## Market Price Monitor

### Local Equity Markets

- European stock markets fell in June amid expectations for tighter central bank policies.
- The DJ Eurostoxx 50 was among the worst performing indices in the month, with most of its 3% decrease coming in the final week.
- Despite reaching its all-time-high level at the start of June, the FTSE 100 also suffered a 2.4% fall over the month.

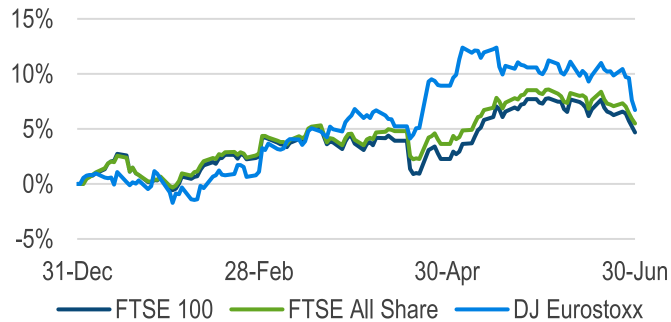
### Global Equity Markets

- The Japanese market posted a 3% gain over the month with the Topix index almost one third higher than a year ago.
- Emerging Markets equity remains one of the best performing asset classes in 2017, returning over 18% for the year.

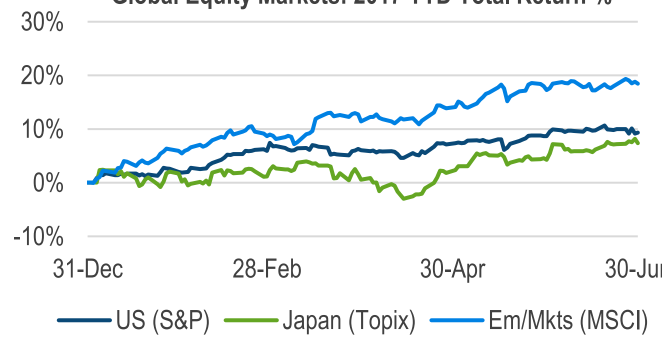
### Bond/FX Markets

- UK government bond yields increased, and the gilt market index dropped by over 2% in June. This on the back of market expectations that the BOE may start raising interest rates sooner than previously anticipated.
- The £ Sterling depreciated against other currencies following the UK general election at the start of the month. It since recovered strongly against US Dollar and Japanese Yen in the second half of the month.

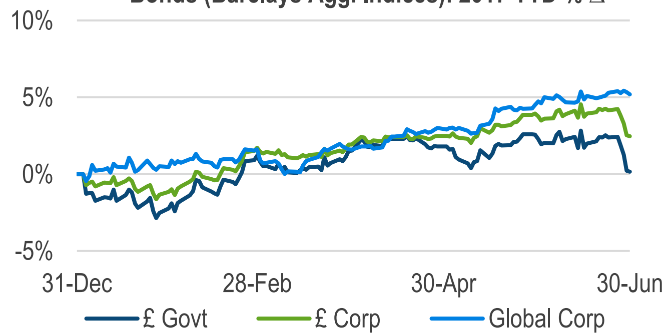
**Local Equity Markets: 2017 YTD Total Return %**



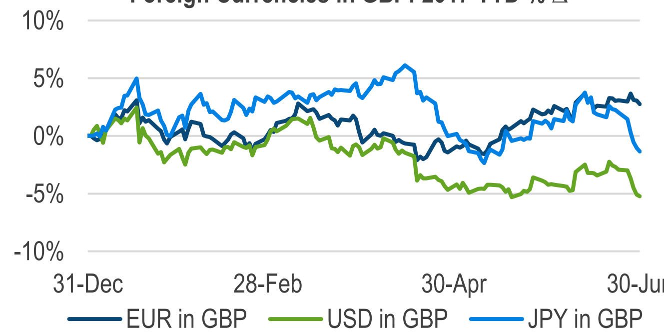

**Global Equity Markets: 2017 YTD Total Return %**




**Bonds (Barclays Agg. Indices): 2017 YTD % ∆**




**Foreign Currencies in GBP: 2017 YTD % ∆**




**Total Returns as of June 30, 2017**

| | FTSE 100 | FTSE All Share | DJ Eurostoxx | US (S&P) | Japan (Topix) | Em/Mkts (MSCI) | £ Govt | £ Corp | Global Corp | EUR in GBP | USD in GBP | JPY in GBP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Month | -2.4% | -2.5% | -3.0% | 0.6% | 3.0% | 1.0% | -2.1% | -1.2% | 0.4% | 0.6% | -1.0% | -2.4% |
| 3 Month | 1.0% | 1.4% | -0.1% | 3.1% | 6.8% | 6.3% | -1.3% | 0.5% | 3.5% | 3.4% | -3.7% | -4.5% |
| 1 Year | 16.9% | 18.1% | 23.3% | 17.9% | 32.2% | 23.7% | -1.0% | 6.5% | 2.7% | 5.1% | 2.2% | -6.1% |
| YTD | 4.7% | 5.5% | 6.7% | 9.3% | 7.4% | 18.4% | 0.2% | 2.5% | 5.2% | 2.8% | -5.2% | -1.4% |

