Sky's profitability

Annex 9 to pay TV phase three document

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Oxera

BSkyB's profitability in the context of the Ofcom market investigation

Prepared for Ofcom

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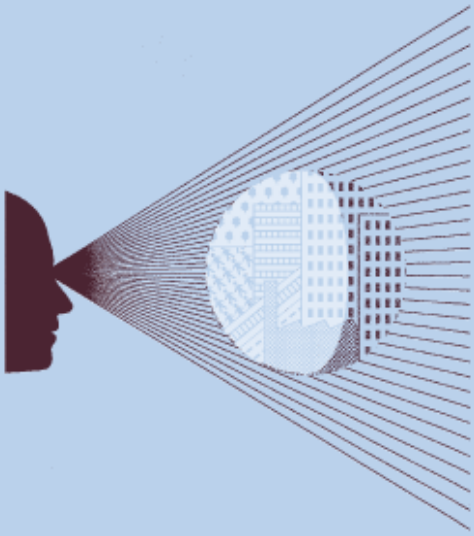

Executive summary

Approach to profitability analysis in this study

Ofcom has asked Oxera to undertake an independent analysis of the economic profitability of BSkyB (Sky) in the context of its investigation in the pay-TV market.

The purpose of the evidence shown in this study is to provide insights into the dynamics and drivers of profitability in the UK pay-TV market and into the range of plausible economic rates of return earned by Sky.[1] The analysis considers the costs of creating Sky's customer base, and the evolution of profitability of additional customers relative to lifetime cash flows and Sky's net cash flows, given the significant investment in increasing the customer base.

Sky's returns are estimated in this study using the internal rate of return (IRR). The IRR and net present value (NPV) are conceptually appropriate measures of profitability in the context of competition investigations.[2] The results have also been cross-checked using the return on capital employed (ROCE). The estimates of returns obtained using different metrics seem consistent.

One of the specific characteristics of Sky's business model that seems to have a considerable impact on the approach and estimates of economic profitability is the likely presence of significant intangible assets, primarily associated with Sky's subscriber base. This study applies a conceptually appropriate framework for valuing intangible assets and estimating profitability in the context of competition investigations, as set out in the Oxera 2003 report for the Office of Fair Trading (OFT) and previously used by the Competition Commission (CC).[3]

The study applies a range of approaches to estimating intangible assets. The subscriber base, Sky's largest intangible asset, is valued in the report at replacement cost on the basis of the publicly available information and data provided by Sky. This approach to valuation takes into account the evolution over time in the number of Sky's subscribers, together with subscriber acquisition costs, as observed in Sky's management and statutory accounts. It also takes account of average economic life of subscribers (as implied by the observed churn rates) and reduction in replacement costs of customers over their economic life. A range of valuation scenarios, considered in the analysis, seem to provide consistent results. While the analysis builds on the relevant CC precedent, the study explores in more depth the costs associated with the creation of intangible assets relative to cash flows from the time of investment.

The study estimates returns for Sky at the aggregate level (seeking to provide returns for pay-TV activities that are as accurate as possible). Also presented are ranges of estimates of different profitability measures at various levels of disaggregation, as implied by several scenarios for cost and revenue allocation. In addition, the study presents the results of benchmarking analysis, comparing the estimates of profitability for Sky against a number of

[1] In order to draw robust conclusions on whether these returns may be deemed high, it may be appropriate to compare them against an ex ante cost of capital. This has not been investigated as part of this study; rather the analysis presented here is concerned with ascertaining a plausible range of economic rates of return achieved by Sky pay-TV over a long period of time (particularly from flotation).

[2] See, for example, Oxera (2003), 'Assessing profitability in competition policy analysis', a report prepared for the Office of Fair Trading.

[3] Oxera (2003), 'Assessing profitability in competition policy analysis', a report prepared for the OFT; CC (2009), 'Rolling Stock Leasing Market Investigation—final report', Appendix 6.4, paragraph 10, April 7th; CC (2006), 'Classified Directory Advertising Services—final report', Appendix 7.1, paragraph 15a, December 12th.

comparator companies. This analysis provides some indication about the level of Sky's returns, as well as an additional high-level sense-check on the results of the profitability analysis based on bottom-up valuation of intangible assets.

Results of the aggregate profitability analysis

The aggregate profitability analysis suggests that, over the last five years under the base case scenario, the returns appear to be around [✂]%.[4] Over the longer term, the returns appear higher, up to [✂]% on the IRR basis.(In Table 1 below, under the base case scenario, the IRR ranges from 20% to 28%).

Table 1 presents some key estimates; further results are reported in the main body of the report and the appendices (as can be seen from the sensitivities reported in the appendices, the adopted approach provides conservative estimates of returns).

Table 1 Aggregate profitability estimates

	Market value	Replacement cost (base case—churn)		Replacement cost (conservative)		Book value
		Year of investment	Annual revaluation	Year of investment	Annual revaluation	
IRR (pre-tax, nominal)						
1995–2008	9%	[✂]%	[✂]%	[✂]%	[✂]%	54%
2004–2008	0%	[✂]%	[✂]%	[✂]%	[✂]%	27%

Sources: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

To cross-check the estimates of the IRR, the study considers the estimates of the ROCE, again on the basis of different asset values. On a book value basis, an approach typically considered by the CC, the ROCE over the last five years is 29%; over the longer term (from flotation) it is 26%. On a replacement cost basis, the ROCE ranges from 16% to 22% under the base case scenario (for period shown in Table 1 above). These estimates should be regarded as conservative because they do not account for holding gains associated with growth of the asset value (as would be accounted for under the clean surplus accounting) in the numerator of the ROCE. If holding gains were accounted for, the ROCE would be closer to the IRR.

The estimated returns seem to be driven by strong cash flows and the generation of operating profits, combined with Sky's significant investments in the acquisition of new subscribers and its growing asset base.

Net cash flows are typically negative or low in periods of high upfront investment activity. Furthermore, ROCEs tend to be biased downwards during periods of significant investment. In Sky' case, positive cash flows are observed almost throughout the entire period from 1995 to 2008. In relation to ROCE, the analysis (based on book and replacement cost asset values) provides results consistent with those based on the IRR, even for recent years when Sky's subscriber base was higher. These results highlight that cash flows and profits in addition to growing asset base represent key drivers of the estimates of profitability.

Sky's ability to generate cash flows seems to be driven by its subscriber acquisition costs being low relative to customers' lifetime cash flows and churn rates. In other words,

[4] The analysis suggests that the estimates of returns (both IRR and ROCE) are lower under the market value approach to asset valuation and significantly higher under the book value approach.

subscribers appear to stay in the Sky's subscriber base for longer than is assumed in the price. This suggests that prices may have been based on assumptions of higher churn rates and a shorter customer lifetime than actually observed.

