

Asset Price Monitor

Local Equity Markets

- Major global equity indices fell at the start of the month, but eventually pared their losses and ended the month positively.
- The Euro Stoxx 50 ended the month up 9.1%.
- The FTSE 100 gained 3.0% in October.

Global Equity Markets

- Developed market equities outperformed their emerging market counterparts, with the S&P 500 and the Japanese Topix up 8.1% and 5.1%, respectively.
- In contrast, the MSCI Emerging Markets index lost 3.1% in October.

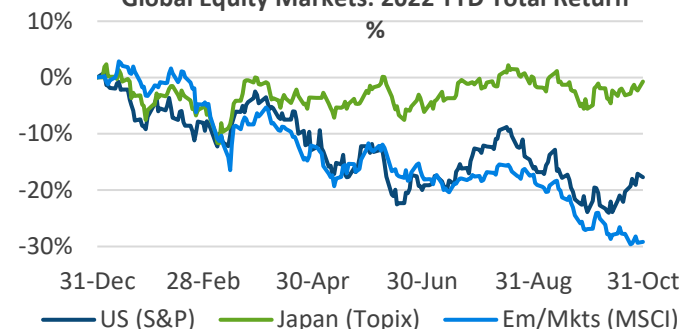
Bond/FX Markets

- Both the European government and corporate bond indices were relatively unchanged over the month.
- The Euro had a mixed performance in October, gaining 0.9% and 3.4% against the US Dollar and the Japanese Yen, respectively. Meanwhile, it weakened by 1.8% against the British Pound.

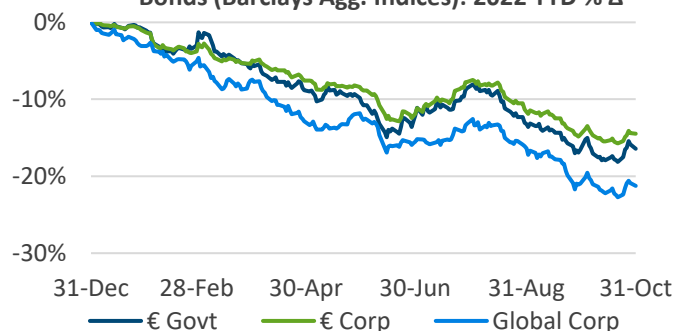
Local Equity Markets: 2022 YTD Total Return %



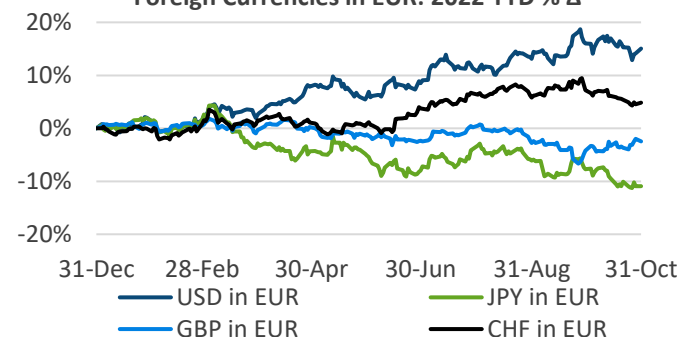
Global Equity Markets: 2022 YTD Total Return %



