

Market Price Monitor

- Equity markets had a positive performance in August with all major indices making gains for the month, as investors and market participants continued to show strong demand for risk assets.
- The FTSE 100 ended the month up 1.8%, but remains 19% down year-to-date.
- The Euro Stoxx 50 index returned 3.2% in August.

Global Equity Markets

- The Japanese Topix index was the best performer of the month, gaining 8.2%. Meanwhile, the S&P 500 index returned 7.2%. The US index is now up 9.7% year-to-date.
- Emerging markets underperformed their developed markets counterparts, with the MSCI emerging markets index up 2.2% at month-end.

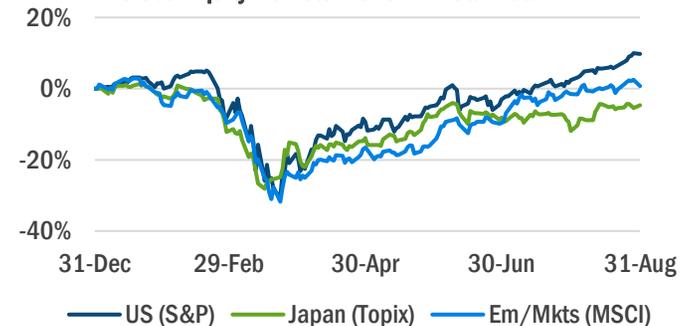
Bond/FX Markets

- The British government bond index lost 3.2% during the month.
- The British corporate bond index lost 1%; meanwhile its global counterpart was down 0.3%.
- The British Pound had a positive month, gaining 2.2% against both the US Dollar and the Japanese Yen. While returning 0.8% against the Euro.

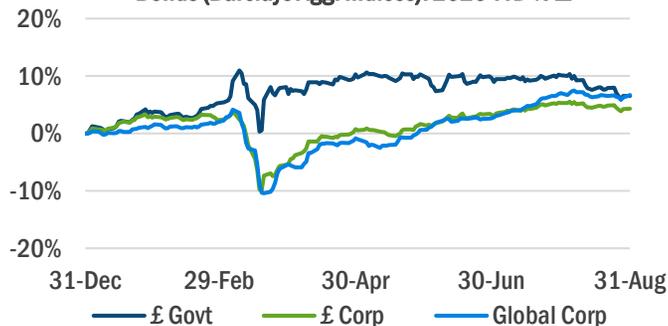
Local Equity Markets: 2020 YTD Total Return %



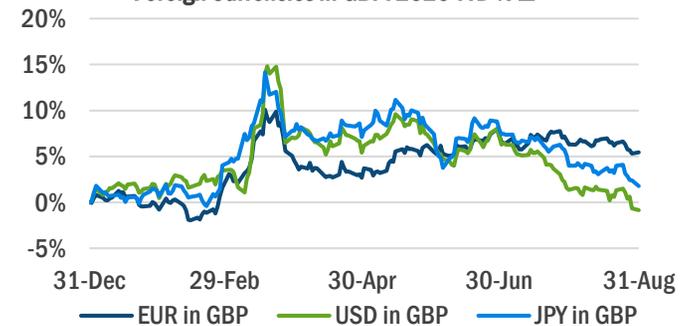
Global Equity Markets: 2020 YTD Total Return %



Bonds (Barclays Agg. Indices): 2020 YTD % Δ



Foreign Currencies in GBP: 2020 YTD % Δ



Total Returns as of August 31, 2020

	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	1.8%	2.4%	3.2%	7.2%	8.2%	2.2%	-3.2%	-1.0%	-0.3%	-0.8%	-2.2%	-2.2%
3 Month	-0.9%	0.3%	8.2%	15.5%	3.6%	19.7%	-3.4%	2.6%	6.1%	-0.7%	-7.7%	-6.0%
1 Year	-14.3%	-12.6%	-1.8%	21.9%	9.8%	14.9%	2.6%	4.1%	7.8%	-1.2%	-9.1%	-8.7%
YTD	-19.0%	-18.5%	-10.5%	9.7%	-4.7%	0.7%	6.5%	4.3%	6.7%	5.5%	-0.8%	1.8%

