

Market Price Monitor

Local Equity Markets

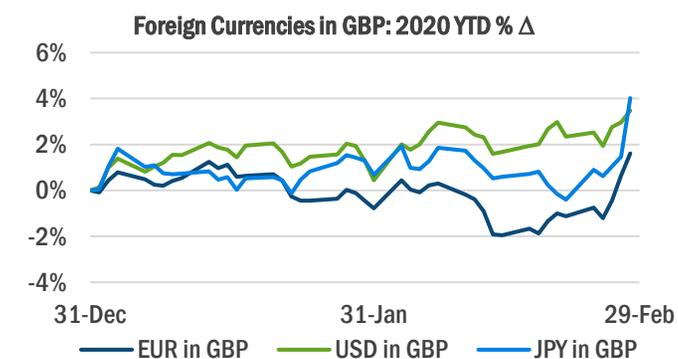
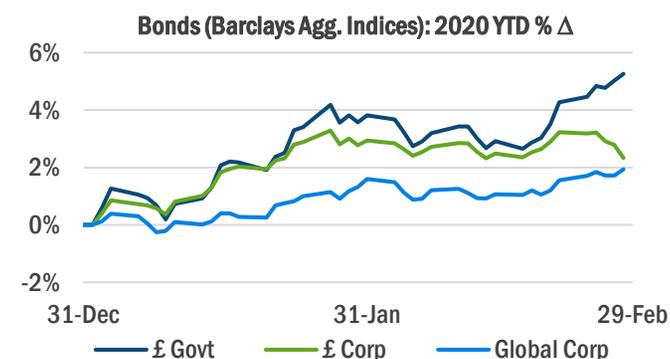
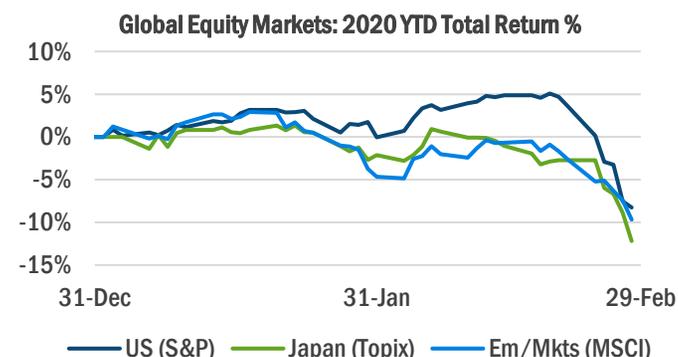
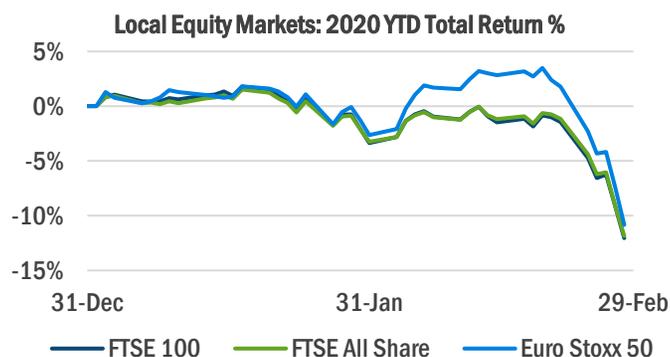
- Equity markets started the month strongly as they initially shrugged off concerns about the coronavirus outbreak, however by month-end they had posted extreme losses as the virus spread worldwide and concerns grew over its impact on global growth.
- The FTSE100 plunged by 9%, having lost 12% for the year so far.
- The Euro Stoxx 50 index ended the month 8.4% down.

Global Equity Markets

- Equity markets in developed economies suffered heavier losses than those in emerging markets.
- The S&P 500 was down 8.2% at month-end, and the Japanese equity index lost 10.3%.
- The MSCI emerging market index ended the month 5.3% down.

