



Vodafone's response to Ofcom's consultation

"Annual licence fees for 900MHz and 1800MHz: methodology to derive a discount rate consistent with CPI inflation"

May 2014

Non-confidential version

Executive Summary

Vodafone welcomes the opportunity to respond to this consultation. On the face of it the consultation is concerned with a simple and relatively minor mechanical conversion from one inflation base to another merely as an adjunct to the wider issue of the setting of annual spectrum licence fees contained in the previous consultation in October 2013¹. In practice, however, the outcome of the present consultation is a very material contributor to the setting of the level of the annual spectrum licence fees and is thus of considerable significance to the mobile industry.

The proposal originally made by Ofcom in October 2013 represented a potential outpayment by industry of £7.9bn over 20 years, when using the discount rate and inflation rate proposed². On a similar basis the present consultation suggests a total outpayment of £8.4bn over the same period, i.e. £500m more.³ This matter is of particular concern to the mobile industry since unlike wholesale regulation, whose primary focus is with the level of transfer of funds **inside** the telecoms industry, annual licence fees represent sums that will be taken **out** of the industry.

There is a clear onus upon Ofcom to act in a commensurately rigorous way when setting the level of spectrum fees. This is because the risk of unnecessarily high spectrum fees raises the spectre of reduced investment and innovation on the part of licensees that ultimately operates to the detriment of the subscribers that they serve. The issue of converting a lump sum into annual payments deserves significantly more detailed consideration than Ofcom has given it in the current consultation.

Vodafone does not agree with the proposed outputs of this consultation. Whilst we support the need for the proposed switch from RPI to CPI in the annualisation calculation, this is a change that would raise considerable difficulties in the event that Ofcom were to use a WACC based discount rate. Our conclusions are:

1. The most appropriate discount rate to be used in the annualisation of a lump sum spectrum valuation is a real cost of debt measure. This rate will make an operator indifferent between an up-front payment or a payment in annual instalments. This rate can be calculated for CPI very simply from a nominal cost of debt in the manner that we suggest in this document. This approach does not require a view to be taken on the size of the RPI-CPI wedge.
2. In the event that Ofcom were to erroneously use a WACC as the discount rate, then estimating a CPI based real WACC would be a new exercise for Ofcom. The method Ofcom suggests of translating and reinterpreting an old MTR RPI based WACC from 2011 is wrong. Ofcom would need to assemble a purpose written CPI based real WACC from first principles and populate it with current input values, but has, as yet, not done so.

¹ Ofcom, Annual licence fees for 900MHz and 1800MHz spectrum, October 2013

² Using Ofcom's lump sum values, a 4.2% discount rate assessed using WACC and 2.5% inflation, as per the Excel workbook supplied with the October consultation

³ Using a 5.5% WACC based discount rate and 2.0% inflation

3. Even if Ofcom were to choose to retain RPI, accepting the difficulties that this may cause in the future, and attempt to use WACC as the discount rate, it would still need to develop a current real RPI based WACC for the present purpose, given that the 2011 MTR WACC is more than three years out of date. Ofcom has not, as yet, done this.
4. Mobile operators will be exposed to inflation forecast risk if annual payments are allowed to rise by unrestricted actual inflation outcomes – we suggest a ceiling is placed on the percentage increase that is applied annually.

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Summary and conclusions

At issue in the current consultation are two interlinked factors related to the planned switch from RPI to CPI as the relevant inflation factor:

- (i) the size/type of the real discount rate that will be used to determine how an assessed lump sum current value of spectrum can be converted into constant real annual payments to be made over the next twenty years by mobile operators; and
- (ii) the level of the inflation rate that should be used to calculate the annual increase of the outpayments.

The total cost of, and the range of, the alternative outpayments that could result from the annualisation of the Ofcom proposed lump sums are substantial: for example the October consultation suggested a 20 year industry outpayment of £7.9bn, whereas on a similar basis the present consultation suggests a total outpayment of £8.4bn over the same period, i.e. £500m more. We consider this in more detail in section 1 below.

Vodafone believes that the methodological and practical issues raised by the present consultation only serve to confirm our previously expressed view⁴ (and that of other mobile operators) that any proper conversion of the Ofcom assumed lump sum⁵ to annual payments via a discount rate should use a cost of debt measure. This best reflects the position sought by Ofcom of equivalence between a lump sum value/payment and annual fees – i.e. where the mobile operator is indifferent between the payment of a lump sum and payment by annual fees. A CPI based real cost of debt is straightforward to estimate and has the advantage that a view on the appropriate size of the CPI-RPI wedge is not needed at all. Our first preference is for such a rate to be set using Vodafone specific cost of debt information; failing that, an industry measure could be adopted. We discuss this further in section 2 below and in the Oxera paper that forms part of our response.

