

Market Price Monitor

Local Equity Markets

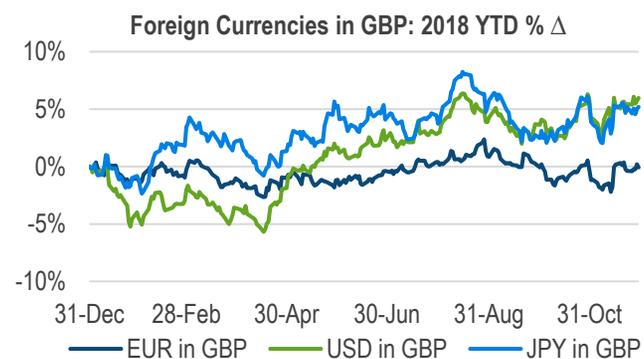
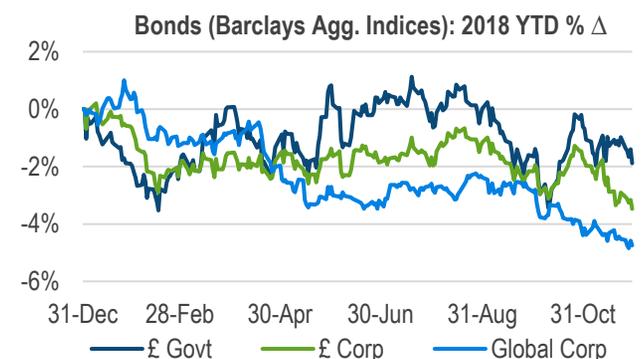
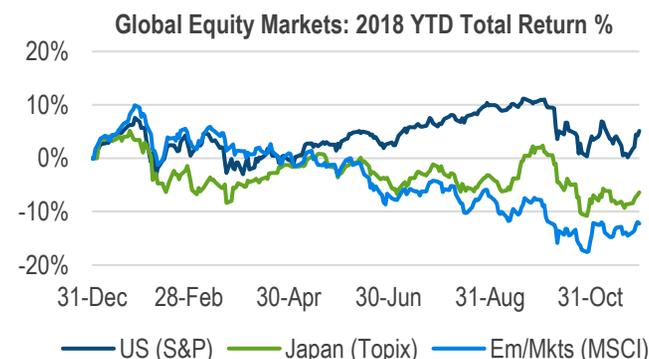
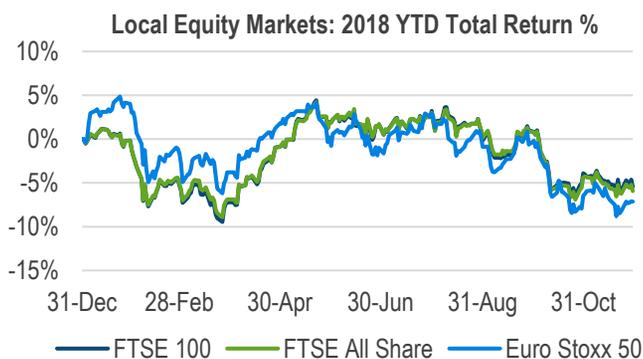
- European equity markets fluctuated in November, as concerns about potential trade wars and the Italian budget continued.
- The Euro Stoxx 50 index ended the month down by just under 1%. Both FTSE indices declined by more than 1.5%.
- All indices are now down by more than 5% year-to-date.

Global Equity Markets

- Equity markets around the globe made a modest recovery from the heavy losses in October, helped by the expectation of more gradual monetary tightening from the US Federal Reserve.
- The Emerging Markets index gained just over 4%, the largest increase in the month. However its year-to-date return remains below -10%.
- The US market gained 2% in the month, and it remains the only market with a positive year-to-date return.

Bond/FX Markets

- Sterling corporate bond return declined by 1.8% in November. Global bonds remained relatively flat.
- British government bonds declined by more than 1% in November.
- The British Pound was relatively flat versus other major currencies at the month end.