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

## Solvency II Monitor - Rates

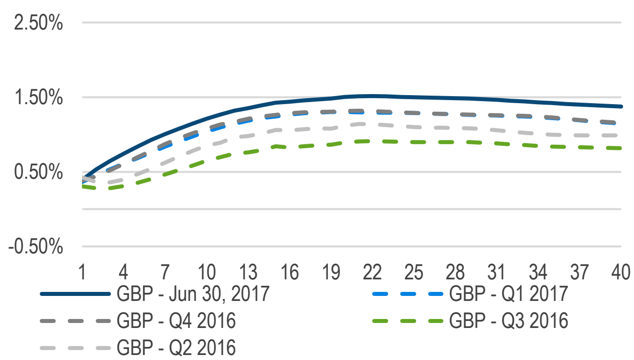
### Risk Free Rates

- The GBP Solvency II GBP discount curve increased by over 20 basis points for most terms during the month of June.
- The EUR interest rate curve also increased, but to a lesser degree.

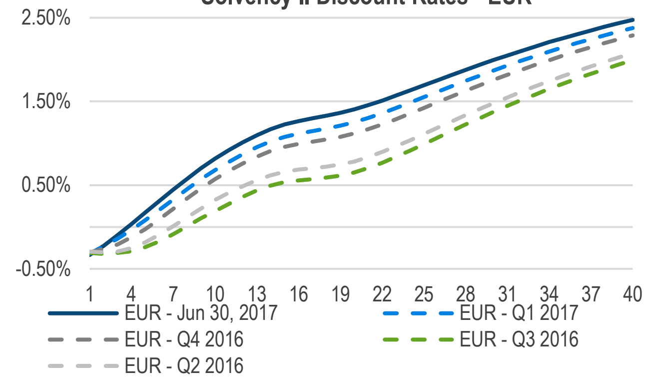
### Credit Risk Adjustment

- The GBP CRA remains unchanged in June, whilst the continually falling LIBOR-OIS spread hit the same level as CRA at month-end.
- The EUR CRA continues to remain at the 10 basis points floor, with the actual LIBOR-OIS spread remains close to 0%.

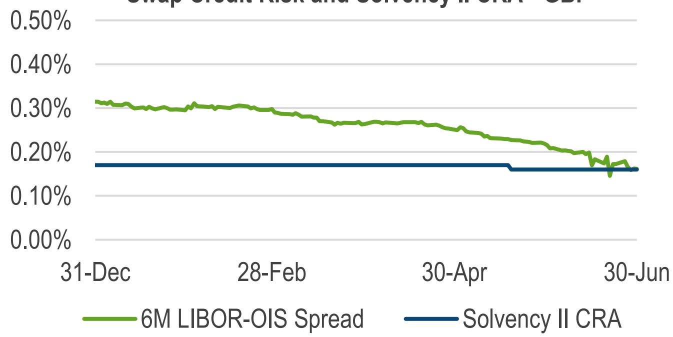
**Solvency II Discount Rates - GBP**



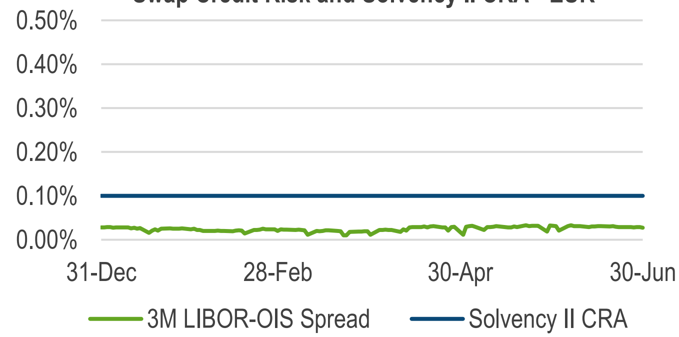

**Solvency II Discount Rates - EUR**




**Swap Credit Risk and Solvency II CRA - GBP**




**Swap Credit Risk and Solvency II CRA - EUR**




**Change in GBP Discount and CRA (bps)**

| | 1Y | Y5 | Y10 | Y20 | Y30 | CRA |
|---|---|---|---|---|---|---|
| Since Q1 2017 | 3 | 16 | 17 | 20 | 22 | -1 |
| Since Q4 2016 | 1 | 15 | 13 | 19 | 21 | -1 |
| Since Q3 2016 | 9 | 49 | 56 | 61 | 58 | 0 |
| Since Q2 2016 | -3 | 37 | 36 | 39 | 40 | 2 |

