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Ofcom

**Pay-TV Model Review
Final Report**

KPMG LLP

26 March 2010

This report contains 16 pages

Contents

1	Introduction	1
1.1	Purpose of the engagement	1
1.2	Disclaimer	2
1.3	Scope	2
2	Methodology	4
2.1	Overview of the two models	4
2.2	Analytical activities	8
2.3	Sources of information	10
3	Findings	11
3.1	Summary of Advice	11
3.2	Sensitivity Analysis	13
4	Conclusions	16

1 Introduction

KPMG LLP (“KPMG”) was commissioned by the Office of Communications (“Ofcom”) to provide advice on two Excel spreadsheet models being developed by Ofcom: the Wholesale Must-Offer pricing model (the “WMO pricing model”) and the Impact Assessment model (the “IA model”). This report presents the approach and findings of this engagement.

1.1 Purpose of the engagement

Ofcom set out in their Third Consultation on the Pay TV market review their belief that “it is appropriate to deal with our concerns about restricted distribution by imposing a wholesale must-offer obligation (WMO) under our sectoral powers.”¹ Section 9 of the document sets out the methodology that Ofcom proposes to use to calculate WMO prices. In particular, the methodology describes an approach to calculating WMO prices for packages of Sky Premium packages of Sport and/or Movie channels.

Ofcom have developed a Microsoft Excel spreadsheet model that aims to calculate WMO prices based on their proposed methodology – the WMO pricing model. We understand that since the publication of the Third Consultation document Ofcom’s proposed methodology has developed further in light of responses to that consultation and the methodology may develop further in the future. Ofcom asked us to provide advice on the version of the WMO pricing model provided to us on 25 January 2010, in relation to their proposed methodology at that point in time.

Ofcom have also produced a separate Excel spreadsheet model that aims to calculate the impact assessment for the proposed introduction of WMO prices – the IA model. This model was also a work-in-progress, and Ofcom has asked us to provide advice on the version of the IA model provided to us on 10 February 2010, in relation to their proposed methodology at that point in time.

Ofcom asked us to advise on whether certain outputs from the WMO pricing model were correctly incorporated into the IA model. At the time the engagement commenced it was made clear by Ofcom that the first versions of the models supplied to us (on 25 January 2010 and 10 February 2010) would not be ready for the purpose of considering data inputs from the pricing model to the IA model. For the specific purpose of checking these data inputs Ofcom supplied us with additional versions of the pricing and IA models on 26 February 2010 and 4 March 2010, respectively. For the specific purpose of considering communication from one model to the other we considered the ‘Data for IA’ worksheet within the pricing model and the ‘Data from pricing model’ worksheet within the IA model. We advised on no other aspect of these revised versions of the models.

We have provided advice in relation to the two original models (i.e. provided on 25 January 2010 and 10 February 2010) as described in Section 1.3. The advice that we provided during the course of the engagement in relation to these two models is set out in this report. This

¹ Paragraph 1.5, “Pay TV phase three document – Proposed remedies”, Ofcom June 2009

engagement is not an assurance engagement conducted in accordance with any generally accepted assurance standards and consequently no assurance opinion is expressed.

We draw attention to the significant limitations to the scope of the advice that we provide, as detailed further below. Our report makes reference to ‘KPMG analysis’; this indicates only that we have (where specified) undertaken certain analytical activities on the Ofcom models to arrive at the information presented; we do not accept responsibility for the models or the underlying data.

1.2 **Disclaimer**

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1.3 **Scope**

KPMG’s advice on the WMO pricing model; and the IA model is based on the findings of a number of analytical activities, which formed the scope of the services that we provided. The analytical activities which we expected to provide evolved somewhat during the course of the project as the nature of the models was better understood. In this report we describe the analytical activities which were conducted during the course of the engagement.

The main value added by our work is the discovery of errors in the model. We were in constant contact with the model designers throughout the project so these errors could be quickly communicated and quickly corrected. The appendices to this report contain a list of all the errors discovered and corrected in both the WMO and IA models.