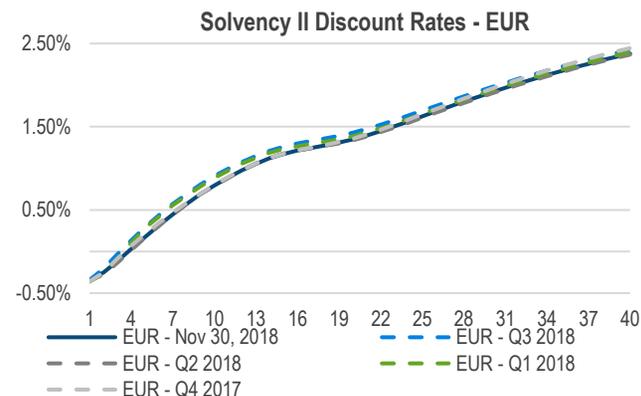
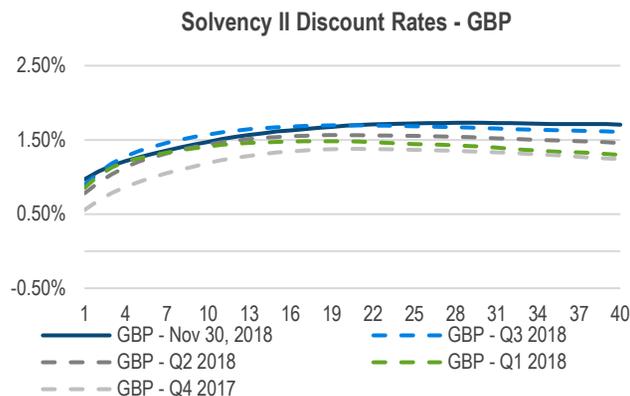
Total Returns as of November 30, 2018

	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	-1.6%	-1.6%	-0.7%	2.0%	1.3%	4.1%	-1.3%	-1.8%	-0.4%	0.1%	0.0%	-0.4%
3 Month	-5.3%	-6.1%	-6.3%	-4.4%	-3.1%	-5.5%	-1.9%	-2.3%	-2.4%	-0.9%	1.6%	-0.5%
1 Year	-0.7%	-1.5%	-8.7%	6.3%	-4.9%	-9.1%	-0.3%	-1.9%	-4.0%	0.8%	5.9%	5.0%
YTD	-5.4%	-5.9%	-7.1%	5.1%	-6.4%	-12.2%	-1.9%	-3.5%	-4.7%	-0.1%	6.0%	5.2%

Solvency II Monitor - Rates

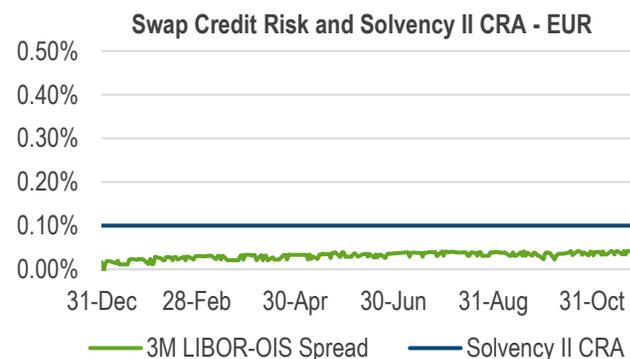
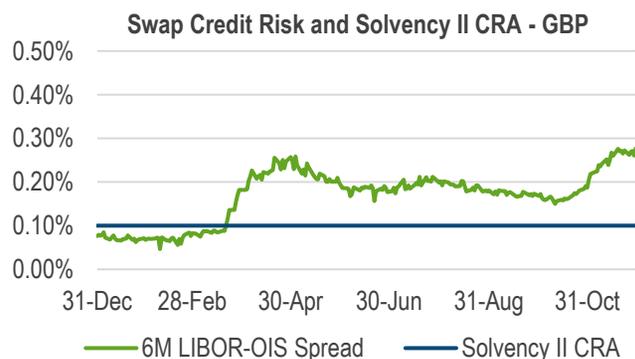
Risk Free Rates

- For GBP, the rates increased in the shortest and the longest terms, with the decreases seen between 5 year and 20 year. The largest increase was more than 10 basis points in the longest terms.
- In contrast, the EUR rates decreased across the curve, with the largest decline close to 10 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	7	-9	-10	-1	7	0
Since Q2 2018	19	6	4	13	20	0
Since Q1 2018	12	1	7	21	32	0
Since Q4 2017	41	33	29	31	39	0