**Change in EUR Discount and CRA (bps)**

| | 1Y | Y5 | Y10 | Y20 | Y30 | CRA |
|---|---|---|---|---|---|---|
| Since Q1 2017 | -2 | 9 | 14 | 16 | 13 | 0 |
| Since Q4 2016 | -3 | 20 | 25 | 29 | 24 | 0 |
| Since Q3 2016 | -3 | 41 | 63 | 76 | 62 | 0 |
| Since Q2 2016 | -4 | 36 | 49 | 62 | 52 | 0 |

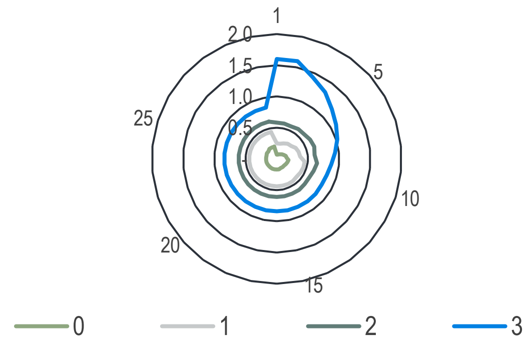
## Solvency II Monitor - Spreads

### Fundamental Spreads

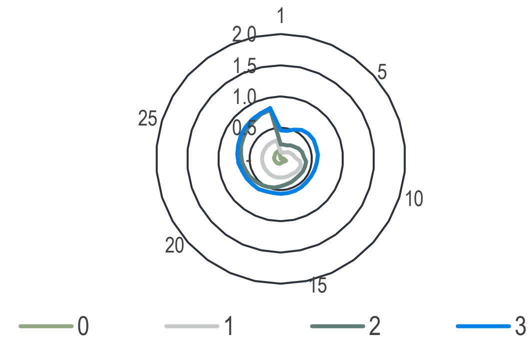
- The fundamental spread data shown is for end of May.
- There were no material changes compared to the end of April.

### Fundamental Spreads %

**GBP - Financial**




**GBP - Non-Financial**




| GBP Financial Fundamental Spread % | | | | | |
|---|---|---|---|---|---|
| | 1Y | Y5 | Y10 | Y20 | Y30 |
| AAA | 0.07 | 0.11 | 0.18 | 0.17 | 0.2 |
| AA | 0.25 | 0.31 | 0.45 | 0.44 | 0.44 |
| A | 0.58 | 0.59 | 0.62 | 0.61 | 0.61 |
| BBB | 1.6 | 1.19 | 0.84 | 0.84 | 0.84 |

| *GBP Financial 'Before Floor' %* | | | | | |
|---|---|---|---|---|---|
| | *1Y* | *Y5* | *Y10* | *Y20* | *Y30* |
| *AAA* | *0* | *0.03* | *0.07* | *0.14* | *0.2* |
| *AA* | *0.04* | *0.07* | *0.11* | *0.19* | *0.28* |
| *A* | *0.07* | *0.14* | *0.22* | *0.37* | *0.5* |
| *BBB* | *0.18* | *0.29* | *0.4* | *0.57* | *0.7* |

| GBP Non-Financial Fundamental Spread % | | | | | |
|---|---|---|---|---|---|
| | 1Y | Y5 | Y10 | Y20 | Y30 |
| AAA | 0 | 0.02 | 0.09 | 0.09 | 0.13 |
| AA | 0.11 | 0.16 | 0.34 | 0.3 | 0.3 |
| A | 0.23 | 0.29 | 0.41 | 0.54 | 0.8 |
| BBB | 0.46 | 0.6 | 0.57 | 0.61 | 0.83 |

| *GBP Non-Financial 'Before Floor' %* | | | | | |
|---|---|---|---|---|---|
| | *1Y* | *Y5* | *Y10* | *Y20* | *Y30* |
| *AAA* | *0* | *0.02* | *0.04* | *0.09* | *0.13* |
| *AA* | *0* | *0.04* | *0.08* | *0.17* | *0.26* |
| *A* | *0.04* | *0.15* | *0.29* | *0.54* | *0.8* |
| *BBB* | *0.12* | *0.24* | *0.38* | *0.61* | *0.83* |

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 30/06/17) 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 31/05/17. **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.