Bonds (Barclays Agg. Indices): 2022 YTD % Δ



Foreign Currencies in EUR: 2022 YTD % Δ

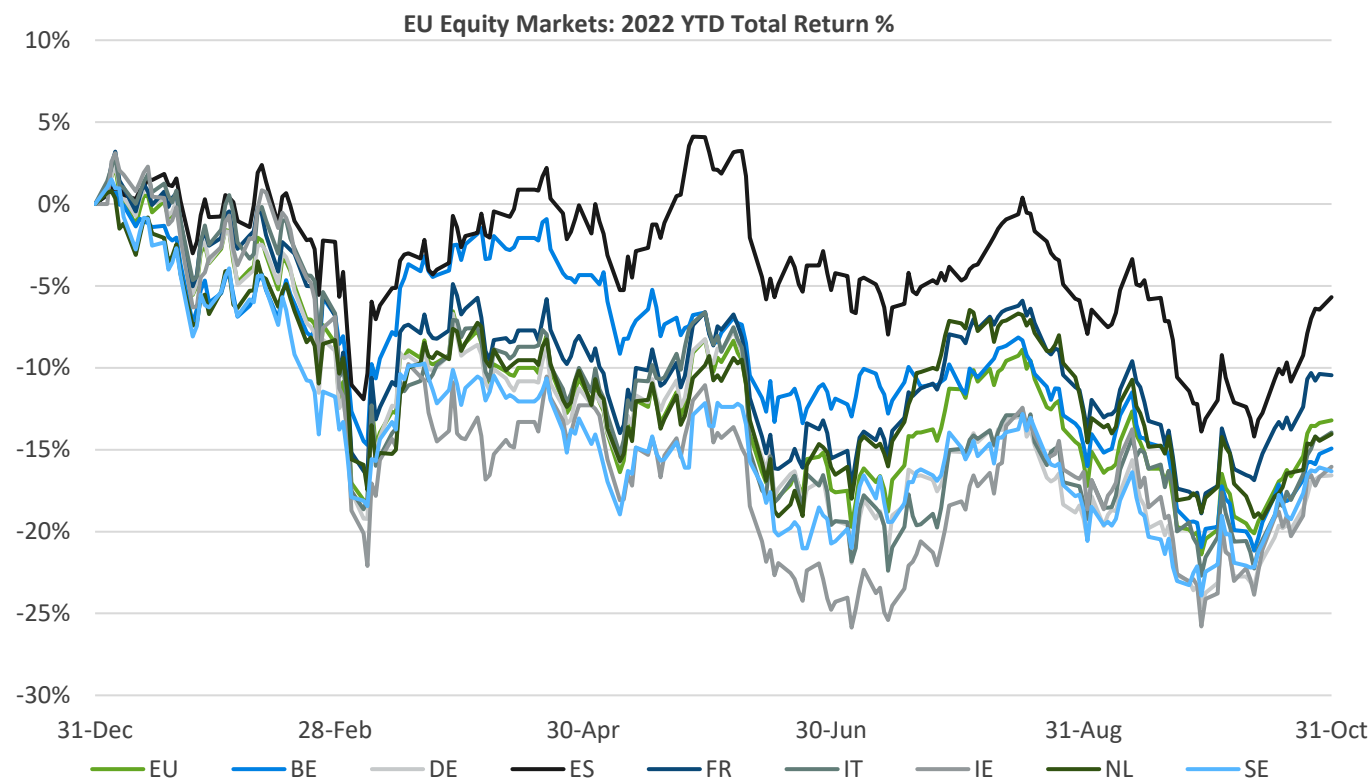


Total Returns as of October 31, 2022

	Euro Stoxx 50	FTSE 100	SMI	US (S&P)	Japan (Topix)	Em/Mkts (MSCI)	€ Govt	€ Corp	CHF in EUR	USD in EUR	JPY in EUR	GBP in EUR
1 Month	9.1%	3.0%	5.5%	8.1%	5.1%	-3.1%	0.1%	0.1%	-2.2%	-0.9%	-3.4%	1.8%
3 Month	-2.2%	-3.4%	-2.7%	-5.9%	0.5%	-14.0%	-8.6%	-7.3%	-1.7%	3.4%	-7.3%	-2.6%
1 Year	-12.1%	1.7%	-8.0%	-14.6%	-1.0%	-30.7%	-16.4%	-14.4%	6.9%	16.9%	-10.3%	-2.0%
YTD	-13.2%	-0.8%	-13.5%	-17.7%	-0.7%	-29.2%	-16.4%	-14.5%	4.8%	15.0%	-10.9%	-2.5%

Eurozone Equity

- All major European equities made gains in October.
- The Irish equity market was the best performer of the month, up 10.6%.
- Dutch equities made the smallest gain in the region in October, returning 4.7%
- The Spanish equity market remains as the outperformer year-to-date, down 5.7% for the year so far.
- The German equity market is the worst performing equity market in the region year-to-date, having lost 16.6%.

