Market Price Monitor

Local Equity Markets

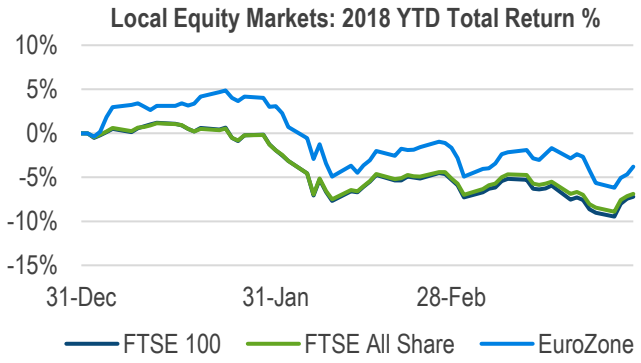
- Equity markets experienced another volatile month, with the markets concerned about a potential trade war between the US and China.
- European equities lost around 2% in March, leading to a further deterioration of year-to-date performance. The UK market was down by over 7% in the first quarter, while the main Eurozone benchmark was down just under 4%.

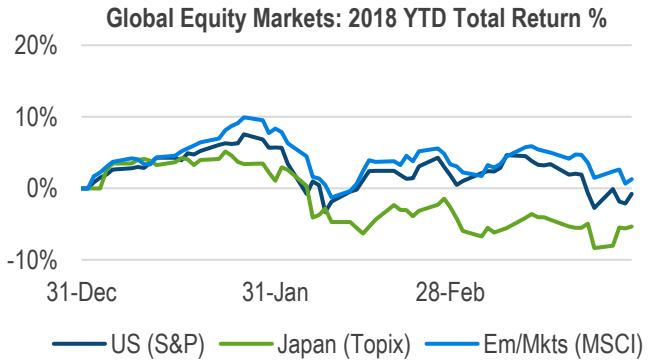
Global Equity Markets

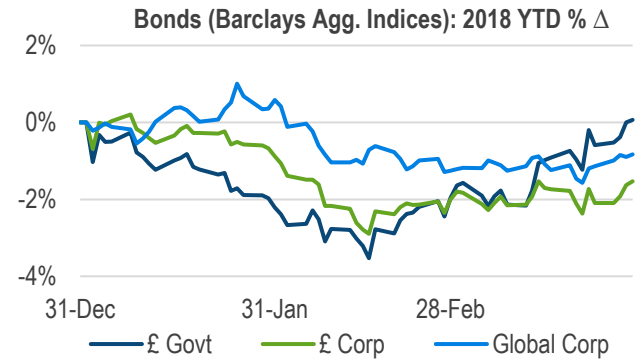
- International equity markets also posted losses of between 2% and 3% during March.
- US and Japanese equities ended the quarter in negative territory, however Emerging Markets equity still remains positive for the year.

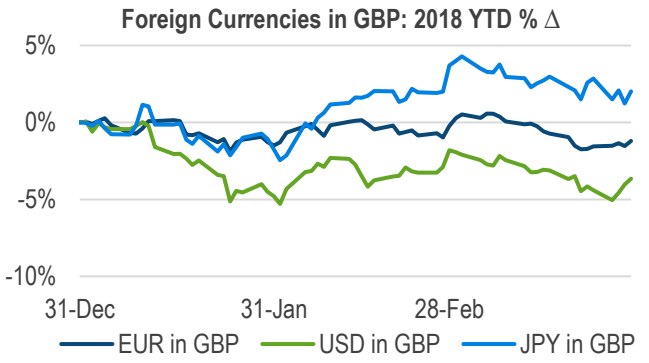
Bond/FX Markets

- Bond markets rose in value in March. The main UK government bond benchmark gained more than 2% in the month, becoming slightly positive for the year.
- Corporate bond markets saw a more muted gain during the month. The year-to-date performance remains negative, but less so than European equities.
- The GBP gained against all major currencies in March.









