

Response to First Actuarial report on Technical Provisions consultation

1. Introduction

The Trustee board of USS Limited (“the Trustee”) has reviewed in detail the report by First Actuarial on the consultation for the 2017 valuation. This paper provides the Trustee’s response to the First Actuarial report.

The fundamental premise underlying the First Actuarial report is their belief that the Trustee could, and indeed should, be willing to take on more risk in the funding of the defined benefit (DB) section of USS (“the scheme”) than that proposed in the original consultation document.

First Actuarial argue that taking more risk is manageable because USS is cash flow-positive and that, in the longer term, holding more return-seeking assets results in a high likelihood of the current benefits being affordable.

Given a long enough period, First Actuarial argue that the current benefits can be afforded on the current level of contributions and, as such, the Trustee should be prepared to alter its views on the margins for prudence from valuation to valuation in order to ensure stability of the benefits promised and stability of the costs to members and employers.

First Actuarial also state (correctly) that the Trustee expects the cost of future benefit accrual to fall over time, and concludes as a result that there is less need to change contributions or benefits now only to change them again at some future point if expectations are met.

2. The Trustee’s response

The Trustee’s response to the First Actuarial report is in two parts. In the first part, we present a summary of the key areas where the Trustee disagrees with the central arguments put forward by First Actuarial and why it cannot adopt the approach suggested.

In the appendix we provide the Trustee’s reply to a number of detailed points that First Actuarial raise in the form of questions to the Trustee.

2.1 Summary of key areas of disagreement

The approach proposed by First Actuarial contains an unacceptable level of risk for members, the Trustee and the employers. For USS to take on this risk would be inconsistent with the Trustee’s primary duty, in exercising its powers in the valuation context, to protect the security of members’ promised benefits given the current assets in the scheme and the likely levels of contributions employers are able to pay in future. The Trustee also has to have due regard to the additional stress placed on employers from demands for higher contributions – not just now but also over the potentially very long term.

The key points behind this conclusion are:-

- Positive cash flow cannot by itself justify taking more risk
- The discount rate assumption is already at the limit of what the Trustee considers to be acceptable
- It is not acceptable that future service benefit accrual should add to the deficit in the short term

These are explained in more detail below.

2.2 Positive cash flow cannot by itself justify taking more risk

The benefit of a positive cash flow is the ability to invest for the long term in assets that do not have to be sold “at a loss” – i.e. when markets are low – just to meet a cash outflow. Being cash flow-positive also supports investment in illiquid assets (those that aren’t readily realisable) and thus allows the scheme to benefit from higher returns over time – the so-called “illiquidity premium” – which the Trustee allows for in its construction of the portfolio of investments and, therefore, in the expected return on the assets used in the valuation.

The existence of positive cash flows alone is not, however, a sufficient guarantee of future success. Positive cash flows can still be consistent, as is the case for the scheme, with a continuing building-up of risk, which eventually could grow beyond what the employers can cope with, thereby threatening the security of members’ benefits.

In the Trustee’s view, therefore, relying excessively on the cash-flow argument understates the importance of the gradual build-up of the value of the past service liabilities and their associated risks. It also understates the critical role of the Trustee in understanding and quantifying the covenant – not just now but also in the future.

The Trustee takes a balanced approach to managing risk and gives due weight to the current funding position. But short-term changes in that funding position cannot be ignored, as First Actuarial argues, simply as “volatility” to be reversed over the long-term – there is no guarantee this this would occur.

The Trustee’s approach also recognises the possibility of investment returns increasing over time. It is simply not the case, therefore, that the methodology leads to only “such benefit accruals as can be afforded using a gilt yields discount rate and investment strategy”.

In summary, positive cash flow is a consideration in the Trustee’s approach, but First Actuarial significantly overstates the benefits: it is not enough to fund a scheme, and certainly not one of this size, solely on this premise. The Trustee also has to consider the ongoing build-up of benefits and the associated risks which include not only the risk of asset underperformance relative to liabilities, but also the risk that the employers will not be able to meet the effects of adverse experience, both now, and over the long term, by which time the scheme will be larger still.

2.3 The discount rate assumption is already at the limit of what the Trustee considers to be acceptable

The Trustee consulted on assumptions with an average assumed discount rate for technical provisions of CPI + 0.9% p.a. In respect of the accrual of future service benefits the average discount rate assumed is slightly higher as the term of these liabilities is longer

That technical provisions assumption started with the expected rate of return on the scheme's assets of CPI + 2.1% p.a. before building in a margin for prudence. The Trustee is required by law to choose that discount rate prudently, but there is deliberately no prescription on the level of prudence that is required in legislation or regulatory guidance, it is for the Trustee to exercise its judgement and determine.