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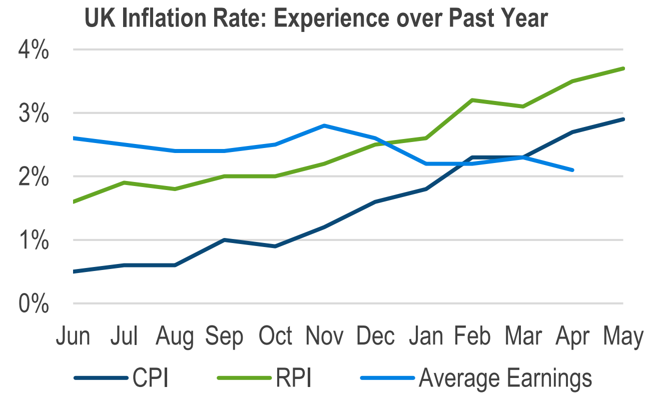
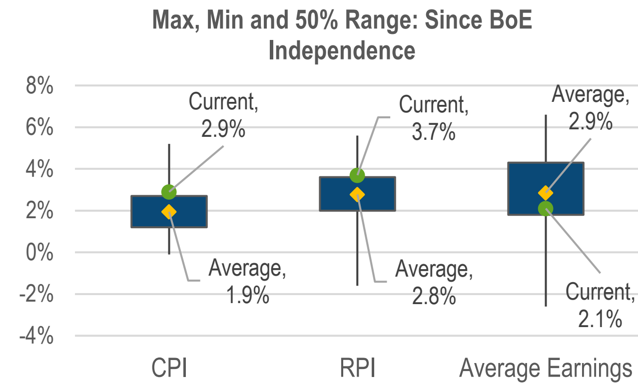
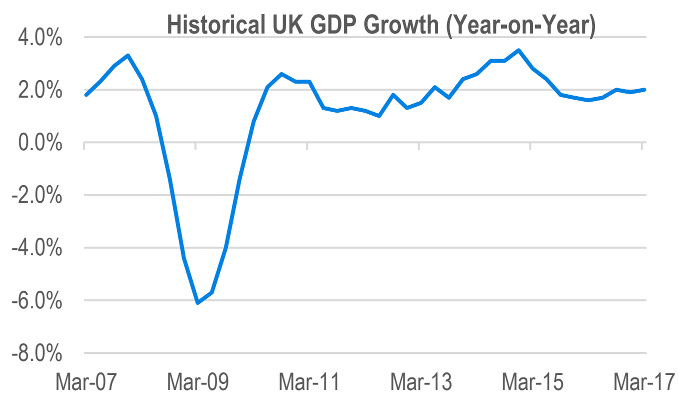
***Data sources: Bloomberg; Barclays; EIOPA; Oxford-Man Institute; ONS; Milliman FRM***

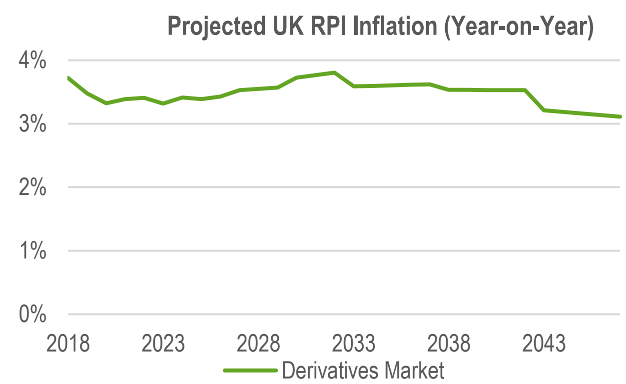
## UK Inflation Monitor

- UK price inflation rate increased again in May, with the current level a full 1 percentage point higher than the historical long-term average.
- The annual earnings inflation rate in contrast fell during April. Price inflation is showing strong signs of outstripping earnings inflation, putting a strain on UK household finances.
- According to ONS: *Rising prices for recreational and cultural goods and services (particularly games, toys and hobbies) was the main contributor to the increase in the rate. There were smaller upward contributions from increased electricity and food prices. These upward contributions were partially offset by falls in motor fuel prices, and air and sea fares, the latter two influenced by the timing of Easter in April this year.*
- The market implied view shows expectation that RPI will remain above 3% for some years to come.  This is broadly consistent with the view from the previous month.



