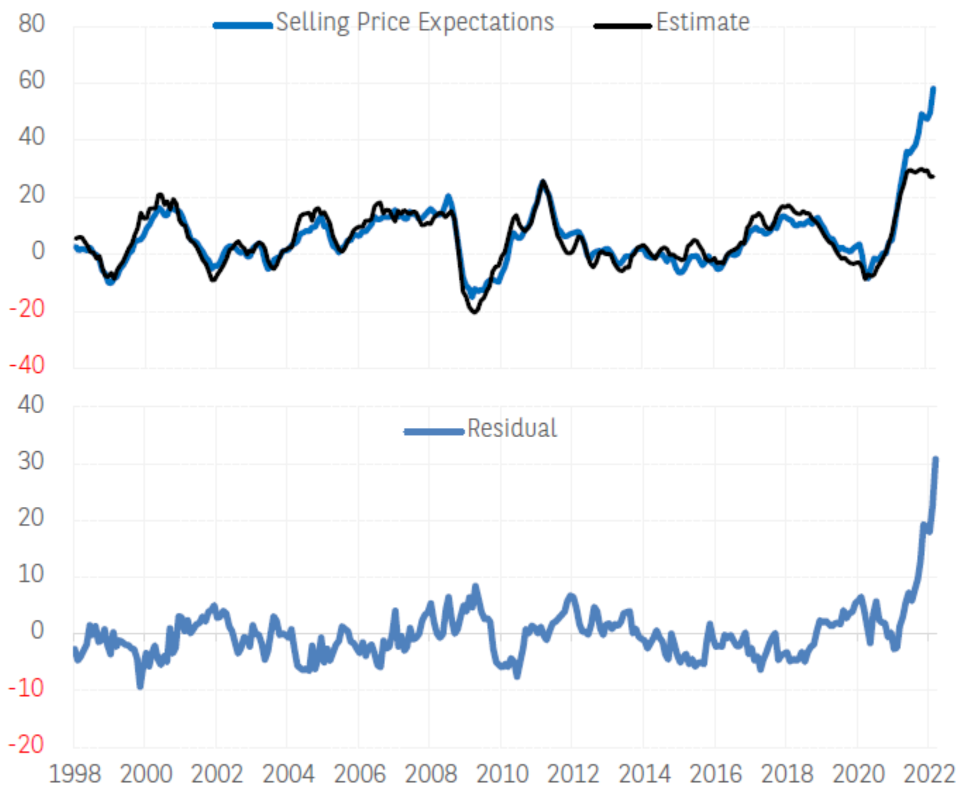


CHART 2

SOURCE: S&P GLOBAL (MARKIT), EUROPEAN COMMISSION, BNP PARIBAS

Euro area inflation

REGRESSION RESIDUAL OF SELLING PRICE EXPECTATIONS VERSUS UNDERLYING INFLATION

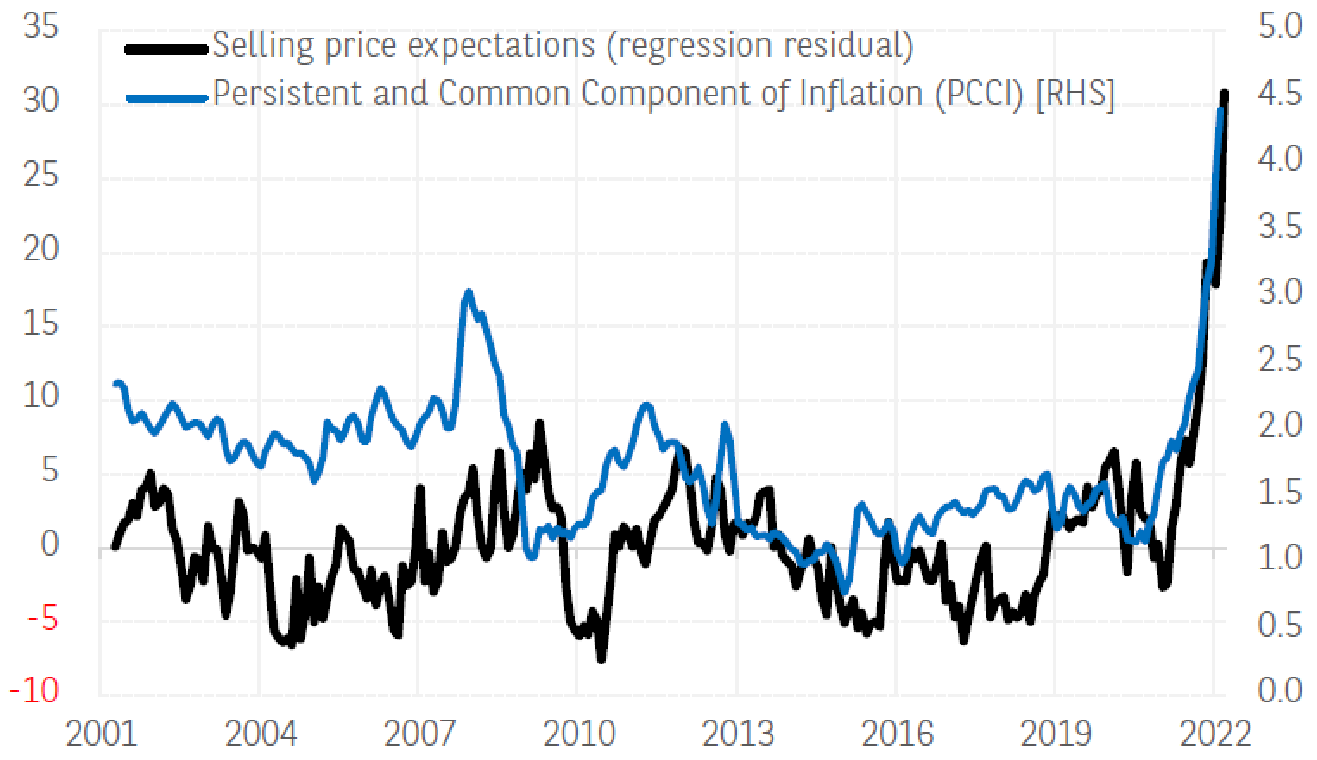
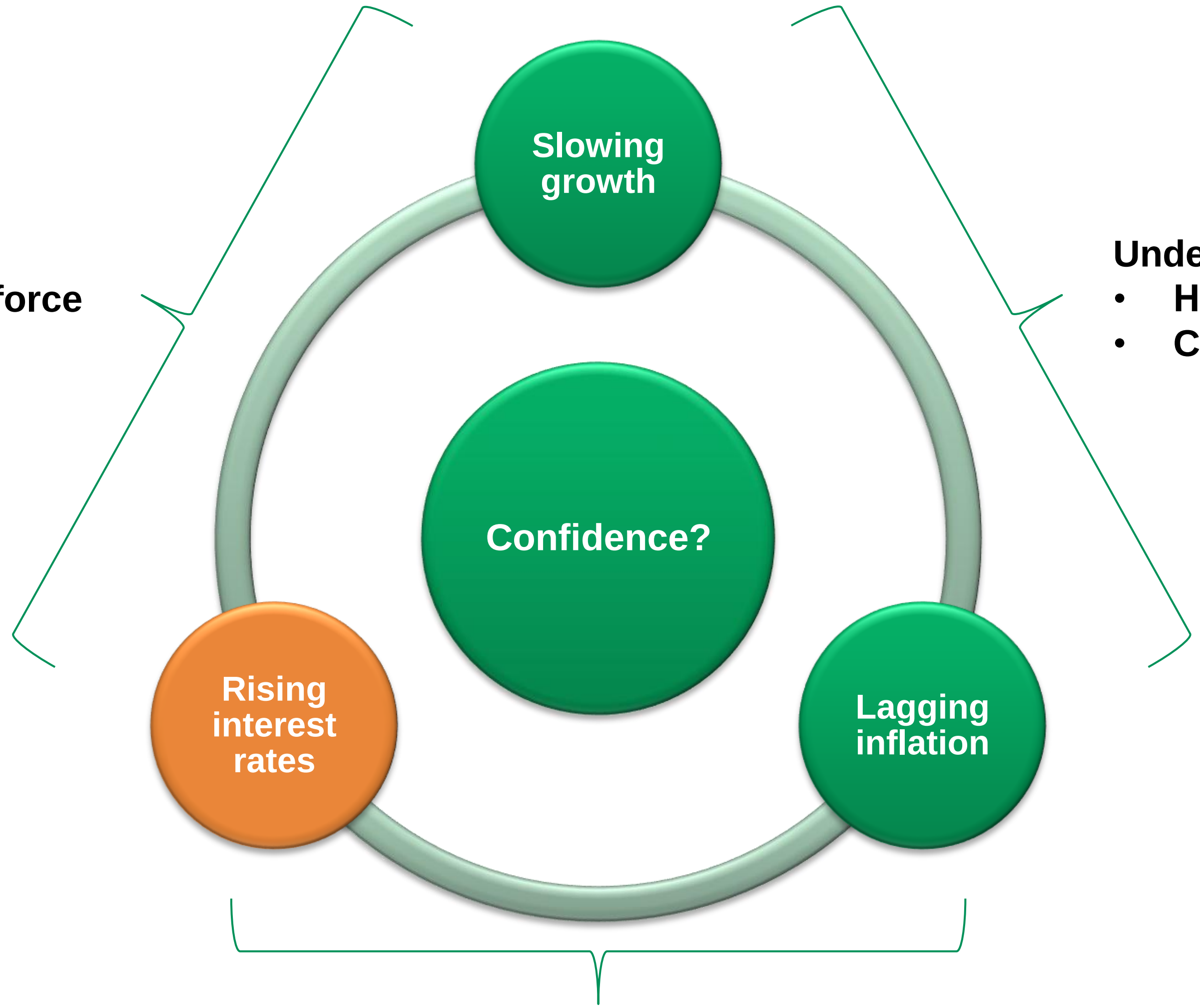