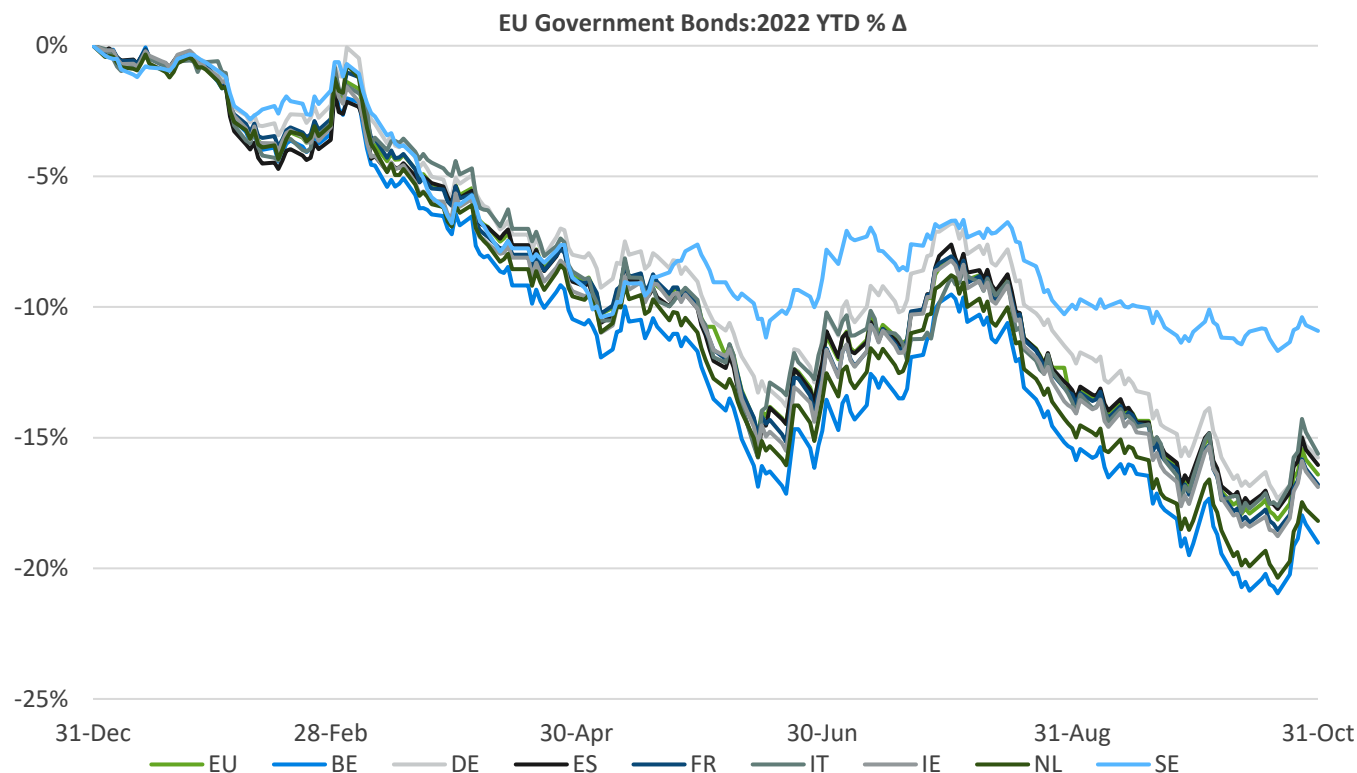


Equity Returns as of October 31, 2022

	EU	Belgium	Germany	Spain	France	Italy	Ireland	Netherlands	Sweden
1 Month	9.1%	6.1%	9.4%	8.5%	8.8%	9.7%	10.6%	4.7%	7.9%
3 Month	-2.2%	-5.7%	-1.7%	-1.9%	-2.7%	1.3%	2.9%	-7.5%	-2.8%
QTD	9.1%	6.1%	9.4%	8.5%	8.8%	9.7%	10.6%	4.7%	7.9%
YTD	-13.2%	-14.9%	-16.6%	-5.7%	-10.5%	-14.0%	-16.1%	-14.1%	-16.3%

Eurozone Government Bonds

- The major European government bond indices had a mixed performance in October, with the majority having a relatively flat performance.
- The Italian government bond index was the outperformer in the region, up 1.1%.
- The German government bond index was the worst performer in October, having lost 0.5%.
- Similar to last month, Swedish government bonds have suffered the smallest drop this year, down 10.9% year-to-date.
- The Belgian government bond index remains the worst performer year-to-date, down 19.0% for the year so far.



Bond Returns as of October 31, 2022

	EU	Belgium	Germany	Spain	France	Italy	Ireland	Netherlands	Sweden
1 Month	0.1%	0.0%	-0.5%	0.3%	0.1%	1.1%	0.2%	0.0%	0.0%
3 Month	-8.6%	-10.2%	-9.3%	-8.7%	-9.2%	-6.4%	-9.1%	-9.9%	-4.3%
QTD	0.1%	0.0%	-0.5%	0.3%	0.1%	1.1%	0.2%	0.0%	0.0%
YTD	-16.4%	-19.0%	-15.8%	-16.0%	-16.8%	-15.6%	-16.9%	-18.2%	-10.9%

