

Market Price Monitor

Local Equity Markets

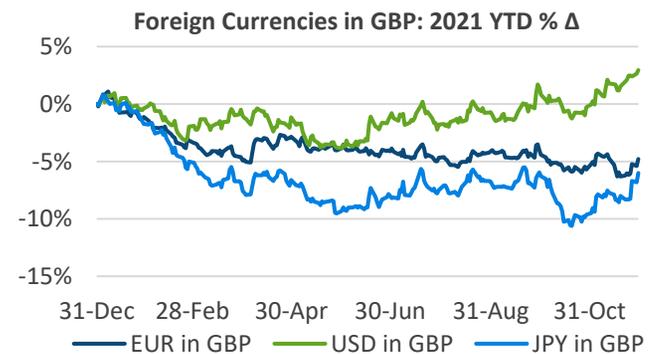
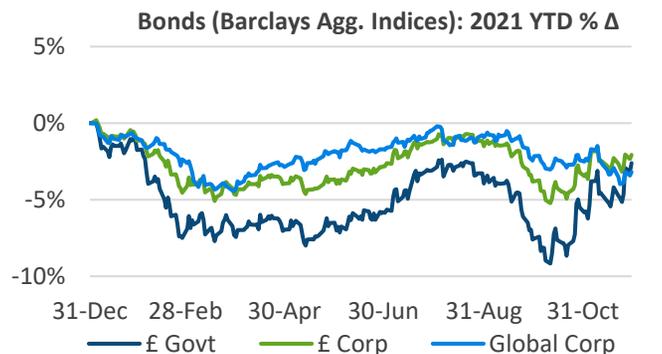
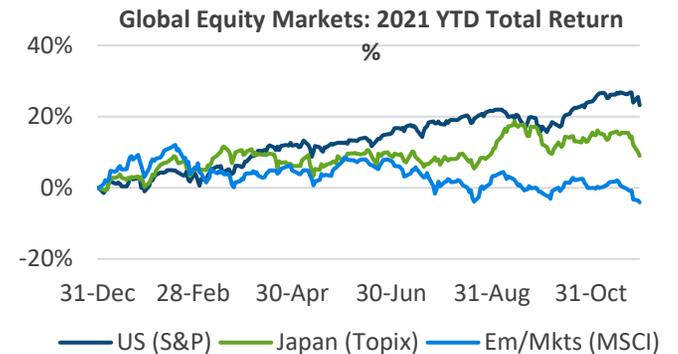
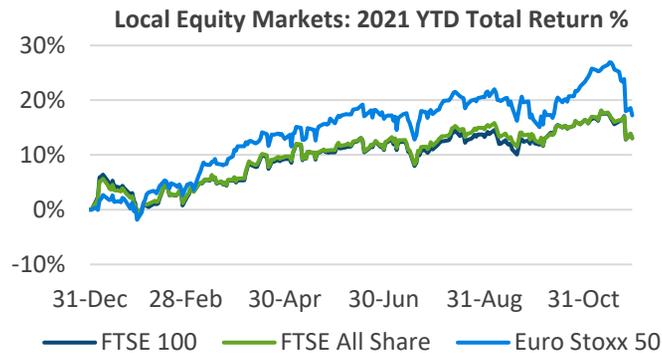
- Equity markets had a positive start to the month, however, on the back of rising COVID infections in Europe and the discovery of the new Omicron variant, they suffered losses and ended the month down.
- The FTSE 100 was down 2.2% at month-end.
- The Euro Stoxx 50 lost 4.3% in November.

Global Equity Markets

- Emerging markets suffered heavier losses than most of their developed markets counterparts, with the MSCI Emerging Markets index down 4.1%.
- The S&P 500 lost 0.7% and the Japanese Topix index was down 3.6% at month-end.

Bond/FX Markets

- The British government bond index gained 3.1%.
- The British corporate bond index was up 1.2% at month-end, while its global counterpart lost 0.8%.
- The British Pound weakened against the major currencies, losing 4.0% and 3.2% against the Japanese Yen and the US Dollar, respectively. The Pound lost 1.0% against the Euro during the month.