If however, despite the strong arguments in favour of the use of cost of debt as the discount rate, Ofcom were to consider the use of a WACC based rate, then given the scale of potential impact, the proper derivation of a CPI based real WACC requires and deserves a more rigorous approach using up-to-date information – this has to date not been conducted by Ofcom, and therefore stakeholders have not had the opportunity of examining such an exercise. A suitable CPI based real measure should be developed from the ground up from the best available current information, rather than adapted from an out of date measure derived for a different purpose (namely a 3 year old MCT

⁴ Vodafone response to October consultation, section 6.1.1 and annex 12

⁵ The issue as to whether Ofcom's lump sum values from October 2013 are the correct values to be used in the annualisation calculation is outside the scope of the current consultation – they are used here without endorsement simply for illustrative purposes to highlight the materiality of the issues in this consultation

calculation)⁶. This would involve a detailed examination of all the myriad constituent elements of the WACC calculation⁷. Ofcom has as yet not attempted such an exercise in the context of spectrum licence fees or proffered its view of the current values for such parameters, so we have not had sight of the outcome of any such calculation, but we would suggest that the general direction of travel compared with the 2011 values is clearly downwards⁸. As detailed further below and in the accompanying report from Oxera a more appropriate, and purpose built real CPI based WACC discount rate informed by current parameter values is likely to yield a significantly lower level of outpayments than those suggested above. We consider these issues in more detail in sections 4 and 5 below.

There is a further issue that needs to be considered – that of the risk of the forecast inflation being adopted into the discount rate calculation being different from the actual outcome that is applied to increase the annual outpayments. So if for example the CPI target of 2.0% were to be adopted in the discount rate calculation and the real outturn were to be an average of 2.5%, then mobile operators will pay significantly more than Ofcom intended, even under a cost of debt based discount rate.

If Vodafone is required to take such an inflation risk then we are taking a risk which cannot be managed through our approach to financing, and therefore we cannot be truly indifferent. As we discuss in section 3, we see two possible ways to resolve this issue:

- Apply the 2% target into the discount rate calculation but apply as an annual uplift factor the lower of the 2% target and the actual recorded CPI outcome; or
- Apply a constant inflation factor such as 2% into the both parts of the calculation⁹, irrespective of the actual recorded CPI outcome.

As we noted in our previous submission in January, given the materiality and range of the potential new exposure for spectrum licensees, there is a clear onus upon Ofcom to act in a commensurately rigorous way when setting the level of spectrum fees. This is because the risk of unnecessarily high spectrum fees raises the spectre of reduced investment and innovation on the part of licensees that ultimately operates to the detriment of the subscribers that they serve. This principle of ‘double proportionality’ logically encompasses the methodology adopted by Ofcom to determine the discount

⁶ Any decision on the lump sum value of spectrum that is appropriate to a 20 year initial licence period must be one that is made prospectively at the point when the final ALF statement is published – we assume that this will occur during 2014. Thus it follows very clearly that any calculation annualising the lump sum over 20 years must use a discount rate that is relevant at that point in time, rather than one that was relevant for a different purpose in March 2011, more than three years earlier

⁷ A similar consideration obviously also applies in the event that Ofcom were to retain RPI and apply a WACC based discount rate – Ofcom would in this circumstance need a current 2014 RPI based real WACC, rather than a 2011 version

⁸ We note in passing the 2014 CC decision on the Northern Ireland Electricity Price Determination, which gives weight in its cost of capital assessment to contemporary market evidence

⁹ I.e. in both the calculation of the real rate and in the annual uplift factor

rate and the inflation rate applicable to spectrum fees annually. There is, unfortunately, no evidence, based on this relatively meagre consultation document that Ofcom has taken into account this necessarily high standard of proof.

The rest of this document and the accompanying Oxera paper that also forms part of our response considers these matters in more detail.

Section 1 sets out the quantification of some of the alternative outcomes of the consultation;

Section 2 considers the calculation methodology for of a real CPI based cost of debt measure and its use as the discount rate in the present context;

Section 3 examines the issue of inflation risk;

Section 4 considers the problems of Ofcom's suggested real CPI based WACC measure and examines what a properly constructed CPI based WACC measure would require; and

Section 5 looks at the likely level of the CPI-RPI wedge, an assessment that is only needed if a WACC discount rate were to be pursued.

The Oxera paper also discusses these arguments, specifically the appropriateness of a cost of debt measure and the simplicity of developing a CPI based real cost of debt rate, the difficulties and problems the CPI based real WACC formulation presented in the current consultation, and the likely size of the CPI-RPI wedge.

Section 1: The impact on ALF payments of the proposed changes in this consultation

Ofcom in the consultation suggests that if CPI is to be used as the measure of inflation that, on a forward looking basis, is to be applied to annual spectrum payments (and Vodafone agrees that it should), then the initial year 1 payment should be calculated from a CPI based real rate, rather than by means of the RPI based real rates that Ofcom has developed in the past for use in telecoms charge control regulation. This would appear to be a non-controversial starting point.