CHART 3

SOURCE: S&P GLOBAL (MARKIT), EUROPEAN COMMISSION, BNP PARIBAS

Triggering disinflation: the big picture (1)

Disinflationary force



Under pressure:
- **Households' purchasing power**
- **Corporate profits**

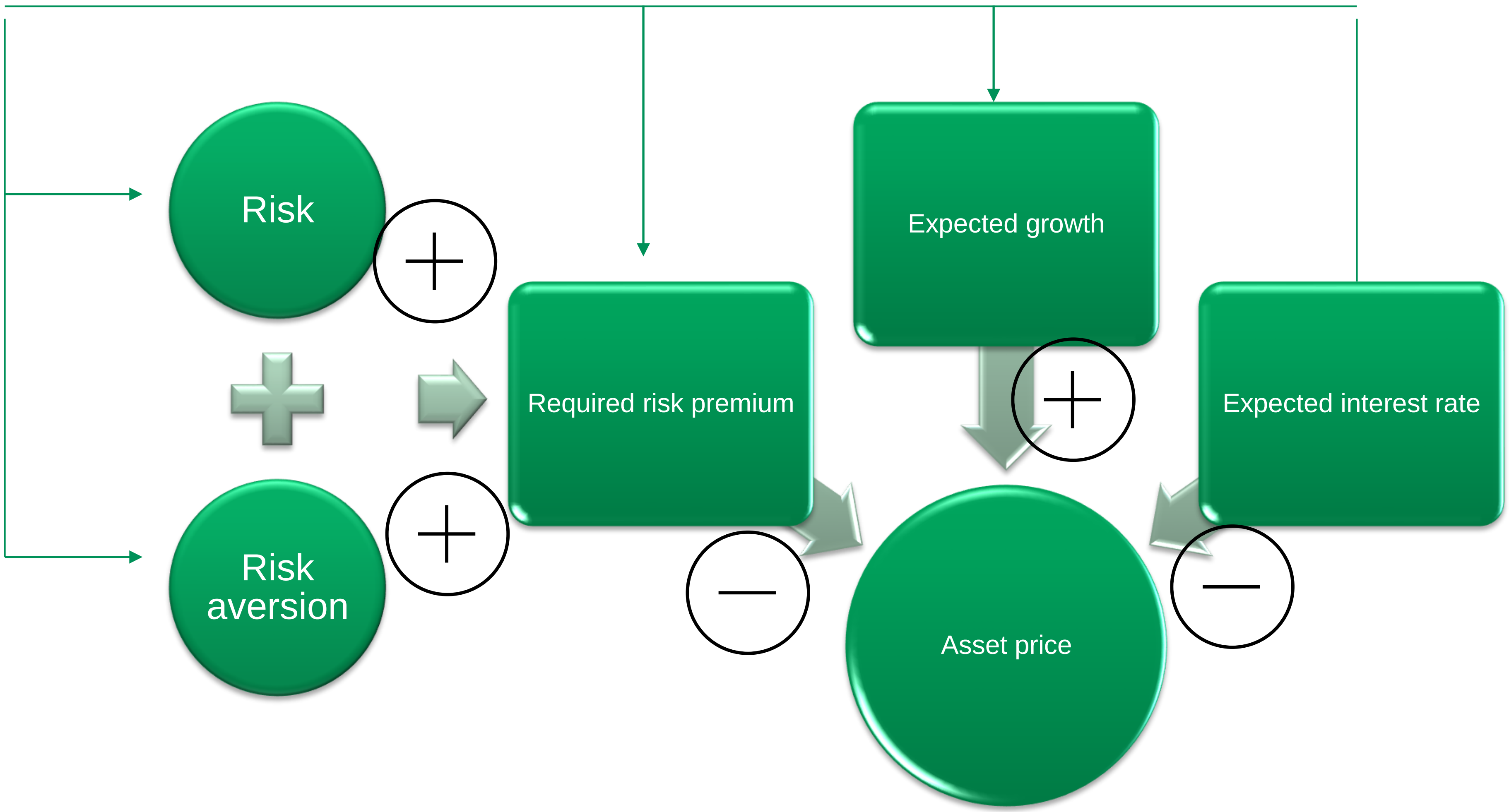
Tighter monetary policy so as to keep inflation expectations well-anchored

Triggering disinflation: the big picture (2)

About cashflow and discount rate effects

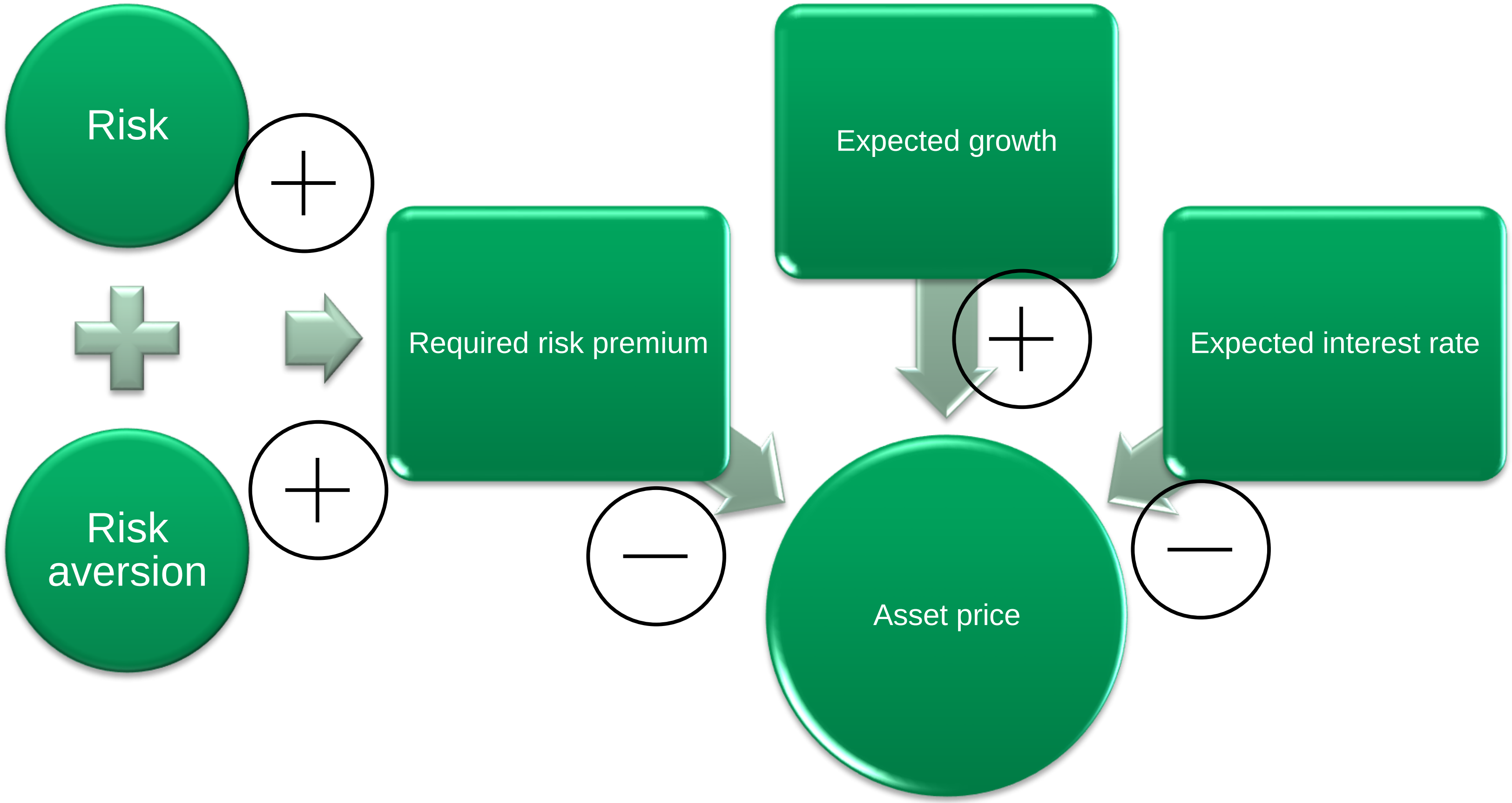
Rising interest rates influence everything else

