Annex 4 – Cost of capital

a. Introduction

4.1 When establishing the *'costs actually incurred'* in supplying a product, it will normally be necessary to allocate a reasonable rate of return to cover the cost of capital, i.e. the 'Plus' element of Cost Plus.[1] The reasonable rate of return reflects the opportunity cost to investors of providing capital to Advanz to purchase assets and fund working capital requirements. In order to establish a reasonable rate of return in this case, the CMA has followed the return on capital employed (ROCE) model. ROCE is the standard approach used by the CMA when modelling returns on capital for the purposes of an economic cost assessment, when there are significant asset investments and where the relevant data are available to measure both capital employed and the cost of capital, which are the two inputs required to calculate the reasonable rate of return.[2]

4.2 This Annex sets out the CMA's approach to the second input to the reasonable rate of return, i.e. the cost of capital. The CMA concludes that where firms like Advanz fund their investments through a combination of debt and equity finance, the weighted average cost of capital (WACC) is the most appropriate figure to use for the rate of return expected by investors. This is consistent with the standard ROCE model.

4.3 The internal documents produced by Advanz and its advisors during the Infringement Period set out a range of different values for Advanz's cost of capital.[3] The estimates from these internal documents range between [✂] and [✂].

4.4 The CMA concludes that the cost of capital estimates from the Parties' internal documents are not suitable for an assessment of efficient capital costs in this case. All of them were created in order to provide an assessment at a specific point in time and for a particular purpose, which makes them unsuitable for the purpose of estimating a WACC for the whole Infringement Period. Furthermore, some of the assumptions underpinning the estimates are inappropriate for the purposes of an economic cost assessment. For these and the other reasons set out in paragraphs 4.11ff below, the CMA carries out an independent assessment to estimate a reasonable range for the WACC using market data that takes into account any potential changes in

[1] See paragraph 5.62 of this Decision and Annex 3 to this Decision, paragraphs 3.59 ff.

[2] See Annex 3, paragraphs 3.60-3.64.

[3] See paragraphs 4.10ff below for more detail.

the cost of debt and equity over the course of the Infringement Period, rather than simply selecting one of Advanz's estimates.

4.5 The CMA's analysis estimates a 'low' and 'high' case WACC of [✂] and 12.7%, respectively. The higher estimate of 12.7% reflects evidence provided by HgCapital and the CMA's analysis that the cost of debt was higher in the earlier part of the Infringement Period.

4.6 In the CMA's view, a reasonable WACC estimate is likely to fall between the CMA's 'low' and 'high' case estimates. Based on its own assessment, the CMA considers that it would be appropriate to use a point estimate WACC of 10%, which is the midpoint of the CMA range, as the reasonable rate of return for its Cost Plus calculation.

4.7 As a cross-check to the 10% WACC estimate, the CMA carries out a sensitivity analysis using a WACC of 15%, which is above the CMA's 'high case' estimate and the majority of the WACC estimates set out in Advanz's internal documents. While the CMA considers that the 15% WACC is higher than the rate of return that investors require to operate in the UK Liothyronine Tablets market, it has used this higher estimate to illustrate that the finding of abuse is not sensitive to the choice of WACC.

4.8 The WACC is based on three inputs:

a) cost of equity – this is assessed using the Capital Asset Pricing Model (CAPM). Under the CAPM approach, the cost of equity is estimated as the risk-free rate ('**RFR**') plus (equity beta x market risk premium). The RFR and the market risk premium are general non-company specific market factors while the beta is a firm-specific measure of investors' exposure to systematic risk.[4]

b) cost of debt – this is assessed by observing yields of corporate bonds with credit ratings comparable to those of a typical pharmaceutical business active in the generics sector in the UK.

c) gearing – this is the average gearing ratio of a set of comparator companies[5] operating in the UK generics sector during the Infringement Period.[6]

[4] See section c below for more detail on the CAPM model; and the Information Paper: UKRN Cost of Capital Annual Update Report (December 2020).

[5] See paragraph 4.59 below for the list of comparator companies used in CMA's assessment.

[6] The gearing ratio is defined as $g = \frac{D}{D+E}$ where is D is Debt and is E is Equity.

The values the CMA ascribed to each of the components of the WACC are shown in Table A4.1:

Table A4.1: CMA estimate of the WACC

	Low	High
Cost of equity		
- Nominal risk-free rate (%)	3.0%	4.4%
- Equity risk premium (%)	5.2%	6.5%
- Equity beta	0.70	0.90
- Tax rate (%)	24%	28%
Pre-tax, nominal cost of equity (%)	8.7%	14.2%
Cost of debt		
Pre-tax, nominal cost of debt (%)	3.8%	8.6%
Gearing		
Gearing (%)	28%	28%
Outturn		
Pre-tax, nominal WACC (%)	**7.4%**	**12.7%**
Note: The figures in this table are based on data from the CMA's WACC model and have been rounded to one decimal place. The 'low' and 'high' WACCs, if calculated on the rounded inputs, will lead to small rounding errors of 0.1% (i.e. the WACC range would be from 7.3% to 12.6%). This has no bearing on the CMA's WACC of 10%.		

Source: CMA WACC estimate.

b. Summary of Advanz's documentary evidence on the cost of capital

4.9 The CMA sought information from Advanz as to the cost of capital it used internally.

i. Advanz's own assessment of the cost of capital

4.10 Advanz has not provided formal estimates of the cost of capital it uses as a business, stating that '*No formal estimates of the cost of capital are available for the period prior to the acquisition of the company by Concordia Healthcare Corp. in October 2015'*.[7] Advanz has, however, stated that a rate of [✂] was applied from at least 2010 onwards for internal project appraisals.[8]

4.11 The CMA does not consider it appropriate to rely on the [✂] figure used by Advanz. That figure is a hurdle rate which Advanz uses for project appraisal, rather than an accurate reflection of Advanz's actual cost of capital. A hurdle rate indicates the rate at which Advanz's management would discount cash flows in prospective projects to help them decide whether the project should proceed, i.e. the rate of return that management would expect to achieve from an investment. It is likely to reflect the rate of return that management would hope to generate but this will not necessarily be the case. For example, it may

[7] Document LIO2589, Advanz's response to question 1 of the CMA's s.26 notice dated 27 February 2017.
[8] Document LIO2589, Advanz's response to question 1 of the CMA's s.26 notice dated 27 February 2017.

be that management deliberately use a higher figure for project appraisal as a way of overcoming optimism bias.[9]

4.12 The CMA further notes that the [✂] figure only relates to the latter part of the Infringement Period and it is unknown whether Advanz used a different figure for the earlier part.

ii. The Globalview Advisors report

4.13 Advanz has also provided a copy of a valuation report dated 16 May 2013 produced by Globalview Advisors.[10] This report was prepared to provide a valuation of the intangible assets of Mercury Pharma Group Limited following its acquisition by Cinven. The report could be potentially relevant as it shows the cost of capital that Advanz's advisors used in determining the value of intangible assets.

4.14 In producing their valuation, Globalview Advisors used a post-tax WACC of [✂].[11] The breakdown of this figure provided in Exhibit F of the valuation report shows that the cost of capital figure includes a *'small company premium'* and a *'specific company premium'*.[12] The *'small company premium'* amounted to [✂] while the *'specific company premium'* was [✂].