In this case the discount rate was set based on the maximum possible risk the Trustee felt the employers could reasonably bear, whilst ensuring there was a high degree of confidence that pensions promised to date remain secure. In considering the margin of prudence between the expected return and the prudent discount rate it should be noted that the Trustee is using the concept of broadly a 2/3 confidence level or "chance of success". This means that there is still broadly a 1/3 probability that average returns will be lower than the prudent assumption and a material chance that they could be *substantially* lower.

The approach suggested by First Actuarial would result in a higher assumed future return for the discount rate of CPI + 1.35% p.a. While this is lower than the Trustee's best estimate, adopting such a higher discount rate, as proposed by First Actuarial, goes beyond the acceptable level of risk, in terms of the build-up of assets compared to the build-up of commitment to benefits.

The Trustee's approach has been set out in detail in its consultation document and two points are particularly important to note. Firstly, at the stakeholders' request, the margins for prudence for the whole valuation are largely contained in the discount rate: the other assumptions, including CPI and demographic assumptions are now closer to "best estimates". Secondly, the Trustee's best estimate asset return is based on an assumption that future interest rates will increase – a further change since the 2014. The Trustee has, therefore, already reviewed and simplified the margins for prudence within the assumptions having regard for the views of wider stakeholders. First Actuarial proposes that the Trustee goes further still.

The independent Scheme Actuary has advised the Trustee that its proposals are close to the upper end of the range which he would consider to be reasonable for the funding of the current level of benefits. An increase of 0.45% p.a. to the discount rate, as suggested by First Actuarial, would take the assumptions proposed beyond the upper limit of a reasonable basis for funding the scheme.

Furthermore, tPR (the Pensions Regulator) has also confirmed the proposed assumptions are at the very limit of what it would find acceptable. This view is based on the covenant of the employers meriting a top quartile ranking (based on tPR's own criteria) – and to date tPR is not convinced that the covenant is in this bracket.

The Trustee's covenant advisers, PwC re-affirmed that the capacity exists for the employers to pay higher contributions *in extremis*. If the Trustee had to call on this capacity in the near future then, given other broad business risks they face, many employers could be financially stretched. Thus they may be unable to respond adequately to further adverse experience. PwC recommended steps be taken to reduce the risk that in-extremis contributions would be required in order to help preserve the long-term covenant of the employers.

UUK's consultation response states that only 5% of employers are willing to take more risk and 42% want to take less risk. Employers clearly do not wish the Trustee to go further.

The First Actuarial proposals are, therefore, well beyond the level of risk the Trustee feels the employers can reasonably be asked to bear (having taken two independent sources of advice in this area); in the Trustee's view they would be far past what tPR would accept too.

2.4 It is not acceptable that future service benefit accrual should add to the deficit in the short term

The Trustee will re-consider its assumptions at every future valuation based on conditions prevailing at the time, when different conclusions may be reached. The Trustee recognises that conditions can change and that assumptions may not be borne out in practice.

Whilst it may be desirable, where possible, to avoid major changes at each valuation, the stakeholders asked the Trustee to fund the scheme in the 2014 valuation at the very limit of its risk budget at the time. As noted above, at the current valuation, the Trustee has looked through the current low interest rates in its long-term forecasts with a central assumption that future rates will be higher than markets are currently pricing in.

It is not appropriate to increase risk further by anticipating future favourable scenarios today that underestimate the cost of future benefit accrual over the next 3-6 years.

The Trustee also considered the level of "reliance" placed on employers at the valuation date. The assets held then of £60bn were £23bn short of the assets required under a low risk investment portfolio. A low risk portfolio is one that would have a less than 5% chance of requiring further contributions.

The Trustee set its target for reliance to fall to £10bn over a 20-year period. On the proposed contributions, an extra £2bn of reliance would accrue over the next three years. Asking for lower contributions still increases reliance at a time when all efforts need to be aligned to reduce it to within acceptable long term targets.

3 Conclusion

The Trustee does not believe that the approach advocated by First Actuarial is consistent with the principles underpinning the prudent financial management of the scheme's liabilities.

Bill Galvin

17 November 2017

Appendix – Response to Detailed Questions

Page 4, section: Future service rate

First Actuarial note that:

"We cannot detect whether this progressive reduction in the future service rate is recognised in the consultation document. It appears to us that the rate for year ending 2018 is assumed to apply for all time, which it does not."