Over time, as Sky's subscriber base becomes larger relative to the number of all potential subscribers in the UK, and subscriber preferences change, the costs of acquiring new subscribers increase relative to lifetime cash flows. Thus, the lifetime profitability of new subscribers decreases over time and becomes lower than for existing subscribers. This is consistent with the evidence that, over a longer time period, Sky's aggregate returns appear higher than over a more recent period.

These results seem to suggest that, from the point of view of a potential new entrant, the costs of acquiring new customers have been increasing over time and currently seem higher relative to expected lifetime cash flows than in the past. This may highlight the challenges associated with profitable entry into this market in future. To the extent that there may be learning-by-doing effects, the costs of acquiring customers from the point of view of a hypothetical new entrant would be higher.

Additional sensitivities with respect to the treatment of current liabilities, cash and past losses were tested. The results suggest that, in the event that current liabilities are subtracted from total assets when calculating capital employed (as typically done in profitability analysis), the IRR over the period 2004 to 2008 increases from [✂]% (base case year of investment scenario) to [✂]%. In the event that annual cash on the balance sheet is excluded, the IRR increases to [✂]%. Inclusion of a relevant share of past losses into the asset base reduces the IRR from [✂]% to [✂]% between 1995 and 2008; the IRR from 2004 to 2008 remains unaffected.[5]

Results of disaggregate profitability analysis

The objective of the disaggregate profitability analysis has been, where possible, to provide an indication of the sources of profitability at the aggregate level. In light of this objective, the results of disaggregate profitability analysis were used to inform relative returns between activities, as opposed to absolute levels of returns.

Unlike profitability analysis at the aggregate level, which relies on observable data, disaggregate profitability analysis relies on assumptions about the allocation of costs, revenues and assets, and as such is inherently more uncertain. Hence, the results of the disaggregate profitability analysis should be seen in the context of the adopted cost and revenue allocation approaches.

The key results of the disaggregate analysis can be summarised as follows.

– Returns for Sky wholesale activities appear higher than for Sky retail activities. These results seem to hold under a number of cost allocation approaches and sensitivity checks.

– Estimates of returns for basic/premium channels do not seem sufficiently robust to conclude on the relative returns at the retail level. At the wholesale level, returns for premium channels appear higher than for basic channels. However, this should be interpreted with care, given the adopted allocation approaches.

– Estimates of returns for sports/movies channels do not seem sufficiently robust to conclude on the profitability of movies and sports channels, although the analysis seems

[5] There does not appear to have been a CC precedent for the inclusion in profitability analysis of past losses.

to provide some weak evidence that movies channels may have higher margins than sports channels (given the adopted approaches to cost and revenue allocation).

Results of benchmarking analysis

The objective of the benchmarking analysis was to crosscheck the results of the profitability analysis by comparing Sky's accounting and valuation ratios against a set of comparator companies.

The results of this analysis depend on the selection of comparators. In this study, the choice of benchmarks was informed by the principle that, in the long term, returns should be in line with risk. Hence, appropriate comparators were selected according to their risk exposure. Benchmark companies were selected from large samples of domestic and international television companies, and companies from the media and telecommunications industries.

Appropriate comparators from international TV markets were selected by identifying the major players in respective countries, and excluding any companies whose business model was considered to be significantly different from that of Sky, given a set of defined criteria. To identify suitable sets of comparators from other sectors, different sub-sectors within the media and telecoms industries were assessed in terms of the similarities and differences to Sky's business characteristics. The closest comparators to Sky were identified by applying statistical clustering analysis, where the comparators were ranked on the basis of selected quantitative metrics which reflect a range of risk drivers inherent in Sky's business model.

Benchmarking was undertaken at two levels: aggregate and disaggregate.

– At the aggregate level, the results of benchmarking suggest that Sky's accounting and valuation ratios are higher than those for the identified comparators. This provides an independent cross-check of the results obtained from the profitability analysis based on bottom-up asset valuation.

– At the disaggregate level, Sky's retail activities were benchmarked separately from its wholesale activities. The analysis suggests that accounting and valuation ratios for Sky wholesale are higher than for the identified comparators. At the retail level, benchmarking analysis does not seem to provide conclusive results. These observations appear consistent with results of the disaggregate profitability analysis.

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1 Introduction

1.1 Objectives of the study

Ofcom has asked Oxera to undertake an independent analysis of the economic profitability of BSkyB (Sky) in the context of its investigation in the pay-TV market.

Owing to potential conceptual and measurement issues, caution should be exercised when undertaking profitability assessments and drawing conclusions from them. However, this holds equally for most of the other indicators and techniques commonly used in competition policy. Therefore, profitability analysis should be seen as one among a number of complementary economic indicators and techniques that can be used together in a competition policy analysis.

The study estimates returns for Sky at the aggregate level (seeking to provide returns for pay-TV activities that are as accurate as possible). It also presents ranges of estimates of different profitability measures at certain levels of disaggregation, as implied by a number of scenarios on cost and revenue allocation. These estimates include:

– Sky's retail and wholesale activities, where the former are defined as sales of channels to domestic and commercial subscribers, and the latter as acquisition of content, creation of channels, and sales of channels to third-party retailers and implicitly to Sky retail;
– margins for the provision of basic and premium channels, where the latter include a list of channels as defined by Ofcom;
– margins for sports and movies channels implied by the adopted approaches to cost and revenue allocation.

This study provides evidence on the level of returns earned by Sky under a range of scenarios. In order to draw robust conclusions about whether these returns may be deemed high, it is appropriate to compare them with an ex ante cost of capital. This is because, in principle, competitive markets with free entry and exit would be expected to lead to an outcome over the long run where profitability in the market is in line with the returns required by investors in that market. As such, one benchmark for the 'normal' level of profits would be the cost of capital for firms operating in the market. This has not been investigated as part of this study; rather the study is concerned with ascertaining a plausible range of economic rates of return achieved by Sky pay-TV over a long period of time (mainly since flotation).

In addition, the report presents the results of benchmarking analysis, comparing the estimates of profitability for Sky with a number of comparator companies. Assuming that these comparators operate in competitive markets, their profitability might provide an indication of whether estimates of Sky's returns could be regarded as high.