However since Ofcom's existing work on cost of capital for regulatory purposes uses¹⁰ a real rate that is developed from RPI measures of inflation, then such existing RPI based measures are not capable of being used in the present context directly. Rather than develop a purpose built CPI based measure from first principles using current data, Ofcom has proposed in the current consultation to adapt the WACC calculation from the 2011 MTR statement (only otherwise changing it for corporation tax rates) and then to carry out proposed translations between the previously developed RPI based real rate into a CPI based real rate. The consultation attempts this for the three different measures of discount rate that have been suggested by different parties. All are expressed as in post-tax real terms and all have been generated from the WACC in the 2011 MTR statement:

- WACC from RPI real of 4.1% (in October 2013 this was suggested by Ofcom to be 4.2%) to CPI real of 5.5%;
- Cost of debt from 1.7% RPI real (in October 2013 this was implicitly suggested to be 1.9%) to CPI real of 3%; and
- Risk-free rate from 0.6% RPI real (October 2013 implied 0.7%) to CPI real of 1.9%;

We can attempt to quantify the implications of some of these differences. We note at the outset that Vodafone has already made clear in its response to the previous ALF consultation our very strong belief that Ofcom's view of the lump sum values of £25m per 1MHz of 900MHz spectrum and £15m per 1MHz of 1800MHz spectrum represents a very significant overstatement. However the size of the initial lump sum of spectrum value is out of the scope of the present consultation, and for simplicity we adopt without endorsement Ofcom's £25m/£15m lump sum values in any illustrative calculation of the implications of alternative discount rate/inflation assumptions in this response.

Ofcom supplied as part of the October 2013 consultation an Excel workbook that converts on a per MHz basis a lump sum of £25m for 900MHz and £15m for 1800MHz, and applies a tax adjustment (intended to equalize annual with lump sum tax treatment). It is straightforward to extend this calculation over 20 years using the matching assumed inflation rate and to apply it across industry using the total relevant volume of spectrum (2*34.8MHz for 900MHz and 2*71.6MHz for 1800MHz).

¹⁰ Where a real rate is required

Cost of debt

Vodafone's view as discussed in our previous consultation response¹¹ is that the only way to correctly achieve Ofcom's objective of equalisation between the alternative outflows of a lump sum and annual payments is to use a cost of debt measure as the discount rate. To quantify the impact of such a measure:

- If Ofcom's apparent current view of the real cost of debt of 3.0% with a 2% CPI from the present consultation were to be applied, with no tax adjustment, then the total outpayments over 20 years would be £6,166m¹².
- Ofcom's previous view of the post-tax cost of debt was 1.9%¹³ with 2.5% inflation - this would have resulted in total outpayments of £5,616m¹⁴.
- Vodafone's current best view of an appropriate real CPI industry cost of debt, as discussed in section 2 is 1.4% with 2% CPI¹⁵ – this would give total outpayments of £5,359m. A Vodafone specific real cost of debt on the same basis would be less than this, potentially at 0.5% - this would give total industry outpayments of £4,964m.

These different formulations of a cost of debt discount rate thus result in very material differences in the level of total outpayments that might be imposed on the mobile industry.

WACC

Similarly for WACC:

- In the October 2013 consultation Ofcom suggested the use of a post-tax real WACC of 4.2%, and a likely RPI of 2.5%. This would involve a total undiscounted industry outpayment for years 1-20 of £7,891m.
- In the present consultation Ofcom is now suggesting a post-tax real WACC of 5.5% and a likely CPI of 2.0% - this would result in a total industry payment of £8,365m, an increase of £474m.
- We explain in section 4 below that this 5.5% is not a proper interpretation of the 2011 MTR WACC, and that application of the method Ofcom advocates for translation between RPI and CPI more reasonably produces an output of 4.7%.

¹¹ In section 6 and in annex 12

¹² We explained in our previous response in section 6.1 that Ofcom's proposed tax adjustment, even if it were to be thought theoretically correct, becomes negligible when properly modelled, particularly in a cost of debt discount rate calculation

¹³ This was not formally supplied in the October consultation, but can be calculated from the recorded 4.43% nominal rate to have implicitly been 1.9%.

¹⁴ With no tax adjustment

¹⁵ This is based on January 2014 data, so would need refreshing at the date of the final Statement

On a 20 year basis, a 4.7% discount rate would give a total outpayment of £7,815m, i.e. £550m less than Ofcom's faulty calculation of 5.5%.

We also discuss in section 4 that given the materiality of the decision, if it were deemed necessary to use a WACC based CPI real measure for the discount rate, then it would be appropriate to develop a contemporary CPI based real WACC from first principles, rather than attempt to update/translate an out of date measure created for RPI purposes. Whilst this is not simple exercise, we are confident that such a measure, given the direction of the cost of capital since 2011, would yield a discount rate lower than the rates discussed above, and thus also a lower total outflow.