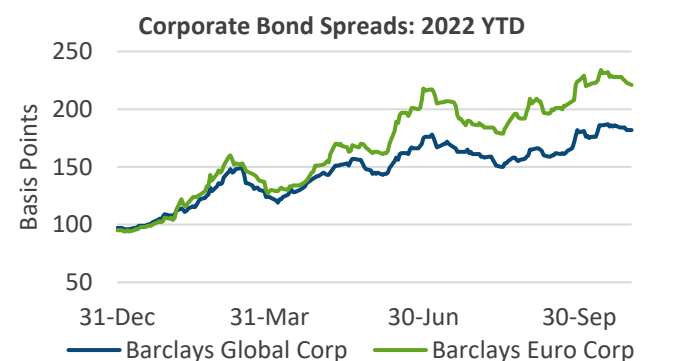
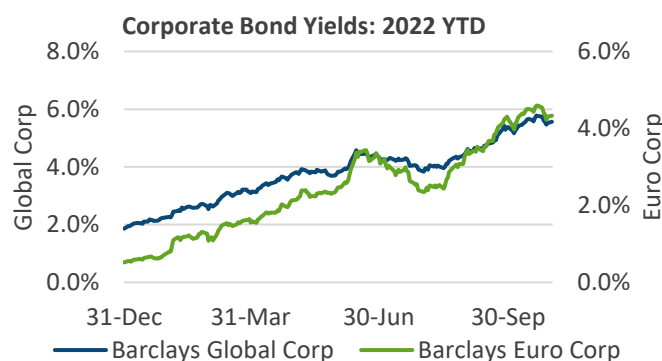
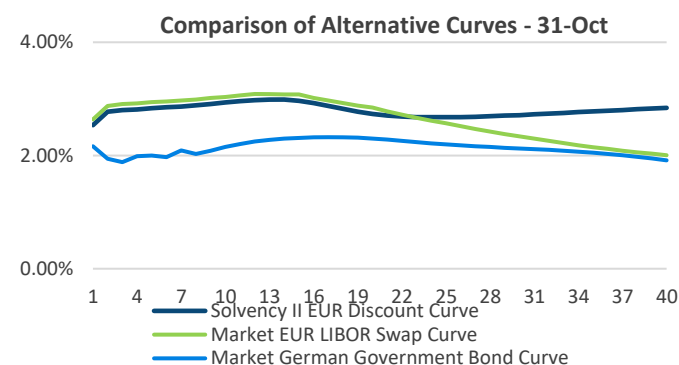
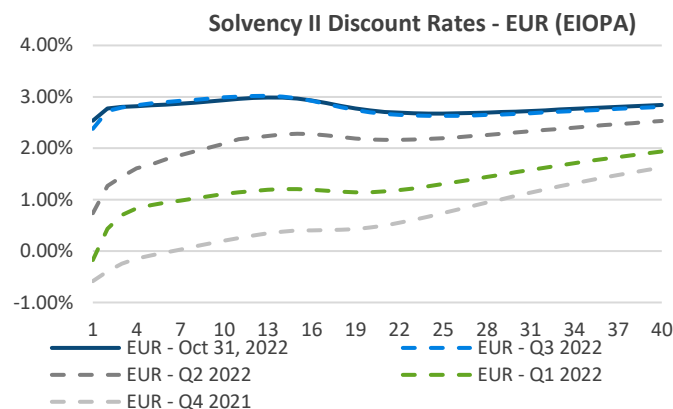
Liability Valuation Monitor

Risk Free Rates

- The movement in EUR risk-free rates was mixed in October.
- The 1-year risk-free rate rose by 16 basis points. Meanwhile the 5 and 10-year rates fell by 4 and 6 basis points, respectively.
- The longer-term EUR risk-free rates increased.

Corporate Bonds

- European and global corporate bond yields increased in October. The former increased by 9 basis points and the latter by 19 basis points.
- Global credit spreads widened by 2 basis points, whilst their European counterparts tightened by 4 basis points.
- The rise in risk-free rates was mostly offset by the tightening in the European corporate bond spreads, resulting in a relatively flat performance for the European corporate bond index.



	Change in Solvency II Discount (bps)						Change in Corporate Bond Yields (bps)		Change in Corporate Bond Spreads (bps)	
	1Y	Y5	Y10	Y20	Y30	Y40	Global Corp	Euro Corp	Global Corp	Euro Corp
Since Q3 2022	16	-4	-6	4	4	4	19	9	2	-4
Since Q2 2022	180	115	85	57	41	31	123	109	7	3
Since Q1 2022	271	194	183	159	118	91	248	278	58	92
Since Q4 2021	312	292	273	228	164	122	371	381	85	126

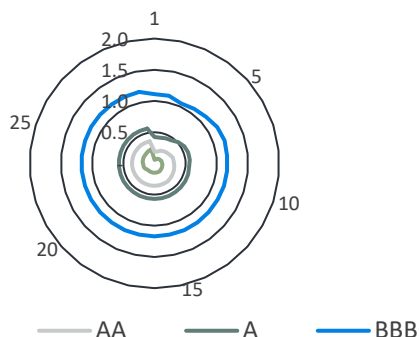
Solvency II Monitor - Spreads

Fundamental Spreads

- There were no material changes since the last report.