Total Returns as of March 29, 2018

	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	-2.0%	-1.8%	-2.2%	-2.5%	-2.7%	-2.0%	2.1%	0.5%	0.4%	-1.0%	-1.9%	-1.6%
3 Month	-7.2%	-6.9%	-3.8%	-0.8%	-5.4%	1.3%	0.1%	-1.5%	-0.8%	-1.2%	-3.6%	2.0%
1 Year	0.2%	1.2%	-1.7%	14.0%	15.0%	24.8%	0.5%	1.3%	6.5%	3.4%	-10.5%	-6.3%
YTD	-7.2%	-6.9%	-3.8%	-0.8%	-5.4%	1.3%	0.1%	-1.5%	-0.8%	-1.2%	-3.6%	2.0%

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

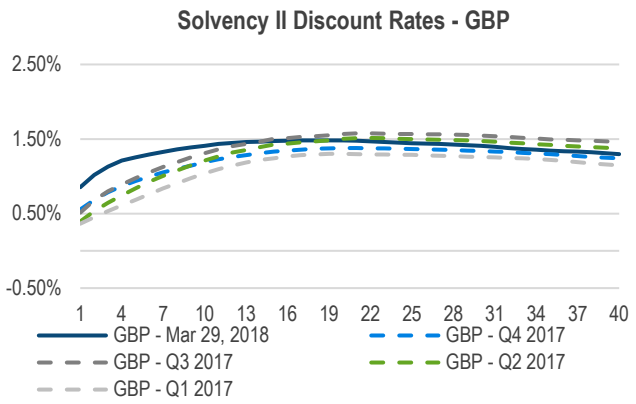
Solvency II Monitor - Rates

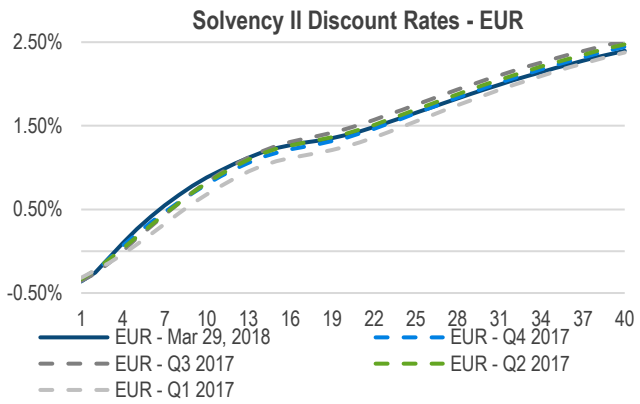
Risk Free Rates

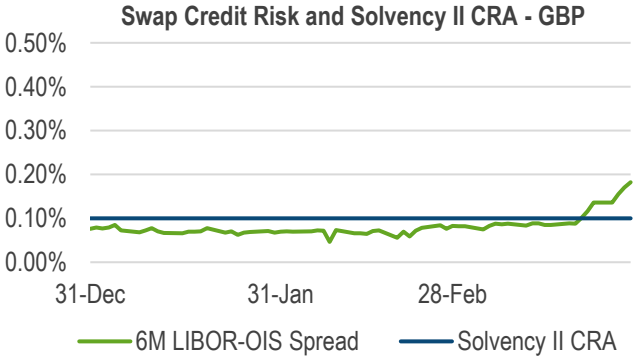
- The GBP Solvency II discount curve remains higher than the 2017 year-end curve. Shorter terms have increased by around 10 basis points in March, whereas longer terms decreased by around 15 basis points, leading to a flattening of the overall term structure.
- The EUR Solvency II discount curve has decreased to a similar level of that at 2017 year-end. The longer term rates are now slightly less than those of year-end.