Circles show sign of correlation



Growth fears influence investor behaviour

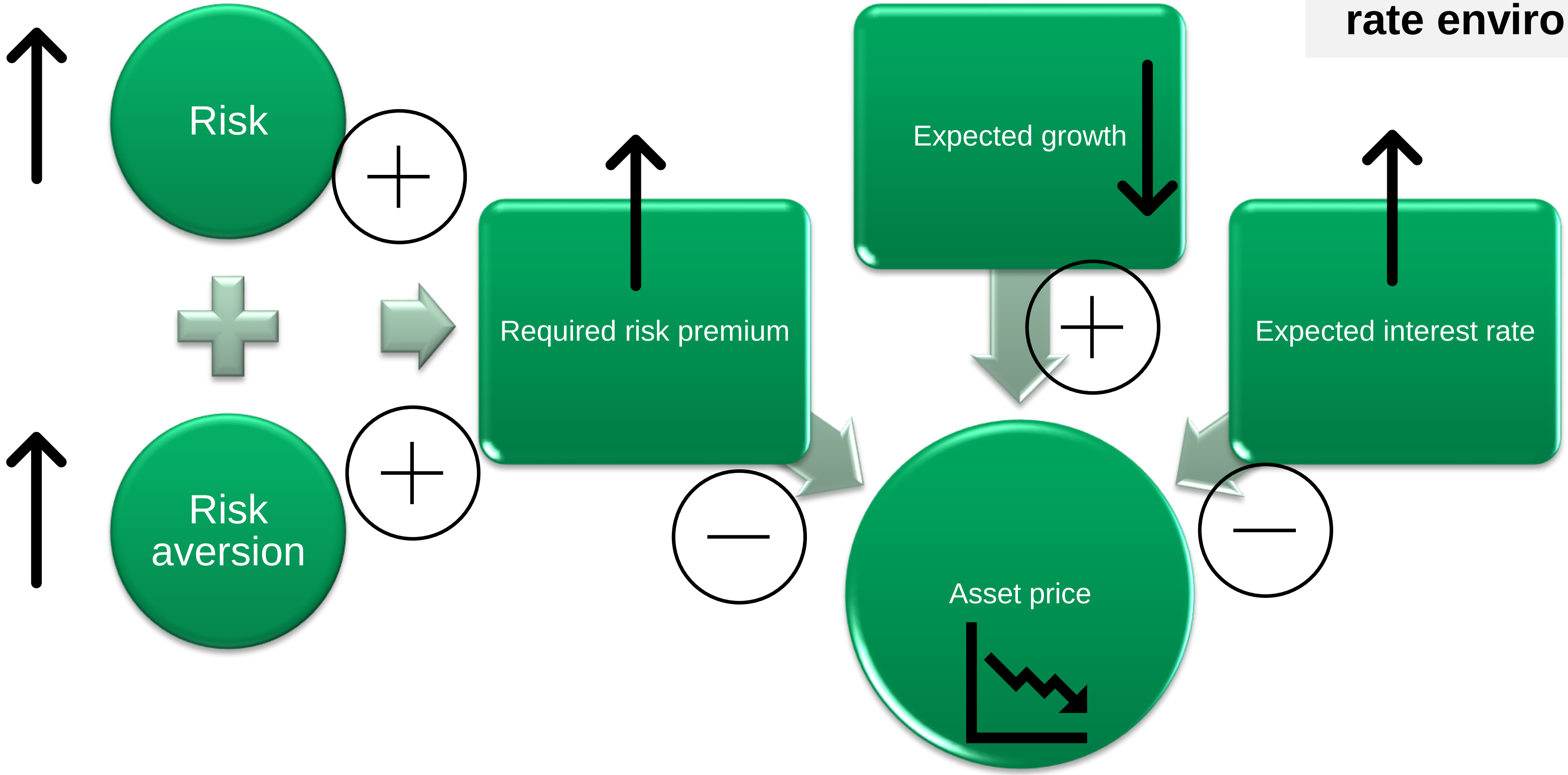
Circles show sign of correlation



Rising rates and hence growth fears influence investor behaviour

Circles show sign of correlation

Arrows show dynamics in a slowing growth/rising interest rate environment (like today)



Global spillovers of US monetary tightening

“We demonstrate that fluctuations in risk premiums, and not risk-free rates and dividends, account for a large part of the observed equity price synchronization after 1990.

We also show that U.S. monetary policy has come to play an important role as a source of fluctuations in risk appetite across global equity markets.”

Global Financial Cycles and Risk Premiums
Òscar Jordà, Moritz Schularick, Alan M. Taylor, and Felix Ward
NBER Working Paper No. 24677
June 2018

“We find economically and statistically significant spillovers from the United States to EMEs and smaller advanced economies.

These spillovers are present not only in short- and long-term interest rates but also in policy rates.

In other words, we find that interest rates in the United States affect interest rates elsewhere beyond what similarities in business cycles or global risk factors would justify.

We also find that monetary spillovers take place under both fixed and floating exchange rate regimes”

Source: BIS Quarterly Review, September 2015

When to 'play' a certain theme: markets as 'sequential worriers'

The pricing of ambiguous outcomes

The impact of future uncertain events depends on

1. How much time it will take for uncertainty to be resolved (distance between A and B)
   - The longer the distance, the more other factors can play a role in driving markets
2. The difference between the possible outcomes (distance between C and D)
3. Whether there is a clear resolution or not (E)

Investing under uncertainty

Return on alternative asset (bond, bank deposit)

Required equity return

$$R \geq \rho + q\lambda L$$

Market decline in case of recession

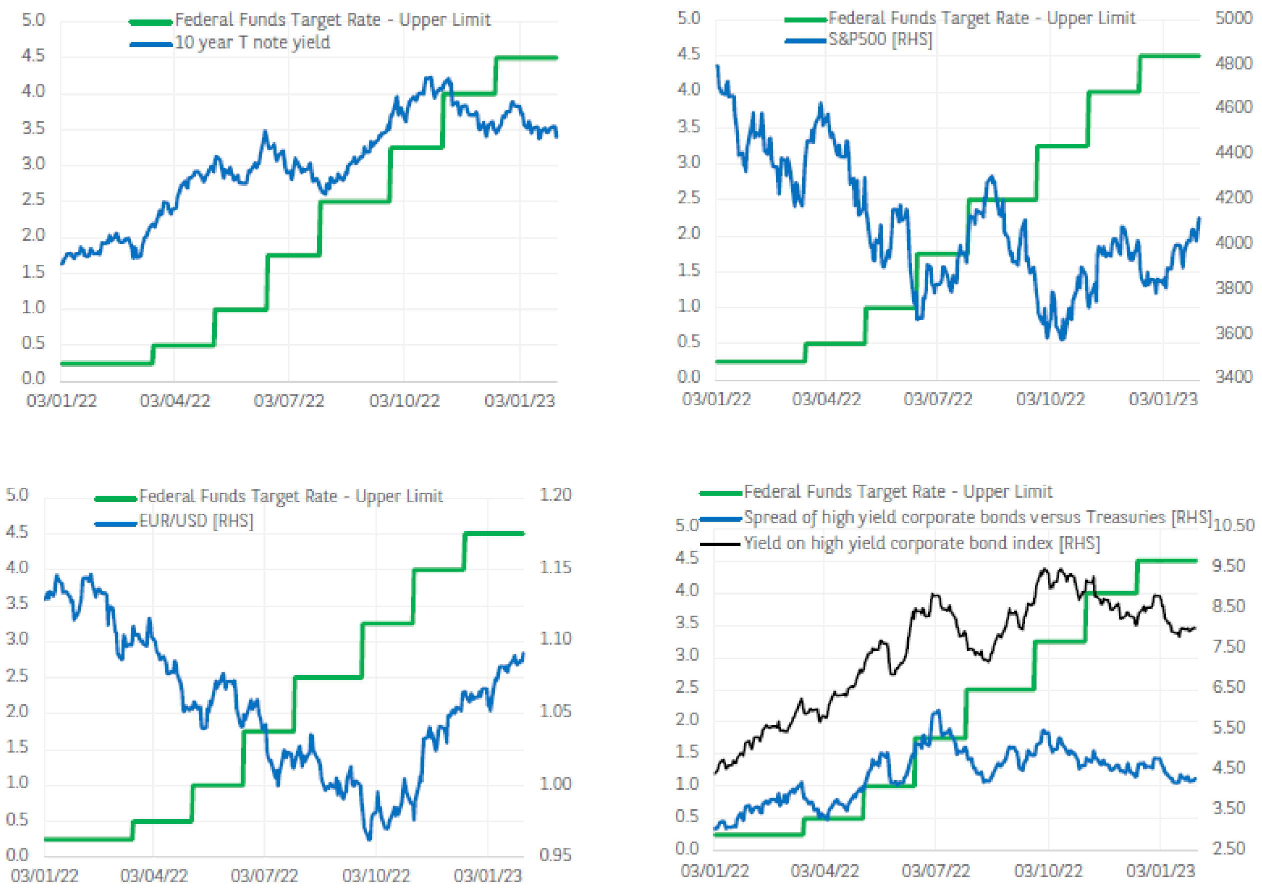
Probability of having a recession within a given time span

1/(time span considered to assess recession risk)

Financial conditions and the effectiveness of monetary transmission

US: easing of financial conditions despite Fed rate hikes

FINANCIAL CONDITIONS AND FED POLICY



CHARTS 2-5

SOURCE: REFINITIV, FED OF ST LOUIS, BNP PARIBAS

Pricing the entire distribution of possible outcomes

In the US, financial conditions have eased in recent months. Despite the aggressive rate hikes by the Fed, Treasury yields, corporate bond yields and their spreads versus Treasuries have declined, equity markets have rallied, and the dollar has depreciated. Such easing of financial conditions reduces the effectiveness of official rate increases, so markets rallied when Jerome Powell didn't express concern at his latest press conference.