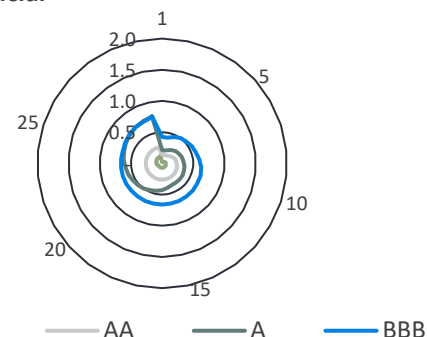
Fundamental Spreads %

EUR: Financial



EUR Financial Fundamental Spread %					
	1Y	Y5	Y10	Y20	Y30
AAA	0.06	0.10	0.13	0.15	0.23
AA	0.19	0.26	0.33	0.36	0.36
A	0.42	0.51	0.57	0.57	0.57
BBB	1.11	1.11	1.17	1.17	1.17
EUR Financial 'Before Floor' %					
	1Y	Y5	Y10	Y20	Y30
AAA	0.00	0.04	0.08	0.15	0.23
AA	0.04	0.07	0.11	0.18	0.26
A	0.06	0.12	0.20	0.32	0.44
BBB	0.15	0.25	0.34	0.48	0.59

EUR: Non-Financial



EUR Non-Financial Fundamental Spread %					
	1Y	Y5	Y10	Y20	Y30
AAA	0.02	0.03	0.06	0.07	0.12
AA	0.14	0.17	0.25	0.26	0.26
A	0.21	0.29	0.37	0.52	0.77
BBB	0.42	0.52	0.65	0.66	0.76
EUR Non-Financial 'Before Floor' %					
	1Y	Y5	Y10	Y20	Y30
AAA	0.00	0.01	0.04	0.07	0.12
AA	0.00	0.04	0.09	0.18	0.26
A	0.04	0.15	0.27	0.52	0.77
BBB	0.11	0.22	0.34	0.57	0.76

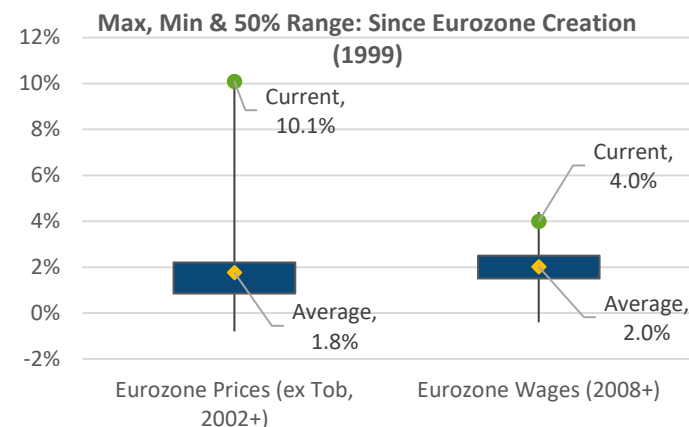
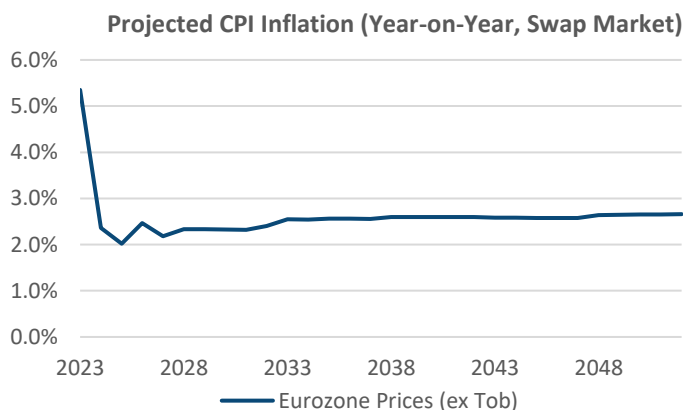
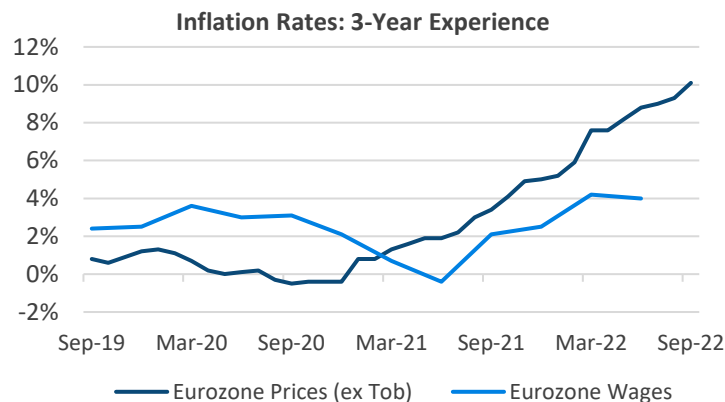
The **Solvency II risk-free discount rates** are based on applying the Smith-Wilson Extrapolation to LIBOR swap rates sourced from Refinitiv and applying the Credit Risk Adjustment as defined in the Technical Specs. The data is provided by EIOPA and as of 31/10/22.