Summary

These alternative outcomes exhibit a very substantial range of the resulting total cash outpayments from the mobile industry, both inside a particular discount rate method and between methods. There is clearly in any event a very material amount of additional liability facing spectrum licensees resulting from Ofcom's questionable approach to real discount rates. Given that these levels of outpayments raises the spectre of a diversion of resource away from welfare enhancing investment decisions, Ofcom is obliged to satisfy itself and the licensees it regulates that it has adopted a methodology that is capable of generating reliable outputs that do not result in an unnecessary transfer of resource away from the mobile industry with no offsetting benefit.

Put simply, given the amounts at stake, the topic merits rather more than the cursory high level overview and analysis that is contained in the current 17 page consultation. Ofcom is simply not in a position to state that it has realised its wider, overarching duties to promote the interests of consumers when setting these spectrum fees.

Section 2: The real cost of debt

We discussed in our previous consultation response that the appropriate measure to be used as a discount factor is the real Vodafone (or as an alternative industry) cost of debt¹⁶. We still consider this to be correct. Our consideration in this consultation is with the straightforward way such a measure can be derived under CPI, as opposed to the difficulties Ofcom is faced with a real CPI based WACC. It is not necessary to calculate a WACC to arrive at a cost of debt measure.

In its WACC calculations, where obviously a cost of debt formulation is an interim step, Ofcom has generally arrived at its estimation of the nominal cost of debt by a roundabout route of determining a risk free rate, adding a value for inflation to reach a nominal risk free rate, and then adding a debt premium, before removing the same measure of inflation when necessary to reach the real cost of debt. Ofcom is proposing

¹⁶ In section 6.1.1 and annex 12 of the Vodafone response to the October 2013 consultation

in the present consultation to extend this approach to develop a different real cost of debt under a different inflation measure. But given that some of the elements of this calculation were made (in 2011 or prior) in the context of an RPI inflation assumption and the desired measure of inflation is CPI requires further assumptions about the size of the CPI-RPI wedge to be used in the specific translation. This adds further steps and further uncertainties to the overall calculation.

Furthermore, as we discuss in section 4 below, it would quite simply be wrong to use the potentially now out of date cost of debt calculation derived as a component of the 2011 MTR RPI based WACC to be the source of a standalone real CPI based cost of debt measure in 2014, without extensive review and potential revision.

There is a better way, however, as Oxera discusses in section 3 of the attached document. It is perfectly possible to take a much simpler approach that avoids many of these complications and estimation uncertainties. One can straightforwardly obtain a representative company specific or industry specific nominal cost of debt and simply discount this by the relevant inflation factor, in this instance CPI. The result can be interpreted as the real CPI based cost of debt.

Ofgem has used an analogous approach to determining the cost of debt for the energy network industry¹⁷, by taking an estimate of the appropriate nominal rate and removing inflation. In detail there are two differences, in that a different measure of inflation (RPI) was removed and the nominal cost of debt has been developed as a weighted historic average, but the same overall approach applies. In the present circumstances, as we have argued previously¹⁸ the need to establish indifference between a current lump sum payment and a future stream of annual payments suggests the use not of historic averages of the cost of debt such as used by Ofgem, but rather a current spot rate.

Oxera in its report that formed part of the Vodafone response to the October 2013 consultation suggested that an appropriate post-tax RPI based real cost of debt could be 0% to 0.7%. In its latest report in section 3 Oxera states that using January 2014 data, the appropriate industry real CPI based cost of debt should be 1.4%, and the Vodafone specific rate would be 0.5%. Clearly these rates are only indicative - the cost of debt calculation will need to be revised at the date of the final ALF Statement.

Section 3: The inflation factor to apply to increase the annual payment

Vodafone's principal concern that led to suggesting the use of the CPI rather than the RPI measure for inflation was the risk that over a 20 year period, the RPI measure might cease to be published, or even if it were to continue to be published, might cease to be a usable and robust measure, given its recent demotion in status from a national statistic and the accompanying uncertainty as to how the measure will continue to be

¹⁷ As a component in the RIIO price controls

¹⁸ Vodafone response to October consultation, annex 12

updated in the future. This concern remains, and we continue to believe that the CPI is the better measure to use.

We agree with Ofcom's approach of setting a constant real rate of annual payments. In theory, assuming that the level of inflation to be adopted in any cost of capital measure is a reliable and usable forecast, as opposed to being simply a target, we could be relatively indifferent to the actual measure used, provided its provenance could be understood and it was coherently calculated. For illustration if the nominal cost of debt were to be found to be 4%, then a real cost of debt of 1.17%¹⁹ with 2.8% constant annual compounding would give the same NPV from a stream of future annual payments as a real cost of debt of 1.96% with 2.0% constant annual compounding. Setting aside any issues with the tax adjustment (after factoring in the tax implications of the interest payments necessary to service the lump sum), both would be equivalent to the payment of a lump sum now.

