

Market Price Monitor

Local Equity Markets

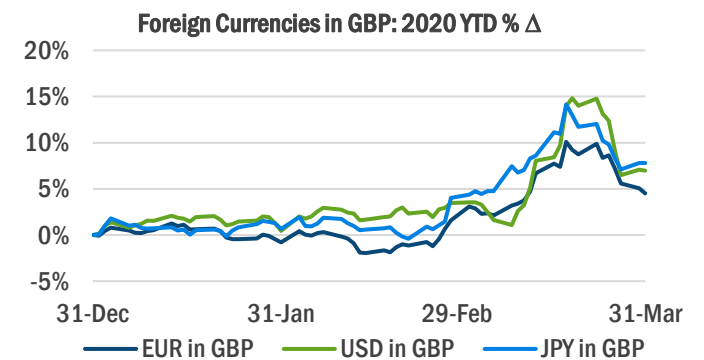
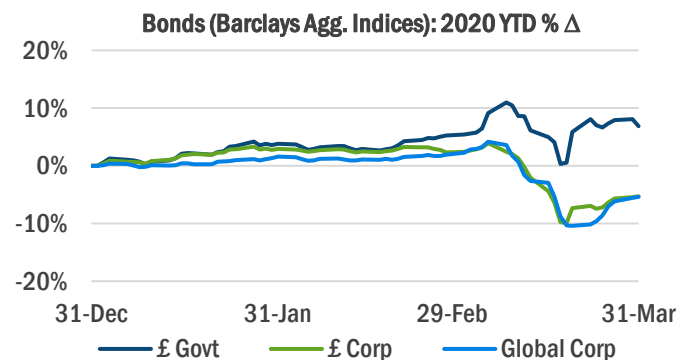
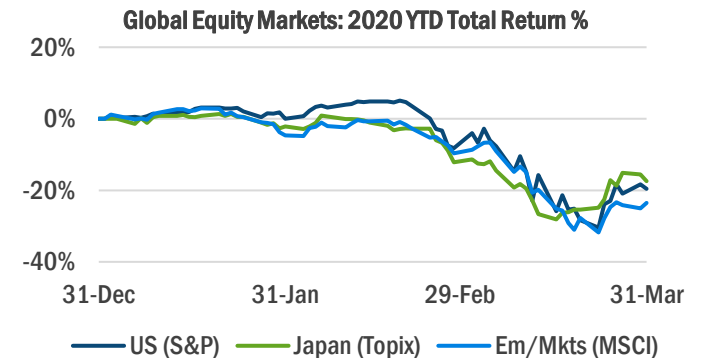
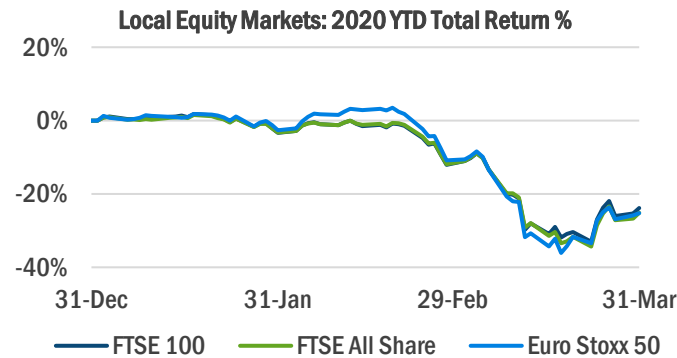
- Financial markets had a very turbulent month in March as more countries around the globe went into lockdowns amid the COVID-19 pandemic.
- Central banks around the world cut rates and restarted quantitative easing in a coordinated effort to tackle the economic fallout from the spread of the virus. The Federal Reserve cut the US base rate by 150 basis points, while the Bank of England made a 65 basis point cut.
- Equity markets recovered some of their losses by month-end as most governments promised strong fiscal stimulus packages.
- The FTSE 100 index declined 13.4% in March, while the Euro Stoxx 50 had lost 16.2% by month-end. The former ending Q1 down by 23.8%.

Global Equity Markets

- The S&P 500 lost 12.4% in March, while the Japanese equity markets declined 6%.
- The MSCI Emerging Markets index lost 15.4% during the month.

Bond/FX Markets

- The UK corporate bond index ended the month 7.4% down, while British government bonds gained 1.5%.
- The Pound had a weak performance in March, losing 3.6% and 3.4% against the Japanese Yen and the US Dollar, respectively. The British currency also weakened by 2.9% against the Euro.