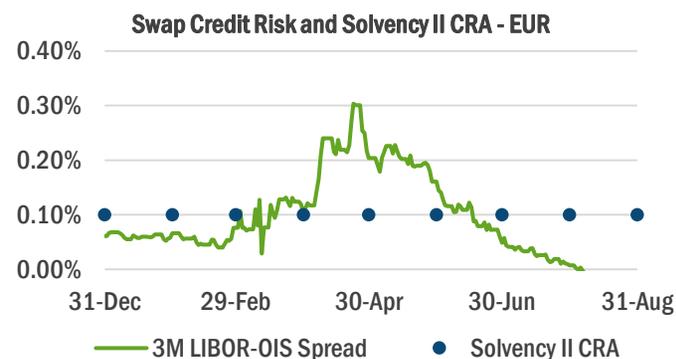
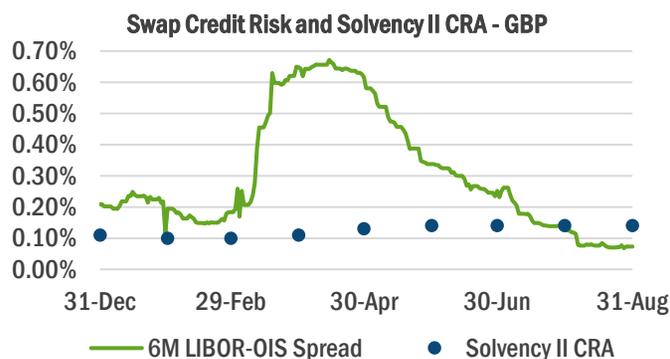
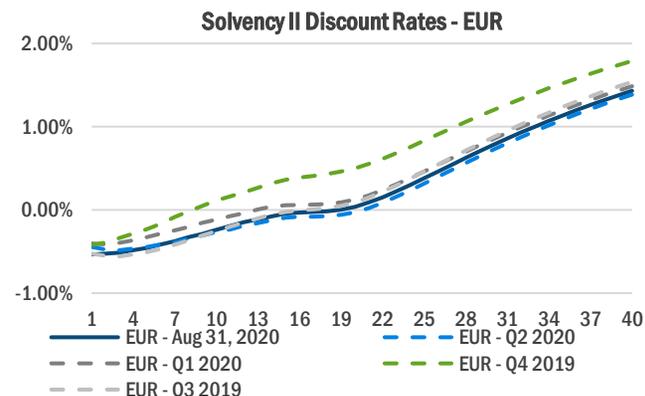
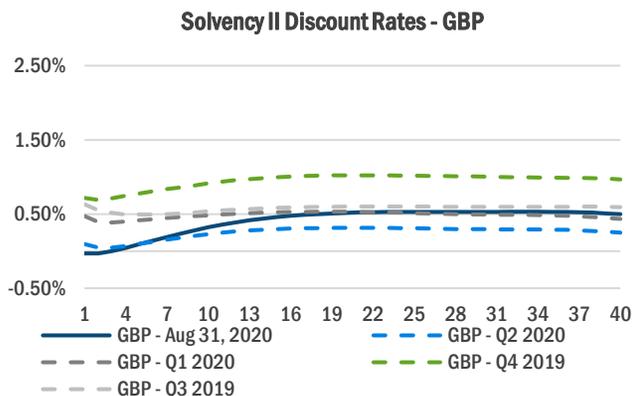
Solvency II Monitor - Rates

Risk Free Rates

- Both the GBP and EUR risk-free rates increased at all terms in August, with the exception of 1-year rate which saw a drop of 3 basis points for both currencies.
- The longer term rates saw the largest increase, with the GBP 30-year and 20-year risk-free rates rising by 24 and 23 basis points, respectively.
- The 10-year GBP risk-free rate increased by 16 basis points.
- EUR risk-free rates followed a similar pattern, with the 30-year and 20-year rates increasing by 14 and 15 basis points, respectively. Meanwhile the 10-year EUR risk-free rate rose by 9 basis points.