Total Returns as of November 30, 2021												
	FTSE 100	FTSE All Share	Euro Stoxx 50	US (S&P)	Japan (Topix)	Em/Mkts (MSCI)	£ Govt	£ Corp	Global Corp	EUR in GBP	USD in GBP	JPY in GBP
1 Month	-2.2%	-2.2%	-4.3%	-0.7%	-3.6%	-4.1%	3.1%	1.2%	-0.8%	1.0%	3.2%	4.0%
3 Month	-0.2%	-1.4%	-2.7%	1.3%	-0.8%	-6.9%	1.4%	-0.6%	-2.3%	-0.7%	3.7%	0.8%
1 Year	16.8%	17.4%	19.3%	27.9%	12.2%	3.0%	-1.0%	-0.3%	-2.0%	-4.7%	0.7%	-7.2%
YTD	13.1%	13.0%	17.3%	23.2%	9.0%	-4.1%	-2.6%	-2.1%	-3.2%	-4.8%	2.9%	-6.0%

Milliman Financial Risk Management

London Market Monitor – 30 November 2021

Data sources: Bloomberg; Barclays; EIOPA; Oxford-Man Institute; ONS; Milliman FRM

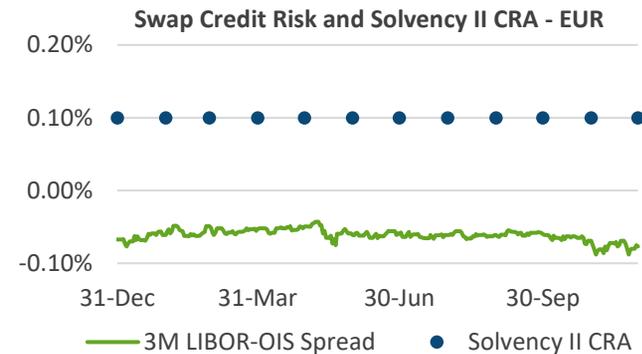
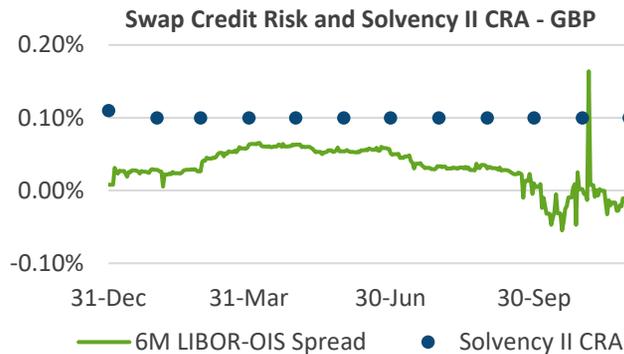
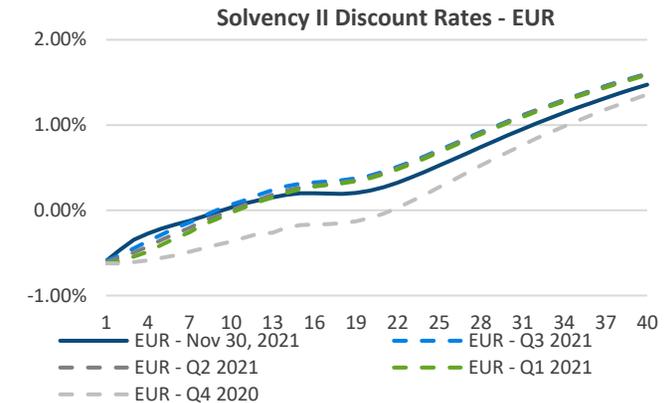
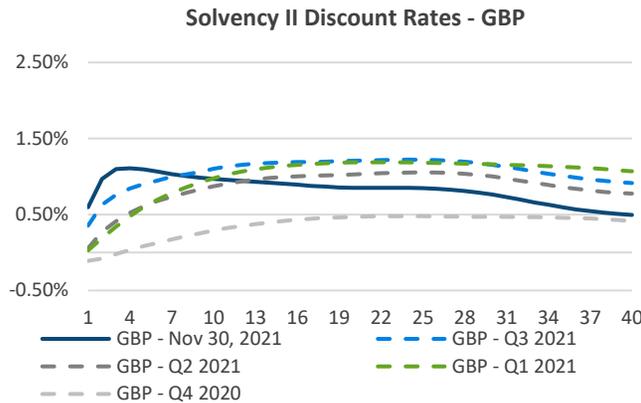
Solvency II Monitor - Rates

Risk Free Rates

- Both the GBP and EUR risk-free rates declined at all terms in November.
- The GBP 1 and 20-year rates fell by 21 and 20 basis points, respectively.
- The EUR 5 and 10-year risk-free rates both decreased by 16 basis points.