1.2 Background to the study

Ofcom has already considered the evidence on Sky's profitability as part of the analysis conducted in this investigation. In the first consultation it looked at several metrics for Sky's aggregate profitability, including operating margins, total shareholder return (TSR) and

Tobin's Q ratios.[6] Ofcom highlighted some challenges in undertaking the profitability analysis robustly in this case and concluded that the results do not appear conclusive.[7]

In the second consultation, Ofcom conducted further analysis of returns for Sky's disaggregate activities, focusing on margins for a hypothetical PremiumChannelCo (offering wholesale provision of premium channels) and movies and sports channels. Ofcom concluded that operating margins for the part of Sky's business hypothetically contained within PremiumChannelCo are higher than those observed or expected for Sky as a whole, and that gross margins observed on movies are significantly higher than those observed on sports.[8]

Ofcom suggested that these results are consistent with what would be expected in light of Sky's business model.[9] This is because, as noted by Ofcom, in the case of movies content, it is Sky that is primarily responsible for content aggregation, whereas in the case of sports content much of the aggregation occurs upstream of Sky. Ofcom expected that monopoly rents associated with content aggregation would flow upstream to the entity responsible for that aggregation—in this case, the FA Premier League (FAPL)—leading to higher gross margins on movies than sports.

In commenting on Ofcom's profitability analysis, Sky suggested that it may not be appropriate to attempt to measure returns for sports and movies channels separately due to them having a common cost and revenue base. According to Sky, in this case the estimates of returns would be driven by cost and revenue allocation as opposed to underlying economic profitability. It is not clear whether the same comment would apply to the retail–wholesale disaggregation. It also suggests that since, in any given year, profitability estimates could fluctuate due to the variability of costs and revenues, returns need to be considered over a certain period. Sky also suggested that it is important to consider not just the company's profitability today, but also how this can be expected to evolve in the future.[10]

In terms of the assessment of whether returns could be seen as excessive, Sky suggested that the appropriate framework against which the reasonableness of profitability should be assessed is to consider the profitability of comparator companies. Comparing Ofcom's estimate of the profitability of Sky's notional premium channel business with the profitability of other pay-TV broadcasters (some of which were used as benchmarks in this study), Sky concluded that its operating margin is normal (ie, within an acceptable range) and hence that it is not setting excessive wholesale prices for its channels.

Setanta and Top Up TV also conducted profitability analysis of Sky. In their joint response to Ofcom's consultation, they suggested that by using the truncated internal rate of return (IRR) methodology, they calculated an IRR for Sky of approximately 40% over the financial years 2003 to 2007. They also argued that Sky's operating margin, profitability per subscriber, return on capital employed (ROCE) and return on equity (ROE) were also all substantially higher than those of comparable companies.[11]

Commenting on this analysis, Ofcom introduced some adjustments to the Setanta/Top-Up TV calculations to test the sensitivity of estimates. The results of these tests suggested a

[6] Ofcom (2007), 'Analysis of profitability and investor returns—Annex 12 to pay-TV market investigation consultation', December 18th.

[7] Ofcom (2007), 'Pay TV market investigation consultation', December 18th, paragraph 4.74.

[8] Ofcom (2008), 'Profitability and investor returns—Annex 9 to second pay-TV market investigation consultation', September 30th, paragraph 2.51.

[9] Ofcom (2008), 'Pay TV second consultation—access to premium content', September 30th, paragraph 1.30.

[10] Sky (2009), 'Response by British Sky Broadcasting Group plc to Ofcom's consultation document "Pay TV second consultation: access to Premium content" of 30 September 2008', Section 6, January.

[11] Setanta Sport Holdings Limited and Top Up TV Europe Limited (2008), 'Ofcom's consultation on the "Pay TV market investigation"—Response by Setanta Sport Holdings Limited and Top Up TV Europe Limited', March.

lower IRR.[12] Ofcom concluded that the results of the analysis presented by Setanta and Top Up TV were volatile and sensitive to assumptions about asset values and the time period considered.

One of the specific characteristics of Sky's business model that seems to have a significant impact on the approach and estimates of economic profitability is the likely presence of significant intangible assets, primarily associated with Sky's subscriber base. The analysis of Sky's profitability carried out so far could be seen as providing initial estimates of intangible assets, and hence initial estimates of returns. This study goes further in aiming to apply a conceptually appropriate framework for profitability analysis in the context of competition investigations, as set out in the OFT discussion paper and previously used by the Competition Commission (CC).[13] Specifically, this study applies a range of approaches for estimating intangible assets.

1.3 Structure of the report

The report is structured as follows.

– Section 2 describes the analytical approach to economic profitability analysis.

– Section 3 undertakes a valuation of Sky's intangible assets.

– Section 4 presents results for asset valuation, cash flows, and profitability at the aggregate level.

– Section 5 discusses how costs, revenues and assets have been allocated between Sky's different business activities, and presents the results of the disaggregated profitability analysis under a number of scenarios.

– Section 6 presents the results of the benchmarking analysis.

Further details on scenarios and the results of the sensitivity analysis are provided in the appendices.

[12] Ofcom (2008), 'Profitability and investor returns—Annex 9 to second pay-TV market investigation consultation', September 30th, paragraphs 1.50–1.57.

[13] Oxera (2003), 'Assessing profitability in competition policy analysis', a report prepared for the Office of Fair Trading (OFT); Competition Commission (2009), 'Rolling Stock Leasing Market Investigation—final report', Appendix 6.4, paragraph 10, April 7th; Competition Commission (2006), 'Classified Directory Advertising Services—final report', Appendix 7.1, paragraph 15a, December 12th.

2 Overview of the analytical framework

This report applies a conceptually appropriate framework for the analysis of economic profitability in the context of market investigations, as set out in Oxera's report for the OFT and applied by the CC in a number of inquiries.[14]

Before describing the analysis of the profitability of Sky's activities, it is worthwhile summarising the components of this framework, focusing on:

– the choice of the appropriate profitability metric;
– the approach to asset valuation;
– how cash flows are defined.

The remainder of this section is structured as follows:

– Section 2.1 introduces the net present value (NPV) and IRR profitability metrics;

– the 'value-to-the-owner' principle is discussed in section 2.2 as a basis for choosing the appropriate asset valuation approach in the context of economic profitability analysis;

– Section 2.3 describes how to define cash flows for use in calculating the IRR.

2.1 Profitability metrics

A number of metrics can be used to measure returns. In the context of economic profitability analysis, the conceptually appropriate approach under several conditions is to apply the internal rate of return (IRR) and net present value (NPV) measures.[15]

The IRR reflects the way in which firms make investment decisions in competitive markets. Specifically, the pattern of cash flows associated with economic activities typically has an initial cash outflow followed by a series of net cash inflows in subsequent periods. The net increase in value of the activity over time can be measured according to the NPV of cash flows. An alternative—and, in most cases, equivalent—measure is to consider what discount rate makes the NPV of the cash flows zero (ie, the project's IRR) and to proceed with the investment if this IRR is greater than the company's cost of capital or hurdle rate. Moreover, in addition to this being a theoretically robust method of investment appraisal, it is the one most commonly used in the business world.[16] The IRR and the NPV take into account the inflows and outflows of an activity over time, and reflect the economic principle of the time preference of money.[17]

[14] Oxera (2003), 'Assessing profitability in competition policy analysis', a report prepared for the Office of Fair Trading (OFT); Competition Commission (2009), 'Rolling Stock Leasing Market Investigation—final report', Appendix 6.4, paragraph 10, April 7th; Competition Commission (2006), 'Classified Directory Advertising Services—final report', Appendix 7.1, paragraph 15a, December 12th.