Section 2 below provides a detailed description of the approach that we adopted. Here we provide a brief summary of these activities to describe the scope of services, which comprised:

- Checking that key model inputs were translated properly from source data – Ofcom provided us with most (but not all) source data for this purpose. Ofcom preferred to check some data internally so some input cells could not be checked. Full details of the data used in the pricing model, the data we checked and the data Ofcom did not ask us to check are included in the Appendix;
- Checking that the formulae in the model correctly interpret the principles of the methodology as described by Ofcom – we did not check all of the formulae in the spreadsheet on a cell by cell basis, but rather sought to understand the logic of the formulae and that they had been translated across years consistently;
- Providing advice on selected model relationships - to ensure they were consistent and made broad economic sense and used parameters of a sensible order of magnitude, as well as being consistent with the principles of the methodology; and

- Testing the outcomes of model in response to selected shocks to input variables – including cost measures and inflation, to see how the model responded.

For the avoidance of doubt, KPMG did not conduct a model audit and consequently no assurance opinion is expressed. The analytical activities we conducted to provide a basis for our advice focused on specific areas as agreed with Ofcom, but were in no way exhaustive or comprehensive. In particular, we do not provide any assurance on the appropriateness of sources of information and we do not comment on the appropriateness of the principles of the methodology adopted by Ofcom in their Third Consultation document. Our advice is primarily focused on specific elements of the translation of Ofcom’s methodology into a spreadsheet model.

To provide additional clarity on this important aspect of our advice, Section 2 below sets out our methodology in detail, explaining the extent and limitations of our advice and providing details on the sources of information used.

2 Methodology

In this section we describe our methodology for this engagement. We begin with an overview of the two models to provide clarity on the nature of the advice. We then describe the analytical activities we conducted and the sources of information used.

Our work was conducted between 26 January 2010 and 16 March 2010, and the work comprised mostly desk-based analysis of the models and meetings and conversations with Ofcom staff. We maintained a continual dialogue with the Ofcom staff responsible for developing the model, discussing with them our preliminary findings. The meetings with Ofcom staff have included an initial ‘teach in’ for the pricing model (1 February 2010), several conference calls and an interim project meeting (16 February 2010) at which we discussed our preliminary results.

2.1 Overview of the two models

Wholesale Pricing Model

The pricing model is divided into a number of sheets, each of which has been analysed by KPMG to check the validity of the calculations. The purpose of each sheet is set out in the table below:

Sheet Name	Description
Control sheet	Lists sensitivities and other significant model parameters. Contains the charges based on selected sensitivities and model parameters.
Range of charges	Provides an overview of the calculated wholesale prices resulting from different approaches for SD packages.
Sky subscribers	Provides relevant historic data points and calculates forecasts of Sky's subscribers by package.
VM subscribers	Provides relevant historic data points of Virgin Media premium subscribers by package.
Other subscribers	Contains existing subscriber numbers used to allocate common costs. Contains wholesale premium subscriber forecasts.
New entrant subscribers	Calculates forecasts of the hypothetical new entrant's subscribers and gross additions (i.e. total new subscribers including subscribers switching from other providers, not just net additions which is the number of new subscribers added to the size of the market) by package.
Sky retail prices	Calculates effective retail prices (e.g. including average consumer discounts) for Sky's premium packages and forecasts the development of these prices over time.
Sky advertising revs	Calculates advertising and sponsorship revenue forecasts for Sky, split between basic and premium channels and DTH, DTT and cable platforms.
Minimum fixed costs	Derives minimum fixed costs required for a new entrant operator based on competitor benchmarks for operating costs and a bottom-up model for