The **Credit Risk Adjustment** is a component of the risk-free discount curve defined by EIOPA. It is calculated from actual experience in the 'LIBOR-OIS' spread (3 months for EUR), and is bounded between 0.10 and 0.35. We show actual LIBOR-OIS spread levels and the defined CRA, for EUR.

EIOPA fundamental spreads show the credit spread corresponding to the risk of default or downgrading of an asset. This is shown here across financial and non-financial assets, credit quality steps 0-3 and durations of 1-30 years. The data is provided by EIOPA and as of 31/10/22. **Fundamental spread** = maximum (probability of default + cost of downgrade; 35% of long-term average spread). In the tables we show the 'before floor' measure = probability of default + cost of downgrade.

Inflation Monitor

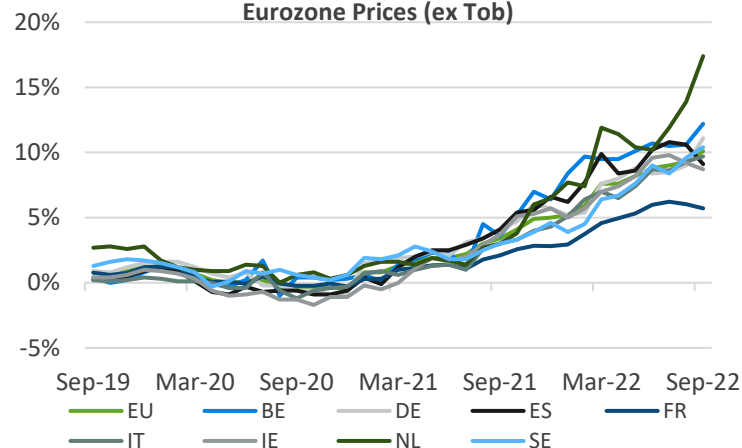
- Eurozone price inflation rose to 10.1% in September, an increase of 80 basis points from the previous month.
- The Eurozone projected CPI curve rose at the very near-term but the rest of the curve remained relatively unchanged from the previous month.
- The Eurozone Q3 2022 GDP growth figure fell by 220 basis points to 2.1%, after the previous quarter's figure was revised higher by 20 basis points.
- There were no updates to the wage inflation figure this month.



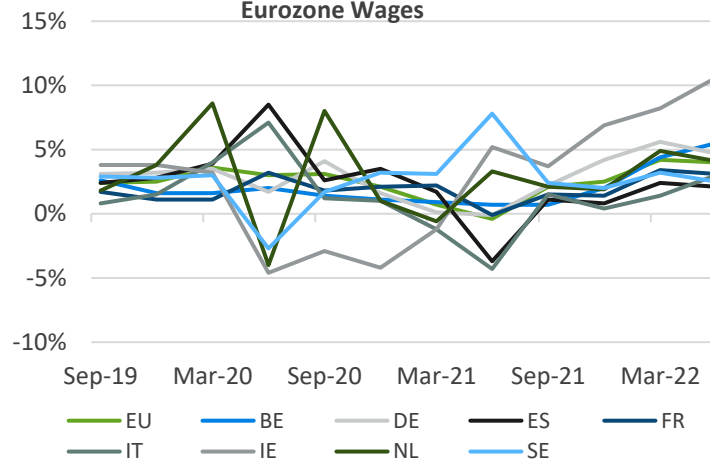
Inflation Monitor

- Inflation figures for major European economies were mixed in September.
- For the second consecutive month, Dutch price inflation saw the largest increase in the region, with the headline figure increasing by 350 basis points to 17.4%, which was the highest price inflation in the Euro area in September.
- Spanish prices fell by 150 basis points to 9.1%, the largest drop in comparison to the other European economies.
- France remained the country with the lowest price inflation in the Eurozone, at 5.7%.
- There were no updates to the wage inflation figures this month.