[15] See, for example, Oxera (2003), 'Assessing profitability in competition policy analysis', a report prepared for the Office of Fair Trading (OFT); and Morris, D. (2003), 'Dominant Firm Behaviour under UK Competition Law', paper presented to the Fordham Corporate Law Institute, October.

[16] In a survey of 392 chief financial officers of companies in the USA and Canada, Graham and Harvey (2001) found that around 75% always or almost always use the IRR or NPV as their evaluation technique. Graham, J.R. and Harvey, C.R. (2001), 'The Theory and Practice of Corporate Finance: Evidence from the Field' *Journal of Financial Economics*, **60**, 187–243.

[17] Kay, J.A. (1976), 'Accountants Too, Could be Happy in a Golden Age: The Accountant's Rate of Profit and the Internal Rate of Return', *Oxford Economic Papers*, **28**, 447–60; Edwards, J., Kay, J. and Mayer, C. (1987), *The Economic Analysis of Accounting Profitability*, Oxford: Claringdon Press.

This principle can be taken from the investment appraisal framework and applied to the concept of competitive markets. In theory, in a competitive market where there is free entry and exit, the NPV of projects/activities, or of an entire business, would not be expected to continue to be positive—or, equivalently, the IRR would not be expected to be greater than the cost of capital—indefinitely. Instead, with free entry and exit, other companies would be expected to enter the market or undertake a similar project. In theory, with each additional entrant, the returns of each company in the market should fall until the IRR equals the cost of capital, or, equivalently, the NPV is zero. By contrast, the IRR, being persistently and substantially above the competitive benchmark (eg, the cost of capital), could indicate the existence of entry barriers and hence market power.

For the purposes of competition analysis, there is usually a need to measure the IRR over a specific period during the lifespan of an economic activity. In practice, therefore, a truncated IRR can be calculated using accounting information on net cash flow during the period under consideration.[18] Since only a segment of the lifespan of an investment is considered, the initial asset value is treated as a cash outflow and the residual value at the end of the period is treated as an inflow.[19]

This report applies the IRR framework to measure Sky's profitability. The IRR estimates are also supported by ROCE estimates. While, at the aggregate level, the quality of the cash flow and asset value data (including the valuation of intangible assets) could be seen as sufficiently robust to use the IRR framework, at the level of retail and wholesale activities, more weight may need to be placed on alternative profitability measures. More disaggregate estimates of returns (eg, basic and premium channels, and movies and sport channels), obtained under different scenarios for costs and revenue allocation, are based on margins.

2.2 Asset valuation

The application of the IRR framework requires the assets to be valued at the beginning and end of the period under investigation. This can be one of a number of ways. In the context of economic profitability analysis, the value-to-the-owner principle, as defined by Edwards, Kay and Mayer (1987), provides a basis for choosing between the various approaches to asset valuation.[20] This principle requires assets to be valued at *the minimum loss that a firm would suffer were it deprived of the use of that asset.*[21] This loss is assessed with respect to the options available to a business at any point in time.

– **Replace the assets**—the replacement cost or the cost of a modern equivalent asset (MEA) becomes the appropriate valuation base.

[18] The CC has also accepted the potential appropriateness of using the (truncated) IRR. For example, in the home credit inquiry, it stated that the truncated IRR and the ROCE were appropriate, but that the latter was a more readily understood calculation in that instance. CC (2006), 'Home Credit Market Investigation', November.

[19] Under certain circumstances, the IRR and NPV might lead to different conclusions about the difference between the estimated profitability and the cost of capital (as a competitive benchmark). For example, there might be two projects with the same NPV, but different IRRs. A divergence in the profitability estimates based on the IRR and the NPV could be driven by a difference in assumptions about the borrowing and lending rates. The IRR assumes that any money moved through time is either borrowed or reinvested at the IRR, while the NPV assumes that the free cash flow is reinvested at the cost of capital and cash shortages are financed at the cost of capital. However, the assumption that cash flows are reinvested at the IRR is less problematic when measuring profitability in the context of competition investigations. This is because it might be more appropriate to assume that reinvestment is made at the IRR rather than the cost of capital, as the latter approach implicitly assumes that markets are competitive. Furthermore, the smaller the difference between the IRR and the cost of capital and the more delayed the negative cash flows (which would imply that borrowing was required), the less material the impact of the reinvestment rate assumption would be. Oxera has therefore cross-checked the IRR results against a modified IRR that adjusts the borrowing and lending rates to be equal to the estimated cost of capital. The alternative assumptions about borrowing and lending rates implicit in these approaches do not materially affect the profitability results (for example, as shown in Table 4.5 the IRR from 2004 to 2008 is [✂]%, while the modified IRR is [✂]% (not shown in Table 4.5); under the same scenario the IRR from 1995 to 2008 is [✂]% and the modified IRR is [✂]%).

[20] Edwards, J., Kay, J. and Mayer, C. (1987), *The Economic Analysis of Accounting Profitability*, Oxford: Claringdon Press.

[21] This requirement is the reason why the CC refers to the value-to-the-owner principle as the 'deprival value' principle.

– **Sell the assets**—the amount that could be realised by disposing of the assets (the net realisable value, NRV) would then be the appropriate valuation base.

– **Continue to use the assets**—the assets would be valued as the NPV of cash flows associated with continued use of the assets.

The higher of the NRV and the NPV can be referred to as the economic value of the assets. If the NRV is higher than the NPV, the business would sell the assets; if this relationship was reversed, the business would continue to use the assets.