Credit Risk Adjustment

- Both the GBP and EUR CRAs were unchanged and remain floored at 10 basis points.



	Change in GBP Discount and CRA (bps)					
	1Y	Y5	Y10	Y20	Y30	CRA
Since Q3 2021	24	19	-13	-35	-39	0
Since Q2 2021	54	49	10	-17	-24	0
Since Q1 2021	57	49	-1	-33	-40	0
Since Q4 2020	71	101	68	38	29	-1

	Change in EUR Discount and CRA (bps)					
	1Y	Y5	Y10	Y20	Y30	CRA
Since Q3 2021	0	7	-4	-18	-17	0
Since Q2 2021	1	13	3	-16	-16	0
Since Q1 2021	2	19	6	-15	-15	0
Since Q4 2020	3	34	40	32	20	0

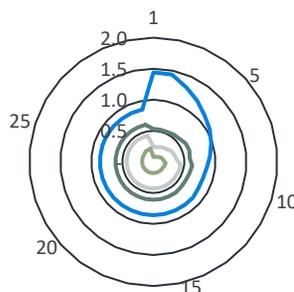
Solvency II Monitor - Spreads

Fundamental Spreads

- There were no material changes since the last report.

Fundamental Spreads %

GBP - Financial

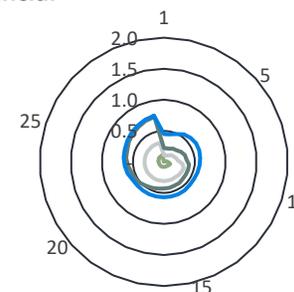


— AAA — AA — A — BBB

GBP Financial Fundamental Spread %					
	1Y	Y5	Y10	Y20	Y30
AAA	0.08	0.12	0.19	0.18	0.22
AA	0.24	0.30	0.44	0.43	0.43
A	0.53	0.56	0.61	0.61	0.61
BBB	1.44	1.11	0.84	0.86	0.86

GBP Financial 'Before Floor' %					
	1Y	Y5	Y10	Y20	Y30
AAA	0.00	0.04	0.08	0.15	0.22
AA	0.04	0.07	0.11	0.19	0.26
A	0.06	0.12	0.20	0.32	0.44
BBB	0.15	0.24	0.34	0.48	0.59

GBP - Non-Financial



— AAA — AA — A — BBB

GBP Non-Financial Fundamental Spread %					
	1Y	Y5	Y10	Y20	Y30
AAA	0.00	0.01	0.11	0.08	0.11
AA	0.11	0.16	0.34	0.31	0.31
A	0.22	0.28	0.41	0.51	0.74
BBB	0.45	0.58	0.57	0.57	0.76

GBP Non-Financial 'Before Floor' %					
	1Y	Y5	Y10	Y20	Y30
AAA	0.00	0.01	0.04	0.07	0.11
AA	0.00	0.04	0.08	0.17	0.25
A	0.04	0.14	0.26	0.51	0.74
BBB	0.11	0.23	0.36	0.57	0.76