4.15 The CAPM, which is the model used by both the CMA in its assessment and by Globalview Advisors in their report to estimate the cost of equity, assumes that all risk is diversifiable, other than systematic risk. On that basis, and as explained in more detail in paragraphs 4.99 to 4.103 below, the CMA does not include a small and/or specific a company premium when calculating the economic cost and does not consider doing so appropriate, as there is no basis for the inclusion of a risk premium within the CAPM.[13]

4.16 The Globalview Advisors report also notes that the specific company premium was added '*to account for the optimistic financial projections despite our sensitisation*'.[14] While this approach may be appropriate in the context of the

[9] See Brealey, Myers, Allen, 'Principles of Corporate Finance', chapter 10.
[10] Document LIO1724, '*Mercury PPA Report.pdf*.'
[11] Globalview Advisors' figure is a post-tax WACC, which would be lower than the pre-tax WACC, which the CMA uses in its analysis, if the same CAPM model assumptions were applied. Conversely, Globalview Advisors' WACC includes small and specific company premia which, as explained in paragraph 4.15–4.16, is not appropriate for the purposes of an economic cost assessment. Removal of the premia would result in a significantly lower WACC.
[12] Document LIO1724, '*Mercury PPA Report.pdf*.', page 28.
[13] See Brealey, RA (1991), '*Principles of Corporate Finance'*, chapter 8.
[14] Document LIO1724, '*Mercury PPA Report.pdf*.', page 28.

report, it does not represent a genuine premium on the company's cost of capital.[15]

4.17 Removing both the *'small company premium'* and the *'specific company premium'* from the cost of capital used by Globalview Advisors and adjusting the analysis to make it comparable with the CMA's WACC estimate results in a pre-tax WACC of [✂].[16]

4.18 The CMA finds that these premia are not justified, for the purposes of measuring economic cost in an excessive pricing case and their removal would result in WACC estimates that are consistent with the CMA's analysis.

iii. The Goldman Sachs report

4.19 Advanz has also provided a presentation prepared for Concordia Healthcare Corporation (as Advanz Pharma Corp was then called) by Goldman Sachs dated 4 September 2015 which contains analysis of the potential financial impact of acquiring AMCo from Cinven.[17] Goldman Sachs estimated AMCo's post-tax WACC to be [✂]. A similar analysis estimates Concordia Healthcare Corporation's post-tax WACC to be [✂] and that of the merged entity to be [✂].[18] Adjusting the analysis to make it comparable with the CMA's WACC estimate results in pre-tax WACCs of [✂] respectively.[19]

4.20 While Goldman Sachs' WACC estimates do not suffer from the same methodological issues as the Globalview Advisors or EY Report assessments with respect to the inclusion of premia outside the CAPM, the CMA observes that, after adjusting the analysis to make it comparable with the CMA's pre-tax WACC, Goldman Sachs' WACC estimates fall towards the lower end of the CMA's WACC estimate range. Therefore, on a cautious basis, the CMA does not use them to assess efficient capital costs.

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[15] Businesses may sometimes include premia in figures which are described as the cost of capital as a way of building in some contingency in valuations or project appraisal analyses. However, it would be inappropriate to include such premia in an assessment of the cost of capital since the risks that these premia are intended to remunerate can either be diversified (so need not be remunerated in the cost of capital) or are captured through the beta value (if they are non-diversifiable risks).

[16] After removing the small and specific company premia, the CMA applies a factor or 'tax wedge' 1/(1-t) to the cost of equity, where t is the corporation tax rate (Globalview Advisors' model assumes a tax rate of 21%). This converts the post-tax cost of equity used in the Globalview Advisors' model, which is sufficient to meet the requirements of equity investors, to a pre-tax cost of equity. This adjustment provides the notional company with sufficient revenues to meet its corporation tax liabilities.

[17] Document LIO1923, '*Document 2.pdf *Project Harmony – presentation*'.

[18] Document LIO1923, '*Document 2.pdf *Project Harmony – presentation*', pages 27–29.

[19] As explained in footnote 16, the CMA converts the post-tax cost of equity into a pre-tax cost of equity by applying a factor of 1/(1-t). Goldman Sachs' model assumes corporation tax rates of between 20% and 25%.

iv. The EY purchase price allocation report

4.21 EY prepared a report for Advanz, dated 16 September 2016, that includes an annex titled *'exhibit 15'* in which EY estimates the WACC of Concordia International Corporation (as Advanz Pharma Corp was then called). This analysis estimates the post-tax WACC to be in the range of [✂] to [✂] and selects a value of [✂] for the analysis.[20,21]

4.22 The analysis includes a *'size and company specific premium'* of [✂] to [✂].[22] For the reasons set out in paragraph 4.15 above, the CMA does not consider it appropriate to include such a premium for the purposes of an excessive pricing case. Removing this premium and adjusting the analysis to make it comparable with the CMA's WACC estimate results in a pre-tax WACC range of [✂] to [✂].[23]

v. Conclusion on using Advanz's internal figures for the cost of capital

4.23 While the overall level of the Differential (i.e. the difference between prices charged by Advanz during the Infringement Period and the CMA's Cost Plus) is not highly sensitive to the cost of capital figure, the CMA concludes that it would be inappropriate to use any of the WACC estimates set out in Advanz's internal documents for the purposes of an economic cost assessment for the reasons outlined above.

4.24 Consequently, the CMA has conducted its own independent assessment using market data to establish a reasonable WACC estimate for the purposes of an economic cost assessment, taking into account the particular circumstances of this case, including any potential changes in the cost of debt and equity over the course of the Infringement Period.

vi. WACC estimates provided in response to the 2017 SO

4.25 In response to the 2017 SO, the Parties submitted their own bottom-up estimates of the relevant WACC. Table A4.2 below summarises the WACC estimates that were submitted. The CMA addresses the points raised by the

[20] Document LIO4937, *'Final - Concordia Amco PPA Report'*, Exhibit 15.
[21] The EY Report figures are post-tax WACC estimates, which are lower than the pre-tax WACC estimates that would result if the same CAPM model assumptions were applied. Conversely, as noted in paragraph 4.22, the EY Report post-tax WACC estimates include a small and specific company premium, which the CMA considers to be inappropriate for the purposes of an economic cost assessment and removal of the premium would result in a significantly lower WACC.
[22] Document LIO4937, *'Final - Concordia Amco PPA Report'*, Exhibit 15.
[23] As explained in footnote 16, the CMA converts the post-tax cost of equity into a pre-tax cost of equity by applying a factor of 1/(1-t) (after removal of the small and specific company premia). EY's model assumes a corporation tax rate of 13%.

Parties and the assumptions that were adopted, in order to arrive at the WACC estimates set out in Table A4.1, under sections c and d below.

Table A4.2: WACC estimates submitted by the Parties in response to the 2017 SO

	CMA	Hg	Cinven	Advanz
Low	[✂]	11.8%-13.9%	10.0-11.8%	n/a
High	12.7%	17.7-20.4%	15.4-17.7%	n/a
Cost Plus WACC	10%	16.0-18.7%	13.9-16.0%	13.8-14.1%
CMA range in Cost Plus and sensitised Cost Plus	10%-15%			

Source: Document LIO6361.3, First FTI Report (Table A2-8), document LIO6259, First HgCapital CRA Report (Table 6) and document LIO6331, First Cinven CRA report (Tables 6, 7 and 8) and CMA analysis.

c. The CMA's approach to estimating Advanz's WACC

4.26 This section sets out the CMA's approach to estimating the WACC and is structured as follows:

a) The CAPM model – the theoretical foundations of the CAPM model and its practical, real-world applications;

b) Estimating Advanz's WACC based on information from a selection of appropriate comparators; and

c) The time period over which the WACC is assessed.

i. The CAPM model

4.27 The CAPM is a widely understood technique with strong theoretical foundations that also has practical, real-world applications.[24] The CAPM relates the cost of equity (K_e) to the risk-free rate (R_{rf}), the expected return on the market portfolio (R_m) and a firm-specific measure of investors' exposure to systematic risk (beta or β) as follows:

$$\boldsymbol{K_e = R_{rf} + \beta \times \left(R_m - R_{rf}\right)}$$

[24] For example, the CAPM is used widely to calculate the cost of equity, which, in turn, is used to calculate the WACC for equity valuation and investment appraisal purposes. Financial analysts use the CAPM to measure risk and returns investors expect when investing in companies. The CAPM is also used by UK regulators to determine an appropriate rate of return when setting prices in regulated industries such as gas, electricity, and water.