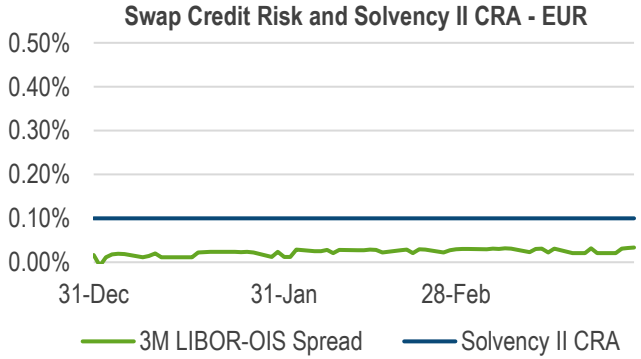
Credit Risk Adjustment

- GBP LIBOR-OIS spread increased in March, rising above the CRA 10 basis point floor at the end of the month. However, this has yet to have an impact on the CRA, as it is based upon a historical average.
- EUR LIBOR-OIS continues to remain below the 10 basis point floor.









Change in GBP Discount and CRA (bps)

	1Y	Y5	Y10	Y20	Y30	CRA
Since Q4 2017	30	32	22	10	7	0
Since Q3 2017	34	28	10	-8	-14	-3
Since Q2 2017	46	42	20	-2	-7	-6
Since Q1 2017	49	57	37	18	15	-7

Change in EUR Discount and CRA (bps)

	1Y	Y5	Y10	Y20	Y30	CRA
Since Q4 2017	0	6	8	3	-2	0
Since Q3 2017	-1	11	5	-7	-11	0
Since Q2 2017	-3	9	6	-2	-5	0
Since Q1 2017	-4	18	20	14	7	0

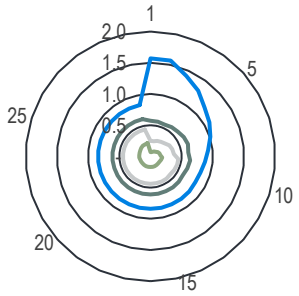
Solvency II Monitor - Spreads

Fundamental Spreads

- The fundamental spread data shown is for end of February.
- There were no material changes compared to the end of January.

Fundamental Spreads %

GBP - Financial



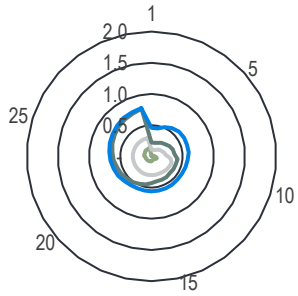
GBP Financial Fundamental Spread %

	1Y	Y5	Y10	Y20	Y30
AAA	0.07	0.11	0.18	0.17	0.22
AA	0.25	0.31	0.45	0.44	0.44
A	0.57	0.59	0.62	0.61	0.61
BBB	1.57	1.17	0.84	0.84	0.84

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*	*0.27*
A	*0.07*	*0.14*	*0.22*	*0.36*	*0.49*
BBB	*0.17*	*0.28*	*0.39*	*0.57*	*0.69*

GBP - Non-Financial



GBP Non-Financial Fundamental Spread %

	1Y	Y5	Y10	Y20	Y30
AAA	0.00	0.02	0.09	0.09	0.14
AA	0.11	0.16	0.34	0.30	0.30
A	0.22	0.29	0.41	0.53	0.78
BBB	0.46	0.59	0.57	0.59	0.79

GBP Non-Financial 'Before Floor' %

	1Y	*Y5*	*Y10*	*Y20*	*Y30*
AAA	*0.00*	*0.02*	*0.04*	*0.09*	*0.14*
AA	*0.00*	*0.04*	*0.09*	*0.19*	*0.27*
A	*0.04*	*0.15*	*0.28*	*0.53*	*0.78*
BBB	*0.11*	*0.23*	*0.36*	*0.59*	*0.79*

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 29/03/18) and applying the Credit Risk Adjustment as defined in the Technical Specs.