Application of the value-to-the-owner principle implies that if the replacement cost is lower than the economic value, a company deprived of the assets would pay to replace them, and hence the assets would be valued at replacement cost. In contrast, if the economic value is lower than the replacement cost, the assets would not be replaced, and would be valued at the economic value—ie, the higher of NRV and NPV. This can be expressed in the following set of equations. The value of the assets (V) is given by:

$$V = min \{MEA, EV\} \quad \text{Equation 2.1}$$

where the economic value (EV) is given as:

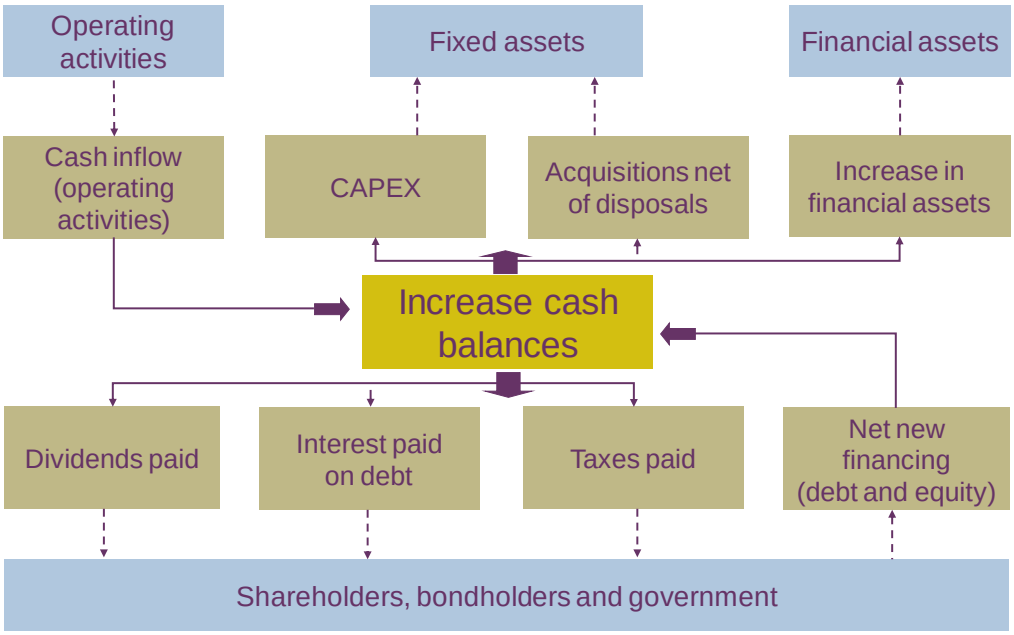
$$EV = max \{NPV, NRV\} \quad \text{Equation 2.2}$$

In this report, the value-to-the-owner principle has been applied and involved estimating the market value (as an estimate of the economic value) and the replacement cost value of Sky's assets (as an estimate of the MEA value). The estimation of the replacement cost value of assets also involved valuation of Sky's intangible assets. This component of the analysis is discussed in section 3, while section 4 sets out the valuation of Sky's aggregate asset base under a number of scenarios.

2.3 Cash flows

In addition to asset valuation, the IRR framework requires an estimation of the cash flows. In the context of economic profitability analysis, these can be defined as cash flows to investors or cash flows to the firm. Both approaches should provide the same estimate if applied correctly (see Figure 2.1).

Figure 2.1 Cash flows of a company



Source: Oxera.

A company generates cash inflows from its operating activities. This cash inflow, net of operating costs (CI), can be used in various ways: to pay dividends (D), interest (I) and taxes (T); to finance CAPEX and acquisitions, net of disposals (A); and to invest in financial assets (FA)—ie, current investments. In addition, a company may receive new financing (through new share issues or loans), or reduce its financing by repaying some of its loans and repurchasing shares. The net new financing (NNF) is the difference between new share issues and loans, less loan repayments and share repurchases. At the end of the financial year, therefore, the net increase in cash balances (NIC) held by the company is the difference between:

– the sum of cash inflows from operating activities and NNF;
– the sum of outflows of dividends, interest and taxes paid, net additions to fixed assets through CAPEX and acquisitions (net of disposals), and net additions to current investments.

The pre-tax net cash flow (CF) to investors (share- and bondholders) and government is given by:

$$CF = D + I + T - NNF \qquad \text{Equation 2.3}$$

Similarly, it could be expressed as a cash flow to the firm, as follows:

$$CF = CI - CAPEX - A - (FA + NIC) \qquad \text{Equation 2.4}$$

As these two equations are equivalent, either can be employed to estimate the cash flows required to calculate the IRR of investments made in a company or activity.

3 Valuation of intangible assets

To apply the value-to-the-owner principle, set out in section 2.2, the market value and replacement cost values of Sky's assets need to be estimated. The estimation of the market value of assets typically involves consideration of the market value of equity and debt.[22] For listed firms, these components can typically be directly observed from the market and statutory accounts. The replacement costs of assets, however, tend not to be directly observable and need to be estimated. The analysis therefore requires consideration of individual asset types owned by the company and separate estimation of their replacement costs. The starting point for such analysis is usually provided by the statutory accounts.

In Sky's case, given the nature of its business, it may be reasonable to expect that there are certain intangible assets that are not recognised on the statutory balance sheet, but would need to be included in the asset base in the context of an economic profitability analysis. For example, in its first consultation, Ofcom suggests:[23]

> we are aware that there are potentially a large number of assets pertaining to Sky which may have economic value but which are not reflected on its accounting balance sheet.

Therefore, an important component of asset valuation in this case is the valuation of Sky's intangible assets that are not recognised on the balance sheet. This section discusses how such intangible assets were identified and valued.

There are also some intangible assets that are recognised on Sky's balance sheet. In the context of this analysis, one important consideration is whether some of these may not qualify as intangible assets in competition policy analysis and would need to be excluded from the asset base. The assessment of intangibles already included on Sky's balance sheet is also provided in this section.

The section is structured as follows.

– Section 3.1 outlines the analytical framework used to value Sky's intangible assets.

– Section 3.2 identifies the potential sources of Sky's intangible asset value.

– Section 3.3 examines approaches that could be adopted to value the intangibles, considers why a cost-based approach is appropriate in this context, and describes how this was applied in the case of Sky.

– Section 3.4 presents results for the valuation of the three main categories of Sky's intangible assets under both conservative and base case scenarios.

– Section 3.5 summarises the results for the valuation of Sky's intangible assets under the base case scenario.

[22] While the market value of assets requires estimation of the market value of debt, in some cases it may be appropriate to use the book value of debt as a proxy. To the extent that interest rates fell between the issuance of debt and the purchase by the current owners, the market value of debt could potentially exceed book value, implying that the tangible asset value could be underestimated.

[23] Ofcom (2007), 'Analysis of profitability and investor returns—Annex 12 to pay-TV market investigation consultation', December 18th, paragraph 4.6.

3.1 Analytical framework

The valuation of intangible assets in this study in general follows the principles applied by the CC in the context of economic profitability analysis. The CC considered intangible assets in three investigations, as set out in the table below.