The future service rate would, if the Trustee's central assumptions are borne out in practice, reduce at future valuation dates. The Trustee's central view is that long term interest rates will rise faster than markets currently allow for in their pricing of long dated gilts. The Trustee believes that the price set should reflect the prevailing conditions at the valuation date. Underpayment of contributions towards the cost of future accrual in the early years in the expectation that this will average out in later years is not acceptable to the Trustee as it adds to the gap between assets and the build-up of benefits in the shorter-term at a time when all efforts need to be aligned to reduce that.

Page 4, section: Future service rate

First Actuarial note that:

"We wonder whether the complex structure of the discount rate is really appropriate for assessing the cost of future service, and whether the structure of the discount rate could be simplified."

The Trustee has a robust financial management plan to manage the risk of being unable to meet the benefits promised to date. As part of its commitment to transparency and openness, the valuation methodology was discussed with stakeholders extensively after the 2014 valuation and documented in detail. Further discussions were held leading up to the current valuation. The discount rate used by the Trustee results from applying its best view of future investment returns relative to inflation over time. The result is a high level of confidence that benefits will be paid from within the available resources of the scheme's assets and the sponsoring employers' future contributions. It would be possible to express this in a simplified manner but this risks losing the objectivity and discipline that currently exists. Ultimately there needs to be consistency between various assumptions to ensure that, after allowing for future service benefit accrual, the Scheme targets to achieve full funding on the technical provisions basis by the end of the recovery period.

Page 4, section: Contributions to an open scheme

First Actuarial note that:

"Page 25 of the consultation document says about the discussion of the recovery plan, "This approach also delivers stability of deficit funding for employers." We do not think that stability of the deficit contributions is an important objective. It is the stability of the aggregate contributions which is important to the employers."

Employers do have a strong desire for stability in the overall contribution rate. Employers also wish to ensure that promises made today do not preclude their ability to offer good pensions in future. Pensions earned to date are secured by the scheme rules and the law: they cannot be reduced. If deficit contributions are set so that there is a significant probability of future change then unless the employers are willing to vary their overall level of contributions, then there is a much greater risk that benefits offered to future employees could have to vary instead. Thus stability of deficit recovery contributions is an important factor in achieving both stability in overall contributions and sustainable benefits across future generations of members.

Page 4, section: Contributions to an open scheme

First Actuarial note that:

“An actuarial valuation need not result in the changing of the contribution rate at each valuation. Rather, one can, and arguably should, aim to hold the contribution rate constant as far as possible, and tolerate varying margins of prudence from one valuation to the next (or, as the Trustees define it, varying reliance on covenant). There is insufficient merit in a fixed reliance on covenant to override other important objectives such as a stable total contribution rate.”

In general terms, the Trustee would agree that there could be some flexibility around the margins for prudence and reliance on the covenant to smooth through changes to contributions and benefits that would otherwise be required; however, under the funding regulations stability in contribution rates cannot be an over-riding objective for the Trustee. The Trustee needs to formally reassess their funding assumptions at each valuation and that may require changes or allow the Trustee accept certain changes, but these need to be objectively justified based on changes in demographic, legal or financial circumstances.

The Trustee was asked by the employers in 2014 to adopt a riskier approach than it proposed initially for the 2014 valuation. The Trustee has, therefore, already used all its available “risk budget” in agreeing to the 2014 valuation. The scheme’s current financial position has worsened as a result of falling long term interest rates and with it lower expected future investment returns.

Whilst the Trustee expects these to reverse (to some extent) over time, that is not guaranteed to happen, and the Trustee cannot ignore the possibility that the current position may prevail for longer than expected or indeed may deteriorate further.

Page 5, section: Investment strategy

First Actuarial note that:

“Setting a funding target high enough to permit low return investment does not mean that low return investment needs to be implemented in advance of any events triggering a need to do so.”

"Switching to low risk / low return investments, as closed schemes do to manage their cash flow at high cost to their sponsors, need not be done until such time as the scheme is closed, if it ever is."

The scheme is projected to grow substantially relative to the size of the payroll supporting it and contributions to the scheme are based on a percentage of that payroll.

To ensure that the investment risk remains proportionate to the sponsoring employers' ability to support the scheme (should the predicted investment returns not be achieved) then the scheme needs to gradually reduce its exposure to growth assets.