Change in EUR Discount and CRA (bps)						
	1Y	Y5	Y10	Y20	Y30	CRA
Since Q3 2018	0	-12	-11	-8	-6	0
Since Q2 2018	1	1	1	1	2	0
Since Q1 2018	2	-11	-9	-4	-2	0
Since Q4 2017	2	-4	-1	-1	-4	0

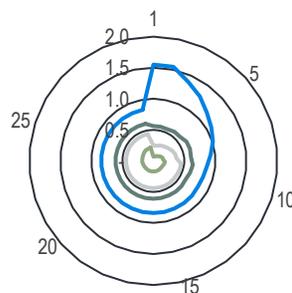
Solvency II Monitor - Spreads

Fundamental Spreads

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

Fundamental Spreads %

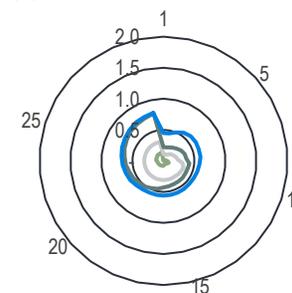
GBP - Financial



— 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	0.79
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

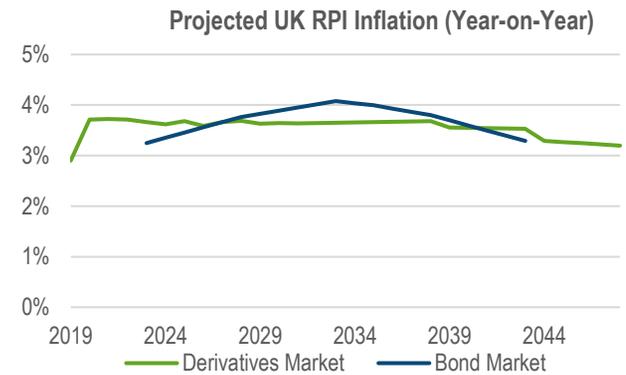
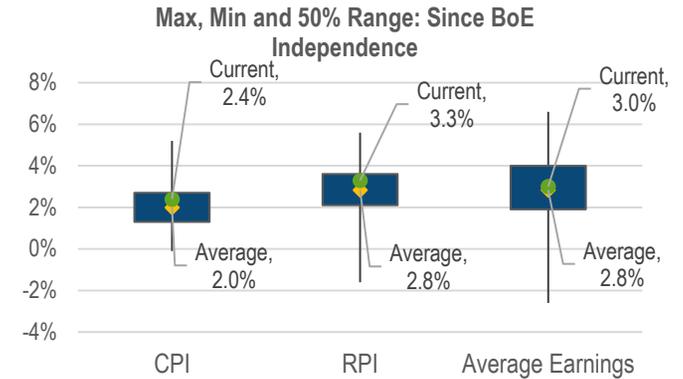
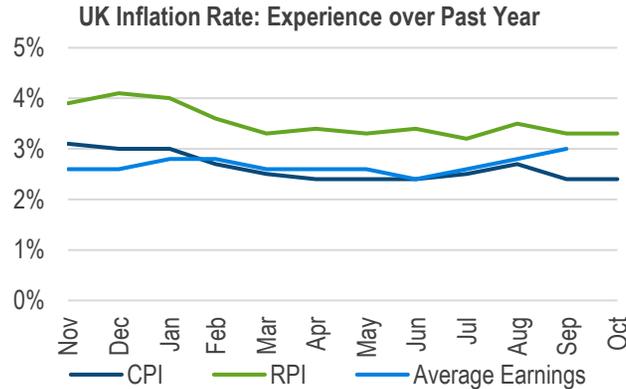
The **Solvency II risk-free discount rates** are based on applying the Smith-Wilson Extrapolation to LIBOR swap rates sourced from Bloomberg (current curve is for 30/11/18) and applying the Credit Risk Adjustment as defined in the Technical Specs.

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 31/10/18. **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 remained unchanged at 2.4% in October, and RPI price inflation also remained unchanged at 3.3% in the same month.
- The earnings inflation in September was 3.0%. This is the highest level seen in the last 12 months.
- According to the ONS: *The large downward contributions to the change in the 12-month rate from food and non-alcoholic beverages, clothing and footwear, and some transport elements were offset by upward contributions from rising petrol, diesel and domestic gas prices.*
- The market implied view of future inflation remained unchanged.