Bond/FX Markets

- The British government bonds index gained 1.4% in February.
- While the UK corporate bonds index ended the month 0.6% down.
- The British Pound performed poorly in February, losing 3.3% and 3% against the Japanese yen and the US dollar, respectively.
- The Pound ended the month 2.4% down against the Euro.



	Total Returns as of February 29, 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	-9.0%	-8.9%	-8.4%	-8.2%	-10.3%	-5.3%	1.4%	-0.6%	0.3%	2.4%	3.0%	3.3%
3 Month	-9.6%	-8.9%	-9.7%	-5.5%	-10.9%	-2.9%	3.7%	2.4%	2.8%	1.0%	0.9%	2.2%
1 Year	-2.7%	-1.4%	4.6%	8.2%	-3.6%	-1.5%	12.7%	11.4%	10.9%	0.3%	3.5%	6.6%
YTD	-12.0%	-11.9%	-10.8%	-8.3%	-12.2%	-9.7%	5.3%	2.3%	1.9%	1.6%	3.5%	4.0%

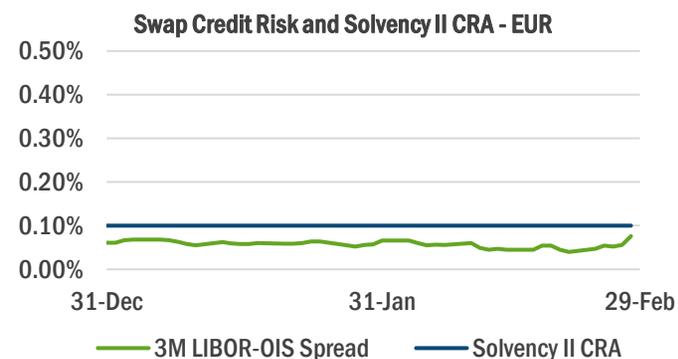
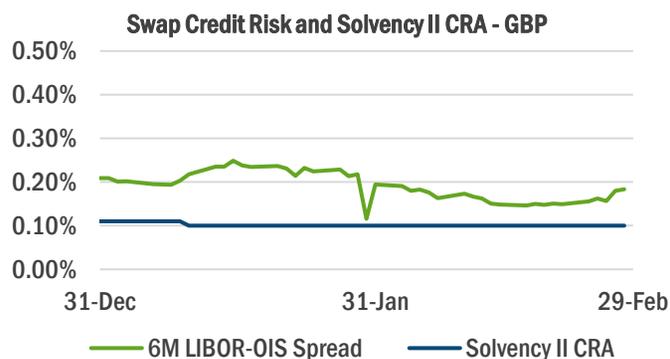
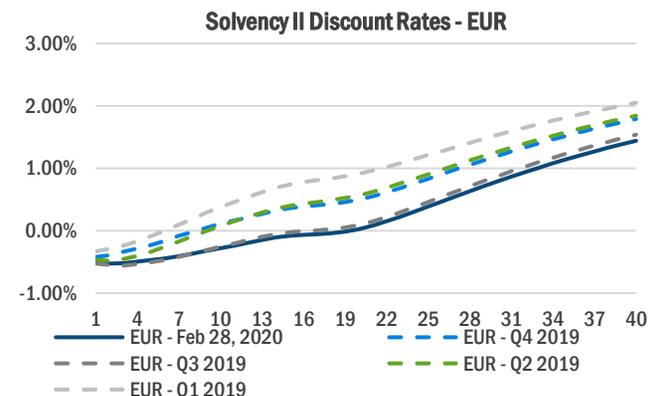
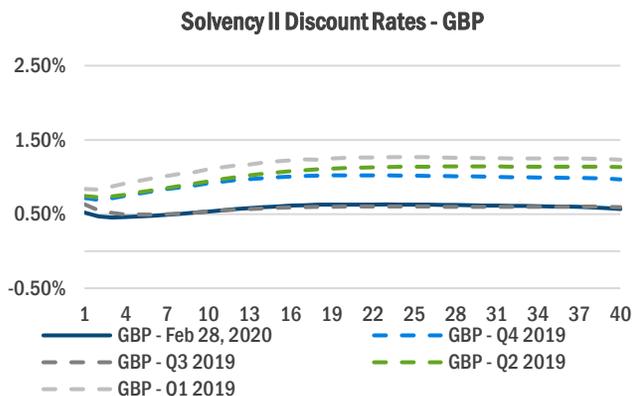
Solvency II Monitor - Rates