Page 5, section: Prudent margin relative to best estimate

First Actuarial note that:

"In "Methodology and Inputs for the 2017 valuation" of 17 February 2017, the description of USS's approach to forecasting expected returns in paragraph 5.1.1 is excellent, especially paragraph 4. Expected returns are then quoted in 5.1.2, without any data or quantified description of how the expected returns are arrived at. The absence of an explanation is unsatisfactory."

See Annex B providing some more detail on USS' Fundamental Building Blocks approach to developing expected returns.

Page 5, section: Prudent margin relative to best estimate

First Actuarial note that:

"We note the observation in 5.1.1 that constructing a forecast based on expected cash flows accruing to shareholders can generally be expected to give a similar result to the other methods described in the paragraph. We would say that the expected returns quoted in 5.1.2 on equity and property are rather lower [than] would be expected from a cash flow analysis."

The Trustee's views on expected returns by asset class are lower than those put forward by First Actuarial. There is no single right answer to any view on future investment returns. Overall, the Pension Regulator has stated that the assumptions proposed by the Trustee were at the limit of what would be acceptable suggesting strongly that the Trustee has not been overly conservative in its forecasts relative to other pension schemes.

Page 6, section: Adjusting parameters

First Actuarial note that:

"The suggested change to the rate of growth in reliance on covenant is an easy change to make, because a rate of growth reflecting expected salary growth would be a technically more appropriate assumption to make."

The Trustee was willing to consider making this change to its approach and sought views from employers explicitly on this in its technical discussion on assumptions in February 2017.

Employers were strongly of the view that they did not wish to contemplate increasing the parameters defining the maximum level of reliance placed on the covenant.

Page 6, section: Best estimate discount rate and the recovery plan

First Actuarial note that:

“The consultation document does not state what the construction of the best estimate discount rate is. It would be helpful if this is provided.”

Under the approach proposed in the consultation, the best estimate discount rate was.

10 year period following valuation: CPI +1%; years 11 to 20: CPI + 4% declining linearly to CPI + 2.56% at year 20 and for the period thereafter too.

Page 7, section: Beware a vicious circle

First Actuarial note that:

“The Trustee defines a low risk portfolio as “one which has less than a 5% chance of requiring further contributions” [our emphasis added]. The trouble with this definition is it appears to ignore the very large additional cost of buying the low risk portfolio in the first place.”

The Trustee’s prime duty is to ensure benefits promised can be paid with a high degree of confidence. Ensuring that the scheme always targets holding assets that are within affordable reach of a low risk portfolio is the method that gives this high degree of confidence.

To ignore the gap between the costs of buying a low risk portfolio simply to keep the current price of pensions stable could, over time, put benefits earned to date at too great a risk of non-payment. If the assumed levels of returns on growth assets were overstated relative to real achieved returns then the gap could become so large that employers could not afford to make it up. There is the possibility that a “vicious circle” could arise in future from taking too much risk now.

Page 8, section: The role of The Pensions Regulator

First Actuarial note that:

“We hope that the Trustee is alert to the risk that tPR’s input could inappropriately influence the Trustee’s decision making.”

Trustee’s primary duty, in exercising its powers in the valuation context, is to protect the security of members’ promised benefits. It does that by seeking a high degree of confidence that they will be paid from a combination of the resources of the scheme (its assets) and future contributions paid by the sponsoring employers. The Trustee welcomes feedback from employers (through UUK), members (through UCU) and the Pensions Regulator. The Trustee has made its own judgements based on robust, expert analysis and professional independent advice.

Page 8, section: The advantages of an open pension scheme

First Actuarial note that:

“An actuarial model of a continuing scheme which displays vulnerability to market value fluctuation can be questioned as to whether it is representative.”

The Trustee’s method is robust and objective. It links the contributions paid by employers and members; the investments held by the scheme and the benefits offered in an explicit and logical framework.

Current markets do have a material impact on the results because the stakeholders and Trustee agreed at the 2014 valuation to take the maximum possible level of risk; and market conditions have materially worsened since then.

To ignore the current market conditions totally, in the belief that the future will be very different, would place too great a risk that pensions promised could not be met from within the available resources of the scheme’s assets and future contributions from the employers.

Page 14, section: Growth of the USS

First Actuarial note that:

“The exposure to an unlimited growth of the USS is a concern that has been voiced by the employers. An open pension scheme does not grow without limit. It grows until benefit outgo offsets benefit accrual and asset income and grows no further. Just because a scheme is open to accrual does not mean it is growing. Having projected the liabilities of the USS into the future, we can see that the USS’s liabilities in real terms relative to salary growth are in fact expected to decline, for plausible salary growth assumptions. Only if long run salary growth is less than 0.6% more than CPI are the liabilities projected to grow in real terms relative to salaries. The employers should be reassured about the size of the USS”.