Table 3.1 CC's precedents on the treatment of intangible assets

SMEs (2002)	Financial services (banking)	Staff recruitment and training costs Customer acquisition costs IT systems development costs	Assets valued using cost-based approaches
Home credit inquiry (2006)	Financial services	Staff recruitment and training costs Customer acquisition costs Knowledge of customers' creditworthiness IT systems development costs	Assets valued using cost-based approaches
CDAS (2006)	Classified directory advisory services	Start-up costs Database development costs Sales force training costs Marketing and branding costs	Relevant expenditure which built up intangible assets was judged to be impossible to identify separately; hence intangibles were valued using comparators

Source: CC (2002), 'The Supply of Banking Services by Clearing Banks to Small and Medium-sized Enterprises: A Report on the Supply of Banking Services to Small and Medium-sized Enterprises within the UK', Cm 5319, March 14th; CC (2006), 'Home Credit Market Investigation', November; CC (2006), 'Classified Directory Advertising Services market investigation', December 21st.

Given the specific context of this analysis, the CC's approach was modified to reflect the nature of Sky's activities and to increase the robustness of estimates. Given the CC's approaches and a number of modifications, the valuation of Sky's intangible assets involved three main steps:

– identification of the sources of intangible asset value;
– choice of the valuation approach;
– application of the valuation approach.

The first step is to consider the sources of intangible asset value that may be present in the case of Sky, given its business model and nature of activities. This would enable identification of the types of intangible assets that are not reflected on Sky's balance sheet, but need to be included in the asset base in the context of economic profitability analysis. Once intangible assets have been identified, it is important to choose the appropriate approach for their valuation, taking into account that this valuation is carried out in the context of competition policy analysis. The final step is to implement the chosen asset valuation approach, taking account of specific considerations in the case of Sky, and minimising potential sources of uncertainty.

3.2 Identification of intangible assets

To understand potential sources of intangible asset value in the case of Sky, it is necessary to consider its business model.

The main activity of Sky's pay-TV operations is sales of channels to customers on a subscription basis. Under a typical retail contract,[24] customers incur a fixed upfront cost (eg, payment for the set-top box), as well as periodic (monthly) subscription payments. Once the customer takes out a subscription to Sky's channels, it typically stays with Sky for several years. Hence, at the time when the customer takes out the subscription, it is reasonable to expect subscription revenue over a period of few years. Therefore, the subscriber base seems to represent one type of intangible assets that may need to be included in the asset base.

The value of the subscriber base encapsulates several other types of potential intangible assets, such as brand, customer relations and corporate reputation. The relationship between is described in greater detail in section 3.3, which sets out various approaches that could be adopted to value the identified intangibles.

Sky also acquires content on the basis of long-term contracts (eg, the FAPL contracts). These are structured such that Sky commits to future payments under the contract, once signed; in exchange, it receives the right to acquire and transmit certain programming content.

Sky capitalises certain programming content on its balance sheet, including content that is at the stage of completed programmes that could be transmitted to viewers—this is shown within inventories. However, in the case of these contracts, Sky has entered into commitments to make future payments before the content will be available in a form that can be transmitted to viewers, and hence these contracts are not recognised within inventories.

The acquisition of contracts seems to represent another type of intangible assets that may need to be included in the asset base.

The subscriber base and contractual obligations represent intangible assets that are associated with Sky's business model. This means that Sky undertakes investments to create these assets, which, at the time of the investment, are expected to create economic benefits over the long term.

In addition to these types of assets, in the case of Sky there may be another intangible asset, which originates from the timing of cash flows associated with the investments. For example, an investment could have a profile of cash flows whereby, in the earlier years, cash flows are low and high in the later years. In this case, if profitability analysis is undertaken over a truncated period, which includes the period of high cash flows only, the opening asset value needs to be adjusted to reflect low cash flows in earlier years. If this adjustment is not made to the opening asset value, the profitability estimates would be overstated.

In this study, profitability analysis starts from 1995, the first year after Sky's flotation. However, before this (more specifically, before 1991), Sky incurred significant losses. To the extent that these losses in earlier years are linked to profits made by Sky in later years, or represented investments in subscribers, they would need to be incorporated in the opening asset base. Therefore, past losses are considered in this study as the third type of intangible assets.

In terms of specific treatment in the analysis, past losses were analysed as part of the sensitivity analysis, as opposed to being included in the capital base. This is because the opening asset in the profitability analysis was revalued using the replacement costs of market values in the year. As such, the impact of past losses may be captured in the opening asset base, and additional adjustments may not be required. Furthermore, it should be noted that there has been no CC precedent for the inclusion, in profitability analysis, of past losses in the capital employed.

[24] Sales to retail customers represent the largest part of Sky's revenues (76% of total in 2008). See Sky Annual Report 2008.

Table 3.2 summarises the types of intangible assets that are considered in this study.

Table 3.2 Key types of Sky's intangible assets to be capitalised

Intangible asset	Description
Subscriber base	Sky's investments in acquiring customers and raising customer awareness of its products
Contractual obligations	Sky's contractual obligations to incur payments for programming content in future years (eg, FAPL rights)
Past losses (analysed as part of the sensitivity assessment)	Proportion of past losses that reflect the timing of cash flows from past investment, if relevant

Source: Oxera analysis.

In addition, it is important to consider intangible assets already capitalised on Sky's balance sheet. According to Sky's statutory accounts, these include software associated with customer management systems, capitalised development costs and copyright licences, customer lists and relationships, patents and brands acquired in business combinations and programming content.[25] In relation to these assets, it is important to:

– identify the asset types that may need to be excluded from the asset base;

– ensure that there are no overlaps between existing intangible assets and those that need to be added in the context of this analysis.

On the first point, the analysis excluded goodwill associated with acquired subsidiaries. First, such goodwill may include capitalised monopoly rents, which should be excluded from the capital employed in the context of economic profitability analysis. Second, some of this goodwill relates to investments in companies that are not related to Sky's pay-TV operations. Other types of intangible assets capitalised on Sky's balance sheet were included in capital employed in this study.

On the second point, the valuation approaches described in section 3.3 ensure that there is no overlap between different types of intangibles. More specifically, under the valuation approach—where intangible assets are valued as capitalised expenditure—there would be no overlap because expenditure that forms the basis for intangibles already capitalised on the balance sheet would not be included in the expenditure that is capitalised to value the subscriber base.

In past inquiries, the CC has also considered other types of expenditure. For example, in the CDAS, SME and home credit investigations, it considered intangibles associated with staff training and development. In the case of Sky, a significant part of the intangible asset in relation to staff training would be expected to be associated with developing the subscriber base and would therefore be included in the value of the subscriber base. Hence, no additional intangible assets were included in the asset to reflect potential intangible asset value associated with staff training.

Overall, the combination of assets shown in Table 3.2 and intangibles already on Sky's balance sheet (excluding goodwill) were valued and included in capital employed.

3.3 Approaches to valuation of intangibles

The value of intangible assets can be estimated in a number of ways, which can be classified as value- or cost-based approaches. The choice of the appropriate valuation approach needs to reflect the context of the analysis.