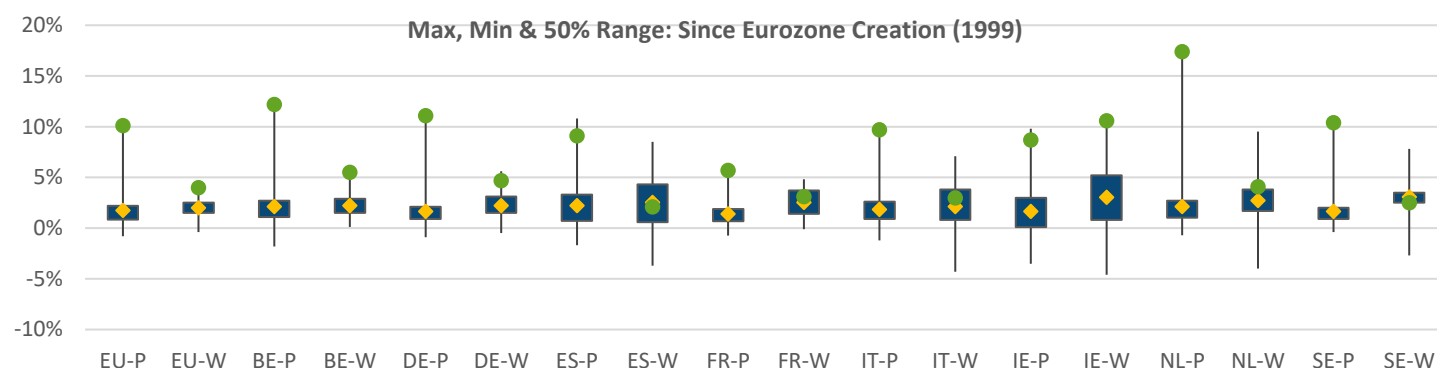
Eurozone Prices (ex Tob)



Eurozone Wages



Max, Min & 50% Range: Since Eurozone Creation (1999)



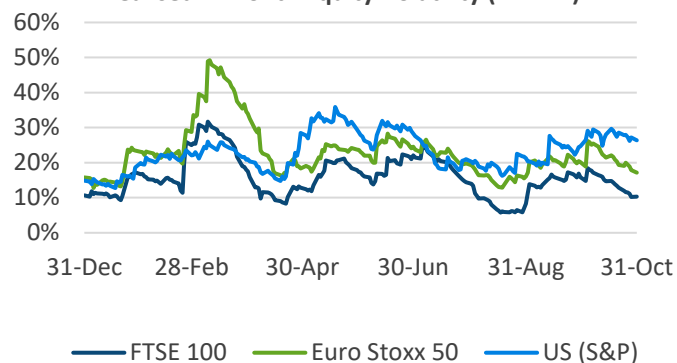
	EU-P	EU-W	BE-P	BE-W	DE-P	DE-W	ES-P	ES-W	FR-P	FR-W	IT-P	IT-W	IE-P	IE-W	NL-P	NL-W	SE-P	SE-W
Avg.	1.8%	2.0%	2.1%	2.2%	1.7%	2.2%	2.2%	2.5%	1.4%	2.5%	1.9%	2.1%	1.7%	3.0%	2.1%	2.7%	1.7%	3.1%
Cur	10.1%	4.0%	12.2%	5.5%	11.1%	4.7%	9.1%	2.1%	5.7%	3.1%	9.7%	3.0%	8.7%	10.6%	17.4%	4.1%	10.4%	2.5%

Volatility and Hedging Cost Monitor

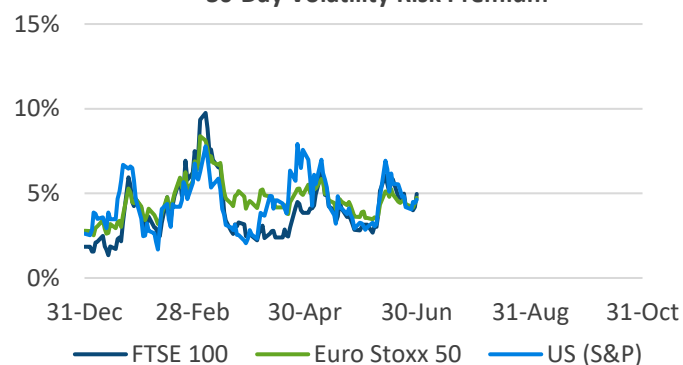
- Realised volatilities on major indices were mixed in September, declining by month-end for the European indices but increasing for the S&P 500.
- The FTSE 100 ended the month with a realised volatility of 10.3%. The same measure stood at 17.1% and 26.4% on the Euro Stoxx 50 and the S&P 500.
- ** Please note that due to some missing data the volatility risk premiums have only been updated to the 28th of June. ****

Please contact Milliman for more information on the basis and methodology used for these results.