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

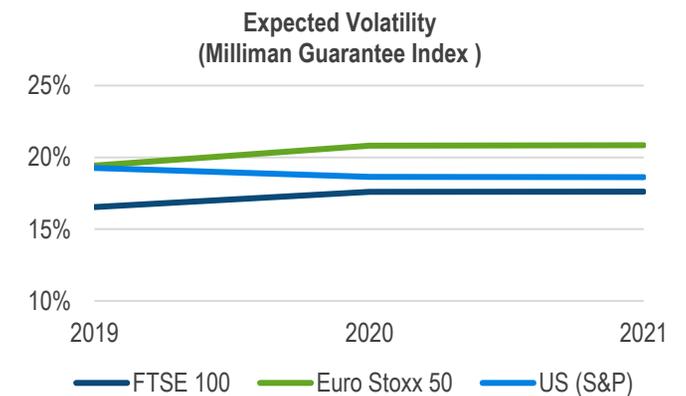
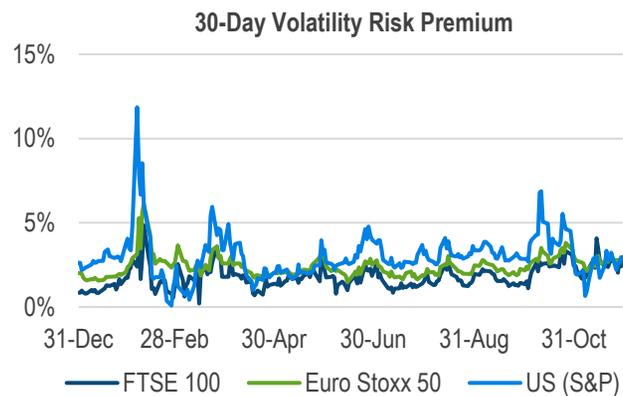
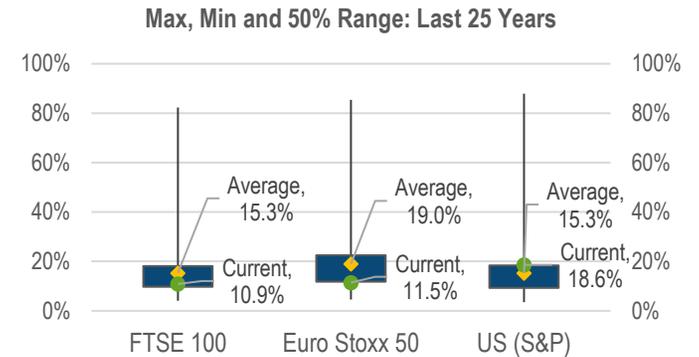
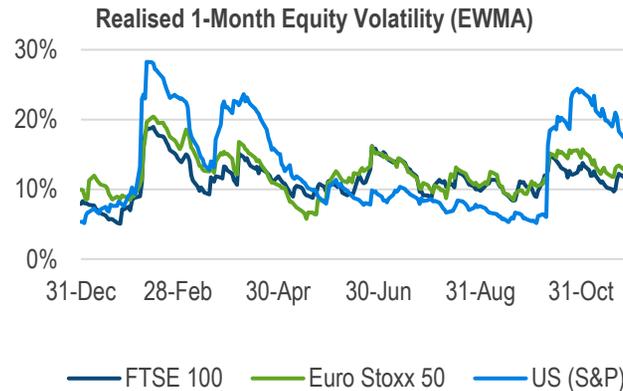
- **Consumer Price Index (CPI)** – measuring the monthly price of a basket of consumer goods and services
- **Retail Price Index (RPI)** – similar to CPI, but the main difference due the addition of mortgage payments, council tax and other housing costs
- **Average Earnings** – measuring the average 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 declined gradually in November, as equity markets pared some losses from the previous month.
- The US market saw its volatility dropping below 20% but the volatility remains above its historical average.
- The volatility in the European markets dropped to slightly above 10%.
- The volatility risk premium also reduced in the month, with the Euro Stoxx and S&P indices ending the month close to 3%.



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.