Risk Free Rates

- GBP Solvency II Risk-free rates decreased at all terms for the second month in a row.
- The 1-year and 30-year GBP risk-free rates dropped the most, as they decreased by 11 basis points.
- The 20-year GBP Solvency II rate was lower by 10 basis points at month-end.
- The biggest drop in the EUR solvency II curve was at the 20-year term, which saw a decline of 18 basis points from the previous month.
- The 10-year EUR risk-free rate decreased by 13 basis points, whilst the 30-year rate declined by 15 basis points.
- Medium to longer-term EUR risk-free rates are now below those levels last observed in Q3 2019, with the curve ending the month below zero up to the 16-year term.

Credit Risk Adjustment

- Both the GBP and EUR CRAs remained unchanged at the floor of 10 basis points.



	Change in GBP Discount and CRA (bps)					
	1Y	Y5	Y10	Y20	Y30	CRA
Since Q4 2019	-20	-31	-38	-39	-39	-1
Since Q3 2019	-11	-3	0	3	2	-1
Since Q2 2019	-23	-33	-41	-49	-53	-1
Since Q1 2019	-32	-48	-57	-63	-64	-1

	Change in EUR Discount and CRA (bps)					
	1Y	Y5	Y10	Y20	Y30	CRA
Since Q4 2019	-10	-24	-40	-47	-41	0
Since Q3 2019	1	4	-3	-6	-8	0
Since Q2 2019	-6	-13	-36	-54	-47	0
Since Q1 2019	-19	-38	-66	-88	-74	0

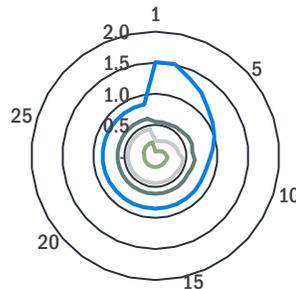
Solvency II Monitor - Spreads

Fundamental Spreads

- The fundamental spread data shown is for the end of January.
- There were some marginal decreases in the long-term spreads this month.

Fundamental Spreads %

GBP - Financial

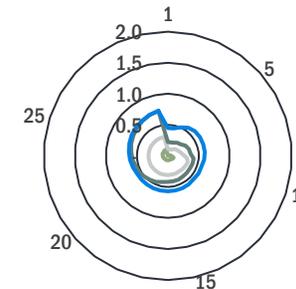


— AAA — AA — A — BBB

GBP Financial Fundamental Spread %					
	1Y	Y5	Y10	Y20	Y30
AAA	0.07	0.11	0.19	0.18	0.22
AA	0.24	0.31	0.45	0.44	0.44
A	0.55	0.58	0.62	0.61	0.61
BBB	1.51	1.14	0.84	0.85	0.85

GBP Financial 'Before Floor' %					
	1Y	Y5	Y10	Y20	Y30
AAA	0.00	0.04	0.08	0.16	0.22
AA	0.04	0.06	0.11	0.19	0.26
A	0.06	0.13	0.20	0.33	0.45
BBB	0.16	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	0.28	0.42	0.50	0.74
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	0.04	0.14	0.26	0.50	0.74
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 Bloomberg (current curve is for 28/02/20) and applying the Credit Risk Adjustment as defined in the Technical Specs.