Nevertheless, whilst we have sought to respond to Ofcom's specific consultation question of how to apply a CPI deflator, our indifference relies on the choice and reliability of the value forecast for CPI.

A problem however lies in the fact that as is discussed in the Oxera report in section 5, a CPI of 2% is a Bank of England target, and not a robustly derived forecast of the likely average outcome. Historically it is clear that the target has been exceeded, both in detail and in average – this may not be an unrealistic expectation of the future outcome as well. But if for example the real CPI based discount rate were to be calculated using the 2% target and the actual outcome were to be 2.5%, then the initial payment would have been set too high to be consistent with an annual compounding of 2.5%. In this example, assuming a 2% CPI based real cost of debt from the example above, (based on a 2% CPI), then the industry payments would be £5,668m if the actual CPI annual uplift were to be 2%²⁰, but £5,959m or £291m more if the actual annual uplift were to turn out to be 2.5%.

If Vodafone is required to take a CPI risk then we are taking a risk which cannot be managed through our approach to financing, and therefore we cannot be truly indifferent. We see two possible ways to resolve this issue – both use the inflation factor used in the discount rate calculation as a ceiling to the annual increase to be applied:

- Apply the 2% target into the discount rate calculation but apply as a compounding factor the lower of the 2% target and the actual recorded CPI outcome, or:
- Apply a constant inflation factor such as 2% into the both parts of the calculation²¹, irrespective of the actual recorded CPI outcome.

¹⁹ To 2 decimal places

²⁰ On the basis that the tax adjustment is no longer being applied

²¹ I.e. in both the calculation of the real discount rate and in the annual uplift factor

Section 4: The calculation of a CPI based real WACC

There is general regulatory consensus about the use of the CAPM to derive a WACC, but there are several different approaches as to how to derive a real WACC from the key subordinate measures of the cost of equity and the cost of debt. Each regulatory decision that Ofcom has made in the past that has made use of a WACC, for mobile or for fixed operators, has included at both the consultation and the Statement stage a detailed evaluation and update of the appropriate level of each of the individual building blocks of the WACC calculation, i.e.:

- the real risk free rate,
- the level of inflation,
- the nominal risk free rate,
- the cost of debt premium,
- the equity risk premium,
- the industry beta,
- industry gearing

The overall Ofcom method calculates a nominal cost of debt and a nominal cost of equity as interim steps and thus also allows as a by-product the calculation of a real cost of debt and a real risk-free rate. (Both of these are alternative discount rate measures that have been suggested in the responses to the October 2013 consultation as being suitable for converting the spectrum lump sum value into annual outpayments – although as we have discussed in section 2 above there is a far superior way to more directly derive a CPI based real cost of debt.)

The WACC method employed in the MTR statement is methodologically the same as that adopted for other telecoms regulation, for example in the cost of capital calculations that have been performed for BT wholesale regulation – such calculations therefore share several common inputs with the MTR calculation. Some WACC calculations in respect of fixed market reviews have obviously been performed by Ofcom since the 2011 MTR determination, with some of the common parameters being adopted being different in value from the 2011 assumptions. For example the fixed access market review consultation in July 2013 used a risk free rate of 1.3% rather the 1.5% of the MTR in 2011.

In previous consultations and statements where WACC is a relevant component, Ofcom has expended considerable resources on estimating the cost of capital. So for example the 2011 MTR statement considered the cost of capital over 25 pages – and this was following on from a 30+ page analysis in the 2010 MTR consultation, including a specially commissioned study published in December 2009 on mobile industry betas. The fixed access market review consultation of July 2013 devotes 80 pages, including a March 2013 report on BT's beta, commissioned from the Brattle Group to update their previous view from July 2011, i.e. less than 2 years earlier.

For the ALF consultation however, despite the materiality of the sums resulting from the discount rate adopted, the subject of the level of the WACC was considered in less

than two pages in the previous consultation and four in the present one. The paucity of the examination in the previous conclusion was partly as a result of the fact that Ofcom considered the relevant time point for assessing the level of WACC to be adopted in the annualisation calculation was no later than December 2012:

“5.72 We have reviewed whether we should update the parameters used in the main assumptions and found no material change in circumstances, for the majority of parameters, from those estimated in March 2011 and the WACC estimated prior to bidder applications being submitted in December 2012. We consider that the date on which the bidders estimated the value of the 4G spectrum is important as we are using the auction prices as an important source of evidence to inform our estimate of the lump sum value.”

This is wrong because any decision on the lump sum value of spectrum that is appropriate to any 20 year initial licence period must be one that is made prospectively at the point when the final ALF statement is published – we presume that this will occur later in 2014. Such a position is entirely logical since an approach that was based on facts from three years ago would be ossified and entirely incapable of taking into account all relevant changes in facts and circumstances since 2011 that may be relevant to the level of *future* value of spectrum. Thus it follows very clearly that any calculation annualising the spectrum lump sum over 20 years must use a discount rate that is relevant at the point in time when the lump sum is determined, rather than one that was relevant for a different purpose in March 2011, more than three years earlier.