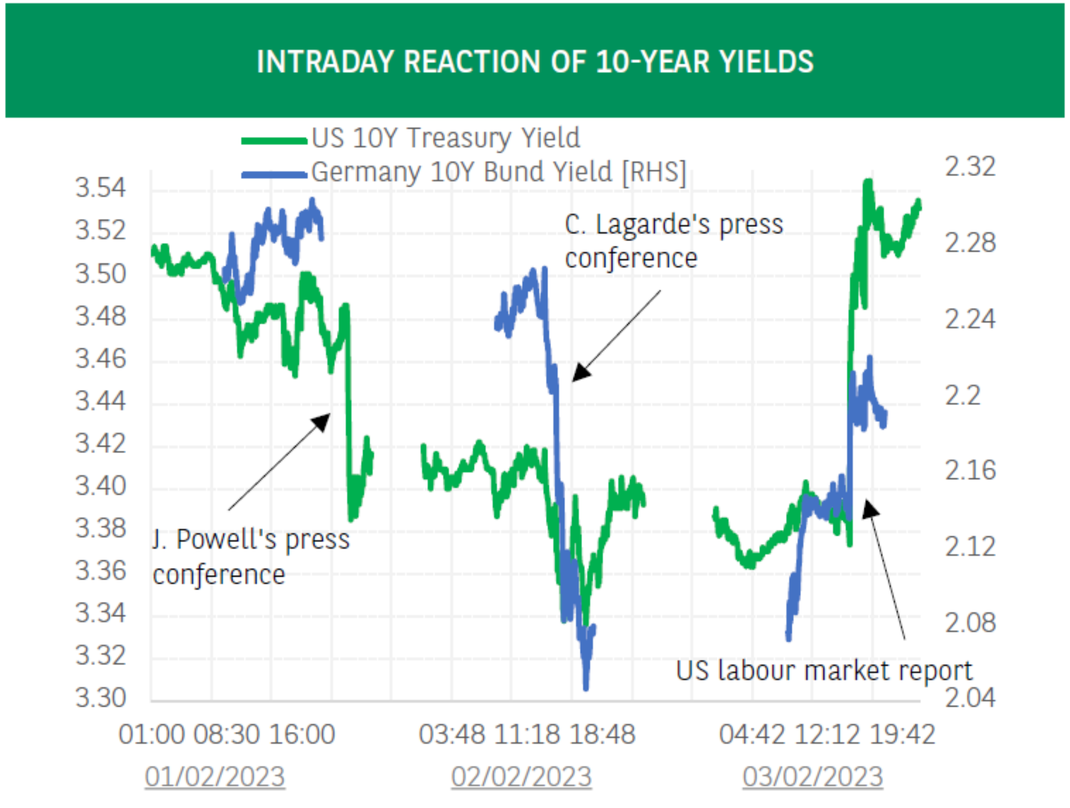


CHART 1

SOURCE: BLOOMBERG, BNP PARIBAS

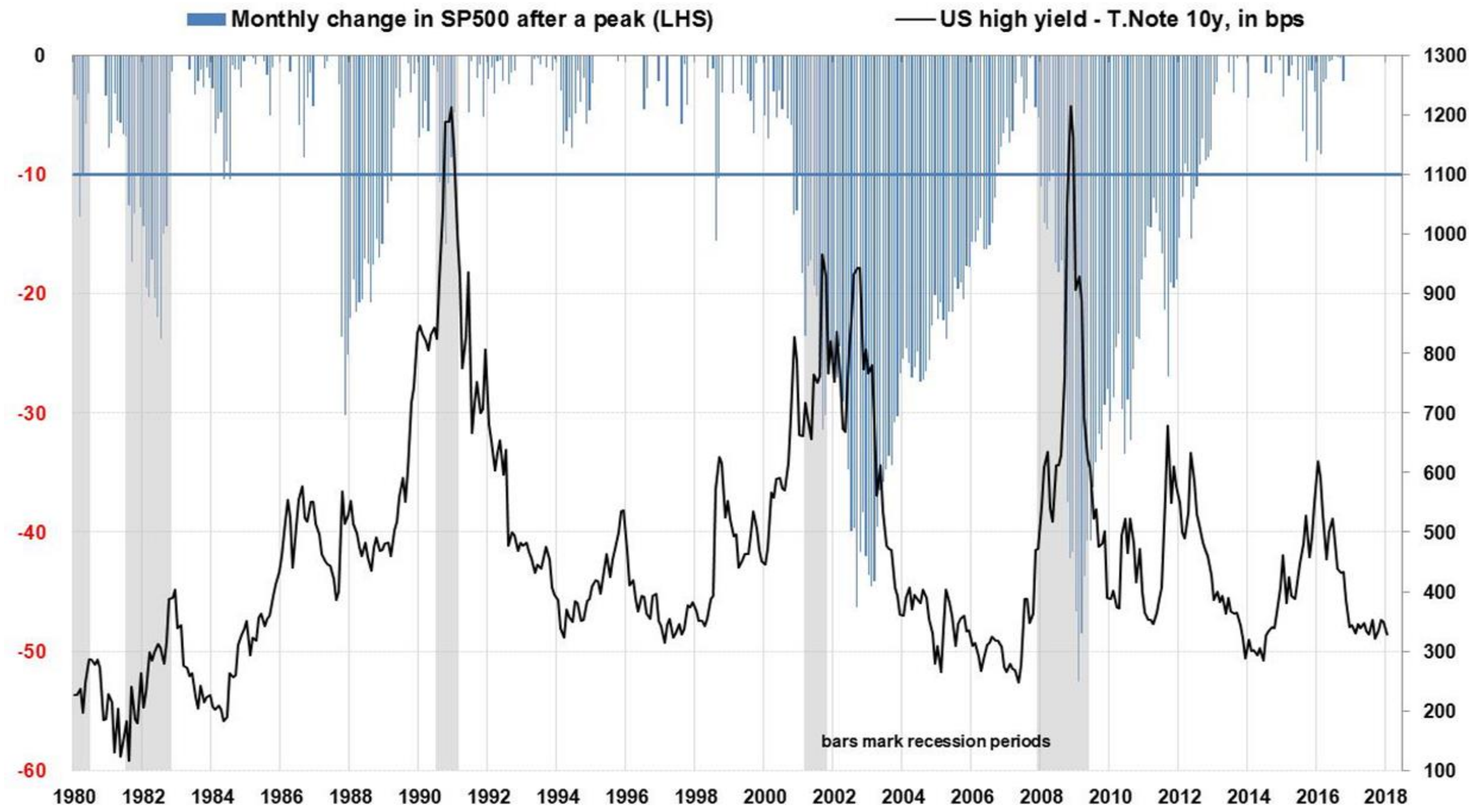
There was a huge drop in bond yields in reaction to the ECB's announcement that "we intend to raise interest rates by another 50 basis points at our next monetary policy meeting in March and we will then evaluate the subsequent path of our monetary policy." Clearly, this was interpreted as signaling an increasing likelihood that the rate hikes, if any, beyond the March meeting could come in smaller steps - like in the US- and that the terminal rate -the cyclical peak of the policy rate- was getting closer

Haunted by the stylised facts

Recurring patterns between economic variables and between economic variables and financial markets.