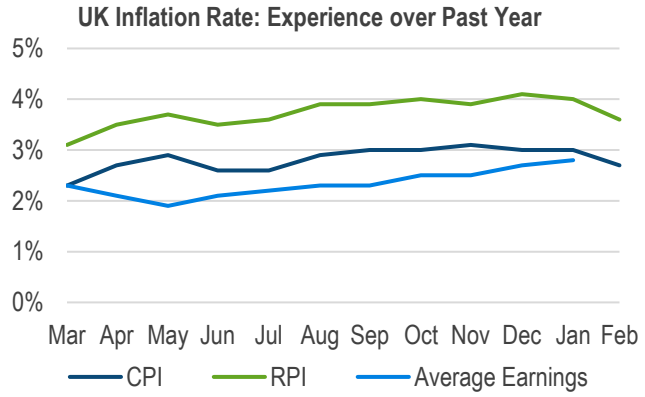
The **Credit Risk Adjustment** is a component of the risk-free discount curve defined by EIOPA. It is calculated from actual experience in the 'LIBOR-OIS' spread (3 months for EUR, 6 months for GBP), and is bounded between 0.10 and 0.35. We show actual LIBOR-OIS spread levels and the defined CRA, for both GBP and EUR.

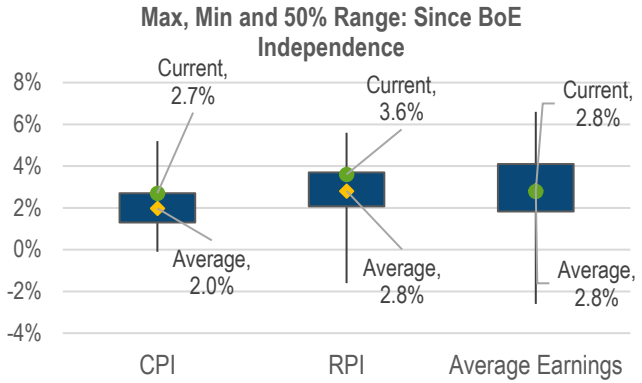
EIOPA fundamental spreads show the credit spread corresponding to the risk of default or downgrading of an asset. This is shown here across financial and non-financial assets, credit quality steps 0-3 and durations of 1-30 years. The data is provided by EIOPA and as of 28/02/18. **Fundamental spread** = 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.

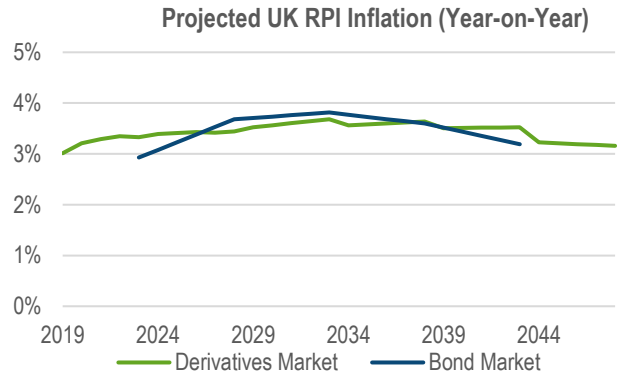
Data sources: Bloomberg; Barclays; EIOPA; Oxford-Man Institute; ONS; Milliman FRM

UK Inflation Monitor

- UK price inflation declined in February. CPI price dropped from 3.0% to 2.7%, RPI price inflation dropped slightly to 3.6%.
- However, the latest data for earnings inflation shows an increase, reaching 2.8% in January.
- According to ONS: *The largest downward contributions to the change in the rate came from transport and food prices, which rose by less than a year ago. Falling prices for accommodation services also had a downward effect. Rising prices for footwear produced the largest, partially offsetting, upward contribution.*
- The market implied view of future inflation shows little change since February in the near term, with a slight drop for the longer term levels. The derivatives market implies an RPI inflation rate of just less than 3% for very short terms, rising to higher levels in future years.