Credit Risk Adjustment

- Both GBP and EUR CRAs remained unchanged at 14 and 10 basis points, respectively.



	Change in GBP Discount and CRA (bps)					
	1Y	Y5	Y10	Y20	Y30	CRA
Since Q2 2020	-13	-1	9	20	23	0
Since Q1 2020	-50	-32	-16	-2	4	3
Since Q4 2019	-75	-69	-59	-51	-48	3
Since Q3 2019	-66	-40	-21	-9	-7	3

	Change in EUR Discount and CRA (bps)					
	1Y	Y5	Y10	Y20	Y30	CRA
Since Q2 2020	-9	-1	3	7	6	0
Since Q1 2020	-13	-13	-12	-9	-7	0
Since Q4 2019	-11	-23	-35	-46	-42	0
Since Q3 2019	-1	5	2	-5	-9	0

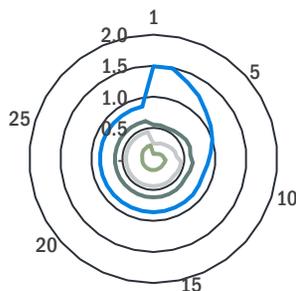
Solvency II Monitor - Spreads

Fundamental Spreads

- There were no material changes since the last report.

Fundamental Spreads %

GBP - Financial

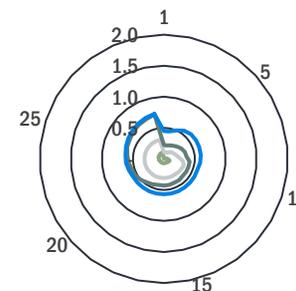


— AAA — AA — A — BBB

GBP Financial Fundamental Spread %					
	1Y	Y5	Y10	Y20	Y30
AAA	0.08	0.12	0.19	0.18	0.22
AA	0.25	0.31	0.45	0.44	0.44
A	0.55	0.58	0.62	0.62	0.62
BBB	1.49	1.14	0.84	0.86	0.86

GBP Financial 'Before Floor' %					
	1Y	Y5	Y10	Y20	Y30
AAA	0.00	0.04	0.08	0.16	0.22
AA	0.03	0.06	0.11	0.19	0.26
A	0.06	0.13	0.20	0.33	0.45
BBB	0.15	0.25	0.35	0.50	0.61

GBP - Non-Financial



— AAA — AA — A — BBB

GBP Non-Financial Fundamental Spread %					
	1Y	Y5	Y10	Y20	Y30
AAA	0.00	0.01	0.10	0.07	0.10
AA	0.11	0.16	0.34	0.31	0.31
A	0.22	0.29	0.42	0.50	0.73
BBB	0.45	0.59	0.57	0.57	0.74

GBP Non-Financial 'Before Floor' %					
	1Y	Y5	Y10	Y20	Y30
AAA	0.00	0.01	0.04	0.07	0.10
AA	0.00	0.04	0.08	0.16	0.24
A	0.03	0.14	0.26	0.50	0.73
BBB	0.11	0.22	0.34	0.56	0.74

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 31/08/20.

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 31/08/20. **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.

Milliman Financial Risk Management

London Market Monitor – 31 August 2020

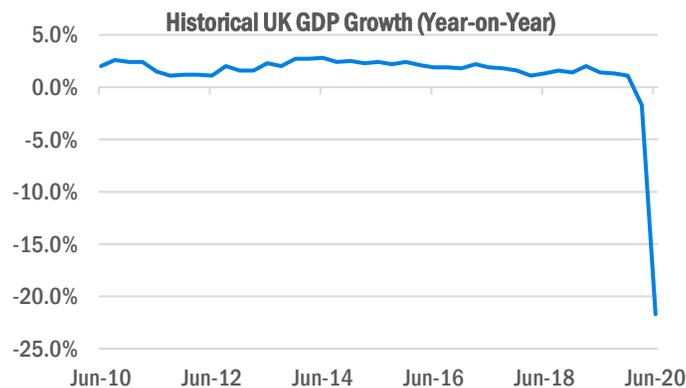
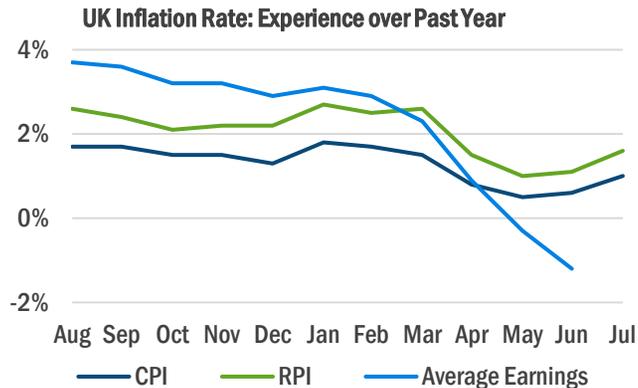
Data sources: Bloomberg; Barclays; EIOPA; Oxford-Man Institute; ONS; Milliman FRM