4.28 If a business were entirely funded by equity, the expected return on equity could be considered to be its *'cost of capital'*. However, most firms are funded by a combination of both debt and equity, such that the appropriate cost of capital to consider is the weighted average of the cost of debt and the cost of equity. The WACC is given by the following expression where K_d is the cost of debt and E and D represent the market values of the firm's equity and debt respectively:

$$\boldsymbol{WACC = K_e \times \frac{E}{E+D} + K_d \times \frac{D}{E+D}}$$

4.29 Returns to debt investors take the form of payments of interest which are typically tax deductible. Returns to equity investors (i.e. shareholders) are typically not tax deductible. Consequently, where the WACC is expressed on a pre-tax basis the cost of equity must reflect the fact that actual returns to shareholders will be reduced by the payment of tax. The pre-tax WACC is calculated as follows, where *t* is the corporate tax rate:

$$\boldsymbol{Pre\ tax\ WACC = K_e \times \frac{E}{E+D} \times \frac{1}{1-t} + K_d \times \frac{D}{E+D}}$$

4.30 Additionally, the WACC needs to be specified as either real or nominal. A real rate of return does not include any allowance for inflation and is suitable when comparing revenues which are expressed in constant prices, i.e. before applying inflation. The nominal return includes an amount in respect of inflation and is suitable for comparing revenues expressed in the money of the day.

ii. Estimating Advanz's WACC based on information from a selection of comparators

4.31 The CMA has assessed the WACC for an investor in a pharmaceutical business active in the generics sector in the UK. To do this, the CMA has observed the beta, gearing and credit ratings of other firms which are active in the supply of generic pharmaceuticals and which have a UK presence.

4.32 The Parties have made the following objections to the model used by the CMA to derive the WACC estimate:

a) Advanz submits that the WACC should be product-specific and not the WACC of a diversified notional company.[25]

[25] Document LIO6361.3, First FTI Report, paragraphs 6.15 to 6.17.

b) Advanz submits that an *ex post* assessment of an individual product should include an allowance for the possibility that upside specific risks will be realised, referring to a *'fair bet'* principle.[26]

c) All three Parties submit that the WACC should be an *ex ante* rather than *ex post* estimate.[27]

d) HgCapital and Cinven submit that revealed preference suggests that the efficient ownership model was a private equity model. It follows that the target rates of return used by HgCapital and Cinven are therefore appropriate data points to use for the rate of return.[28]

4.33 In relation to the arguments made at paragraphs 4.32(a) and (b) above, the CAPM model is based on well-established portfolio and corporate finance theory. Portfolio theory shows that the company specific risks associated with investments can be fully diversified and that investors require a return only for the systematic risks (i.e. risks related to the general economy) that a firm presents relating to the relevant investment. The cost of equity derived from the CAPM should therefore capture investor risk aversion to variation around the return on an asset, caused by changes in systematic risk factors only, not company- or industry-specific risks. There is nothing to suggest that Advanz was more exposed to systematic risk in respect of Liothyronine Tablets than a typical generic drug. It follows that whether a WACC is product-specific or for a notional diversified company should not make a material difference to the WACC assessment.

4.34 Notwithstanding this, the CMA still makes an allowance for any purported specific risks that Advanz may have faced by taking account of potential risk of failure in its Product Rights valuation. The CMA's sensitivity on Product Rights increases the valuation from [✂] to £2.1m. The sensitivity is applied and is included in the CMA's Cost Plus assessment, even though Advanz did not, in fact, face any such risk during the Infringement Period as it had already acquired the Product Rights in 1992. The CMA further notes that, given Advanz's position as the sole supplier of Liothyronine Tablets in the UK during the Infringement Period, it was unlikely to have faced any specific risks in relation to achieving its forecasted cashflows during that period.

[26] Document LIO6361.3, First FTI Report, paragraph 3.38 and 6.13.
[27] Document LIO6361.3, First FTI Report, paragraphs 6.7, 6.9 and 6.11 to 6.13; both HgCapital and Cinven submit that the overall cost and rate of return assessment should be done on the basis of ex ante expectations, rather than ex post/outturn results. See for example, document LIO6331, First Cinven CRA Report, paragraph 68, and document LIO6259, First HgCapital CRA Report, paragraph 15.
[28] Document LIO6331, First Cinven CRA report, paragraphs 96 to 98; document LIO6259, First HgCapital CRA report, paragraphs 114 to 115 and section 4.3.3.

4.35 In relation to the argument set out at paragraph 4.32(c) above, the CMA agrees that in principle the WACC should be an *ex ante* estimate of what returns investors might expect. However, in the circumstances of this case, the average WACC derived using an *ex post* and *ex ante* approach are broadly similar, as the actual returns during the Infringement Period were consistent with expected returns. This is evidenced by Advanz's assessment of the *ex post* and *ex ante* WACC, which are 14.1% and 13.8%, respectively.[29]

4.36 In relation to the argument set out at paragraph 4.32(d) above, the CMA does not consider that target rates of return in private equity are appropriate for estimating the efficient costs of finance. Private equity rates of return are effectively hurdle rates. As explained in paragraph 4.11 above, a hurdle rate reflects the rate of return that management would hope to generate and may include a premium above the cost of capital, i.e. the additional profits that managers or investors might expect over and above the economic cost related with that investment. The CMA does not consider that a premium above the cost of capital should be included when estimating efficient costs of finance in Cost Plus. In any event, private equity rates of return reflect the 'equity return' rather than the total return on capital (i.e. the weighted average cost of debt and equity). As private equity investors generally tend to increase a firm's level of gearing, the WACC would be expected to be lower than the private equity rate of return, as the cost of debt would have to be taken into account and this is lower than the cost of equity.

iii. The time period over which the WACC is assessed

4.37 The CMA has assessed the WACC over the Infringement Period, by using market data that would have been available at that time. The CMA's analysis results in a WACC estimate of 10%.

4.38 HgCapital and Cinven argue that it is inappropriate to apply a single WACC estimate for the entire period. They submit that the cost of debt and RFR were substantially higher in earlier years and that it would be more appropriate to calculate separate WACC estimates for each year.[30]

4.39 The CMA acknowledges that macroeconomic conditions and prevailing interest rates changed during the Infringement Period. However, estimating the WACC involves a degree of judgement, meaning that there is no single

[29] Document LIO6361.3, First FTI Report, Table 6-4.
[30] Document LIO6259, First HgCapital CRA Report, paragraph 132; document LIO6331, First Cinven CRA Report, paragraph 97.

right answer. It is not clear that calculating separate WACC estimates for each year would necessarily lead to a more accurate result.

4.40 The CMA addresses these concerns by calculating a 'high case' estimate of the WACC, which includes the high-point cost of debt and RFR during the earlier part of the Infringement Period, to illustrate the size of the effect of changing macroeconomic conditions on the WACC estimate. This is explained in further detail in sub-sections d.i and d.v below in relation to the RFR and cost of debt, respectively.

4.41 Further, the CMA recognises the uncertainty and potential temporal variability in the WACC in its Cost Plus analysis, where an upper-end sensitivity has been run using a WACC of 15%, that is five percentage points above the CMA's Cost Plus WACC estimate of 10%. The CMA therefore considers that variations in macroeconomic conditions are accommodated within its analysis.

d. CMA estimation of the WACC

4.42 This section sets out the analysis that the CMA has undertaken, in order to estimate the components of the WACC calculation, including both market-wide and industry-specific components. The former comprise the RFR, the equity risk premium and the tax rate; the latter comprise beta, cost of debt and gearing. In calculating each of the respective components, the CMA has taken account of standard practice in the application of the CAPM framework and has also drawn on its extensive experience in applying the CAPM during the course of its investigations and proceedings.

i. Risk-free rate (RFR)

4.43 The CMA has followed the standard approach of using the yields on long-maturity gilts as a reliable proxy for the RFR in the cost of equity since equities also have long (indefinite) maturity. In order to estimate the RFR applicable during the Infringement Period, the CMA has referred to two sources of data:

a) Index-linked gilt yields; and

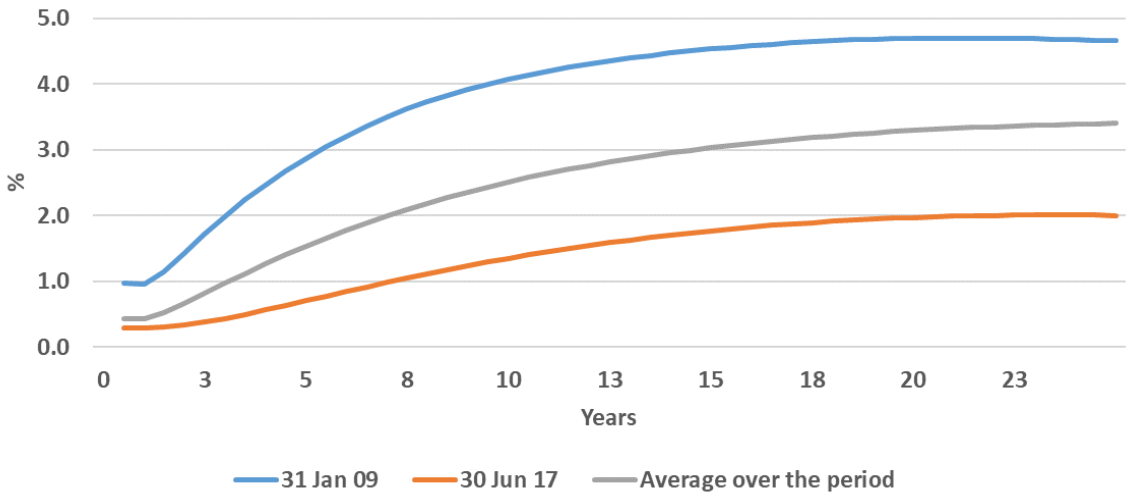
b) Nominal gilt yields.