Total Returns as of March 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	-13.4%	-15.1%	-16.2%	-12.4%	-6.0%	-15.4%	1.5%	-7.4%	-7.2%	2.9%	3.4%	3.6%
3 Month	-23.8%	-25.1%	-25.3%	-19.6%	-17.5%	-23.6%	6.9%	-5.3%	-5.4%	4.5%	7.0%	7.8%
1 Year	-18.4%	-18.5%	-13.9%	-7.0%	-9.5%	-17.4%	10.6%	0.5%	1.3%	2.8%	5.1%	8.1%
YTD	-23.8%	-25.1%	-25.3%	-19.6%	-17.5%	-23.6%	6.9%	-5.3%	-5.4%	4.5%	7.0%	7.8%

Milliman Financial Risk Management

London Market Monitor – 31 March 2020

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

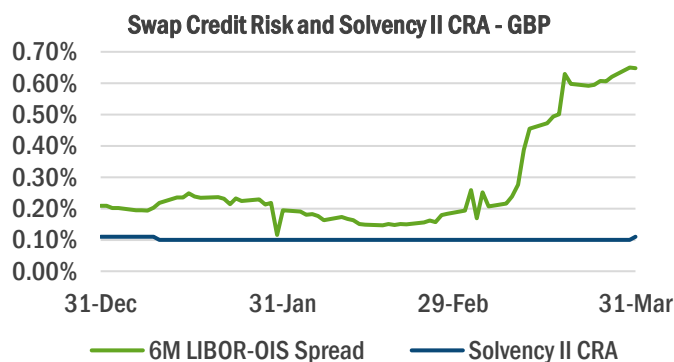
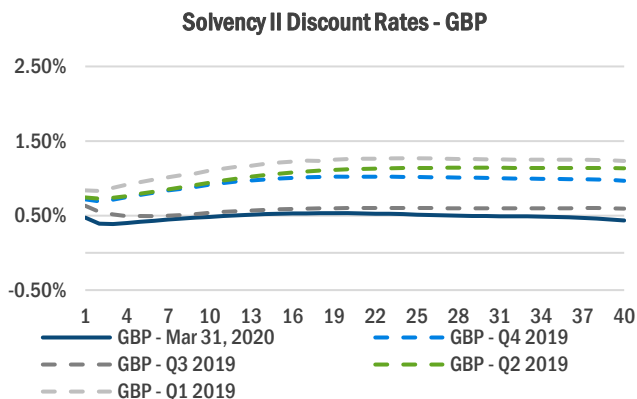
Solvency II Monitor - Rates

Risk Free Rates

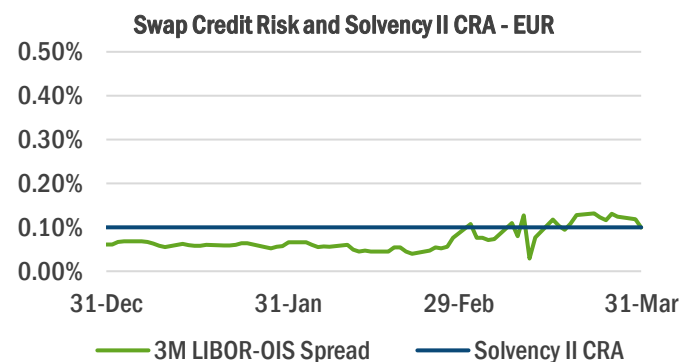
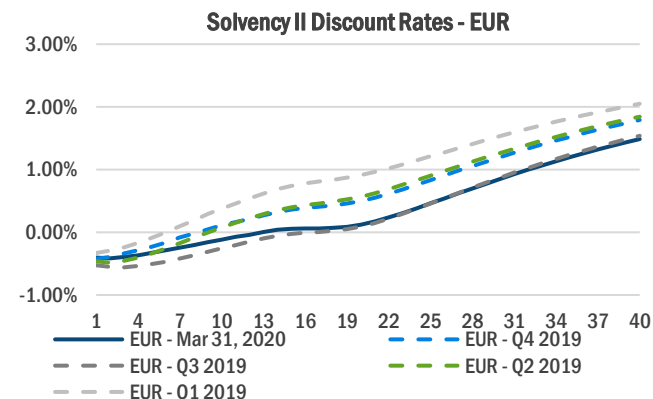
- GBP Solvency II risk-free rates decreased at all terms for the third month in a row, as the Bank of England cut the benchmark rate to the lowest level in its history.
- The 30-year risk-free rate declined the most, decreasing by 12 basis points.
- The 20-year risk-free rate was lower by 10 basis points at month-end, while the 10 and 5-year rates both decreased by 5 basis points.
- EUR Solvency II risk-free rates increased at all terms in March, with the short to medium-term rates seeing the largest increase.
- The 10-year EUR risk-free rate increased by 17 basis points, while the 5-year rate increased by 14 basis points and the 1-year rate by 12 basis points.