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 31/01/20. **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 – 28 February 2020

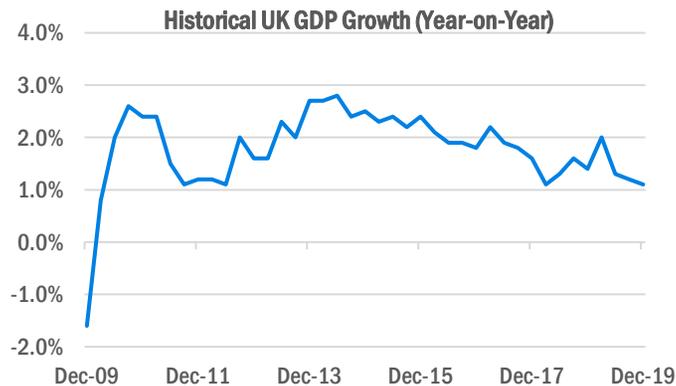
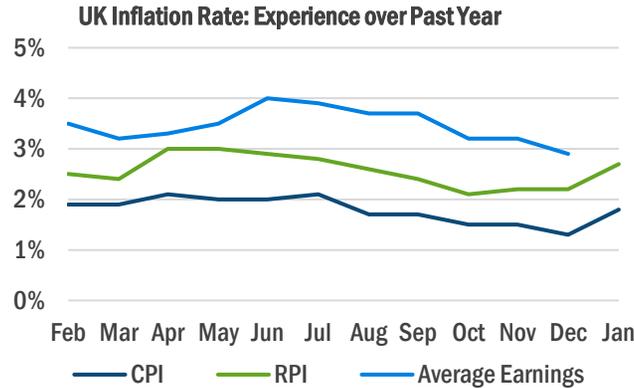
Data sources: Bloomberg; Barclays; EIOPA; Oxford-Man Institute; ONS; Milliman FRM

UK Inflation Monitor

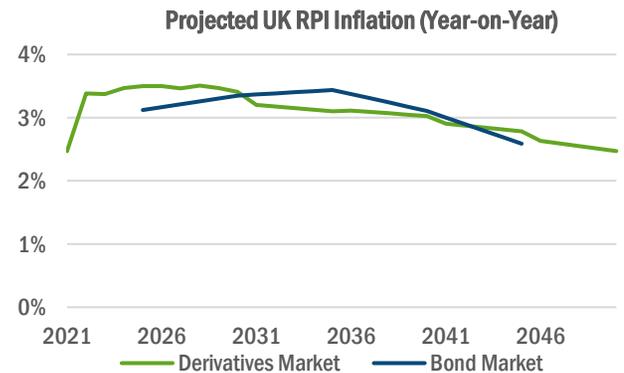
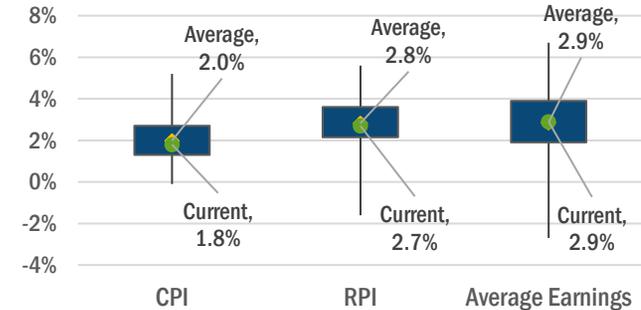
- CPI inflation increased by 50 basis points to 1.8% in January.
- UK's RPI inflation also increased by 50 basis points from the previous reading, with the headline figure at 2.7%.
- According to the ONS: *"The largest contribution came from housing, water, electricity, gas and other fuels."*
- UK average earnings declined by 30 basis points in December, posting a reading of 2.9%.

House of Lords' Report

- There has been no further correspondence on this topic since the last report.