4.44 Both these securities have negligible default risk, though nominal gilts present investors with inflation risk (and, therefore, should contain an inflation risk premium). The CMA has estimated the RFR using yields on both types of gilt instrument and then sought to reconcile the results of each in order to reach an overall conclusion on an appropriate RFR.

Observing the nominal RFR directly

4.45 Figure A4.1 shows nominal gilt yields on 31 January 2009 and 30 June 2017, as well as the average over the period between these dates.

Figure A4.1: yield curves for nominal gilts in 2009, 2017 and the average over the period



Source: Bank of England, nominal spot yield curve data.

4.46 The CMA observes from Figure A4.1 that for maturities of 15 years and more, yields were between 1.8% and 4.6% with an average of 3.3%. Focusing principally on the average curve for maturities of 15 years and more in Figure A4.1, the evidence from nominal gilt yields between 2009 and 2017 suggests a nominal RFR range of 3% to 4%.

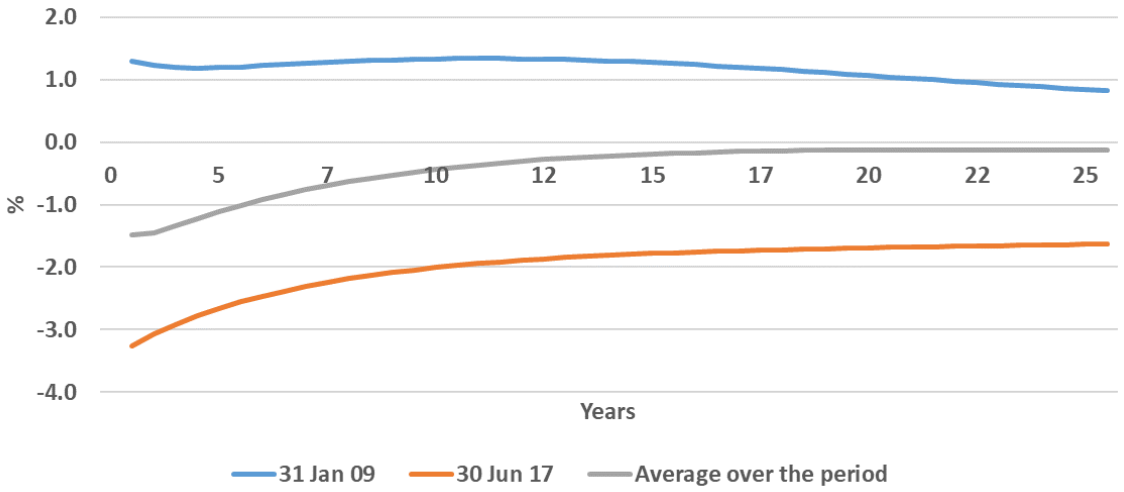
4.47 HgCapital and Cinven have both submitted that the RFR was higher in earlier years and that taking averages smooths over this underlying trend.[31] To test the impact of a higher RFR on the WACC estimate, the CMA has run a high-end WACC estimate, which includes HgCapital's high-end nominal RFR estimate of 4.4%.[32]

Observing the real RFR

4.48 Figure A4.2 shows the index-linked yield curve on 31 January 2009 and 30 June 2017, as well as the average over the period.

[31] Document LIO6259, First HgCapital CRA Report, paragraphs 132 and 133; document LIO6331, First Cinven CRA Report, paragraphs 97 and 118.
[32] Document LIO6259, First HgCapital CRA Report, Table 6.

Figure A4.2: yield curves for index-linked gilts in 2009, 2017 and the average over the period.



Source: Bank of England, real spot yield curve data.

4.49 Figure A4.2 shows that for maturities of 15 years and more, RPI-stripped[33] yields were between -1.7% and 1.3% with an average of approximately 0.0%.[34] The average RPI inflation between January 2009 and June 2017 was approximately 3.1%.[35] Focussing principally on the average for maturities of 15 years and more in Figure A4.2, when RPI inflation is added back to the RPI-stripped yields, the evidence suggests a nominal RFR of 3%. This is broadly consistent with the evidence on the RFR range from the nominal gilt yields.

Conclusion on the RFR

4.50 Based on the data described above, the CMA has decided to use a range of 3.0% to 4.4% (with the upper end of the range reflecting HgCapital's high end estimate) for the nominal RFR and an RPI-real RFR of 0% in its calculations.[36, 37]

ii. Equity risk premium

4.51 The total market return is the total return that investors require for investing in a diversified basket of equities. It is the sum of the RFR and the equity risk premium, which is the part of this return that compensates investors for the

[33] RPI is the Retail Price Index.
[34] The average real yield for maturities of 15 years and more was -0.13%.
[35] Average RPI inflation over the Infringement Period was 3.13%. See ONS RPI Index (January 2009 index value: 210.1; June 2017 index value: 272.3).
[36] See paragraph 4.47 above.
[37] The CMA uses a point estimate for the RPI-real RFR (rather than a range), as it is deducted from the total market range to determine the equity risk premium range. Deducting an upper end RFR would reduce the equity risk premium range.

additional risk associated with investing in equities, rather than in risk-free assets. Therefore, when seeking to understand what the expected equity risk premium was over a historic period of time, it is necessary to identify the returns which investors expected to make on the market and deduct the relevant RFR (as estimated above).

4.52 The CMA has recently assessed the total market return in the context of the Ofwat price determinations that reported an overall total market return range of between 5.2% and 6.5% (RPI-real).[38] This range is broadly consistent with the CMA's previous assessments of the total market return.[39]

4.53 As the RPI-real RFR is 0.0%, the equity risk premium range is 5.2% to 6.5%, and this is the range the CMA uses in its assessment.

iii. Beta

4.54 The beta of an asset (or equity beta) measures the relationship between the returns on the asset and the returns on the market as a whole, or the exposure of the firm to systematic or *'non-diversifiable'* risk.

4.55 The beta value of a listed firm can be estimated as the covariance between the stock's returns and the market's returns, divided by the variance of market returns. This is a measure that financial market systems such as Bloomberg and Reuters estimate. As set out in Table A4.3 below, the CMA has used the beta estimates from Bloomberg for six listed companies operating in the generics pharmaceutical sector (the '**Beta Comparator Companies**') in order to estimate the beta of Advanz.

4.56 Within the CAPM framework, changes in gearing affect equity betas. Accordingly, it is necessary to adjust for gearing differences in order to make comparisons between equity betas. This is done by calculating the asset beta, i.e. the beta at zero gearing and then re-gear to the notional gearing level (28% in this case).[40]

4.57 In this section the CMA identifies the Beta Comparator Companies, estimates their beta values, examines the impact of gearing on the beta values and concludes on what it considers a suitable beta value to use as part of its cost of capital assessment.

[38] Ofwat Price Determination (CMA Final Report of 17 March 2021), page 839.
[39] In the context of the Bristol Water appeal (CMA Final Report of 6 October 2015), the CMA used the upper-end of the 5.0%–6.5% total market return range used in the Northern Ireland Electricity appeal.
[40] See Tables A4.3 – A4.54.924.98 below.

The Beta Comparator Companies

4.58 In conducting this cost of capital assessment, the CMA is attempting to identify the reasonable rate of return that a company might expect to earn, if it were operating in the UK generics sector over the Infringement Period. The CMA has therefore sought to identify listed companies which were active in the UK generics sector during the Infringement Period.