But that is only part of the problem - what in effect Ofcom is proposing to do in the present circumstances is not only to use what is an old and potentially out of date result, but also to attempt to adapt the 2011 RPI based method derived for the purpose of a 4 year RPI based charge control and superimpose a CPI adjustment on it in a manner that lacks intellectual rigour. The correctness of this translation and reinterpretation approach is only considered by Ofcom in a very brief mechanistic manner in the present consultation. This is totally inadequate in the context of a decision that as we showed above has so substantial a cash outflow dependent on it.

When, as in the past WACC calculations, only one measure of inflation has been used throughout the calculation, the choice of method and the order of calculation has been relatively unimportant to the overall real result. The previous 2011 method weights together (using a measure of gearing) the two separate measures of the nominal cost of capital, i.e. the cost of debt and the cost of equity, adjusting the cost of tax for the level of taxation to obtain a post-tax weighted average cost of capital or WACC, calculated on a nominal basis. As a final adjustment this nominal rate is then discounted by inflation to produce a real rate.

Ofcom's conventional approach has thus been to use a measure of inflation to develop these nominal measures for both the cost of debt and the cost of equity to derive a nominal WACC, and then when necessary to discount this nominal measure by the same inflation value to derive a real WACC. In these circumstances the real WACC outcome is relatively insensitive to the size of the measure of inflation that is first added

to and then removed from the calculation (although strictly speaking perhaps the method ought to be totally insensitive to it).

The co-existence of two alternative measures of inflation inside the same WACC calculation however, is not something that Ofcom has previously addressed, and it is not at all clear that the historic methodology can adequately deal with it. In particular we consider erroneous the extraction in the present consultation of a 5.5% post tax CPI based real rate from the 2011 MTR WACC assessment – on the face of it a 4.7% outcome would be suggested by the 2011 calculation.

Ofcom suggests that its approach to translate a nominal rate to a real one is to discount by the appropriate measure of inflation. In paragraph 3.182 of the FAMR July 2013 consultation Ofcom states:

“for real cost modelling – when a real cost of capital is required – the real cost of capital can be obtained from this nominal cost of capital by either deflating the nominal WACC by RPI (for an RPI real terms model) or by CPI (for a CPI real terms model)”

This argument is then repeated in paragraph 4.1 of the present consultation:

“Our proposed approach for deriving the real discount rate would be to deflate the nominal discount rate by CPI inflation, using the formula $((1 + \text{nominal discount rate}) / (1 + \text{inflation rate})) - 1$.”

But this is not what Ofcom has actually done. It has not taken from the March 2011 consultation the nominal cost of debt of 5.5% and the nominal cost of equity of 7.8%, to arrive at a nominal post tax WACC of 6.8%²² (the 2011 calculation came to a result of 6.7% with a slightly different CT rate) and then from this discounted by CPI. Had Ofcom done this it would have reached a real post tax CPI based rate of 4.7%. The Oxera paper that is part of our response considers this in section 2.

Rather Ofcom has first assumed the appropriateness of two completely different and significantly higher values than were actually made in the 2011 estimation of the nominal cost of debt and the nominal cost of equity of 6.35% and 8.65% respectively, and as a result calculated a completely different, and higher nominal post tax WACC of 7.6%, before deducting the CPI to arrive at a real post tax CPI based rate of 5.5%. We do not consider this approach of assuming the validity of totally different and significantly higher nominal rates to be a justifiable use of the outputs of the 2011 WACC calculation, particularly as our view is that the general direction of discount rates since 2011 has been in the opposite direction.

The difference between these two discount rate outcomes is not insignificant – as we showed in section 1 above a real discount rate of 5.5% produces with 2% annual compounding, total industry 20 year outflows of £8,365m, whereas a real rate of 4.7% with the same 2% annual increases gives £7,815m, or £550m less.

²² Via a gearing of 30% and the latest corporation tax rate

As we discuss in section 2 above, much of this methodological difficulty is avoided if Ofcom accepts Vodafone's approach that a real CPI based cost of debt is the most appropriate discount rate to be used to derive an annualisation of payments where operators are indifferent between the lump sum payment and annual outflows. This method needs far fewer input parameters than a complete real WACC calculation. However, given the materiality of the sums involved, if Ofcom were to consider that it needed to calculate a CPI based real WACC for the purpose of setting annual spectrum fees, then it is necessary that Ofcom should use a purpose built CPI based real measure assembled from first principles from the ground up. It may very well be that the approach that Ofcom has previously used to develop a RPI based WACC rate should change somewhat when a CPI based rate is required. Such a measure should use or specifically generate current estimates of those input parameters that are determined to be necessary to the method adopted.

