

**Market Price Monitor**

**Local Equity Markets**

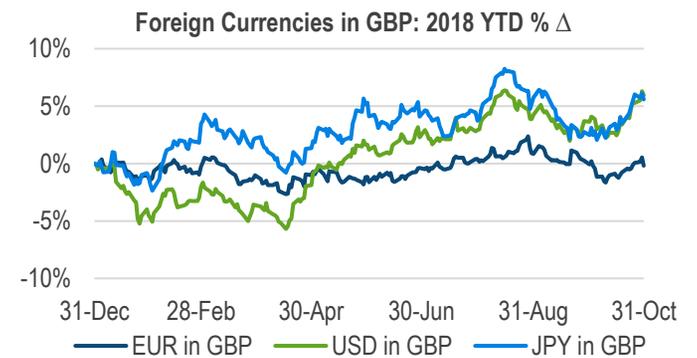
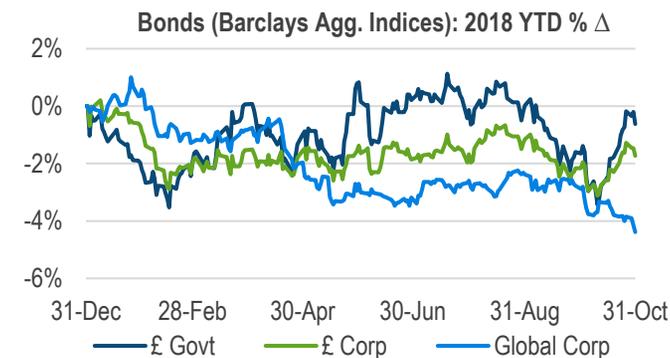
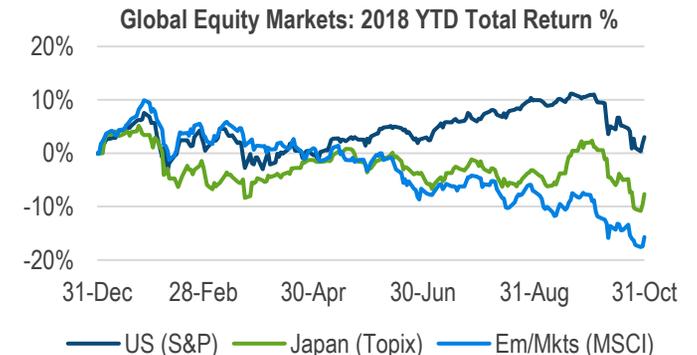
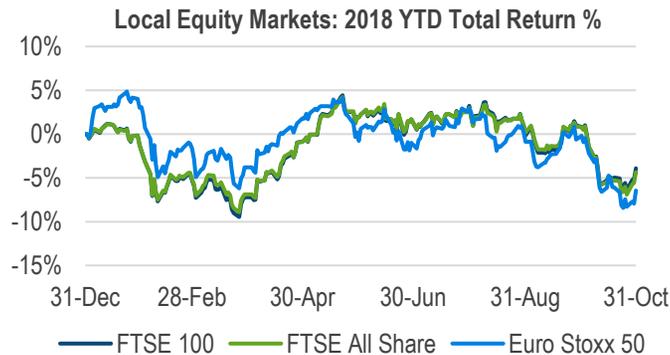
- European equity market returns suffered the largest monthly decline in 2018, with signs of concern for high equity valuation, continuing trade tensions and tightening of monetary policies.
- Both the Euro Stoxx 50 and FTSE All Share indices ended the month down by more than 5%. The indices are firmly in the negative territory for the year.

**Global Equity Markets**

- Equity markets around the globe also took heavy tumbles in October, with declines of more than 6%. The Japanese market was down by more than 9%, one of the largest monthly losses.
- The US market is alone in keeping its year-to-date return positive at the month end. The Emerging Markets index has dropped by more than 15% year-to-date.