Credit Risk Adjustment

- The GBP CRA increased by 1 basis point to reach 11 basis points at the end of March. This comes after the GBP LIBOR-OIS spread widened by more than 47 basis points in the month.
- The EUR CRA 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	-24	-36	-43	-49	-51	0
Since Q3 2019	-16	-8	-5	-7	-10	0
Since Q2 2019	-27	-38	-46	-59	-65	0
Since Q1 2019	-37	-54	-62	-73	-76	0



	Change in EUR Discount and CRA (bps)					
	1Y	Y5	Y10	Y20	Y30	CRA
Since Q4 2019	2	-10	-23	-38	-35	0
Since Q3 2019	12	18	14	3	-2	0
Since Q2 2019	6	1	-19	-44	-41	0
Since Q1 2019	-8	-24	-49	-79	-68	0

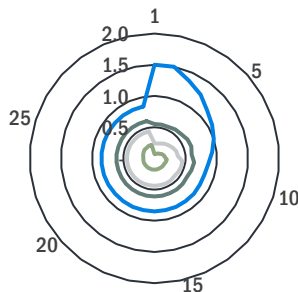
Solvency II Monitor - Spreads

Fundamental Spreads

- There were no material changes since the last report.

Fundamental Spreads %

GBP - Financial

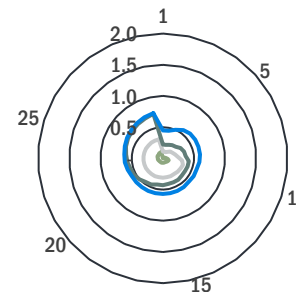


— AAA — AA — A — BBB

GBP Financial Fundamental Spread %					
	1Y	Y5	Y10	Y20	Y30
AAA	0.07	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	1.50	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	0.73
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	0.04	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 31/03/20.

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 31/03/20. **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 March 2020

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

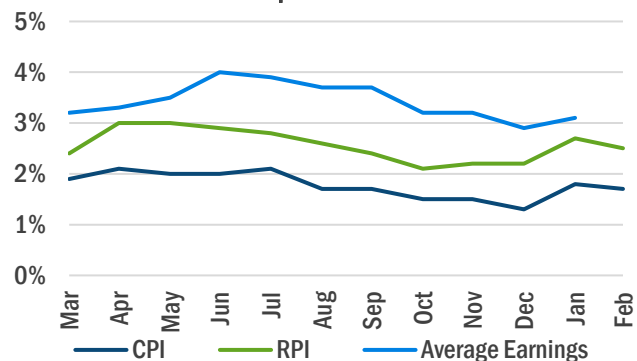
UK Inflation Monitor

- UK's CPI inflation decreased by 10 basis points to 1.7% in February.
- RPI inflation decreased by 20 basis points, posting a reading of 2.5%.
- According to the ONS: "The largest contribution came from housing, water, electricity, gas and other fuels. Fall in the price of motor fuels, games, toys and hobbies resulted in the largest downward contributions".
- UK Average earnings increased by 20 basis points to 3.1% in January.
- The Projected RPI curve was materially lower at the 1-year term as well as the longer terms at month-end, in comparison to the previous month.
- There were no updates to the GDP growth figure this month.

House of Lords' Report

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

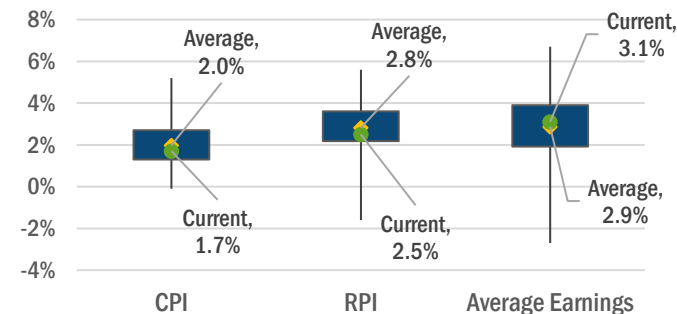
UK Inflation Rate: Experience over Past Year



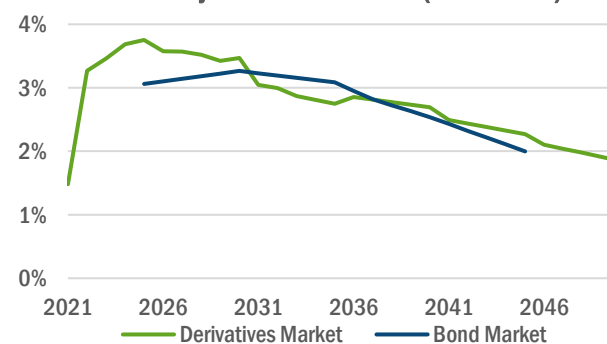
Historical UK GDP Growth (Year-on-Year)