Max, Min and 50% Range: Since BoE Independence



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

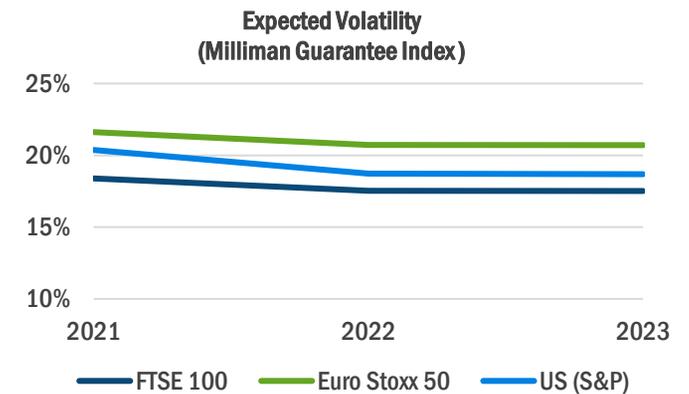
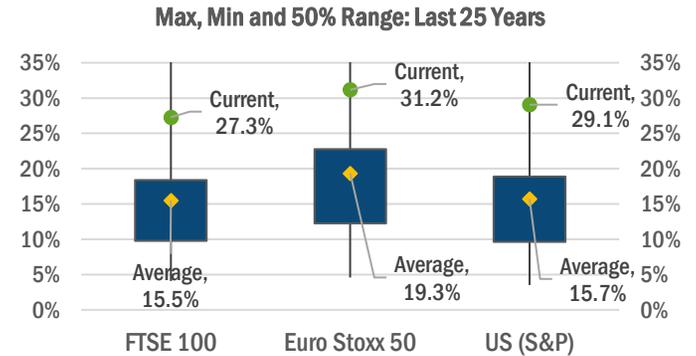
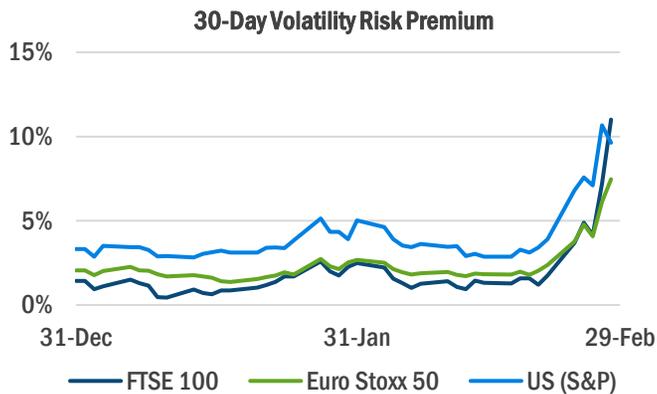
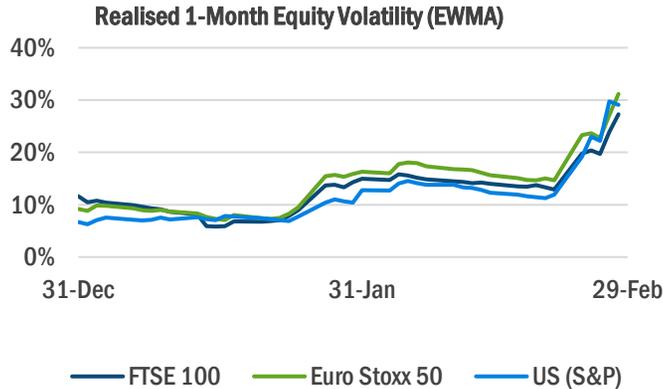
- **Consumer Price Index (CPI)** – measuring the monthly price of a basket of consumer goods and services
- **Retail Price Index (RPI)** – similar to CPI, but the main difference due the addition of mortgage payments, council tax and other housing costs
- **Average Earnings** – measuring the average 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 volatilities surged higher for all major indices during the second half of the month, with the Euro Stoxx 50 index posting a realised volatility in excess of 31% at month-end.
- The S&P 500 had a realised volatility of 29.1% at month-end, almost double its historical average, while the FTSE 100 had this figure at 27.3%.
- The sharp rise in implied volatilities contributed to risk premiums ending the month well above the historical averages.
- The risk premium on the FTSE 100 index was 11% at month-end. While the same measure stood at 9.6% and 7.5% for the S&P 500 and the Euro Stoxx 50 indices, 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.

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