**Bond/FX Markets**

- Global corporate bonds declined by close to 2% in October. In contrast, Sterling corporate bonds rose by 0.4%.
- UK government bonds increased by more than 1.0% during the month.
- The British Pound depreciated against the US Dollar and Japanese Yen in October, but remained relatively flat against the Euro.



|         | 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 | -4.9%    | -5.2%          | -5.9%         | -6.8%    | -9.4%         | -8.7%          | 1.0%   | 0.4%   | -1.7%       | -0.4%      | 2.1%       | 2.8%       |
| 3 Month | -6.9%    | -7.2%          | -9.1%         | -3.3%    | -5.3%         | -11.6%         | -0.5%  | -0.1%  | -1.8%       | -0.6%      | 2.9%       | 1.8%       |
| 1 Year  | -0.9%    | -1.5%          | -10.6%        | 7.3%     | -4.8%         | -12.5%         | 1.3%   | -0.1%  | -3.1%       | 1.0%       | 4.1%       | 4.7%       |
| YTD     | -3.9%    | -4.4%          | -6.5%         | 3.0%     | -7.6%         | -15.7%         | -0.6%  | -1.7%  | -4.4%       | -0.2%      | 5.9%       | 5.6%       |

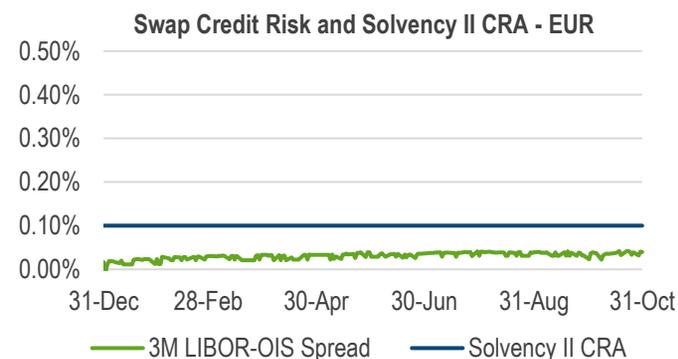
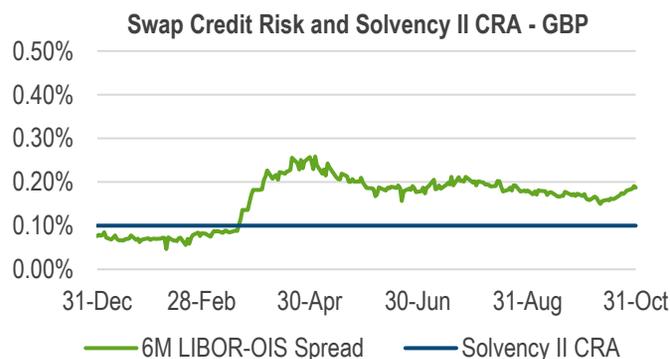
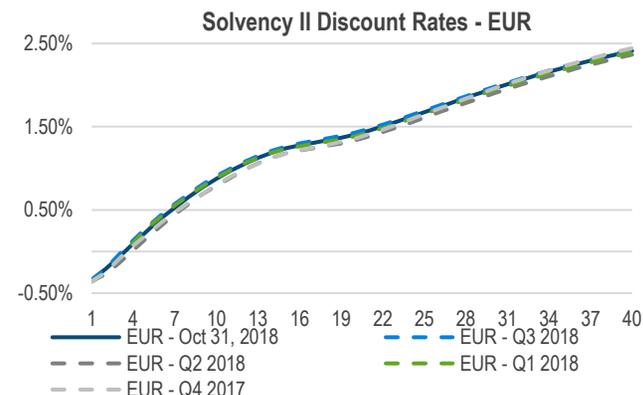
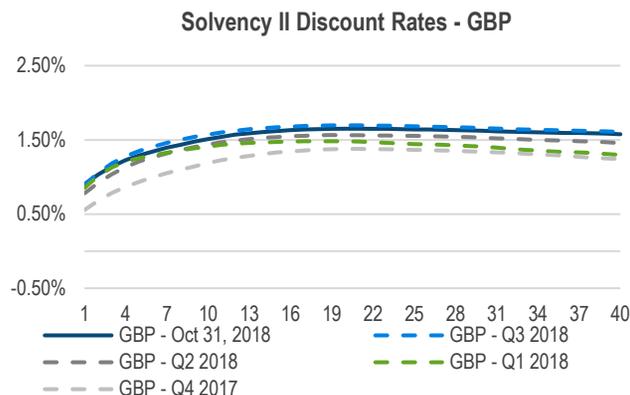
## Solvency II Monitor - Rates

### Risk Free Rates

- For GBP, there were decreases in all but the shortest term on the curve during October. The decreases were mostly around 5 basis points.
- There were similar but smaller changes for the EUR curve, with the decreases up to 4 basis points.