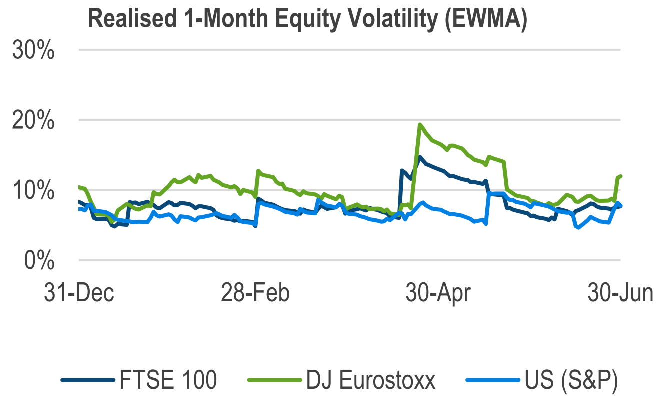

Historical year-on-year inflation rate is assessed by the % change on:
- **Consumer Price Index (CPI)** – measuring the monthly price of a basket of consumer goods and services
- **Retail Price Index (RPI)** – similar to CPI, but the main difference due the addition of mortgage payments, council tax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

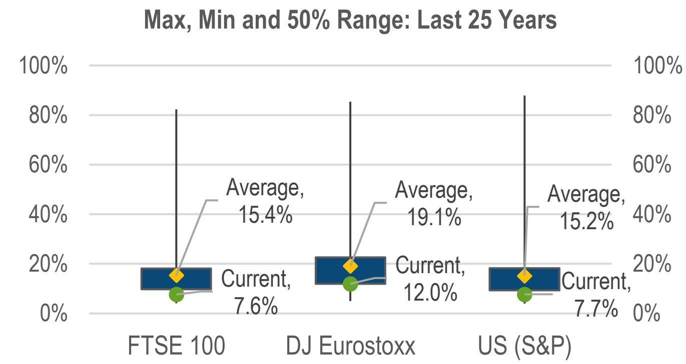
Projection year-on-year inflation rate is the forward rate calculated from market data:
- **Derivatives Market View** – constructed from zero coupon inflation par swap rates against the RPI index at various tenors
- **Bond Market View** – constructed from the difference between the nominal rates implied by the conventional gilts and the real rates implied by the index-linked (RPI) gilts.

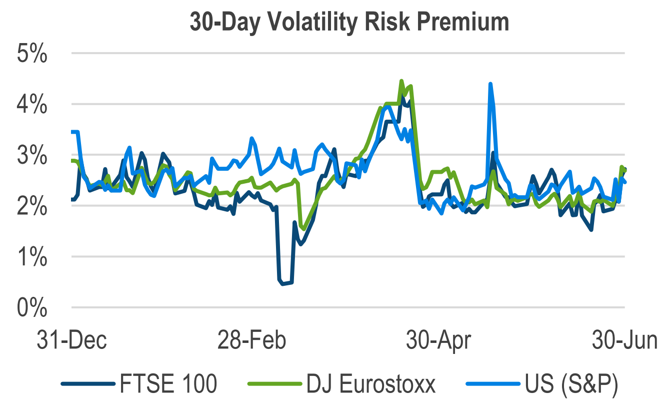
***Data sources: Bloomberg; Barclays; EIOPA; Oxford-Man Institute; ONS; Milliman FRM***

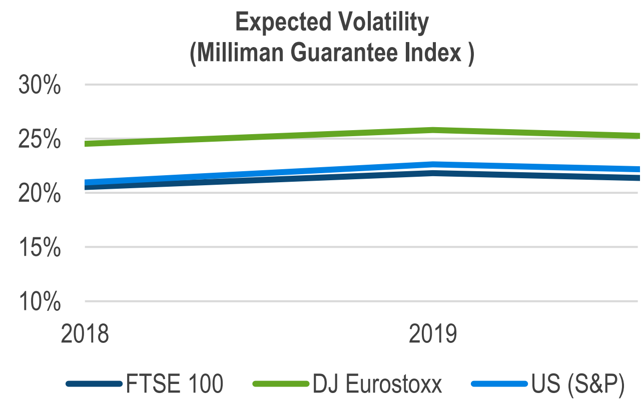
## Volatility and Hedging Cost Monitor

- Realised volatility on the major equity indices remained at historically low levels. There were slight pick-ups in volatilities at the end of the month, due to falls in the underlying index levels during the final week.
- The volatility risk premium levels have remained relatively steady in June, staying within the 1%-3% corridor.




**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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