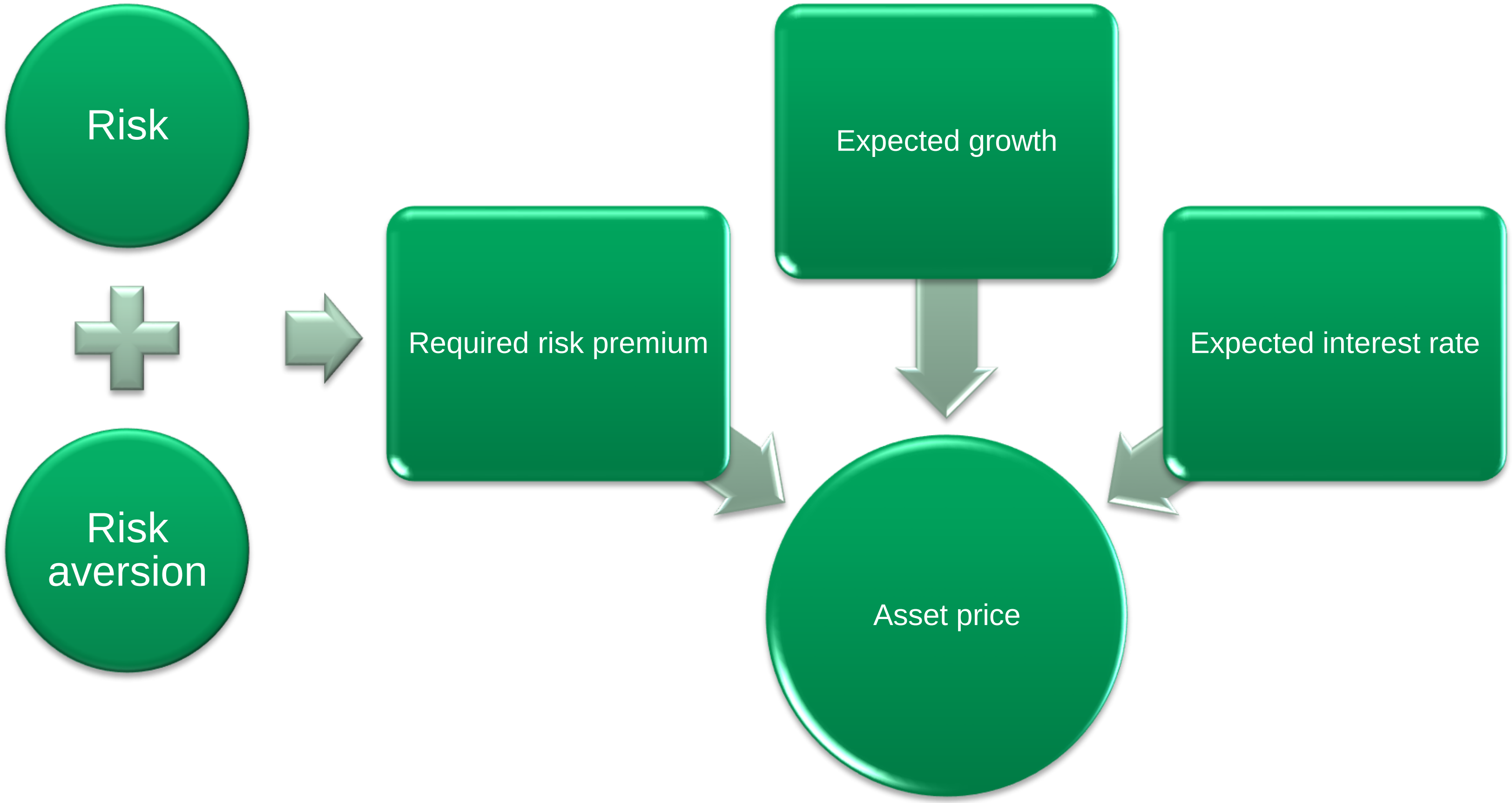
These patterns are conditioned by the economic environment or expectations about this environment.

Example: US recessions, equity markets and high yield spread



Source: Thomson Reuters, BNP Paribas

Stylised facts help in forecasting process and risk budgeting: history is supposed to repeat itself



FOMO markets

- Despite the still hawkish messages from the Fed and the ECB, markets are already pricing in rate cuts later this year. What explains these seemingly premature rate cute expectations?
- They could reflect differences in views on the economic outlook, but it is unlikely these would be so big as to explain current market pricing.
- Another explanation is that investors are rationally managing their risk exposure.
- Investors know that
  - an unexpected dovish twist in central bank guidance would cause a rally in bond and equity markets
  - central banks have no incentive to already soften their guidance but that they have the option to surprise, like they have done in the past.
- The closer we get to the terminal rate, the bigger the likelihood that central banks would change their message. For investors, waiting to reposition until the announcement is made would be too late.
- This causes markets to anticipate rate cuts well ahead of time. It reflects an investor attitude marked by the fear of missing out (FOMO), in this case, the fear of missing the rally.
- It implies that by the time central banks change guidance, markets will already have priced this in.
- In the meantime, strong economic data will cause a repricing of the rate cut prospects and cause an increase in market volatility.

Principal/agent problems and market behaviour

- Under the (realistic) assumption that relative performance rankings influence flows into and out of mutual funds, fund managers will try to avoid underperformance versus peers.
- When market volatility increases, the risk of underperformance versus competitors can increase, so the aversion to underperformance may trigger short-termism on behalf of fund managers.
- Managers in a given peer group may act in the same way creating a selling wave.
- Closely related to the previous point, relative performance versus a benchmark can “lead to an increase in the effective risk-aversion of a benchmarked institutional investor, particular so as his “surplus performance" relative to the index declines”.
- This means that as the excess return goes down, risk versus the benchmark will be scaled back.

- Our focus is on market “tantrums” (such as that seen during the summer of 2013) in which risk premiums inherent in market interest rates fluctuate widely.
- Large jumps in risk premiums may arise if non-bank market participants are motivated, in part, by their relative performance ranking
- Redemptions by ultimate investors strengthen such a channel.
- We sketch an example and examine three empirical implications. First, as a product of the performance race, flows into an investment opportunity drive up asset prices so that there is momentum in returns. Second, the model predicts that return chasing can reverse sharply. And third, changes in the stance of monetary policy can trigger heavy fund inflows and outflows. Using inflows and outflows for different types of open-end mutual funds, we find some support for the proposition that market tantrums can arise without any leverage or actions taken by leveraged intermediaries. We also uncover connections between the destabilizing flows and shocks to monetary policy.

Market Tantrums and Monetary Policy, Michael Feroli, Anil K Kashyap, Kermit Schoenholtz, Hyun Song Shin, Working Paper No. 101 Chicago Booth Paper No. 14-09

Institutional Investors and Information Acquisition: Implications for Asset Prices and Informational Efficiency

Matthijs Breugem and Adrian Buss

NBER Working Paper No. 23561
June 2017
JEL No. G11,G14,G23

ABSTRACT

We jointly model the information choice and portfolio allocation problem of institutional investors who are concerned about their performance relative to a benchmark. Benchmarking increases an investor's effective risk-aversion, which reduces his willingness to speculate and, consequently, his desire to acquire information. In equilibrium, an increase in the fraction of benchmarked institutional investors leads to a decline in price informativeness, which can cause a decline in the prices of all risky assets and the market portfolio. The decline in price informativeness also leads to a substantial increase in return volatilities and allows non-benchmarked investors to substantially outperformed benchmarked investors.