### Credit Risk Adjustment

- The GBP CRA remains at 10 basis point. This will only change when the one-year average of LIBOR-OIS spread becomes greater than 20 basis points.
- 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 Q3 2018                        | 1  | -6 | -6  | -5  | -4  | 0   |
| Since Q2 2018                        | 12 | 8  | 7   | 9   | 9   | 0   |
| Since Q1 2018                        | 5  | 4  | 10  | 17  | 21  | 0   |
| Since Q4 2017                        | 35 | 35 | 32  | 27  | 28  | 0   |

| Change in EUR Discount and CRA (bps) |    |    |     |     |     |     |
|--------------------------------------|----|----|-----|-----|-----|-----|
|                                      | 1Y | Y5 | Y10 | Y20 | Y30 | CRA |
| Since Q3 2018                        | 0  | -4 | -3  | -2  | -2  | 0   |
| Since Q2 2018                        | 1  | 8  | 9   | 7   | 6   | 0   |
| Since Q1 2018                        | 2  | -4 | -1  | 2   | 2   | 0   |
| Since Q4 2017                        | 2  | 4  | 7   | 5   | 0   | 0   |

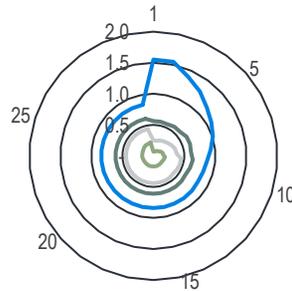
Solvency II Monitor - Spreads

Fundamental Spreads

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

Fundamental Spreads %

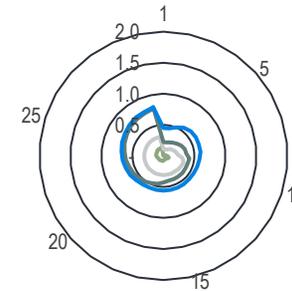
GBP - Financial



— AAA — AA — A — BBB

| 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                                  | 0.56 | 0.58 | 0.62 | 0.61 | 0.61 |
| BBB                                | 1.55 | 1.16 | 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



— AAA — AA — A — BBB

| 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 | 0.31 | 0.31 |
| A                                      | 0.22 | 0.29 | 0.41 | 0.53 | 0.78 |
| BBB                                    | 0.45 | 0.59 | 0.57 | 0.59 | 0.80 |
| 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 | 0.80 |

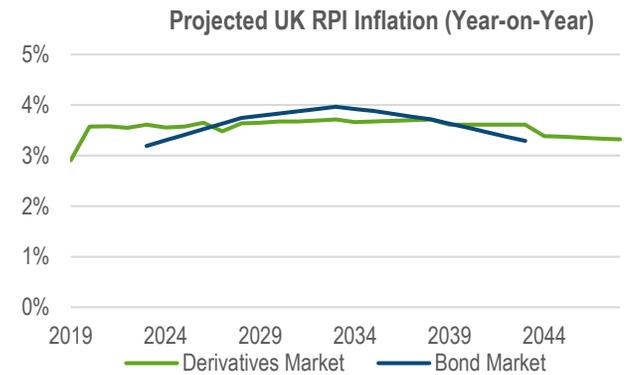
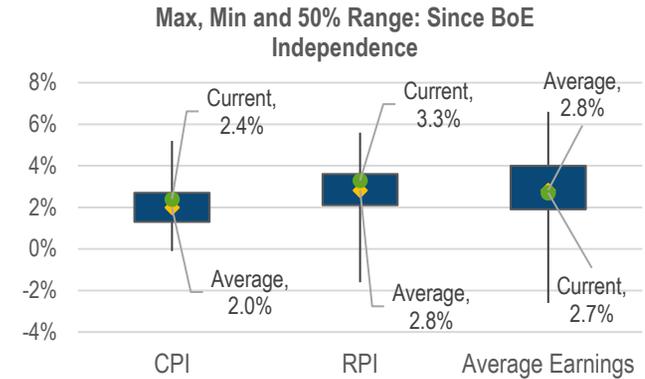
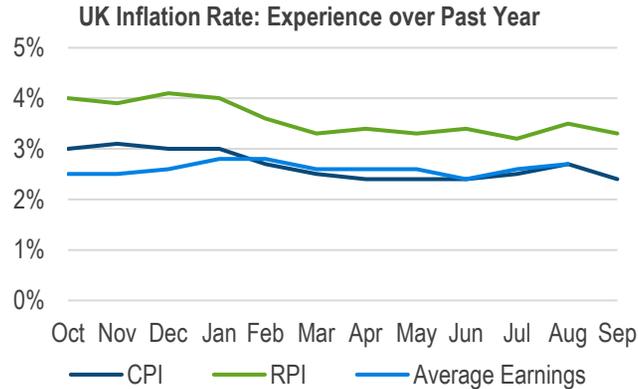
The **Solvency II risk-free discount rates** are based on applying the Smith-Wilson Extrapolation to LIBOR swap rates sourced from Bloomberg (current curve is for 31/10/18) and applying the Credit Risk Adjustment as defined in the Technical Specs.