Sheet Name	Description
	estimating marketing costs.
Sky operating costs	Calculates Sky's TV-related fixed and variable operating costs and allocates them between the different business functions. Separately calculates Sky's transponder costs and allocates these between different channels and business functions.
HD costs	Calculates and forecasts forward the costs of Sky's HD services, for use in the capital employed allocation.
Sky capital employed	Provides forecasts and an allocation of Sky's depreciation and capital employed between business functions and packages.
Sky other revenues	Generates forecasts of other non-subscription Sky revenue streams such as third party channel revenues.
Sports programming costs	Forecasts total premium sports programming costs (sports rights and production costs).
Movies programming costs	Forecasts total premium movies rights costs.
New entrant costs	Calculates forecasts of the new entrant's fixed and variable costs, including transmission costs, based on Sky's operating cost forecasts.
Retail minus calculations	Derives overall subscriber Average Revenue per Unit (ARPU) for each package (adjusting for basic mix take-up) and allocates other associated revenues between business functions.
Retail minus prices	Calculates the wholesale prices via retail minus for each package.
Cost plus prices	Calculates the wholesale prices via cost plus for each package.
Cost allocation	Calculates Subscriber Acquisition Costs (SAC) for Sky and adds these to the results of the cost allocation exercise carried out on the consolidation sheet.
Parameters for cost allocation	Contains the parameters used to allocate Sky's costs.
CostRev	Allocates all line items provided in Sky's 2009/10 management accounts between Sky's different business functions.

This table is based on the contents page in the Wholesale Pricing Model.

The purpose of the model is to calculate Wholesale prices for Sky's premium packages using retail-minus and cost-plus approaches. The packages for which a wholesale price is determined are:

- 1 Sky Sports 1;
- 2 Sky Sports 2;
- 3 Sky Sports 1 and 2;
- 4 Sky Single Movies;
- 5 Sky Movies Mix;

- 6 Sky Sports 1 and Single Movies;
- 7 Sky Sports 2 and Single Movies;
- 8 Sky Sports 1 and 2 and Movies Mix;
- 9 Sky Sports 1 and Movies Mix;
- 10 Sky Sports 2 and Movies Mix; and
- 11 Sky Sports 1 and 2 and Single Movies.

Retail-minus

The retail-minus approach determines the wholesale price level for each Premium package as the price that Sky charges retail customers, less the net costs that the entrant would incur over the period of the proposal. The logic behind the calculations in the model is:

- Calculations of cashflow:
 - Since each of the packages listed above can be sold accompanied by a variety of basic channels (e.g. Sky news) there exist multiple retail prices for each package; a single ex-VAT retail price is determined by weighting all available prices by subscriber numbers;
 - Forecast of subscriber numbers, which in turn allows a forecast of Sky's subscriber revenue;
 - Calculation of a new entrant's costs including subscriber acquisition costs, transmission and other fixed and variable costs;
 - Forecast of non-subscription revenue such as advertising revenues.
- Calculation of net present value of future cashflow:
 - Using an appropriate discount rate (assumed to be equal to Sky's cost of capital regardless of the size of a new entrant) and inflation assumptions; and
 - Including a terminal value in the calculations, which implicitly models retail prices and costs over an infinite time horizon. The calculation of NPV is sensitive to the inclusion of terminal values because new entrants are initially forecast to make losses before becoming profitable in later years.
- Calculating a wholesale price level, adjusted to reflect inflation and the profile of forecast subscriber numbers, such that the net present value of the prices is equal to the net present value of the cashflows above. Wholesale prices are effectively smoothed over an infinite time horizon not just within the ten year period explicitly modelled. The net present value of zero is consistent with the entrant earning normal profits on the business model.