The ‘dash for cash’: UK, September 2022

INTRADAY, 10-YEAR GILT VS GBP/USD

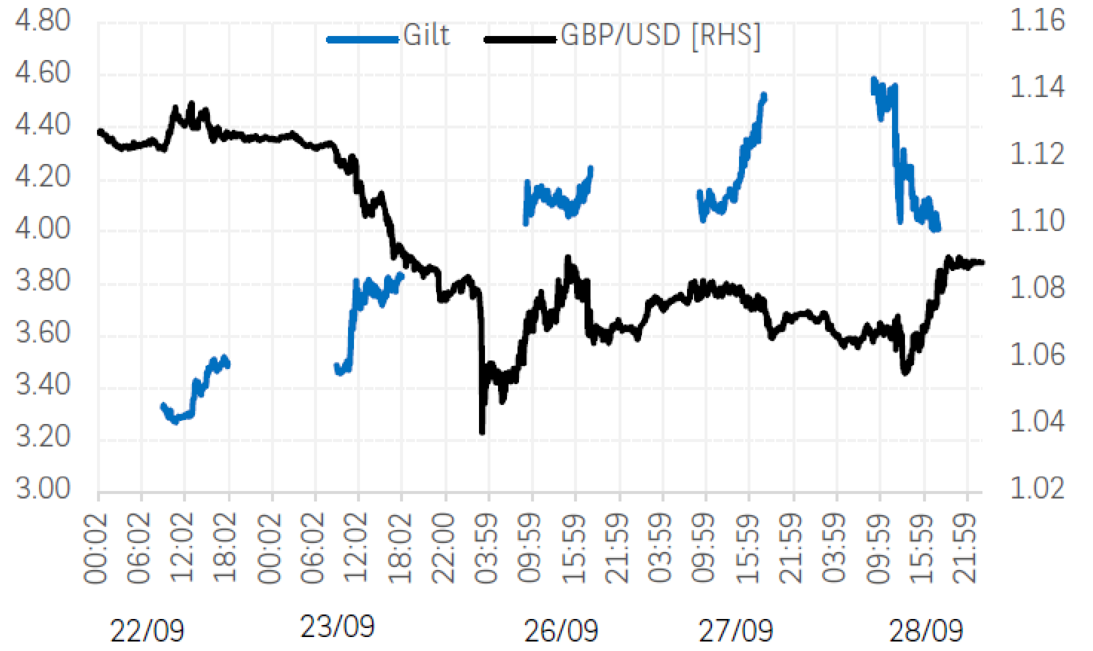


CHART 1

SOURCE: BLOOMBERG, BNP PARIBAS

INTRADAY, GOVERNMENT BOND YIELDS, 10-YEAR

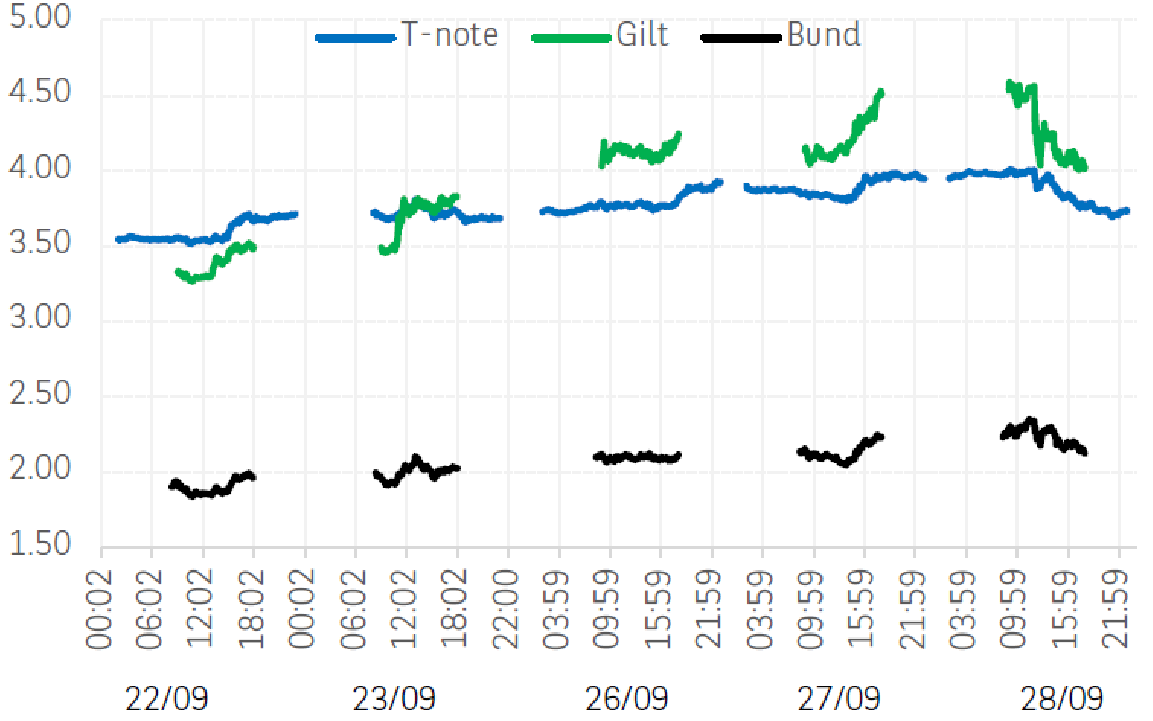


CHART 3

SOURCE: BLOOMBERG, BNP PARIBAS

The more monetary liquidity is abundant, the higher the risk that market liquidity will be lacking in case of big movements in interest rates.

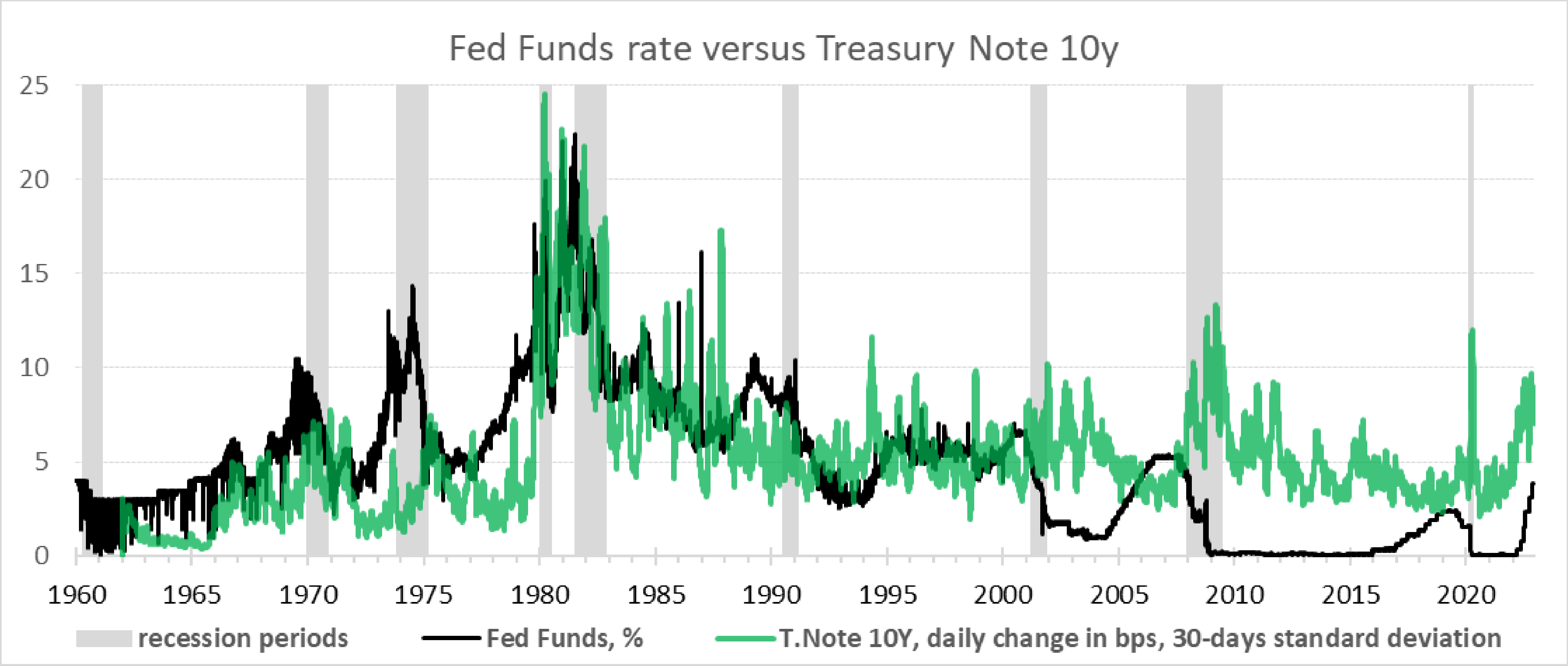
Predicting volatility in financial markets

Source: A Comprehensive Look at Financial Volatility Prediction by Economic Variables, BIS working paper 374, March 2012

1. Scope**: volatility of stock markets, foreign exchange, bonds, and commodities**.
2. We find that there is meaningful information contained in economic variables that helps in predicting future volatility for all four asset classes under study.
3. Importantly, **this predictive content by economic variables goes beyond the information contained in the history of the time series of realized volatility.**
4. The economic variables that are the most robust predictors of volatility are those that have sensible economic interpretations. In particular, variables that proxy for credit risk and funding (il)liquidity consistently show up as common predictors of volatility across several asset classes. Variables capturing time-varying risk premia (such as valuation ratios for equities, or interest rate differentials in foreign exchange) also perform well as predictors of volatility. In contrast to these financial predictors, variables that proxy for macroeconomic conditions, are much less informative about future volatility.

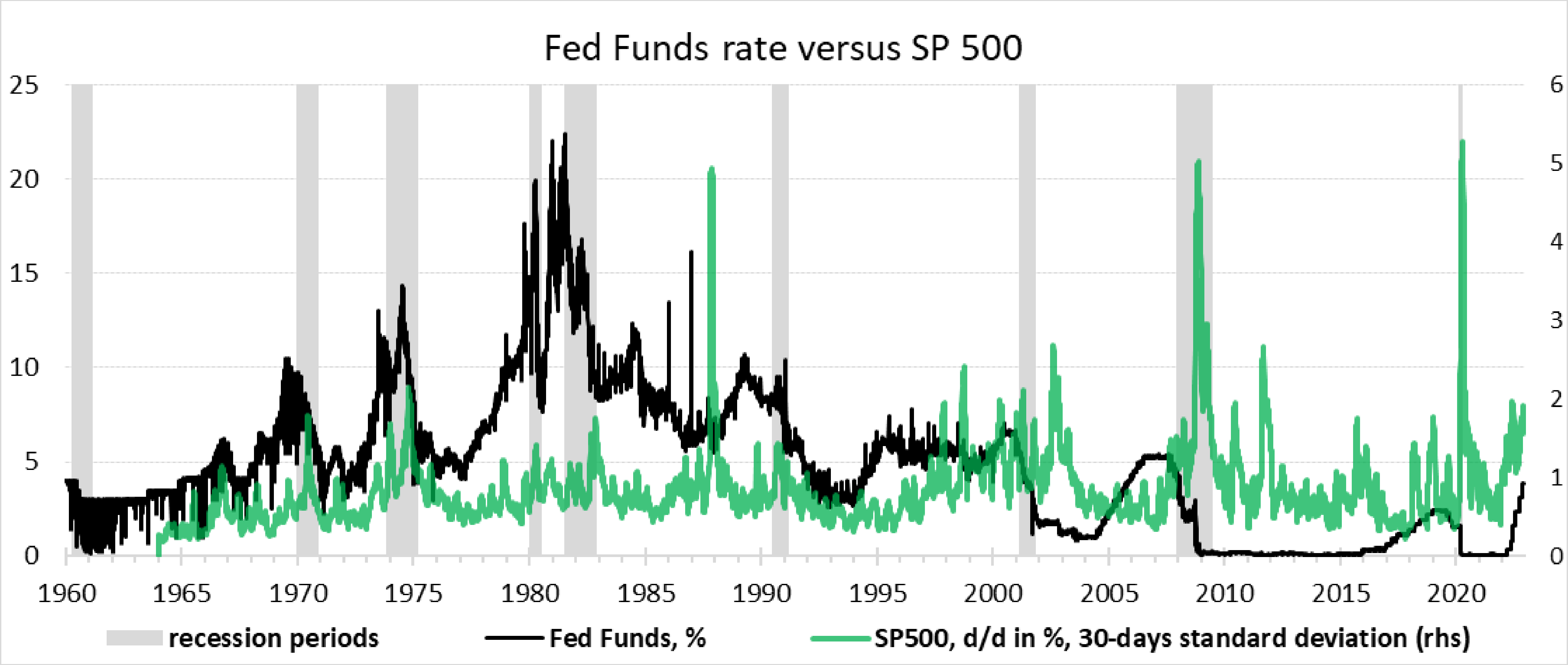
“our results suggest that especially channels that emphasize the effects of leverage, credit risk and funding illiquidity as well as time-variation of risk premia are the most promising candidates for understanding the economic drivers of financial volatility”