UK Inflation Monitor

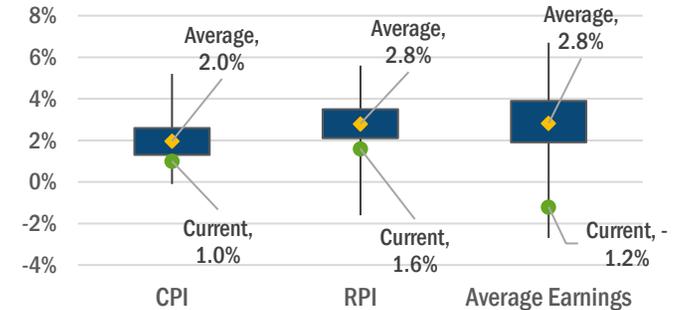
- UK's CPI inflation increased by 40 basis points in July, posting a reading of 1%.
- UK's RPI inflation rose by 50 basis points to 1.6%.
- According to the ONS : *“Clothing, rising prices at the petrol pump, and furniture and household goods made large upward contributions to the change. Falling food prices resulted in a partially offsetting small downward contribution to the change”*
- Average earnings declined by 90 basis points in June, with the headline figure at -1.2%.
- The projected RPI curve was higher at short to medium terms in comparison to the previous month, but remains broadly unchanged at longer terms. The outlook is still highlighting a spike in inflation in the short to medium term followed by a steady decline thereon. To some extent a projected decline could be due to the changes that we're expecting in the calculation of the RPI sometime between 2025 and 2030 from the House of Lords consultation.

House of Lords' Report

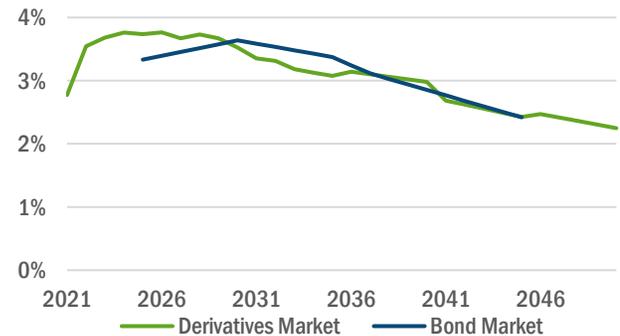
- The consultation on the changes to RPI that was extended from April to August has now concluded, and we are awaiting the findings and the government response.



Max, Min and 50% Range: Since BoE Independence



Projected UK RPI Inflation (Year-on-Year)



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

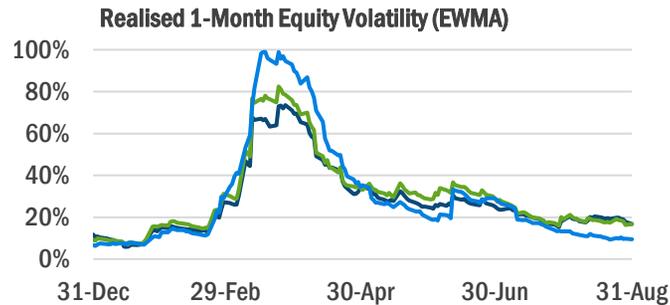
- **Consumer Price Index (CPI)** – measuring the monthly price of a basket of consumer goods and services
- **Retail Price Index (RPI)** – similar to CPI, but the main difference due the addition of mortgage payments, council tax and other housing costs
- **Average Earnings** – measuring the average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