4.59 For this purpose, the CMA has decided to use six Beta Comparator Companies identified in a report produced for Advanz on the basis that, like Advanz, they conduct limited research and development.[41] The six Beta Comparator Companies are:

a) Stada-Arzneimittel AG

b) Allergan plc

c) Hikma Pharmaceuticals plc

d) Teva Pharmaceutical Industries Limited

e) Mylan Inc

f) Hospira Inc.

4.60 The CMA notes that, like many listed businesses, the Beta Comparator Companies operate across multiple geographic regions and multiple operating segments. Therefore, each of the Beta Comparator Company's beta values will reflect business risks particular to the UK generics industry as well as business risks of other geographies and industry sub-sectors. The CMA notes that consequently the beta values of the Beta Comparator Companies provide an indication of the beta of Advanz in respect of its supply of Liothyronine Tablets in the UK but should not be considered to provide a precise value.

Beta values

4.61 In the 2017 SO, the CMA estimated beta values for the Beta Comparator Companies on weekly and monthly bases for a period that included the majority of the Infringement Period.[42] The estimated beta range was 0.75–0.80 (see Table A4.3 below).

[41] Document LIO1724, '*Mercury PPA Report.pdf*'.

[42] The betas for the six Beta Comparator Companies was estimated for the period between January 2007 and October 2016. The CMA carried out a cross-check to cover only the Infringement Period and found that the beta

4.62 The CMA has adjusted its provisional beta estimate range from the 2017 SO to reflect the Parties' representations:

a) Advanz submitted that the CMA did not de-gear observed equity betas using the capital structure of the comparator firms and re-gear the outturn asset betas using the notional gearing. The CMA has carried out this analysis and found the beta estimate range to be 0.74–0.80.[43]

b) HgCapital and Cinven submitted that it is difficult to estimate beta. They suggest that the CMA's relatively narrow provisional beta range of 0.75 to 0.80 did not reflect the uncertainty in the estimate. They suggested widening the beta estimate range to 0.70–0.90.[44]

4.63 The CMA agrees with HgCapital and Cinven that estimating beta precisely is difficult. It uses their suggested wider beta range of 0.70–0.90, using the lower and upper limits of this range as the beta inputs for the CMA's 'low' and 'high' case WACC estimates respectively.

4.64 The CMA notes that, when Globalview Advisors produced valuation reports for Advanz in May and October 2013, they used a beta value of 0.51. The CMA does not consider it appropriate to use this figure as its source is not fully described. For example, the reports do not say against which indices covariances have been calculated. However, the CMA notes that the means of weekly and monthly beta values shown in Table A4.3 are greater than the 0.51 figure used by Globalview Advisors. Using a higher value has the effect of increasing the cost of equity and, ultimately, favours Advanz as it results in a higher WACC.

range was between 0.78 and 0.80. A minor change in estimation period therefore has no effect on the beta range used in the CMA's analysis.

[43] Table A4.4 below sets out the asset betas for the Beta Comparator Companies; and Table A4.5 below sets out the re-geared equity beta estimates at notional gearing of 28% for the Beta Comparator Companies.

[44] Document LIO6259, First HgCapital CRA Report, paragraph 133; document LIO6331, First Cinven CRA Report, paragraph 118.

Table A4.3: Observed equity beta estimates for the Beta Comparator Companies

Company	Relevant stock exchange	Observed equity beta	
		Weekly	Monthly
Stada-Arzneimittel AG	STOXX Europe 600 Health Care EUR prices	1.10	1.00
Allergan plc	S&P500	0.71	0.55
Hikma Pharmaceuticals plc	FTSE Allshare	0.66	0.78
Teva Pharmaceutical Industries Limited	Tel Aviv 100 / TA-100	0.47	0.42
Mylan Inc	S&P500	1.14	0.92
Hospira Inc. (A Pfizer company)	S&P500	0.75	0.80
Mean		**0.80**	**0.75**

Source: Bloomberg; CMA WACC estimate.

Table A4.4: Asset beta estimates for the Beta Comparator Companies

Company	Relevant stock exchange	Asset beta	
		Weekly	Monthly
Stada-Arzneimittel AG	STOXX Europe 600 Health Care EUR prices	0.80	0.72
Allergan plc	S&P500	0.60	0.47
Hikma Pharmaceuticals plc	FTSE Allshare	0.60	0.71
Teva Pharmaceutical Industries Limited	Tel Aviv 100 / TA-100	0.41	0.37
Mylan Inc	S&P500	0.92	0.74
Hospira Inc. (A Pfizer company)	S&P500	0.64	0.68

Source: CMA calculation

Table A4.5: Re-geared equity beta estimates at notional gearing of 28% for the Beta Comparator Companies

Company	Relevant stock exchange	Re-geared equity beta	
		Weekly	Monthly
Stada-Arzneimittel AG	STOXX Europe 600 Health Care EUR prices	0.96	0.87
Allergan plc	S&P500	0.73	0.56
Hikma Pharmaceuticals plc	FTSE Allshare	0.73	0.86
Teva Pharmaceutical Industries Limited	Tel Aviv 100 / TA-100	0.49	0.44
Mylan Inc	S&P500	1.11	0.87
Hospira Inc. (A Pfizer company)	S&P500	0.77	0.82
Mean		**0.80**	**0.74**

Source: CMA calculation

Arguments made by the Parties on beta estimation that the CMA does not accept

4.65 The Parties have made the following representations on the CMA's approach to beta estimation set out in the 2017 SO:

a) Advanz submits that care should be taking in identifying an appropriate comparator set and that a wider range of comparators should therefore be examined.[45]

b) Advanz submits that certain of the stock market indices used to estimate beta were inappropriate.[46]

c) Advanz submits that a Blume adjustment for the outturn beta estimates is required. A Blume adjustment relates to adjusting observed beta estimates upwards to account for the empirical observation that betas tend to 1 over time.[47]

4.66 In relation to the argument set out at paragraph 4.65(a) above, the CMA agrees that in principle a wide range of comparators is useful, where none of the comparators individually are perfect and there is therefore uncertainty in the estimate. However, Advanz proposes introducing firms with a wider range of business models and systematic risks than the CMA's data set.[48] This is evidenced by the fact that:

[45] Document LIO6361.3, First FTI Report, paragraph 6.20.
[46] Document LIO6361.3, First FTI Report, paragraph A2.16.
[47] Document LIO6361.3, First FTI Report, paragraph A2.17.
[48] Document LIO6284.83, *'FTI Report Evidence Item-41 - My WACC Model'* – 'Beta' tabs.

a) The range in monthly equity beta estimates in Advanz's additional data set is 1.66 compared to the range in the CMA's data set being 0.58.[49]

b) 17 out of the 19 additional firms included in Advanz's beta analysis were not used by Advanz or its internal advisers when benchmarking Advanz against its peers.[50]

4.67 Therefore, while Advanz's analysis widens the data set, the CMA does not consider that the analysis makes the beta estimate more robust. In any event, as explained in paragraph 4.63 above, the CMA adopts the wider beta estimate range suggested by HgCapital and Cinven.

4.68 In relation to the argument set out at paragraph 4.65(b) above, the CMA considers that the alternative set of indices suggested by Advanz is not unreasonable. However, the results of beta estimation using Advanz's alternative approach are not materially different to the results from the CMA's analysis and therefore the CMA has continued to use its chosen set of indices.[51]

4.69 In relation to the argument set out at paragraph 4.65(c) above, the CMA accepts that there has historically been a debate around whether a Blume adjustment is required.[52] Blume proposed that an adjustment should be made to observed betas to reflect the observation that betas tended to 1 over time. The adjustment used is to take 66.7% of the observed beta and add 0.33 to that figure.