As noted above, employers were not willing to increase the level of long term risk by linking the limit on the covenant to salary growth rather than consumer price inflation.

Page 15, section: The USS’s investment strategy

First Actuarial note that:

“Care must be taken when using the term “de-risking” in connection with the investment portfolio. It is usually synonymous with investing more in bonds and LDI. However, investing more in these kinds of assets increases, not decreases, the need for higher employer contributions.”

The Trustee has to balance risk (the risk of benefit security deteriorating) and reward (the benefit of investment returns).

If the benefits are to be paid with a high degree of confidence then the contributions have to be capable of meeting any shortfall in expected investment returns. The Trustee could not

allow exposure to growth assets to grow such that the employers could not afford to make good any shortfall should that strategy underperform.

The trustee **will** look to maximise the efficiency of risk and return **in** its investment holdings, using different asset classes, including private market and alternative risk reducing strategies.

Annex B: Fundamental Building Blocks (FBB) approach to expected returns

1. Introduction

Recognising that all forecasts are subject to considerable uncertainty, assumptions about expected returns on assets are developed using the FBB approach but then compared with other approaches and different perspectives to “triangulate” a self-consistent set of best-estimate forecasts. The approaches include going back to first principles and looking at historical data, the long-term economic outlook, fundamental drivers of returns, different models for future asset valuation and the expected return forecasts developed by other major market participants.

2. FBB approach

The Fundamental Building Blocks (FBB) approach was developed by USS in 2016 to build long run return projections for multiple asset classes in the Reference Portfolio. The approach provides an analytical framework to decompose returns into underlying components. It is also consistent with the framework employed by other leading industry providers (e.g., Dimensional (Ibbotson), Morningstar, JP Morgan, AQR, Research Affiliates, BlackRock, Baillie Gifford etc.), who publish return forecasts derived from underlying building blocks. At a very high level, the approach decomposes asset returns according to the following components:

1. Income return, i.e. the return arising from coupons, dividends or rental streams
2. Growth, i.e. the expected growth in cash flows paid out by the asset
3. Valuation change, i.e. the change in the market pricing of future cash flows underlying the asset
4. Other adjustments (i.e. the expected capital losses from defaults or depreciation, foreign exchange changes for overseas assets etc.)

There are several advantages of the FBB framework, in particular:

- It can be applied to historical returns, where like an accounting identity it facilitates decomposition and later aggregation for asset class forecasts. It provides the context and the boundaries for forward-looking expectations
- It can be applied at different investment horizons stretching from 1-3 years (appropriate for Tactical or Medium-Term Asset Allocation) to 10-30 years (relevant for long term Strategic Asset Allocation), with the forecasts for underlying components varying across horizons
- It facilitates identification of the underlying drivers of aggregate forecasts
- It can incorporate subjective expert views which can be easily applied to underlying building blocks
- It is amenable to conducting stress-tests and building a range of alternative scenarios around a set of baseline scenario projections

- It does not require strong assumptions of market equilibrium

3. Application to the valuation

For the 2017 valuation, the FBB expected return forecasts have been derived assuming a 30-year horizon which is broken down into a 10-year convergence phase followed by a 20-year steady state phase. The triangulation process described above was used in the overall calibration.

In the 10-year convergence phase key variables, such as interest rates and equity multiples, converge to steady-state levels and a 20-year steady-state phase. Hence 10-year expected returns are heavily influenced by the starting point (e.g. today's interest rates, price multiples etc.) and the convergence path whereas 10-year forward 20-year returns can be interpreted as "steady state" returns, which are driven by cash flow yields and trend growth without any valuation adjustments.

Below we give some more detail for specific asset classes.