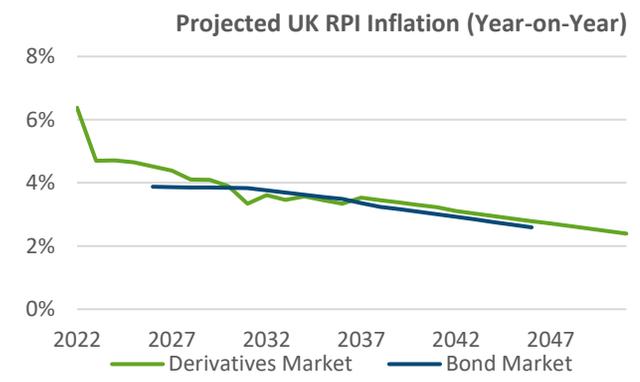
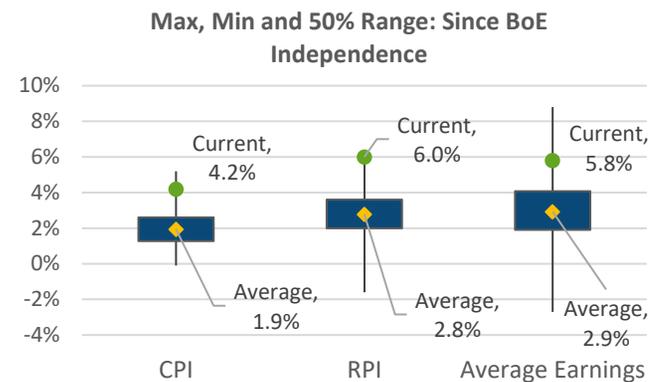
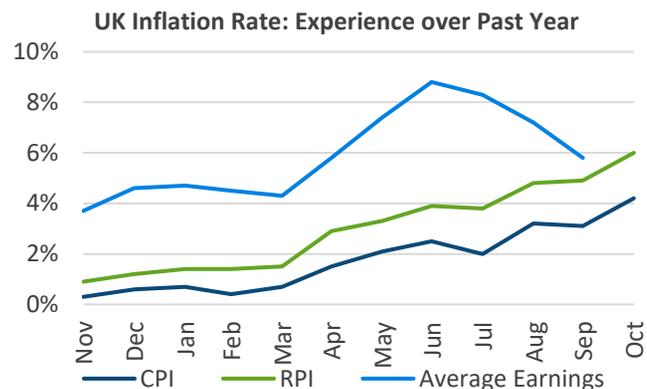
The **Solvency II risk-free discount rates** are based on applying the Smith-Wilson Extrapolation to LIBOR swap rates sourced from Refinitiv and applying the Credit Risk Adjustment as defined in the Technical Specs. The data is provided by EIOPA and as of 30/11/21.

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, 6 months for GBP), and is bounded between 0.10 and 0.35. We show actual LIBOR-OIS spread levels and the defined CRA, for both GBP and 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 30/11/21. **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.

UK Inflation Monitor

- Both the UK's CPI and RPI inflation measures increased by 110 basis points in October. The former came in at 4.2% and the latter at 6.0%.
- According to the ONS: "Housing and household services made the largest upward contribution, with further large upward contributions to change from several divisions, including transport, restaurants and hotels, education, furniture and household goods, and food and non-alcoholic beverages."
- UK's average earnings fell by 140 basis points to 5.8%.
- According to the ONS: "Annual growth in average employee pay has been affected by temporary factors that have inflated the headline growth rate. These factors are now reducing and having a smaller impact on growth rates: factors being base effects where the latest months are now compared with low base periods when earnings were first affected by the coronavirus pandemic; and compositional effects where there has been a fall in the number and proportion of lower-paid employee jobs, therefore increasing average earnings."
- UK's Q3 2021 GDP growth figure came in lower by 1700 basis points at 6.6%.
- The projected UK RPI curve was higher at short to medium terms in comparison to the previous month.



Historical year-on-year inflation rate is assessed by the % change on:

- **Consumer Price Index (CPI)** – measuring the monthly price of a basket of consumer goods and services
- **Retail Price Index (RPI)** – similar to CPI, but the main difference due the addition of mortgage payments, council tax and other housing costs
- **Average Earnings** – measuring the average total weekly employee remuneration over the previous 3 months.

Projection year-on-year inflation rate is the forward rate calculated from market data:

- **Derivatives Market View** – constructed from zero coupon inflation par swap rates against the RPI index at various tenors
- **Bond Market View** – constructed from the difference between the nominal rates implied by the conventional gilts and the real rates implied by the index-linked (RPI) gilts.