Cost-plus

The cost-plus approach determines the wholesale price as being in line with the net costs that Sky face that are attributable to the wholesale business allowing for a reasonable rate of return. The logic behind the calculation in the model is:

- Calculation of wholesale costs for cashflow based on:
 - subscriber acquisition costs (premium wholesale element);
 - cost of premium programming;
 - cost of transmission;
 - an adjustment for Sky’s advertising revenues;
 - an adjustment for Sky’s other revenues associated with premium packages;
 - an adjustment for subscriber acquisition costs;
 - an adjustment for annual capex determined to be variable; and
 - an adjustment for the cost of acquiring starting capital employed.
- Calculation of net present value of future cashflow:
 - Using Sky’s cost of capital as the discount rate; and
 - Inclusion of terminal value in calculations.
- Calculating a wholesale price level, adjusted to reflect inflation, such that the net present value of the prices and forecast subscriber numbers is equal to the net present value of the costs above.

Impact Assessment Model

The primary purpose of the IA model is to estimate the consumer and producer surpluses for the ‘counterfactual’ (without WMO pricing) and ‘factual’ (with WMO pricing) states under different sets of scenarios. The model includes five scenarios in addition to the base case, with differing assumptions about subscriber numbers, prices and elasticity of demand. .

The IA model (received 10 February 2010) is a Microsoft Excel spreadsheet of 251KB (significantly smaller than the WMO pricing model). It comprises a series of worksheets which we describe below:

Sheet Name	Description
Summary	Provides a summary of the key outputs for all scenarios (filled in using the simple macro)
Sensitivities	Provides input data for the scenarios
Parameters	Provides further input data for the analysis
Retail & Choke prices	Calculates retail and choke prices for the analysis ²
Subscriber numbers	Producers projections of subscriber numbers for the analysis
Counter-factual	Calculates consumer and producer surplus for the ‘counterfactual’ scenarios
Factual	Calculates consumer and producer surplus for the ‘factual’ scenarios
Lists	Lists the scenarios included in the analysis

² A choke price is the price at which demand falls to zero.

2.2 Analytical activities

The analytical activities conducted are summarised above in the Scope of services. Here we provide further detail on our activities.

1. *Checking that key model inputs were translated properly from source data*

Ofcom provided separate documents containing source information for the model. We checked the bulk of the input data, except for some categories that Ofcom preferred to check internally and did not provide to us.³ Full details of the data used in the pricing model, the data we checked and the data Ofcom did not ask us to check is included in Appendix 3. In addition we were not requested to consider model parameters calculated externally e.g. the calculation of Sky's cost of capital.

We also considered whether inputs to the IA model from the pricing model had been translated accurately from one model to the other.

For the source data provided to us, we checked that the data was correctly entered into the model and that the data was used in accordance with the Ofcom methodology. Our findings are summarised in Section 3 below.

2. *Checking that model formulae correctly interpret the principles of the methodology*

The models are mainly set out with separate columns for years and the same formulae for each year. We therefore typically worked our way through a single column of formulae to see if this matched our understanding of the principles of the methodology, and then we checked that the formulae were similarly applied across years. This is a standard procedure for understanding what a model is trying to achieve. Some parts of the model were not set out in this way so different procedures were adopted. Our aim was to read through each of the important formulae of the model to understand its function.

This represented the largest single activity that we conducted, as Ofcom indicated that they wanted advice on the appropriateness of the model formulae relative to their proposed methodology. As set out in our initial scope, this exercise never aimed to be complete as the models are too large to check every cell within the scope of the engagement, but instead provided advice on the translation of methodological principles into a spreadsheet model.

As part of this process we provided advice on the Visual Basic for Applications (VBA) macros in both models. These macros were designed to run a range of scenarios and/or populate summary tables with key results. We verified that these macros would perform their functions in an appropriate manner.

Our findings are summarised in Section 3 below.

³ Out of 75 categories of input data, eight were checked by Ofcom internally.

3. *Advice on selected model relationships*

Ofcom asked that we consider selected model relationships to ensure that they were consistent, made broad economic sense and used parameters of a sensible order of magnitude, as well as being consistent with the principles of the methodology. The areas of particular focus were (in the WMO model unless otherwise stated):

- the Cost Allocation sheet;
- the CostRev sheet, which deals with management account information;
- the Virgin Media adjustment in the Sky Advertising Revs sheet;
- forecasts of sports' rights' costs in Sports Programming Costs sheet;
- the calculation of Sky capital employed value;
- the NPV calculations, including terminal value; and
- the calculation of consumer and producer surplus (IA model).