The need in any such WACC calculation is to assemble from current data not only the exogenously derived real CPI-based measure of the cost of debt (most simply achieved using the method suggested in section 2 above) but also an equivalent measure for the cost of equity, and an updated gearing calculation, rather than adopting and adapting a set of parameter values that was created some years ago for an RPI based method. Ofcom's existing RPI based WACC methodology will need at least some revision. It is not at all clear that the best way to create a CPI based real rate is always to calculate a RPI based nominal rate, and then attempt to translate this to CPI. This is an issue that awaits further examination (and discussion with stakeholders) – as also is the related question as to how essential a view on the size of the RPI-CPI wedge actually is for a purpose written bottom up CPI based calculation. Quite clearly however, any method that attempts to translate/reinterpret an old RPI based nominal rate into a current CPI based real rate is inevitably badly compromised. Given the materiality of the impact of this decision, it is just not appropriate to base a major element of the spectrum fee annualisation calculation on such an inadequate basis.

Given the issues above, the derivation of any such new WACC-based CPI methodology should, as a matter of law be subject to industry consultation before any decision about its usage is finalised; such consultation is consistent with basic principles of transparency with which Ofcom must comply, and in this context, a critical procedural safeguard that will enable Ofcom to be appropriately informed about the limitations of the methodology or the validity of data used that may affect the reliability of any outputs generated.

Absent such a consultation, Ofcom's proposed approach is currently characterised by a high degree of uncertainty that may well result in the imposition of unnecessary costs (on a market-wide basis) that might otherwise be avoided with a more robust methodology.

Ofcom has recognised in its last consultation that there is a link between a significant increase in the level of spectrum fees and future investment decisions on the part of mobile operators. In those circumstances, and given Ofcom's obligation, pursuant to the provisions of the Communications Act and the Direction of HM Government to promote efficient investment and maximise coverage to the benefit of mobile consumers, the need for Ofcom to subject its 'bottom-up' approach described above to wider scrutiny is all the more compelling.

As things stand, Ofcom cannot confidently assert that its current approach to determining the annual level of spectrum fees will not lead to significant new additional, avoidable, payments on a market-wide basis that are likely to have adverse consequences for consumer welfare given the amounts at stake.

Section 5 – the size of the CPI-RPI wedge

Ofcom states in paragraph 2.8 of the present consultation that "*a fundamental issue in adjusting from RPI to CPI is the size of the wedge*". This however only holds if a WACC based discount rate is to be adopted. If Ofcom were to continue to attempt to employ a WACC based measure for the discount rate, then, depending on precisely how Ofcom were to determine the best way of calculating a real CPI based cost of equity, it will most likely be necessary to factor in an estimate of the value of the CPI-RPI wedge. But as we have discussed in section 2 above, such an estimate is definitely not necessary in the derivation of real CPI based cost of debt.

As Oxera discusses in some detail in section 4 of the attached paper, a value of the wedge at 1.3% is at the high end of the plausible range of values that could be adopted for use as a factor in a long term discount rate calculation. More realistically, given the evidence adduced by Oxera a wedge of 1.0-1.1% would appear to be the maximum that would be justifiable in any 20 year discount rate adjustment.

If Ofcom were to adopt a WACC based discount rate, and if the calculation of that rate were to require an assumption of the size of the wedge, then the accuracy of this estimate would have a bearing on the appropriateness of the level of outpayments that would be imposed on mobile operators. Too high a wedge estimate would tend to lead to too high a nominal WACC and thus to an excessive estimate of the CPI based real rate – this would mean overpayment of annual spectrum fee costs by the mobile industry. As Oxera conclude, the balance of risks over a 20-year period appears to be on the downside of 1.3%. For all the reasons discussed in our previous response relating to asymmetric risk²³, any estimate of the wedge size, should it subsequently prove to be necessary to the calculation of the discount rate, should therefore also err on the conservative side.

Furthermore the approach that Ofcom has taken to the derivation of the future level of the wedge means that an indirect estimate has been elevated to a direct forecast. The

²³ At section 5 of the Vodafone response to the October 2013 consultation.

wedge has no real independent status of its own – rather it is the result that will be observed from the difference between two independently calculated measures. If the RPI outcome were to be found to be 2.8% it would not follow that the appropriate level of CPI would certainly have to be 1.5%. Rather if the RPI were to be 2.8% and the CPI 1.9%, as in January 2014, one would say that the wedge was 0.9% in that month. Similarly if the CPI were to be over the target of 2%, it is not axiomatic that the RPI would exceed 3.3% by the same margin. It is the wedge that is the dependant measure, not either of the independently calculated measures of inflation. As a consequence any use of an absolute value of the wedge at 1.3% as part of the exercise to derive a real or nominal CPI based rate is not without risk – this also suggests caution in the view taken on the size of the wedge, given its potential impact on the real CPI rate.