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 30/09/18. **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.

**UK Inflation Monitor**

- CPI price inflation declined from 2.7% to 2.4% in September, and RPI price inflation also decreased by 20 basis points to 3.3% in the same month. CPI returned to its lowest level for the past 12 months.
- The earnings inflation in August was 2.7%, a slight increase from July.
- According to the ONS: *The largest downward contribution came from food and non-alcoholic beverages...Other large downward contributions came from transport, recreation and culture, and clothing. Partially offsetting upward contributions came from increases to electricity and gas prices.*
- The market implied view of future inflation shows a slight decline in the short term since September. The derivatives market implies an RPI inflation rate of slightly below 3% for the shortest term, rising to higher levels in future years.



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

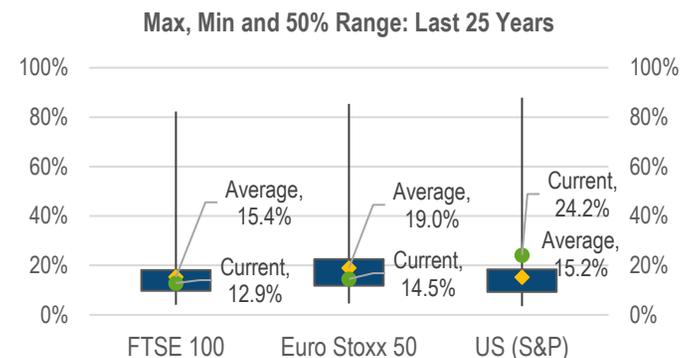
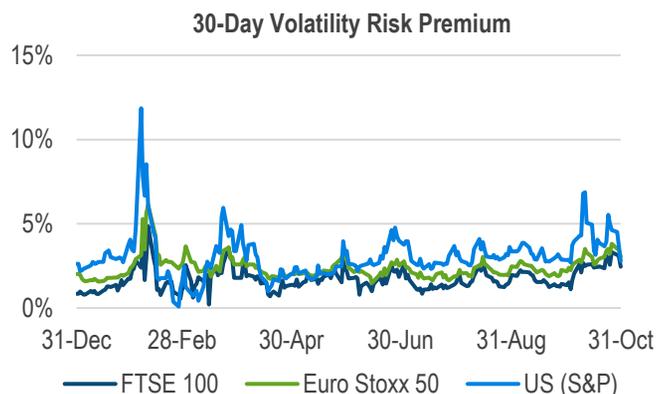
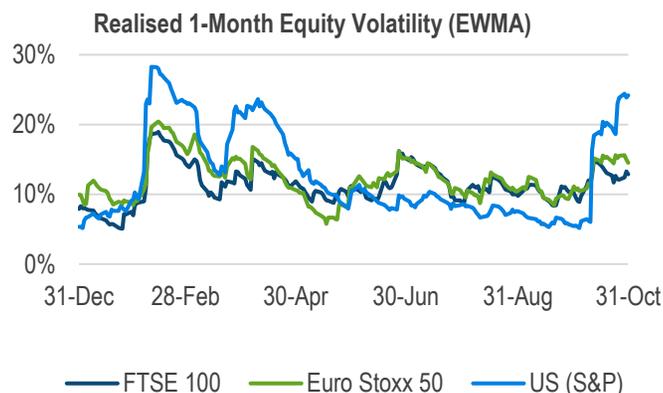
- **Consumer Price Index (CPI)** – measuring the monthly price of a basket of consumer goods and services
- **Retail Price Index (RPI)** – similar to CPI, but the main difference due the addition of mortgage payments, council tax and other housing costs
- **Average Earnings** – measuring the average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

### Volatility and Hedging Cost Monitor

- Realised volatility across the globe increased in the month of October, on the back of large declines in the equity markets.
- The US market saw the largest change in volatility, with a large one-day change in the middle of the month sending the volatility above 20%. The volatility increased from 6% at September end to 24% at October end.
- In contrast to the US, the European markets saw smaller changes in their volatility, as the returns declined at a more gradual pace.
- The volatility risk premium also increased in the month. The US market also saw the largest changes, with premiums reaching above 5% for some of the days in October.



**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.