4.70 However, this trend towards 1 over time does not change the measurement of historical betas, and as such the CMA does not use a Blume adjustment in any of the analysis performed of betas when measuring actual historical betas. The CMA notes that other UK regulators do not use Blume adjustments in their economic cost assessments, either. In any event, the application of a Blume adjustment to the average equity beta of 0.76 from the CMA's analysis, would result in an adjusted equity beta of 0.84. The Blume-adjusted average

[49] Maximum less minimum observed monthly equity beta estimate - see CMA's WACC estimates.
[50] The beta estimates calculated for the two firms which were used in Advanz's internal benchmarking exercises, Valeant and Recordati, do not move the outturn average beta estimate outside the CMA's range of 0.7 to 0.9 (see paragraph 4.70 below). For consistency, the CMA further notes that Allergan was not used for margin benchmarking by Advanz or its advisers but is used by the CMA to estimate beta. The CMA considers that Allergan is still a relevant beta comparator, in particular given its focus on niche generics and sales in the UK and in Europe. The CMA considers that the acquisition of Auden Mackenzie made Allergan a more relevant comparator.
[51] Document LIO6284.83, *'FTI Report Evidence Item-41 - My WACC Model'* – 'Beta' tabs.
[52] Blume, M (1975), *'Betas and Regression tendencies', Journal of Finance*, Volume 30, pages 785-795. Albeit lower frequency sampling tends to mitigate the empirical issue that betas across the market are lower than 1 and lower frequency estimates are used in both the CMA's and FTI's analysis.

beta is therefore within the CMA's beta estimation range (see Table A4.6 below).

Conclusion on beta values

4.71 The CMA has assessed the beta values to use in its cost of capital assessment as shown in Table A4.6.

Table A4.6: Summary of beta values used in the CMA's cost of capital assessment

	Low	High
Equity beta	0.70	0.90

Source: CMA analysis.

4.72 These values reflect a range around the mean averages of the weekly and monthly equity beta estimates of the Beta Comparator Companies. The CMA notes that while a degree of judgement is required in assessing beta values, those shown in Table A4.6 are likely to favour Advanz since they are higher than the values used by Globalview Advisors in their valuation reports for Advanz.[53]

iv. Tax rate

4.73 The corporation tax rates applicable over the period are set out in Table A4.7.

Table A4.7: UK corporation tax rates

For years commencing 1 April	2009	2010	2011	2012	2013	2014	2015	2016	Average
UK corporation tax rate (%)	28	28	26	24	23	21	20	20	24

Source: HMRC.

4.74 For the purpose of estimating the WACC, the CMA uses an average of the tax rates over the period of 24%.

4.75 HgCapital and Cinven have both submitted that a separate WACC should be calculated each year, using the tax rate that prevailed during that year. [54]

4.76 As explained at paragraphs 4.37 to 4.41 above, the CMA does not consider it necessary to have separate WACC estimates for each year. Instead, the CMA uses the average tax rate of 24% in its 'low' case WACC estimate; and to test

[53] Document LIO1724, '*Mercury PPA Report.pdf*', page 59; document LIO1725, '*Amdipharm PPA Report.pdf*', page 67.
[54] Document LIO6259, First HgCapital CRA Report, paragraphs 132 and 133; document LIO6331, First Cinven CRA Report, paragraphs 97 and 118.

the impact of a higher tax rate on the outturn WACC, the CMA has used a higher tax rate of 28% in its 'high' case WACC estimate, in line with submissions made by HgCapital.[55]

v. Cost of debt

4.77 In order to assess the cost of debt, the CMA first observes the credit ratings of the Beta Comparator Companies. The CMA then observes the yield and spread on indices of corporate bonds with three to seven years to maturity and with equivalent credit ratings to the Beta Comparator Companies. The CMA looks at these indices as the maturity of bonds in these indices is comparable to the maturity of debt in issue from the Beta Comparator Companies.

4.78 By observing the typical debt financing costs for the Beta Comparator Companies it is possible to estimate the likely debt financing costs that Advanz would face since, as described in paragraphs 4.58 to 4.60 above, the CMA considers that the Beta Comparator Companies have a similar business risk profile.

Credit ratings of the Beta Comparator Companies

4.79 The credit ratings of the Beta Comparator Companies as of February 2017 are shown in Table A4.8.

Table A4.8: Credit ratings of the Beta Comparator Companies

	Credit rating		
Beta Comparator Company	**Moody's**	**Standard & Poor**	**Fitch**
Stada-Arzneimittel AG	NR	NR	NR
Allergan plc	Baa3	BBB	BBB-
Hikma Pharmaceuticals plc	Ba1	BB+	NR
Teva Pharmaceutical Industries Limited	Baa2	BBB	BBB
Mylan Inc	Baa3	BBB-	BBB-
Hospira Inc[56]	NR	NR	NR

Source: Bloomberg.

[55] Document LIO6259, First HgCapital CRA Report, Table 6.
[56] As of February 2017, when the CMA observed the credit ratings of the Beta Comparator Companies, Hospira was no longer an independent business as it was bought by Pfizer in 2015. The CMA does not consider it appropriate to take account of Pfizer's credit rating since it engages in a substantial amount of research and development and has greater reliance on branded drugs such that it is likely to have a different business risk profile to the Notional Company. See CMA WACC estimate.

4.80 There is some variation in credit ratings among the Beta Comparator Companies with the range extending from low investment grade (Teva and Mylan) to highly speculative grade (Hikma). Some of the Beta Comparator Companies are not rated (Stada, Hospira).

4.81 Where a company does not have a credit rating, its ability to access the debt capital markets may be restricted, which can in turn result in it making use of other forms of debt finance such as bank debt which may have a different cost. The CMA notes that Stada does not hold a credit rating but nonetheless has two bonds in issue.[57] The CMA therefore considers that it is reasonable to assume that a notional generics firm, in respect of the supply of Liothyronine Tablets, would be able to obtain debt finance at rates comparable to those implied by corporate bonds with credit ratings similar to those of the Beta Comparator Companies.

Corporate bond yields and spreads

4.82 To assess the cost of debt finance for a notional company operating in the UK generics sector (the **'Notional Company'**), the CMA observes the yield on indices of corporate bonds with credit ratings equivalent to those of the Beta Comparator Companies. In particular, the CMA observes the yield and spread on the following four indices:

a) Markit iBoxx GBP Non-Financials BBB 3-5 years and iBoxx GBP Non-Financials BBB 5-7 years (the '**BBB Indices**'), based on data covering the Infringement Period; and

b) Markit iBoxx GBP High Yield Corporates BB 3-5 years and Markit iBoxx GBP High Yield Corporates BB 5-7 years (the '**BB Indices**'). Data were only available for the period between January 2012 and April 2017 and therefore the CMA's analysis does not cover the whole of the Infringement Period. As explained in paragraph 4.88 below, to address the potentially higher cost of debt in the earlier part of the Infringement Period (which is not covered by the CMA analysis), the CMA uses HgCapital's upper end cost of debt of 8.6% as the input into its 'high case' WACC estimate.

4.83 In the 2017 SO, the CMA used a cost of debt (pre-tax, nominal) range of 4.3%–5.6%, based on the following evidence:

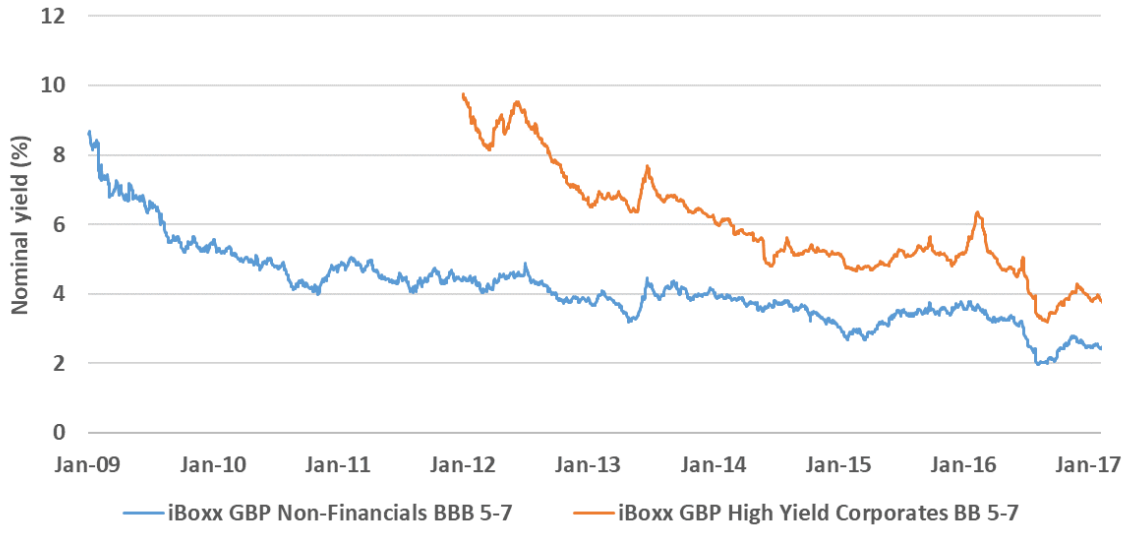
[57] Stada's bonds in issue are: a 300 million Euro denominated bond with a coupon of 1.75% issued in April 2015 and maturing in April 2022; and a 350 million Euro denominated bond with a coupon of 2.25% issued in May 2013 and maturing in June 2018. See CMA WACC estimate.

a) By taking the top of the range to be equal to the average of the yields on the BB Indices over the period January 2012 to April 2017; and

b) By taking the bottom of the range to be equal to the average of the yields on the BBB Indices over the Infringement Period.