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:

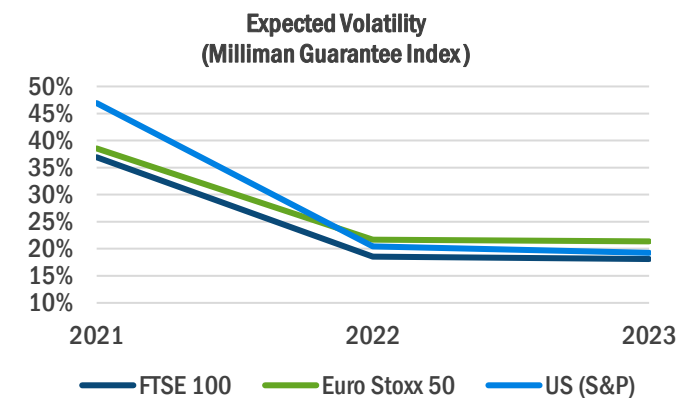
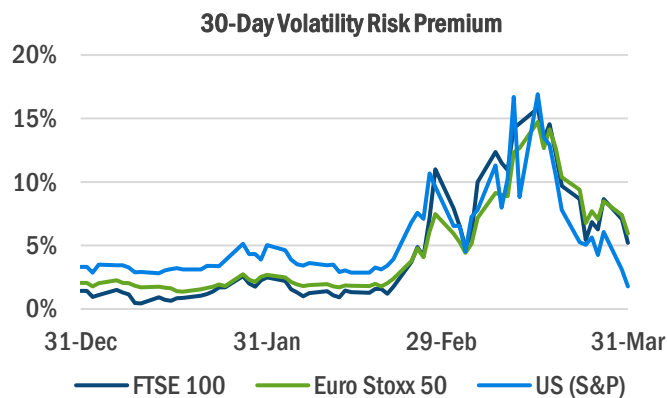
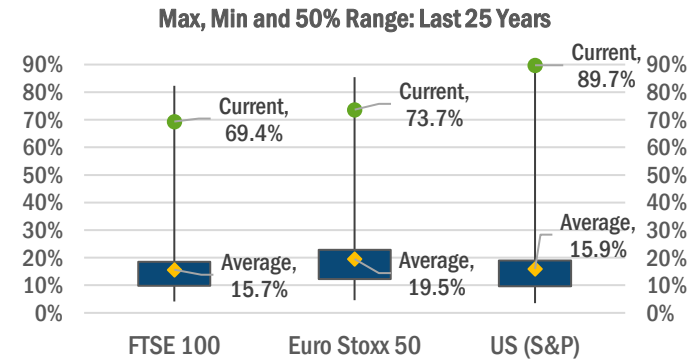
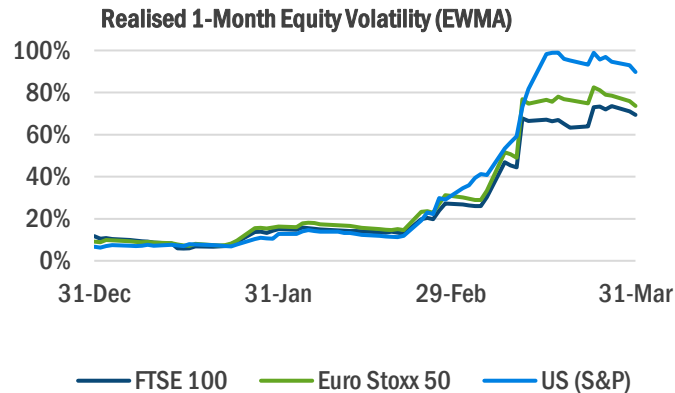
- **Consumer Price Index (CPI)** – measuring the monthly price of a basket of consumer goods and services
- **Retail Price Index (RPI)** – similar to CPI, but the main difference due the addition of mortgage payments, council tax and other housing costs
- **Average Earnings** – measuring the average 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 volatilities increased sharply in March, as major indices experienced volatilities well above their historical averages.
- The FTSE 100 index ended the month with a realised volatility of 69.4%. The S&P 500 had a realised volatility of 89.7% at month-end while the Euro Stoxx 50 index posted a realised volatility of 73.7%.
- Volatility risk premiums increased initially during the first half of the month, but dropped sharply as implied volatilities fell more than realised volatilities during the second half of the month. The Euro Stoxx 50 and the FTSE 100 indices had a volatility risk premium of 5.9% and 5.2%, respectively. While the S&P 500 had a risk premium of 1.8% at month-end.



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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