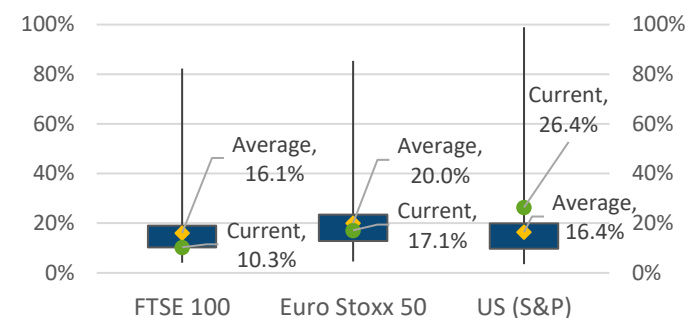
Realised 1-Month Equity Volatility (EWMA)



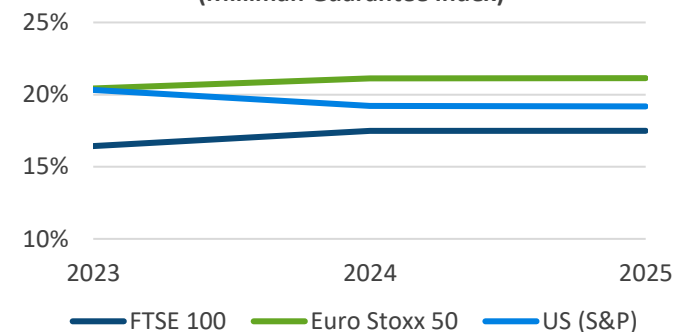
30-Day Volatility Risk Premium



Max, Min and 50% Range: Last 25 Years



Expected Volatility (Milliman Guarantee Index)





Chicago

71 South Wacker Drive
Chicago, IL 60606
+1 855 645 5462

London

11 Old Jewry
London
EC2R 8DU
UK
+44 0 20 7847 1557

Sydney

32 Walker Street
North Sydney, NSW 2060
Australia
+610 2 8090 9100

Amsterdam

Haaksbergweg 75
Amsterdam, 1101 BR
Netherlands
+31 6 211 70 583

Creating transformational improvement in the retirement savings industry.

Milliman Financial Risk Management LLC / Milliman Financial Strategies Ltd. is a global leader in financial risk management to the retirement savings industry. Milliman FRM provides investment advisory, hedging, and consulting services on approximately \$176.1 billion USD in global assets (31 December 2021).

Established in 1998, the practice includes professionals operating from four trading platforms around the world (Chicago, London, Amsterdam and Sydney).

[MILLIMAN.COM/FRM](https://www.milliman.com/frm)

Milliman is among the world's largest providers of actuarial and related products and services. The firm has consulting practices in healthcare, property & casualty insurance, life insurance and financial services, and employee benefits. Founded in 1947, Milliman is an independent firm with offices in major cities around the globe.

Recipients must make their own independent decisions regarding any strategies or securities or financial instruments mentioned herein.

The products or services described or referenced herein may not be suitable or appropriate for the recipient. Many of the products and services described or referenced herein involve significant risks, and the recipient should not make any decision or enter into any transaction unless the recipient has fully understood all such risks and has independently determined that such decisions or transactions are appropriate for the recipient.

Past performance is not indicative of future results. Index performance information is for illustrative purpose only, does not represent the performance of any actual investment or portfolio, and should not be viewed as a recommendation to buy/sell. It is not possible to invest directly in an index. Any hypothetical, backtested data illustrated herein is for illustrative purposes only, and is not representative of any investment or product.

Any discussion of risks contained herein with respect to any product or service should not be considered to be a disclosure of all risks or a complete discussion of the risks involved.

The recipient should not construe any of the material contained herein as investment, hedging, trading, legal, regulatory, tax, accounting or other advice. The recipient should not act on any information in this document without consulting its investment, hedging, trading, legal, regulatory, tax, accounting and other advisors.

The materials in this document represent the opinion of the authors and are not representative of the views of Milliman, Inc. Milliman does not certify the information, nor does it guarantee the accuracy and completeness of such information. Use of such information is voluntary and should not be relied upon unless an independent review of its accuracy and completeness has been performed. Materials may not be reproduced without the express consent of Milliman.

Milliman Financial Strategies Ltd. is authorised and regulated by the Financial Conduct Authority. Firm Registration Number 539399