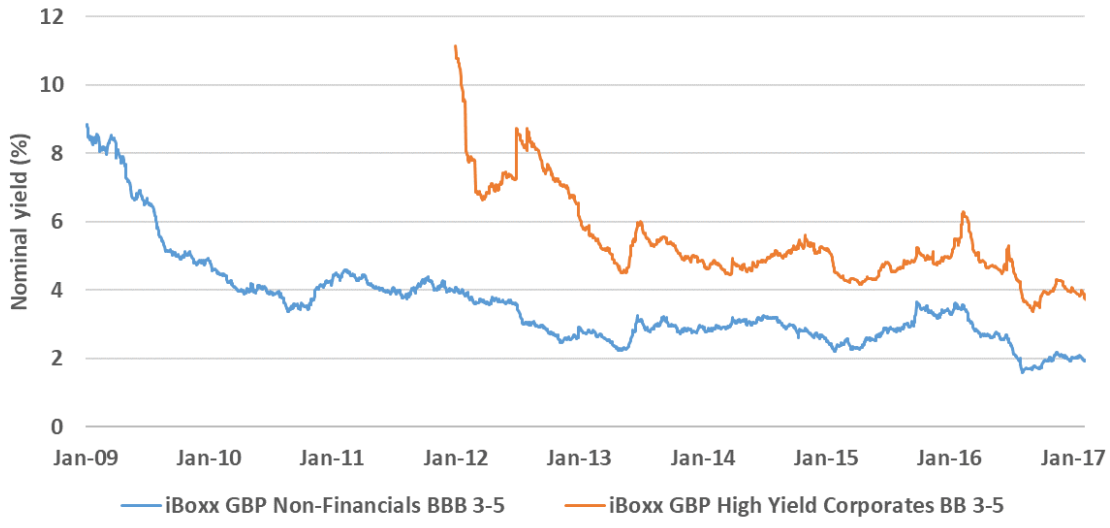
4.84 The CMA has considered the cost of debt for the Infringement Period by considering the nominal yield on BBB indices over the period January 2009 to April 2017 (for the 'low' case); and used the same basis for the 'high case', i.e. by taking the average yields on the BB indices over the period January 2012 to April 2017. Figures A4.12 and A4.13 set out the analysis in more detail.

Figure A4.3: Nominal yield on corporate bond indices with maturity of 5-7 years



Source: Markit.com, CMA analysis.

Figure A4.4: Nominal yield on corporate bond indices with maturity of 3-5 years



Source: Markit.com, CMA analysis.

4.85 The CMA observes that yields on the BBB Index have broadly been falling over the Infringement Period. Yields on the BB Index have also fallen over the period for which data are available, though data for the BB Index only began at the start of 2012 and therefore it is not possible to comment on the BB Index for the earlier part of the Infringement Period.

4.86 This approach results in a range for the cost of debt as shown in Table A4.9.

Table A4.9: CMA's range for the cost of debt

	Low	High
Cost of debt (nominal, pre-tax)	3.8%	5.6%

Source: Markit.com and CMA WACC estimate.

4.87 The Parties have made the following submissions in relation to the cost of debt:

a) HgCapital and Cinven submit that the cost of debt was higher in the period following the 2008 financial crisis. They suggest that the trend in cost of debt could be captured by having a separate WACC estimate for each year.[58]

b) Advanz submits that the upper bound of 5.6% does not properly reflect the higher cost of debt prior to 2012.[59]

c) All three Parties submit that an assumed credit rating of B or BB is more appropriate.[60] Advanz submits that this reflects Advanz's size and its actual credit rating from 2015 onwards (B).[61] HgCapital and Cinven suggest relying on the BB data alone, rather than the BB and BBB data combined, to address this issue.[62] Advanz suggests using an average of the yield data for bonds with a B rating.[63]

d) Advanz also submits that the yield on debt with a 10-year maturity is more appropriate for the period between January 2007 and July 2017 (as set out in the 2017 SO) than the CMA's approach of relying on maturities of three to five and five to seven years.[64]

[58] Document LIO6259, First HgCapital CRA Report, paragraph 132; document LIO6331, First Cinven CRA Report, paragraph 118.
[59] Document LIO6361.3, First FTI Report, paragraph 6.38(3).
[60] Document LIO6259, First HgCapital CRA Report, paragraph 133a.; document LIO6331, First Cinven CRA Report, paragraph 118.
[61] Document LIO6361.3, First FTI Report, paragraph 6.38(1).
[62] Document LIO6259, First HgCapital CRA Report, paragraph 133a; document LIO6331, First Cinven CRA report, paragraph 118.
[63] Document LIO6361.3, First FTI Report, paragraph 6.41.
[64] Document LIO6361.3, First FTI Report, paragraph 6.38(2).

4.88 The CMA's approach of using an average over the Infringement Period smooths over the changes in the cost of debt over the period. However, the CMA does not consider that this warrants a separate WACC calculation for each year in the Infringement Period because each input into the WACC is time varying and a matter of judgement to some extent. There is therefore uncertainty around the precise cost of capital figure. However, to test the impact of a higher cost of debt on the WACC estimate, the CMA uses HgCapital's high-end cost of debt estimate of 8.6% as an input into its 'high case' WACC estimate.[65]

4.89 The CMA also applies a sensitivity to the WACC using 15%, which is five percentage points above the CMA's base case. The CMA therefore considers that variations in macroeconomic conditions are captured within its analysis. It is therefore unnecessary to have separate WACC estimates for each year.

4.90 In relation to the argument set out at paragraph 4.87(c) above, the CMA does not agree that a sub-investment grade credit rating is necessarily appropriate for an efficient cost of capital estimate. The CMA notes that most of the comparator companies have an investment-grade rating, lending support to the view that an efficiently financed company would be unlikely to take on sub-investment grade debt.

4.91 In relation to the argument set out at paragraph 4.87(d) above, the CMA does not consider that the 10 years proposed by Advanz is the appropriate period over which to consider the cost of debt. The aim is to establish the expected cost of debt for a notional investor in a representative pharmaceutical business active in the generics sector in the UK. The relevant maturity is therefore the average maturity of debt used in UK generics, which is reflected by the three to five and five to seven year maturities used by the Beta Comparator Companies. Further, Advanz refinanced a number of times during the Infringement Period so assuming debt maturities between three to five and five to seven years seems reasonable.

vi. Gearing

4.92 In order to estimate the gearing that the Notional Company would have maintained over the Infringement Period, the CMA has looked at the capital structures of the Beta Comparator Companies. As described in paragraphs 4.58 to 4.60 above, the CMA considers that the Beta Comparator Companies face a similar business risk profile to Advanz with respect to the supply of Liothyronine Tablets in the UK.

[65] Document LIO6259, First HgCapital CRA Report, Table 6.

4.93 Companies will typically determine their capital structure in light of the business risk they face, with greater cash flow volatility typically leading companies to lower levels of gearing. Since the CMA considers that the Beta Comparator Companies face a similar business risk profile to the Notional Company, it is reasonable to assess the gearing of the Notional Company by reference to the gearing of the Beta Comparator Companies.