We offered comment and advice on whether we believed that the modelling approaches were sensible and consistent with the aims of the Ofcom methodology. Our findings are summarised in Section 3 below.

4. *Testing the outcomes of model in response to selected shocks*

Our extensive checking of model formulae and our consideration of selected model relationships was further supported by the testing of model outcomes in response to selected shocks to key input variables. Further advice was provided to Ofcom on the provided models based on this more holistic approach which did not consider the detail but rather the degree of consistency between inputs and outcomes.

For the pricing model we independently (i.e. in isolation) tested a range of inputs including:

- Increasing the discount rate / Sky's discount rate from 10.3% to 15%;
- Increasing the inflation rate from 2.5% to 5%;
- Increasing all retail prices by £1;
- Increasing transmission costs by 10%;
- Increasing new subscriber numbers by 10%;
- Doubling the growth rate of Sky's subscriber base from 1.3% to 2.6% per annum;
- Increasing the growth rate of Virgin Media's subscriber base from 0% to 5% per annum;
- Increasing the total DTT market size from 3 million to 4 million subscribers;
- Increasing the churn rate to 15% from 10.35%;
- Increasing minimum fixed costs from BT Vision to Setanta;
- Increasing all costs in Sky's management accounts by 10%; and
- Increasing the wholesale asset base and/or the percentage allocated to wholesale by 10%.

Our approach was to consider *a priori* the change in prices for the two methods (retail minus and cost plus) and to then compare our expectation to the result produced by the model. Where our expectation was different (in either direction, magnitude or both) we investigated further to understand why. Our analysis considered the base case only i.e. the scenarios built into the model by Ofcom were not considered as part of our sensitivity analysis.

For the IA model we reviewed the scenarios built into the model by Ofcom. Specifically we considered the impact of the changes that constituted the scenarios upon producer and consumer surplus. The scenarios were:

- Base case i.e. Ofcom's preferred model parameterisation;
- Scenario 2, Picnic-only - this scenario models the impact of Picnic (Sky's proposed DTT pay-TV service) being the only provider on DTT/IPTV;
- Scenario 3, High - this scenario is designed to model a plausible upper bound for surplus;
- Scenario 4, Low - this scenario is designed to model a plausible lower bound for surplus;
- Scenario 5, Sky – High - this scenario models a plausible upper bound for surplus for Sky, and therefore reflects a greater level of success for Sky; and
- Scenario 6, Sky – Low - this scenario models a plausible lower bound for surplus for Sky, and therefore reflects a reduced level of success for Sky.

2.3 Sources of information

The appendices list the data inputs used in the pricing model and the data sources that were provided to us by Ofcom for the purpose of this engagement. We have reviewed all of the data supplied to us. It is important to note, however, that Ofcom decided not to provide some information to us, and therefore did not ask us to advise on whether the input data was used appropriately⁴. The appendix highlights those data inputs that we have checked *and* those that Ofcom has not required us to check.

⁴ This was the case for eight out of 75 categories of input data.

3 Findings

Our findings challenge a number of calculations and approaches adopted in the models we were asked to provide advice on. The detail of the challenges and queries that we had as well as the response from Ofcom and the agreed solutions are laid out in the Appendices. We had no comments on either the VBA macros or the input data to the IA model.

We highlight a number of the more significant findings below.

3.1 Summary of Advice

Wholesale Pricing Model

- Wholesale prices are determined so that the net present value, discounted at the cost of capital, of a hypothetical efficient entrant's cash flows is zero i.e. so that the entrant makes normal profits⁵. The cash flows are discounted over an infinite time frame through the inclusion of a terminal value for the new entrant's business. The cash flows for the first ten years are explicitly modelled. It was not clear, however, in the model whether the effect of discounting was to value the new entrant in 2008/09 or 2007/08 terms.