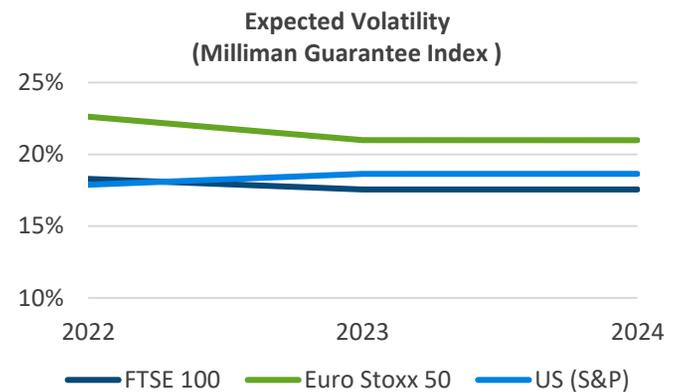
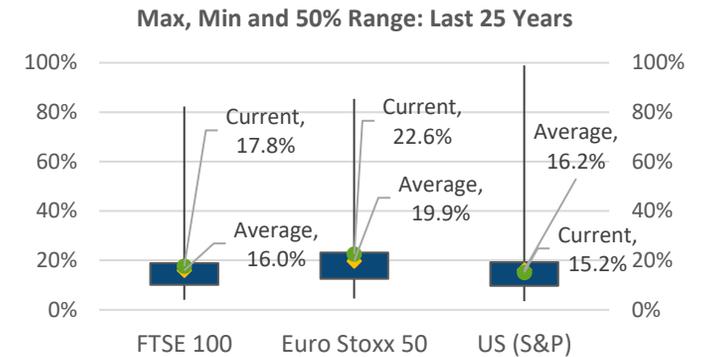
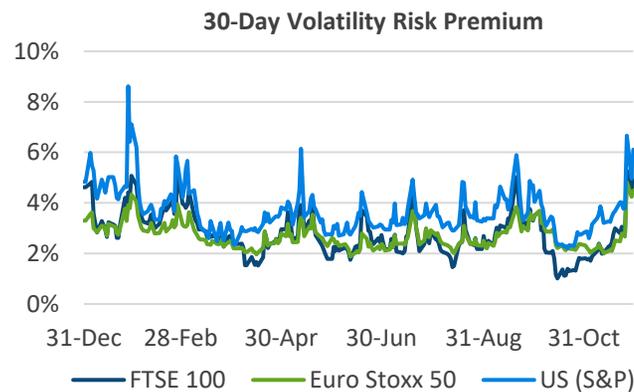
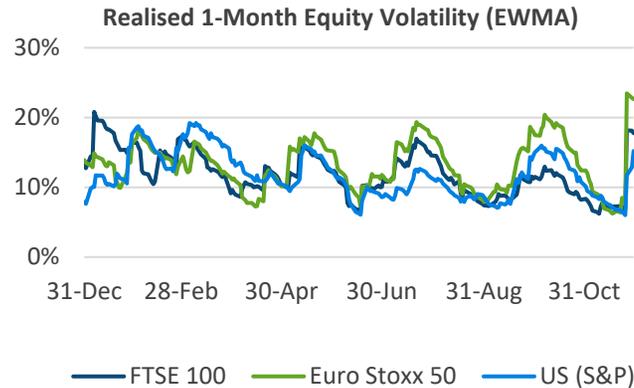
Milliman Financial Risk Management

London Market Monitor – 30 November 2021

Data sources: Bloomberg; Barclays; EIOPA; Oxford-Man Institute; ONS; Milliman FRM

Volatility and Hedging Cost Monitor

- Realised volatility on major indices spiked towards the end of the month, on the back of concerns over the Omicron variant.
- The FTSE 100 had a realised volatility of 17.8% at month-end. The measure stood at 22.6% and 15.2% for the Euro Stoxx 50 and the S&P 500, respectively.
- Volatility risk premiums increased as implied volatilities rose sharply. The FTSE 100 had a volatility risk premium of 4.9% at month-end. The volatility risk premium on the Euro Stoxx 50 and the S&P 500 was 4.5% and 6.1%, respectively.



Actual realised equity volatility is measured by the weighted standard deviation of 1 month daily index change. The Exponentially Weighted Moving Average (EWMA) methodology places more importance to the recent returns in the calculation of the volatility.

Volatility Risk Premium is estimated as the difference between 30-day implied volatility and projected realised volatility (on data from the Oxford-Man Institute). This reflects the additional cost of hedging from purchasing a basket of options, in comparison to managing a dynamic delta hedge with futures (ignoring rolling transaction costs).

Expected realised volatility is an intermediate result from the [Milliman Guarantee Index™ \(MGI\)](#), which provides volatility parameters for variable annuity guarantee (VA) valuation and risk management. The levels shown are on an expected basis, and do not reflect any risk adjustment.



Creating transformational improvement in the retirement savings industry.

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

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