Table A4.10: Summary of gearing levels of the Beta Comparator Companies

	2009	2010	2011	2012	2013	2014	2015	2016	Mean
Stada-Arzneimittel AG	46%	48%	64%	53%	45%	56%	42%	37%	
Hikma Pharmaceuticals plc	11%	7%	22%	20%	10%	9%	10%	16%	
Teva Pharmaceutical Industries Limited	11%	11%	29%	33%	26%	18%	15%	49%	
Mylan Inc	42%	32%	36%	33%	34%	24%	23%	44%	
Hospira Inc. (A Pfizer company)	19%	17%	28%	28%	23%	15%			
Allergan	24%	14%	12%	38%	24%	19%	25%	35%	
Mean	**25%**	**21%**	**32%**	**34%**	**27%**	**23%**	**23%**	**36%**	**28%**

Source: Bloomberg.

4.94 While there has been variation in the level of gearing over time, there has been no clearly discernible trend. Indeed the gearing of some companies (such as Teva) increased over the period while others (such as Stada) decreased over the period.

4.95 There is significant variation in gearing levels between the different companies with some (such as Mylan) maintaining a higher level of gearing than others (such as Hikma). The CMA considers that this variation reflects investor risk appetite, as businesses with similar business risks may respond with different financing choices. For example, the management of one company may be more willing than the management of another to take on debt.

4.96 Therefore, the CMA considers that while it is informative to look at the gearing of each of the Beta Comparator Companies at different periods, it is important also to look at the average gearing level across the Beta Comparator Companies across the Infringement Period.

4.97 The CMA has therefore taken the mean annual average across the Beta Comparator Companies during the Infringement Period, in order to obtain a gearing level of 28% for the Notional Company.

4.98 HgCapital and Cinven have applied the same gearing assumption as the CMA. However, Advanz has submitted a lower gearing estimate, of 9.8-18.7%, based on the gearing in the wider range of comparator firms submitted by Advanz.[66] As explained at paragraph 4.67 above, the CMA concludes that that using this wider range of comparator firms is not necessary and has not therefore changed the gearing estimate of 28%.[67]

vii. Other arguments: Premia outside the CAPM framework

4.99 All three Parties have submitted that additional risk premia should be added to the WACC, as the CAPM does not capture certain risks. More specifically, the Parties have submitted the following:

a) Advanz submits that specific risk premia of 2% should be included, to allow for the possibility that certain of the cash flows associated with producing Liothyronine Tablets are subject to asymmetric risk. Advanz explains the rationale as follows:

> '…*comparing realised returns with an ex post cost of capital does not reflect the specific risks of failure of that investment. The existence of specific risk, in particular when considering a single product, means that actual realised returns may vary significantly from the ex ante expected return – which will reflect the weighted average of a number of possible scenarios. A similar variation is to be expected from the ex ante WACC absent an adjustment for specific risk*.'[68]

b) HgCapital and Cinven submit that both a small company and illiquidity premia (referred to as Discount for Lack of Marketability or DLOM) are required on top of the WACC, estimated using the CAPM. They submit that risks associated with lack of liquidity and investing in a small firm are in practice not diversifiable, as the CAPM assumes. They submit that a DLOM multiplier of 1.25 is required on top of a small company premium of 3.3% to 4.7%. These premia substantially increase HgCapital and Cinven's WACC estimates. By way of example, if no small company and liquidity premia are added to

[66] Document LIO6361.3, First FTI Report, paragraph 6.34.
[67] Nevertheless, use of 10% gearing, rather than 28% adds just one percentage point to the upper-end WACC estimate.
[68] Document LIO6361.3, First FTI Report, paragraph 6.45.

HgCapital's WACC estimate, the range of WACC in its *high*-case scenarios is 10.2% to 12.2%, compared to 17.7% to 20.4% with the premia applied.[69,70]

4.100 The CAPM assumes that risks are symmetrically distributed and that all risk is diversifiable, other than systematic risk. The CMA has therefore had to consider if the above risks might be overlooked within a CAPM framework.

4.101 In relation to Advanz's submission that a risk premium should be included in the WACC (see paragraph 4.99(a) above) to allow for asymmetric variation around the mean *ex ante* expected return, the CMA disagrees that an adjustment to the WACC is required. To the extent that such variations in *ex ante* expected returns are material, they are already captured in the CMA's analysis because:

a) A sensitivity analysis to the Cost Plus estimate is undertaken for a 15% WACC applied to investments in tangible and intangible assets. This is higher than the 14.1% WACC submitted by Advanz, which includes the specific risk premium.[71]

b) A sensitivity analysis on the cash flows associated with the Product Rights is undertaken to allow for an *ex ante* risk of failure in obtaining the Product Rights of 67% (increasing the value of Product Rights from [✂] to £2.1m).[72] This already captures the specific risks of failure associated with investing in the supply of Liothyronine Tablets.

c) Prices are only found to be excessive where they are materially above Cost Plus. This allows for the possibility that firms may make *ex post* returns that are higher than the CMA's WACC and therefore the mean *ex ante* expected return.

4.102 In relation to the argument set out at paragraph 4.99(b) above, the CMA recognises that despite it having no basis within the CAPM model, some practitioners include company-specific premia when estimating discount rates. However, estimating a discount rate for appraising a project is different to estimating an efficient cost of capital. When estimating a discount rate for appraising an investment, practitioners can choose to build in additional premia to add a hurdle rate on top of the efficient cost of capital.

[69] Document LIO6271, '*CRA_CostofCapital_Hg_Forest*' - 'Sensitivities' tab, with DLOM and small company premium set to CMA scenarios. 10.2% is the outturn WACC in 2012 and 12.2% is the outturn WACC in 2010. Document LIO6259, First HgCapital CRA Report, Table 6, sets out HgCapital's high end WACC estimates with the premia applied.
[70] Advanz did not include a size premium but noted that its WACC estimate may therefore be conservative. Document LIO6361.3, First FTI Report, paragraph 6.11.
[71] Document LIO6361.3, First FTI Report, Table 6-4.
[72] Probability of success of 33%.

4.103 Further, a number of academics in the field of corporate finance reject the use of small company premia on the basis that historical evidence, especially in the period since the 1980s, does not support the existence of higher returns on smaller firms (see for example, Damodaran (2015)[73] and Cochrane (2005)[74]). Damodaran states:

> '*I argue that these practices are misguided because the small cap premium is no longer supported by the historical data, does not seem to be priced in by investors in markets today, and is based on faulty intuition.*'[75]

viii. Overall assessment of WACC

4.104 The CMA has set out in the preceding sections the approach it has taken to determining the various elements of the cost of capital. The CMA has then combined these elements using the CAPM (to determine the cost of equity) and the standard calculation of the WACC.

4.105 The results of that calculation are shown in Table A4.11. The results are presented as a range in recognition of the fact that determining the cost of capital requires a degree of judgement.

Table A4.11: Summary of the CMA's assessment of the cost of capital

	Low	High
Cost of equity		
- Nominal risk-free rate (%)	3.0%	4.4%
- Equity risk premium (%)	5.2%	6.5%
- Equity beta	0.70	0.90
- Tax rate (%)	24%	28%
Pre-tax, nominal cost of equity (%)	8.7%	14.2%
Cost of debt		
Pre-tax, nominal cost of debt (%)	3.8%	8.6%
Gearing		
Gearing (%)	28%	28%
Outturn		
Pre-tax, nominal WACC (%)	**7.4%**	**12.7%**
Note: The figures in this table are based on data from the CMA's WACC model and have been rounded to one decimal place. The 'low' and 'high' WACCs, if calculated on the rounded inputs, will lead to small rounding errors of 0.1% (i.e. the WACC range would be from 7.3% to 12.6%). This has no bearing on the CMA's WACC of 10%.		

Source: CMA WACC estimate.

[73] Damodaran, A., 2015. The Small Cap Premium: Where Is the Beef?. Business Valuation Review, 34(4), pp.152-157.
[74] COCHRANE, J., 2005. Asset Pricing, revised edition. Princeton: Princeton., page 452.
[75] Damodaran, A., 2015. The Small Cap Premium: Where Is the Beef?. Business Valuation Review, 34(4), pp.152-157.

4.106 The CMA's WACC estimate range is between [✂] and 12.7%. Based on this assessment, the CMA uses a point estimate WACC of 10%, which is the midpoint of the CMA range, for the purposes of Cost Plus. As a cross-check, the CMA has carried out a sensitivity using a WACC of 15%, which is above the CMA's 'high case' estimate and higher than most of the WACC estimates set out in Advanz's internal documents.