Upon revisiting the issue Ofcom determined that the appropriate discounting regime should focus on mid-year values, rather than year-beginning as had been the case in the model provided to us. This effectively reduced the number of years of discounting by one.

These issues have been satisfactorily resolved.

In relation to the NPV calculation of wholesale prices we also noted that Ofcom's approach – which included a terminal value based on cashflows into perpetuity - implicitly meant that prices were smoothed over an infinite time period. Put differently, Ofcom's approach assumed that the Pay-TV market would continue to operate in a steady WMO-remedy world forever. We queried whether this was Ofcom's intention.

Ofcom responded that the use of an infinite time horizon was a deliberate modelling choice based on standard practice and the absence of an obvious preferable alternative. Ofcom made clear that despite this assumption, no decision has been made on whether the WMO will be in place beyond its initial three-year period.

We agreed with Ofcom's observations and accept their NPV methodology accordingly.

- The forecast of sports' rights' costs was based on the sum of forecast inflation and subscriber growth i.e. $1 + g_{SR} = 1 + g_{SUBS} + g_{INF}$. However, by using the sum instead of the

⁵ The hypothetical entrant is assumed by Ofcom to have the same cost structure as Sky, such that it would face the same operational costs as Sky for a given number of subscribers. Cost per viewer is higher for the hypothetical entrant, however, as it is assumed to have fewer subscribers than Sky and therefore benefit less from economies of scale.

product (i.e. $1 + g_{SR} = (1 + g_{SUBS}) \times (1 + g_{INF})$) the multiplicative effects of inflation and subscriber growth are not included. Intuitively this is an error because the higher per subscriber price driven by inflation needs to be paid by all subscribers, not just existing subscribers.

Ofcom revised its model to reflect our suggested revision.

- The forecast of sports' rights' costs is based on forecasts by sport and a residual category for rights' costs under £5m p.a. Sports whose rights' costs increased substantially over the forecast period should migrate from the sub £5m p.a. category into a category of their own. The rights' costs, however, appear to have been double counted in one instance, namely boxing.

Ofcom adjusted its forecast of the rights' costs for boxing.

Impact Assessment Model

- The model calculates retail prices and choke prices (the price at which demand falls to zero) *inclusive* of VAT. However, the retail price for Virgin Media packages including Sky Premium content did not include VAT.

Ofcom amended the formulae to include VAT, which resolved the issue satisfactorily.

- The model calculates consumer surplus on the assumption of a linear demand curve. Producer and consumer surplus are both calculated assuming that the WMO remedy does not lead to a reduction in retail prices. We queried both of these assumptions since:
 - it seemed plausible that the assumption of a choke price, where demand would be zero, and a linear demand curve might mean that the willingness to pay of some customers was understated in the calculation of consumer surplus, and;
 - by reducing wholesale prices the WMO might lead to lower retail prices, particularly if new entry to the market did occur thereby increasing competition amongst providers.

In response to the first issue Ofcom argued that a more complex estimate of the demand curve may not be possible nor any more certain than the present approach. In addition Ofcom noted that it would be preferable to underestimate consumer surplus rather than overestimate it. Based on these reasons we regard Ofcom's existing approach as satisfactory.

Ofcom argued in relation to the second issue that it was not clear that the introduction of the WMO would lead to lower prices and that even if it did it would be difficult to estimate the magnitude of any reduction. Taken in combination with Ofcom's general desire to produce conservative estimates of the benefits to society, Ofcom felt that it was more reasonable to retain their original approach.

We note that there is no compelling reason to prefer alternatives to Ofcom's proposed method. As a result we are satisfied with Ofcom's methodology.