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

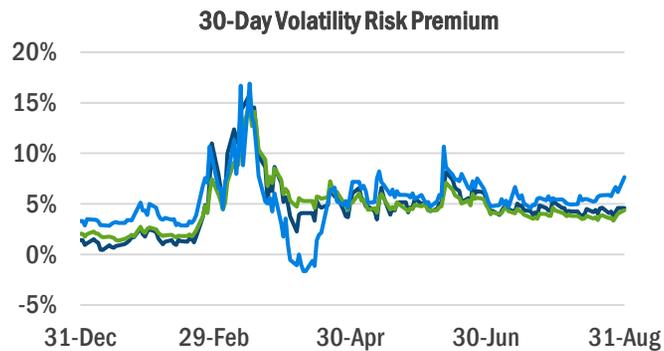
- **Derivatives Market View** – constructed from zero coupon inflation par swap rates against the RPI index at various tenors
- **Bond Market View** – constructed from the difference between the nominal rates implied by the conventional gilts and the real rates implied by the index-linked (RPI) gilts.

Volatility and Hedging Cost Monitor

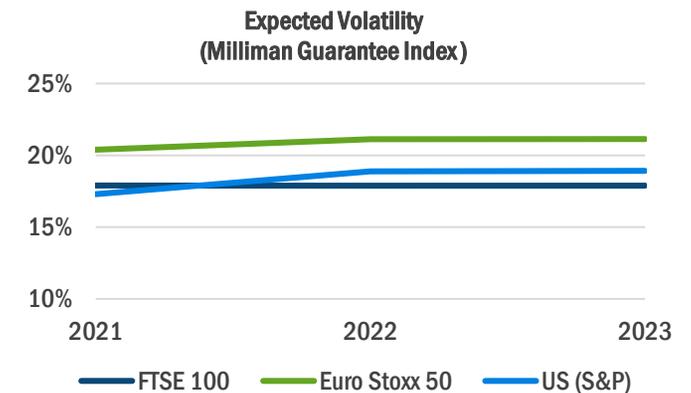
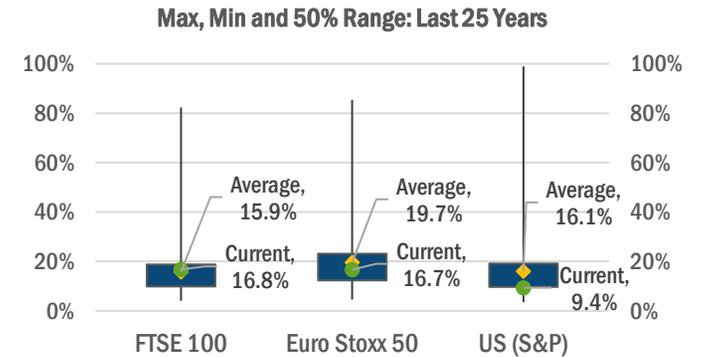
- Realised volatility of the major indices continued to decline in August. However the FTSE 100 is still seeing its realised volatility above its historical average, with the index experiencing a realised volatility of 16.8% at month-end.
- In contrast, the Euro Stoxx 50 and the S&P 500 had realised volatilities of 16.7% and 9.4% respectively at month-end, which are below their recent averages.
- Volatility risk premiums of the FTSE 100 and the Euro Stoxx 50 indices were broadly unchanged, with the former posting a volatility risk premium of 4.6% and the latter having this measure at 4.4%, at month-end.
- The S&P 500 saw its volatility risk premium increase to 7.7%, as its implied volatility had risen by month-end in contrast to its falling realised volatility. This is particularly interesting, as it shows elevated demand for option protection while the index is close to a record high, highlighting that a large segment of the market might be concerned that the index is overvalued.



— FTSE 100 — Euro Stoxx 50 — US (S&P)



— FTSE 100 — Euro Stoxx 50 — US (S&P)



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.

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