[25] Sky Annual Report 2008, note 13 to the accounts.

As set out in section 2.2, in the context of competition policy assessment, asset valuation should follow the value-to-the-owner principle, which implies the lower of the replacement cost or the economic value (where economic value is the higher of the NPV of future cash flows, or the NRV from selling the asset).[26] This sub-section discusses both categories of approaches in the context of economic profitability analysis.

3.3.1 Value-based approaches to intangibles

In general, two types of value-based approaches can be distinguished:

– under a **market-based approach**, intangible assets are primarily valued on the basis of empirical transactional data—actual statistics on the sale or licensing of companies with similar types of intangible assets. The main tool used here is pricing multiples, which are then applied to the company in question;

– under an **income-based approach**, intangible assets are valued according to the present value of income that would be earned from the ownership of the assets. This approach requires careful delineation of economic income that is associated with intangible assets from the income earned by the overall business of the company whose assets are valued.

3.3.2 Cost-based approaches to intangibles

Cost-based approaches are based on costs of creating the intangible assets rather than on the market value that these assets generate. They include valuations based on historical costs incurred by the company to create the relevant intangible assets, as well as on the costs that a hypothetical entrant would have to incur to replace the assets.

A cost-based approach requires identification of the relevant costs, given the sources of intangible value, and identification of the useful lives of the assets that are created by these costs, given the time period over which these costs would be expected to create benefits.

3.3.3 Choice of the appropriate valuation approach

The value-based approaches may not be appropriate in the context of economic profitability analysis if market values used in the analysis are based on the company whose returns are being assessed.[27] This is because these approaches do not allow for the separation of the value that is derived from intangible assets in competitive markets from value that could be derived from potential market power. This may introduce circularity in the analysis of profitability. More specifically, if a customer base is valued as discounted future cash flows from these customers, returns on this asset base would be expected to be equal to the cost of capital at which the cash flows are valued, irrespective of whether prices are high or low.

Value-based approaches can be applied in the context of economic profitability analysis if market valuations are derived from competitive markets. For example, comparator companies (ie, companies with similar sources of intangible value) operating in generally competitive markets may provide additional useful information in explaining the economic rates of return of an activity. More specifically, comparators can be used to infer a relationship between the values of tangible and intangible assets for similar businesses. This relationship can then be used to imply an appropriate value of intangible assets for the relevant company on the basis of, for example, book-to-market or value-per-customer ratios.

For example, during the Classified Directory Advertising Services (CDAS) inquiry, the CC did not estimate the value of intangible assets directly. Instead, the Commission estimated the

[26] Edwards, J., Kay, J. and Mayer, C. (1987), 'The Economic Analysis of Accounting Profitability', Oxford: Claringdon Press. See also Oxera (2003), 'Assessing profitability in competition policy analysis: Economic Discussion Paper 6', report prepared for the OFT by Oxera, July.

[27] Oxera (2003), 'Assessing profitability in competition policy analysis: Economic Discussion Paper 6', report prepared for the OFT by Oxera, July.

value of total assets (tangible and intangible) based on previous transactions involving CDAS companies that operated in a competitive environment.[28]

In this study, a similar cross-check on the valuation of intangible assets has been applied.

In contrast to value-based approaches, valuation of intangible assets based on the costs of creating those assets avoids the potential for capitalisation of value derived from market power. A cost-based approach was used, for example, in the CC's inquiry into the supply of banking services to SMEs. The CC suggested that the most appropriate way to value intangible assets in the banking sector was on a depreciated replacement cost (DRC) basis. The CC's inquiry into the Home Credit market used a similar DRC approach to intangible asset valuation.

Cost-based approaches can be more complex to apply as they involve a 'bottom-up' assessment of intangible asset values, which raises conceptual and practical issues as outlined in section 2.3.2. However, as cost-based approaches to the valuation of intangible assets are more appropriate in the context of economic profitability analysis than approaches based on the market value of the company being analysed, more weight has been placed on valuations from cost-based approaches in this case.

When applying a cost-based approach in this case, a number of specific issues need to be considered.

– **Entrant's costs or Sky's actual historical costs**—the actual costs that an entrant would face to replicate Sky's intangible assets today may be different to the costs actually incurred by Sky. For example, in the case of the customer base, changes in customers' awareness of the different technologies available for receiving and viewing audio-visual content and the emergence of alternative providers of pay-TV services may have increased the costs of acquiring customers and decreased their useful lives over time. In this context, the appropriate basis for analysis (ie, replacement costs at the time of investment or current replacement costs) depends on the definition of a well-functioning market. If, in a well-functioning market, prices are expected to reflect current replacement costs (ie, entry costs) then intangibles need to be valued with reference to current costs of replicating the assets.[29] Similarly, if, in a well-functioning market, prices would reflect replacement costs at the time when the customers were acquired, Sky's past investments need to be used for asset valuation. In practice, it is important to assess the sensitivity of results to different assumptions, which has been done for this study through the use of scenario analysis.

– **Costs needed to create an asset and maintenance costs**—when capitalising relevant costs, it is important to distinguish costs that create new assets from those that maintain existing assets. The former need to be capitalised and added to the asset base, while the latter need to be expensed. Capitalising costs incurred to maintain existing assets would double-count their effect on the asset base. For example, in the case of Sky's subscriber base, some costs are incurred to acquire new customers and therefore to expand the intangible asset base embodied in customer relationships—eg, subsidies for installing set-top boxes. Other costs are incurred to maintain the existing subscriber base and effectively increase the economic life of the embodied intangible assets by decreasing the churn rate—eg, certain entries within the subscriber management cost category. If such entries had been capitalised, their effect would have been counted twice: once through the effect on churn rate, which is incorporated in the asset lives for subscriber related assets; and once through the creation of an additional intangible asset.

[28] CC (2006), 'Classified Directory Advertising Services market investigation', December 21st.

[29] Provided that market values exceed cost values.

In this report, the costs of creating new subscriber base assets have been identified separately from maintenance costs using a number of alternative approaches.

3.4 Application of the valuation approach

This section discusses how the identified intangible assets were valued using the cost-based valuation approach set out in section 3.3. In the case of the subscriber base and past losses, the analysis involved identifying relevant costs and capitalising costs as a measure of asset value. Contractual obligations were valued as the present value of future commitments.

Estimating the replacement costs of intangible assets is inherently uncertain and care needs to be taken to address such uncertainty adequately. To minimise the impact of uncertainty on the analysis, two scenarios have been considered here to value the subscriber base (the main type of intangible assets that needs to be capitalised) (see Table 3.3). This analysis has been supplemented by a number of sensitivity checks (discussed further in section 4).