Real Equity return projections are constructed by aggregating the following components which are our building blocks in the FBB framework:

1. Yield, which is an average of the current dividend yield and a projected dividend yield consistent with growth and valuation assumptions set out in the Growth and Valuation bullet points below.
2. Growth, which is built by aggregating the following inputs:
 - a. Long term domestic GDP growth, based on USSIM view informed by Consensus Economics, OECD, IMF and other professional forecasters
 - b. Breakdown of listed companies' revenues by region of origin. For instance, UK and European companies derive around 20% of their revenues from operations in emerging markets which implies domestic GDP is not the correct reference point for revenues of listed companies. The breakdown enables to build a weighted GDP forecasts based the revenue breakdown and regional GDP forecasts
 - c. Profit margin adjustment, which enables to translate the revenue into a bottom-line earnings growth forecast. This captures the cyclical nature of profit margins (driven by changes in competition policies, taxation etc.) which tend to mean revert over the long run. The steady state profit margin is defined as a weighted average of the current level, the pre Global Financial Crisis (GFC) average and the post GFC average, as per the weighting scheme described above
 - d. Net dilution adjustment, which converts earnings into earnings per share (EPS) forecasts as the latter ultimately matter to equity holders. This reflects the impact of net issuance and buyback activities. The adjustment is calibrated as an equally weighted average of pre GFC and post GFC experience

3. Valuation, which is based on expected change in the price earnings (PE) ratio. The terminal value for the price earnings ratio is defined as a weighted average of the 1-year forward level, the pre GFC average and the post GFC average, as per the weighting scheme described above
4. Foreign Exchange (FX), which, for unhedged projections, is derived by assuming reversion to purchasing power parity and long-term inflation differentials. For emerging markets, we also considered the long-term growth differential to capture the tendency of real exchange rates to appreciate in fast growing economies (consistent with REER valuation frameworks). For hedged projections FX is based on long-term interest rate differentials vs. the UK, which are derived consistently with the expected shifts in UK and foreign yield curves (see Gilts and other Government bond returns section below)
5. Inflation (relative to UK inflation rate), which captures an adjustment for overseas returns based on long term inflation expectations. These are based on the USSIM view informed by Consensus Economics, OECD, IMF and other professional forecasters. This enables expression of all forecasts in real terms from the viewpoint of a UK investor

Gilts and other government bond returns (nominal and index-linked) are derived by aggregating the following building blocks (components):

1. Yield, which is an average of the current yield to maturity and a projected yield consistent with valuation assumptions set out in the Valuation bullet point below. The assumption is also adjusted to take into account the roll-down effect which captures the price appreciation associated with rebalancing to a fixed duration in an upward sloping yield curve.
2. Valuation, which is based upon the expected shift in the yield curve. The terminal value for the yield curve is defined as a weighted average of the 10-year forward curve, the pre GFC average and the post GFC average curve, as per the weighting scheme described above
3. Inflation, which is derived as described in the Equities section and is subtracted from the expected nominal bond returns to derive real return projections. For the UK index linked bonds, an adjustment is made to reflect the long-term gap between the CPI inflation used as baseline for cross-country comparability and the RPI measure employed to calculate indexation factors.
4. Foreign Exchange (FX), which is as described above for equity forecasts and is similarly applied to non-UK bond forecasts

Forecasts for ***corporate and emerging market bonds*** are constructed in a similar fashion, as outlined below based on following building blocks:

1. Yield, which is an average of the current yield to maturity for the relevant index and a projected yield consistent with valuation assumptions set out in the Valuation bullet point below

2. Valuation, which is derived similarly to government bonds but a terminal value for spread levels is added to the expected government yield derived as described above. This is defined as a weighted average of the current spread level, the pre GFC average and the post GFC average, as per the weighting scheme described above
3. Default premium, which is an adjustment to reflect expected default losses calibrated using default and recovery data since 1920 provided by Moody's.
4. Inflation, which is derived as described in the Equities section and the same adjustment to government bonds is applied
5. Foreign Exchange (FX), which is as described above for equity forecasts, based on FX expectations of underlying currencies (i.e. blend of US dollar and Euro for global investment grade, EM countries for EM local currency etc.)

Forecast for **UK property** is constructed in a similar fashion to that for Equities, i.e. based on the following building blocks

1. Yield, which is the average of the current rental yield for the IPD universe and a projected yield consistent with valuation assumptions set out in the Valuation bullet point
2. Rental growth, which is assumed to be lower than UK CPI inflation and calibrated consistently with Property Market Analysis (PMA) baseline projections
3. Valuation, which is derived similarly to corporate bonds where the spread level is defined as the gap between property and long-dated gilt yields
4. Depreciation, which reflects the cost of refurbishing and repairs. This is assumed to be 2% based on research from Property Market Analysis (PMA)
5. Transaction costs, which reflects the impact of stamp duty on buying and selling underlying properties. This is assumed to be 0.50%
6. Inflation, which is derived as described in the Equities section and is subtracted from the expected nominal property returns to derive real return projections.