Treasury note daily volatility



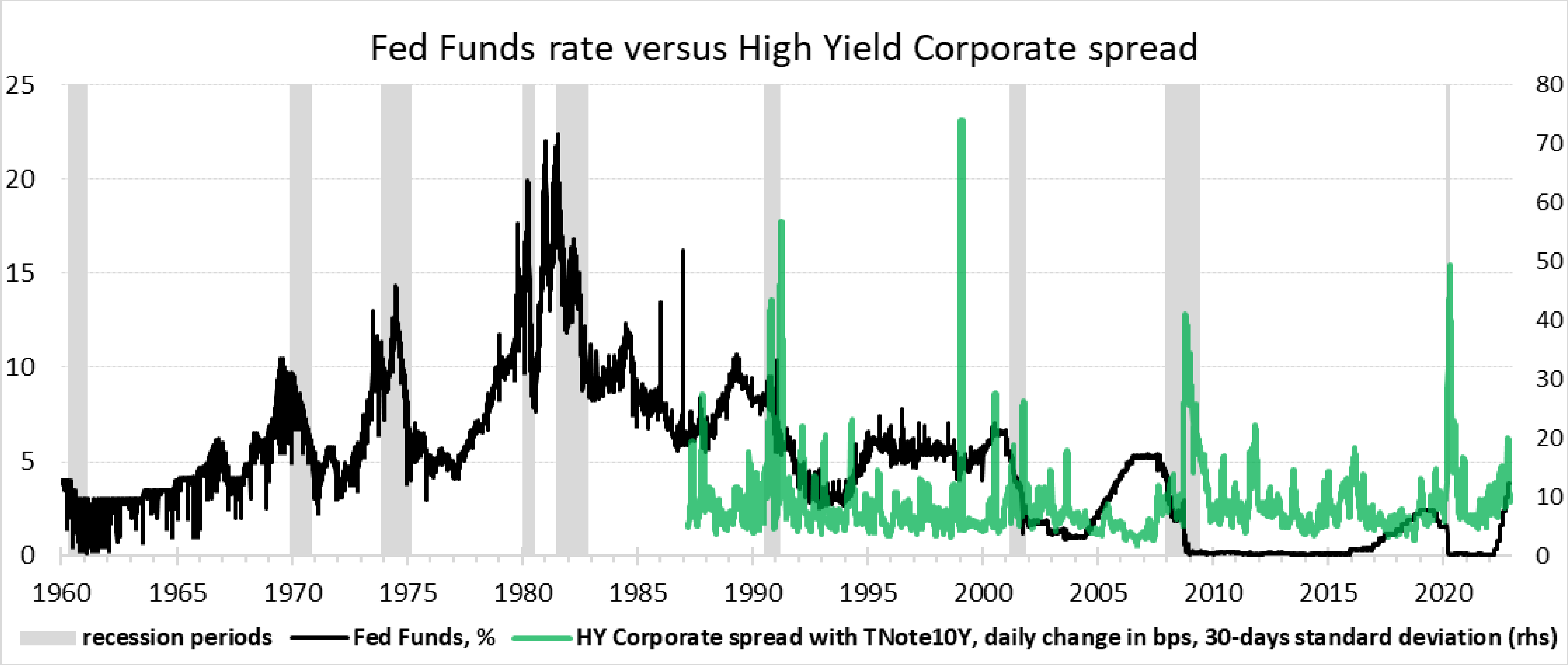
Source: Federal Reserve, NBER, BNP Paribas