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

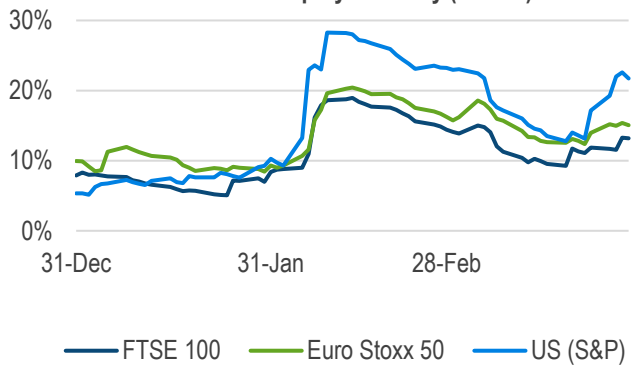
London Market Monitor – 29 March 2018

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

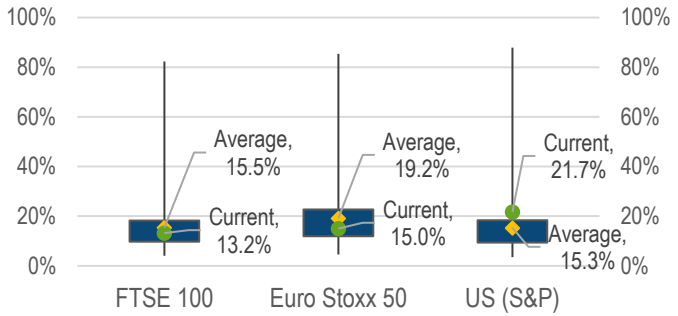
Volatility and Hedging Cost Monitor

- Realised volatility has retreated from its February peak, but remained elevated in March relative to its start-of-year levels.
- The S&P 500 index saw its realised volatility drop below 20% during the first half of the month, before rising above 20% by the month-end.
- Realised volatilities in the FTSE 100 and Euro Stoxx 50 indices also declined and then rose, but the changes were less pronounced. Both ended the month close to 15%.
- The volatility risk premium for the S&P see-sawed, whilst rising to 5% by the end of March.
- The risk premium for the FTSE rose to the positive territory, as projected realised volatility declined more than implied volatility during the month. Whereas the Euro Stoxx's risk premium remained relatively stable.
- Future expected realised volatility remains at similar levels to end-February.

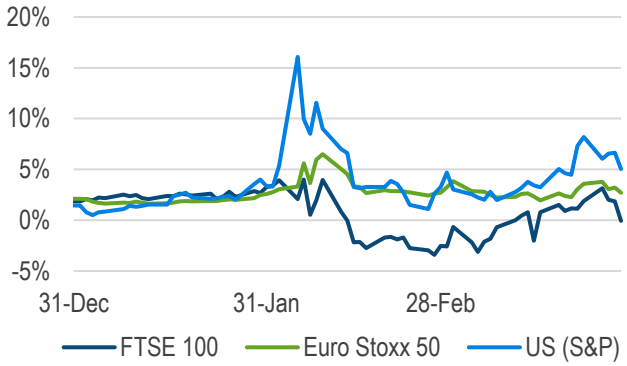
Realised 1-Month Equity Volatility (EWMA)



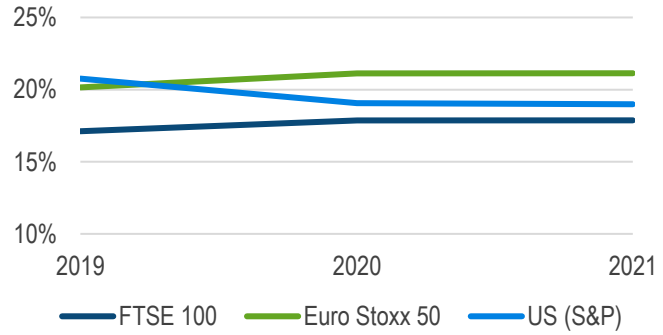
Max, Min and 50% Range: Last 25 Years



30-Day Volatility Risk Premium



Expected Volatility (Milliman Guarantee Index)



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.