3.2 Sensitivity Analysis

The specifics of the sensitivity analysis we conducted are described in some detail in Section 2.2. We performed an agreed set of sensitivities on both the pricing and IA models. The sensitivities performed were not exhaustive or comprehensive, but were selected to provide insight into whether the estimates produced by the model under different scenarios were consistent with our theoretical expectation and our understanding of the functioning of the models.

Wholesale pricing model

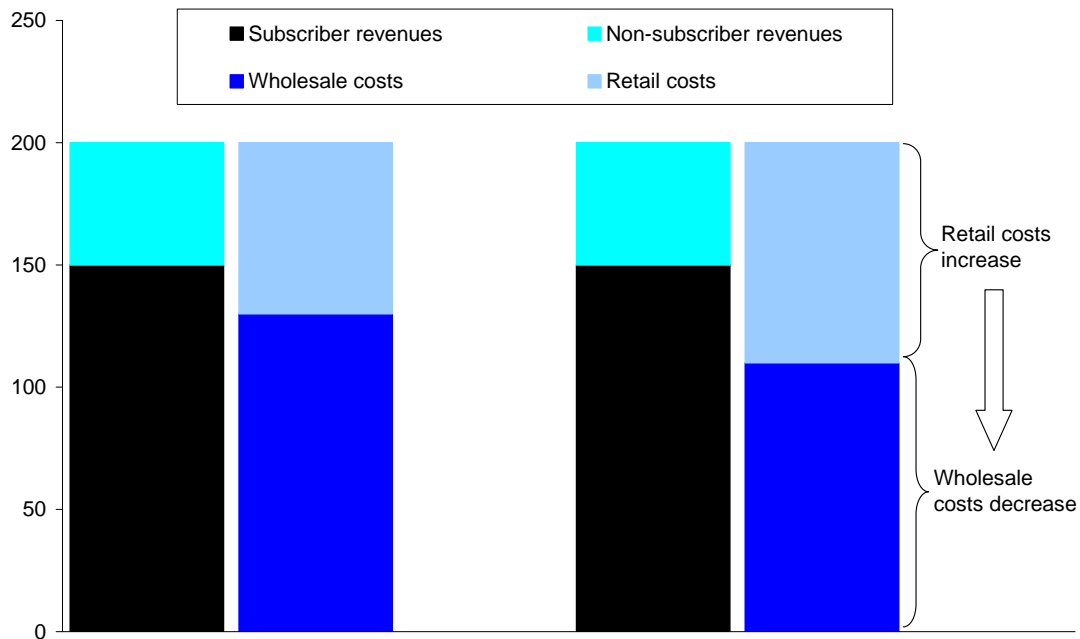
The table below summarises qualitatively the results of our sensitivity analysis. The detailed results of our sensitivity analysis of the pricing model are presented in Appendix 4.

Assumption	Change made to assess sensitivity	Effect on Retail-Minus price	Effect on Cost-plus price
<i>Discount rate / Sky's discount rate</i>	↑ from 10.3% to 15%	↓	↑
<i>Inflation rate</i>	↑ from 2.5% to 5%	↑	↑
<i>Retail prices</i>	↑ by £1	↑	No change
<i>Transmission costs</i>	↑ by 10%	↓	No change
<i>Single new entrant subscribers</i>	↑ by 10%	↓	No change
<i>Sky subscriber forecast</i>	Forecast growth rate doubled from 1.3% (medium) to 2.6% (high)	↓	↓
<i>Virgin Media Growth rate</i>	↑ from 0% to 5%	↑	↓
<i>Total DTT market size</i>	↑ from 3m to 4m	↑ (Δ≤£0.01)	↓
<i>Churn rate</i>	↑ from 10.35% to 15%	↓	↑ (Δ ≤ £0.02)
<i>Minimum fixed cost</i>	↑ in costs by changing from BT Vision to Setanta	↓	No change
<i>Sky's cost</i>	↑ all costs inputs in CostRev by 10%	↓	↑
<i>Asset value</i>	↑ by 10%	No change	↑
<i>Allocation of asset value to wholesale</i>	↑ by 10%	↑	↑