SP500 daily volatility



Source: Federal Reserve, Standard and Poor's, NBER, BNP Paribas

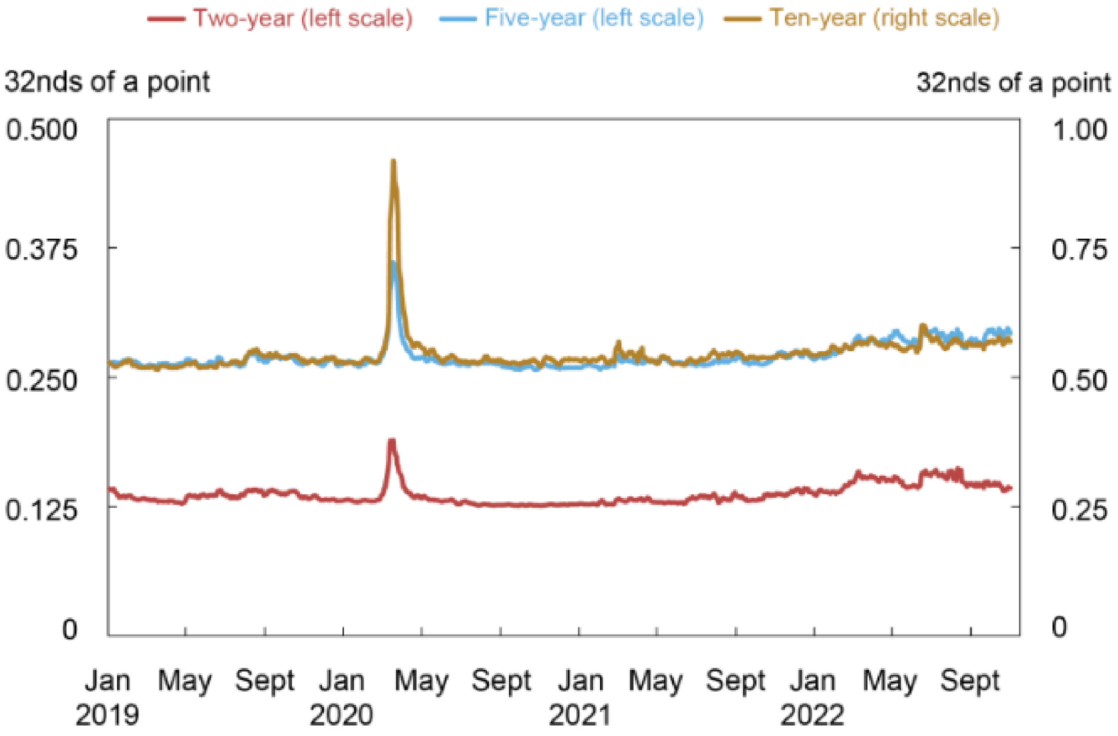
High yield spread daily volatility



Source: Federal Reserve, Bloomberg, NBER, BNP Paribas

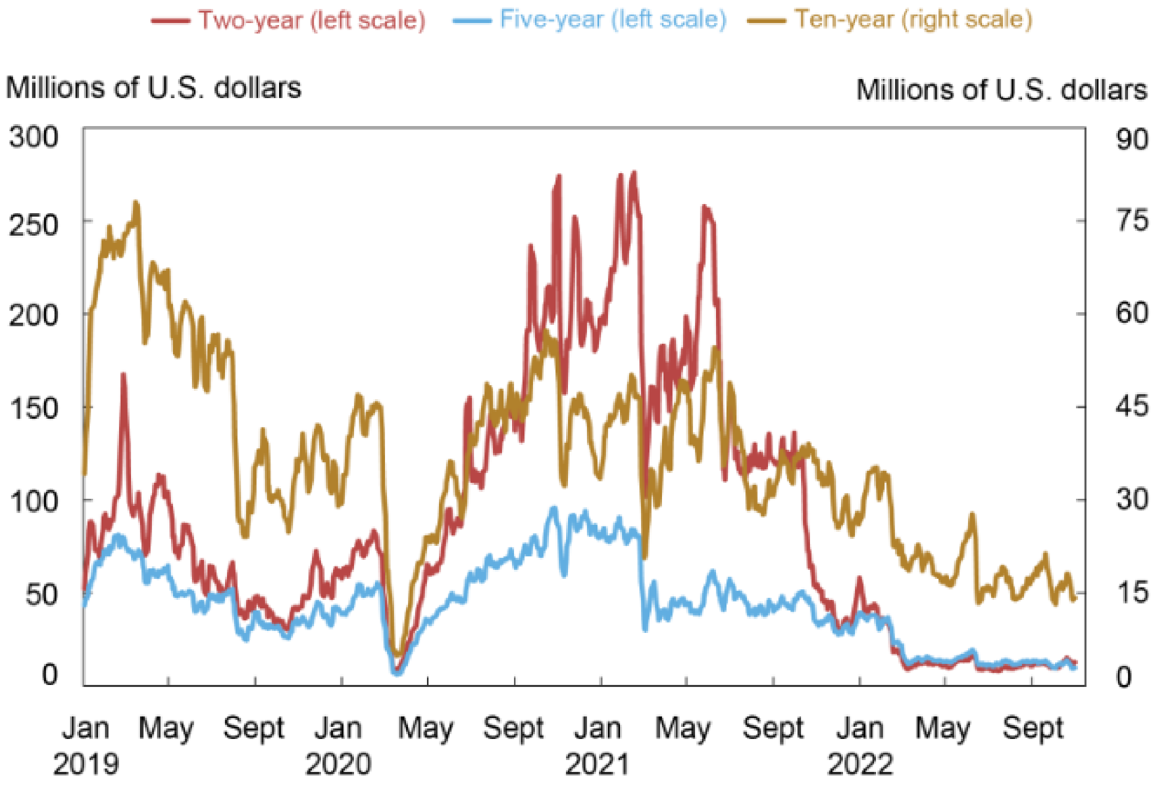
“The US Treasury Market Has Been Relatively Illiquid in 2022”

Bid-Ask Spreads Have Widened Modestly



Source: Authors’ calculations, based on data from BrokerTec.
Notes: The chart plots five-day moving averages of average daily bid-ask spreads for the on-the-run two-, five-, and ten-year notes in the interdealer market from January 2, 2019, to October 31, 2022. Spreads are measured in 32nds of a point, where a point equals one percent of par.

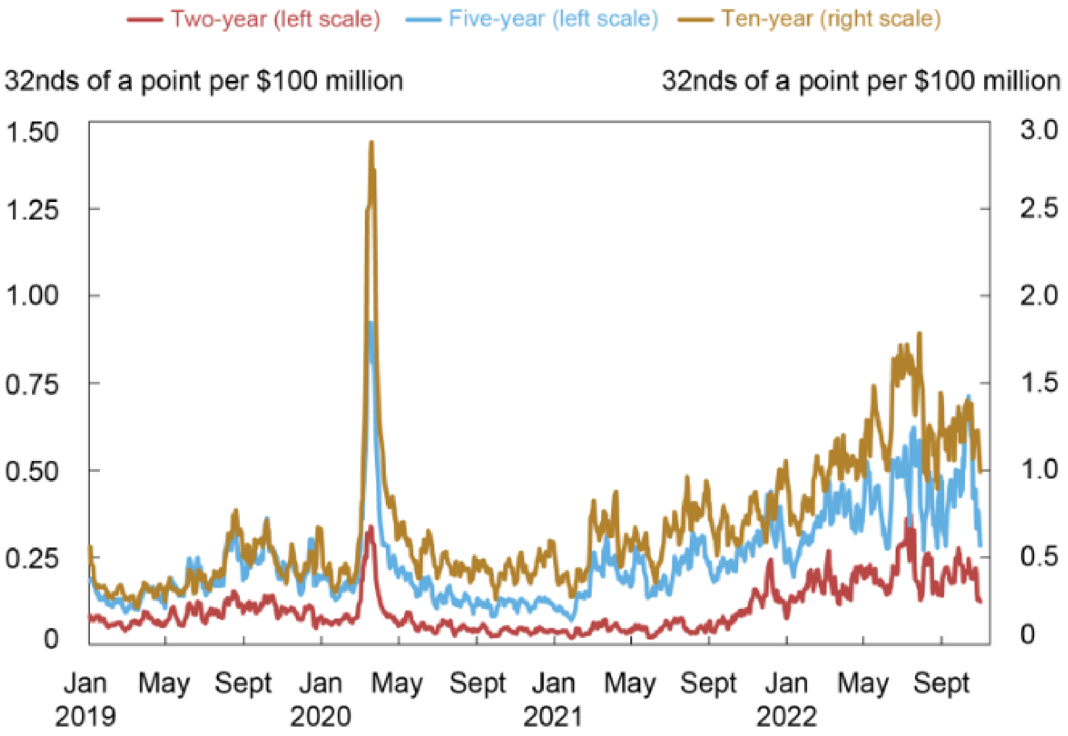
Order Book Depth Lowest since March 2020



Source: Authors’ calculations, based on data from BrokerTec.
Notes: The chart plots five-day moving averages of average daily depth for the on-the-run two-, five-, and ten-year notes in the interdealer market from January 2, 2019, to October 31, 2022. Data are for order book depth at the inside tier, averaged across the bid and offer sides. Depth is measured in millions of U.S. dollars par.

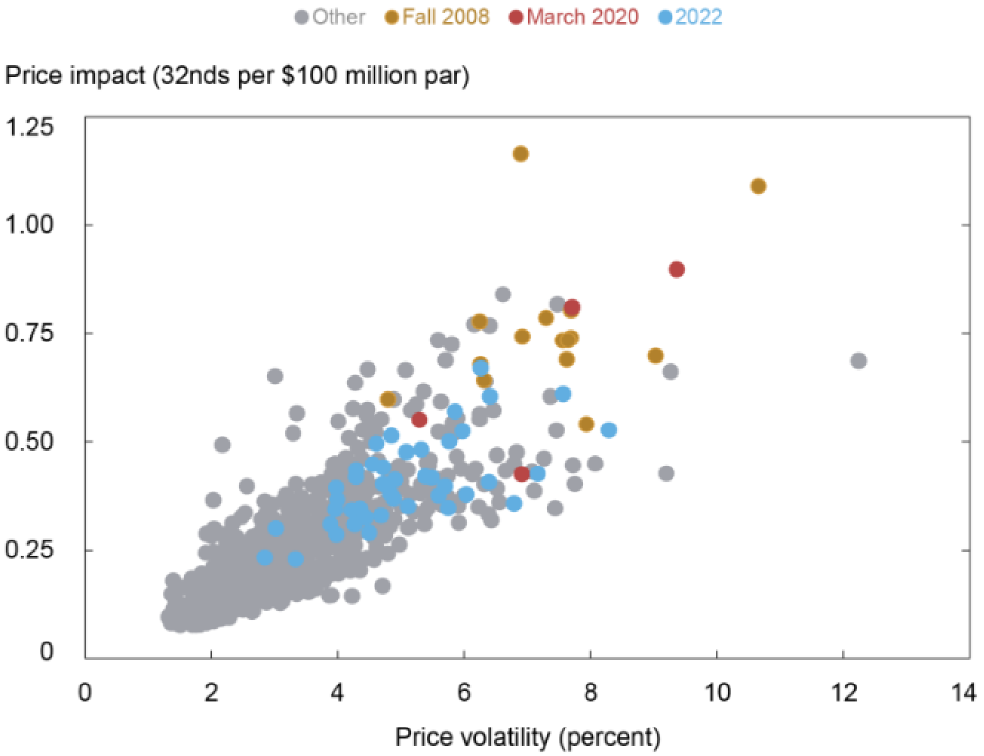
“The US Treasury Market Has Been Relatively Illiquid in 2022”

Price Impact Highest since March 2020



Source: Authors’ calculations, based on data from BrokerTec.
Notes: The chart plots five-day moving averages of slope coefficients from daily regressions of one-minute price changes on one-minute net order flow (buyer-initiated trading volume less seller-initiated trading volume) for the on-the-run two-, five-, and ten-year notes in the interdealer market from January 2, 2019, to October 31, 2022. Price impact is measured in 32nds of a point per $100 million, where a point equals one percent of par.

Liquidity and Volatility in Line with Historical Relationship



Source: Authors’ calculations, based on data from BrokerTec.
Notes: The chart plots price impact against price volatility by week for the on-the-run five-year note from January 2, 2005, to October 28, 2022. The weekly measures for both series are averages of the daily measures plotted in the preceding two charts. Fall 2008 points are for September 21, 2008 – January 3, 2009, March 2020 points are for March 1, 2020 – March 28, 2020, and 2022 points are for January 2, 2022 – October 29, 2022.

“The US Treasury Market Has Been Relatively Illiquid in 2022”

“Periods of high uncertainty are associated with high volatility and illiquidity but also high trading demand.

While Treasury market liquidity has been in line with volatility, there are still reasons to be cautious. The market’s capacity to smoothly handle large flows has been of ongoing concern since March 2020…

Moreover, lower-than-usual liquidity implies that a liquidity shock will have larger-than-usual effects on prices and perhaps be more likely to precipitate a negative feedback loop between security sales, volatility, and illiquidity.”

Source: How Liquid Has the Treasury Market Been in 2022?, Liberty Street Economics, 15 November 2022

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