The RPIJ statistic was introduced in early 2013 as an attempt to resolve the well-established formula issues of the RPI, replacing “Carli formula” calculations with “Jevons formula” calculations. It was initially published only as an experimental statistic, but in November 2013 the UK Statistics Authority confirmed the designation of RPIJ as a National Statistic²⁴. We note that the RPIJ’s published values since 2010 have in fact tracked the CPI very closely²⁵ even though the RPIJ’s difference from the RPI is only 0.7% on average between March 2011 and March 2014. We are not suggesting that the RPIJ should be used as the measure of inflation in the present calculation, but note that the measured performance of the RPIJ may be further evidence that the future wedge should not be expected to be as much as 1.3%.

Summary of conclusions

There is thus a clear onus upon Ofcom to act in a commensurately rigorous way when setting the level of spectrum fees. This is because the risk of unnecessarily high spectrum fees raises the spectre of reduced investment and innovation on the part of licensees that ultimately operates to the detriment of the subscribers that they serve. The issue of converting a lump sum into annual payments accordingly deserves significantly more detailed consideration than Ofcom has given it in the current consultation.

As we have discussed in the sections above, Vodafone does not agree with the proposed discount rate outputs of this consultation. Whilst we support the need for the proposed switch from RPI to CPI in the annualisation calculation, this is a change that would raise considerable difficulties that have not yet been properly addressed by

²⁴ <http://www.ons.gov.uk/ons/rel/cpi/consumer-price-indices/november-2013/stb---consumer-price-indices---november-2013.html#tab-Retail-Prices-Index--RPI--and-RPIJ->

²⁵ Table 2 of the ONS consumer price inflation detailed reference tables shows the RPIJ to be on average 0.1% less than the CPI on a 12 month basis over the period March 2011 to March 2014

Ofcom in the event that it were to use a WACC based discount rate. Our conclusions are:

1. The most appropriate discount rate to be used in the annualisation of a lump sum spectrum valuation is a real cost of debt measure. This rate will make an operator indifferent between an up-front payment or a payment in annual instalments. This rate can be calculated for CPI very simply from a nominal cost of debt in the manner that we suggest in this document. This approach has a further advantage in that it does not require a view to be taken on the size of the RPI-CPI wedge.
2. In the event that Ofcom were to erroneously use a WACC as the discount rate, then estimating a CPI based real WACC would be a new exercise for Ofcom. The method Ofcom suggests of translating and reinterpreting an old MTR RPI based WACC from 2011 is wrong. Ofcom would need to assemble a purpose written CPI based real WACC from first principles and populate it with current input values, but has as yet not done so.
3. Even if Ofcom were to choose to retain RPI, accepting the difficulties that this may cause in the future, and attempt to use WACC as the discount rate, it would still need to develop a current real RPI based WACC for the present purpose, given that the 2011 MTR WACC is more than three years out of date. Ofcom has not as yet done this.
4. Mobile operators will be exposed to inflation forecast risk if annual payments are allowed to rise by unrestricted actual inflation outcomes – we suggest a ceiling is placed on the percentage increase that is applied annually.

Vodafone response to Ofcom's specific questions

“Question 1: Do you agree with this methodology for deriving a real discount rate consistent with the CPI measure of inflation?”

Vodafone response: No.

As we describe in the main body of our response, given that the most appropriate discount rate to be used in the present circumstances is the real CPI based cost of debt, and that this measure can be derived quite straightforwardly from Vodafone specific or industry nominal cost of debt, there is no reason to go through the more complex and convoluted approach of developing a WACC discount rate from scratch.

In any event there is absolutely no justification given the materiality of the consequences of the selection of a particular discount rate to adapt, reinterpret and

translate the MTR RPI based WACC from 2011 for a completely different purpose in 2014. Should Ofcom (erroneously in Vodafone's view) consider that the most appropriate discount rate were to be WACC based then it follows that a real CPI based post-tax discount rate needs to be newly developed from first principles using current best available data and that stakeholders should have a proper opportunity to review the method and the outcome.

Question 2: Do you agree with our approach to deriving estimates of long-run RPI and CPI?"

Vodafone response: No.

As we discuss above in the main body of our response a view of RPI is not needed at all if a real CPI based cost of debt is used as the discount rate. It is not clear whether a forecast of RPI is necessarily needed if Ofcom does attempt to develop a real CPI based WACC. We note however that developing a forecast of RPI from a target for CPI and an estimate of the possible size of the difference between the two measures is no substitute for a robust independent forecast. If Ofcom were to adopt a WACC based discount rate using CPI and the method for arriving at it required a view of the size of the wedge then for the reasons discussed above a conservative (lower) view of its size is necessary.

Furthermore, given the potential exposure of operators to the risk that the actual inflation outcome may be higher than that assumed in calculating the real discount rate, this assumed rate should be used to provide a ceiling on the percentage uplift that should be applied annually.

Vodafone Limited
May 2014