The results of the sensitivity analysis were largely as we anticipated based on our understanding of the functioning of the model and the assumptions Ofcom had incorporated into the model. By way of general comments we note:

- It might seem surprising initially that increasing retail costs like transmission costs leads to a reduction in wholesale prices under the retail-minus approach. However, increasing retail costs leads to lower retail-minus wholesale prices because the model treats (on an NPV basis) per subscriber wholesale costs as a balancing item between per subscriber revenues (subscription and other) and retail costs. Intuitively, as the chart below illustrates statically (rather than dynamically as in the model) increasing costs means other costs need to decrease so that the profits of the new entrant remain 'normal' rather than excessive or

insufficient. Changing retail costs has no effect on cost-plus wholesale prices since these are solely dependent on wholesale costs.



- The impact of a parameter change can be different for retail-minus and cost-plus. For example, increasing the discount rate has different effects because:
 - i. For cost-plus prices discounting at a higher rate means that future costs become relatively less important, such that the weight given to current costs is greater. Prices need to be higher in order to maintain the balance so that over the time period modelled NPV of charges = NPV of costs.
 - ii. For the retail-minus calculation cash flow is the determinant of wholesale prices. Cash flow equals revenues minus costs and the new entrant is forecast, in the base case, to make losses in early years before becoming profitable in later years. Discounting future profits more heavily means that the losses a new entrant is modelled to incur in early years need to be reduced (relative to the base case) in order to maintain the NPV of the new entrant's profits over the period modelled.
- Changes in total costs and revenues (e.g. as a result of changing the number of new entrant subscribers) do not necessarily affect wholesale prices since costs and prices are determined on a per subscriber basis.
- The effect of cost and revenue changes may vary over the ten years modelled due to other assumptions.

Impact Assessment model

For the IA model we considered the five scenarios (plus the base case) Ofcom had included within the model (see Section 2.2). For each scenario we considered:

- the internal consistency e.g. whether an increase in subscriber numbers was associated with a decrease in price, or if not, why not; and
- whether the change in producer and consumer surplus under each scenario was consistent with our expectations in both the ‘counterfactual’ (without WMO pricing) and ‘factual’ (with WMO pricing) states.

The table below summarises qualitatively the effects on consumer and producer surplus under each scenario for both factual (F) and counterfactual (CF) states:

Surplus	Scenario 2		Scenario 3		Scenario 4		Scenario 5		Scenario 6	
	CF	F	CF	F	CF	F	CF	F	CF	F
Producer	↑	↓	↑	↑	↓	↓	None	↑	None	↓
Consumer	None	↓	↑	↑	↓	↓	↓	↓	↑	↑

Our assessment is that the scenarios designed by Ofcom are internally consistent. The effect of each of the scenarios is expected based on our understanding of the functioning of the model.

4 **Conclusions**

We have employed a range of standard techniques to provide advice on the two models supplied to us by Ofcom in relation to a wholesale must-offer remedy for Sky's Pay-TV Premium content. We have not audited Ofcom's models, nor have we conducted a cell-by-cell examination of the models. Consistent with the approaches adopted we do not provide any assurance on the appropriateness of sources of information and we do not comment on the appropriateness of the assumptions or principles of the methodology adopted by Ofcom in their Third Consultation document. Rather, our advice was primarily focused on specific elements of the translation of Ofcom methodology into a spreadsheet model.

Based on the tests we have carried out, which are described in more detail above, we have summarised the results of our advice on the models provided (as at the dates they were provided).

We have supplied to Ofcom a range of comments and queries in relation to both models. In many instances Ofcom has justified its approach to our satisfaction without needing to amend its models. In others Ofcom has adjusted its models in response to our suggestions. We are satisfied that the changes proposed by Ofcom appropriately address the issues we have raised.



Ofcom
Pay-TV Model Review
KPMG LLP
26 March 2010