Table 3.3 Overview of scenarios for the valuation of intangibles

	Conservative scenario	Base case	Sensitivity check
Subscriber base	Use customer acquisition model Use total marketing and subscriber management costs	Use customer acquisition model Exclude costs that do not create an intangible asset (eg, subscriber management costs) Separate investment from maintenance costs	A number of specific sensitivity checks on time period and treatment of specific cost lines
Contractual obligations	Value commitments as NPV of the subsequent year's cash outflows in statutory accounts		Inclusion/exclusion from the capital base
Past losses	Exclude from asset base		Capitalise the portion of losses before 1994 relating to expenditure that may be associated with acquisition of subscribers
Intangibles already capitalised on the balance sheet	Include in the asset base (excluding goodwill)		Inclusion/exclusion from the capital base

Source: Oxera.

The objective of the conservative scenario is to estimate the upper end of the range for the subscriber base (and the portfolio of intangibles). The objective of the base case scenario is to provide a more accurate estimate of the subscriber base, based on a more detailed analysis of costs. The treatment of the three categories of assets under these scenarios is discussed in greater detail below.

3.4.1 Valuation of the subscriber base

The value of the subscriber base depends on the number of subscribers and the value of each subscriber. A subscriber valuation model was used to value this intangible asset comprising three main elements: evolution of subscriber numbers; evolution of subscriber acquisition costs (SAC); and valuation of the subscriber base given subscriber numbers and acquisition costs. Each is discussed in turn.

Number of subscribers

The first component of the model is the evolution of subscribers over time—in particular, for every year, the analysis requires the number of opening subscribers, additions to the

subscriber base, number of departing subscribers, and the closing number of subscribers. This has been estimated on the basis of subscriber numbers and churn rates disclosed in Sky's statutory accounts.

A key source of uncertainty in the valuation of intangible assets is the useful economic life of assets assumed. For example, in past inquiries the CC had to assume this parameter for the purposes of the valuation, given that it is difficult to observe or estimate. In this study, this parameter—which corresponds to the average duration of the subscriber relationship—was estimated directly from the observed data on churn rates, thus removing an important source of uncertainty in the valuation of intangible assets.

Identification of subscriber acquisition costs

The cost attributed to each subscriber has been calculated by dividing the relevant costs, identified as those creating the intangible asset, by gross subscriber additions in the year. This approach assumes that additions to the subscriber base in a given year are a function of these costs in the year in question.

The SAC in each year has been estimated under both a conservative and a base case scenario, with the differences between the two approaches depending on an assessment of which costs are relevant to the creation of intangible assets.

Under the **conservative scenario**, SAC has been defined as the total marketing and subscriber management costs recorded in the statutory accounts divided by the number of gross subscriber additions in a given year. For example, in 2007/08 total marketing costs amounted to £743m and total subscriber management costs were £700m.[30] This provides an upper end of the range because not all such costs would meet the criteria for capitalisation. For example, marketing costs recorded in the statutory accounts include expenditure on 'retention marketing', which may not constitute an investment in new customers. Similarly, subscriber management costs include certain cost lines (eg, the costs of equipment) which would not be expected to create an intangible asset.

Under the **base case scenario**, the selection of the relevant costs to capitalise followed the three criteria for recognising intangible assets used by the CC:

– the assets created must be identifiable;
– the costs must be incurred now for earnings that are to be delivered later;
– the costs must be additional to the baseline costs of running the business.[31]

Therefore, under this scenario, two changes were made to total marketing and subscriber acquisition costs: costs that do not create an intangible asset were excluded and investment was separated from maintenance costs, based on statutory accounts and management accounting data provided by Sky. For example, on the basis of the 2007/08 data, the following cost entries were excluded.

– Subscriber management costs (£700m)—these are likely to relate mostly to maintaining existing subscriber relationships, and would therefore not constitute investments in the subscriber base.

– Marketing costs that do not create investments in intangible assets (£[✂]m). This category of costs comprises retention marketing (£[✂]m), consumer marketing costs (£[✂]m), and other marketing (£[✂]m); therefore only customer acquisition costs, as defined by Sky, were included in the analysis. These costs have been excluded as they

[30] Sky Annual Report 2008.

[31] CC (2002), 'The Supply of Banking Services by Clearing Banks to Small and Medium-sized Enterprises: A Report on the Supply of Banking Services to Small and Medium-sized Enterprises within the UK', Cm 5319, March 14th.

are not classified as marketing related to subscriber acquisition costs in the data provided by Sky.

– Marketing acquisition costs that are not related to pay-TV (£[✂]m). Sky excluded non-TV cost items from the management accounting data provided for 2007/08. These items included, for example, marketing and subscriber-handling costs associated with Easynet and Sky bet.

Once these deductions have been made from the costs in the conservative scenario, the remaining subscriber acquisition costs under the base case scenario are £[✂]m for 2007/08.

Valuation

The evolution of the number of subscribers and SAC was used to value the subscriber base.[32] This involved valuation of the opening value as well as its roll-forward using subscriber additions and departures.

The analysis was carried out at the level of the cohorts of customers acquired in a given year. Upon acquisition, each cohort was valued as the number of acquired subscribers multiplied by the acquisition costs per subscriber. This estimated value of subscribers was added to the asset base and depreciated over the estimated economic life.

Each cohort was depreciated in line with observed churn rates. Annual depreciation included two components:

– every year the number of customers in a cohort decreases, given the observed churn; and

– value of the remaining customers decreases, given that the remaining economic life is getting shorter and a certain amount of the original investment is already recovered.

As a result of the combined effect of these two factors, the profile of depreciation for a given cohort of customers is similar to the declining-balance method.

The maximum economic life of customers in a cohort was estimated using the observed churn rates. In particular, these maximum economic lives were estimated such that the resulting departures from the customer base estimated reconciled with observed churn rates.

More specifically, churn rate in each year identifies the total number of customers departing from the subscriber base. This number could be broken according to the year when these customers were acquired. For example, the total estimated number of departing customers in 1994 was 242,000, which includes 58,000 of customers acquired in 1993 and 184,000 of customers acquired before 1993. On this basis, the economic life of customers acquired in each year was estimated such that the total number of departing customers implied by this economic life reconciled to a number of departing customers implied by the churn rate.

It should be highlighted that the opening value of the subscriber base was estimated as the number of subscribers in 1993 times the SAC in 1993. This represents the replacement costs of the assets in this year. Additions to the subscriber base were valued in terms of the number of customers times SAC in the year when the additions occurred. Departures were valued as the number of departing customers (estimated using the churn rates) times SAC in the year when these customers were originally acquired. It is worth noting that the model takes into account not only departing customers, but also the value of the remaining subscribers. The latter was assumed to decrease as time progresses, reaching zero in the last year of the subscriber's useful life. This valuation approach is referred to 'replacement costs—year of investment'.

[32] Such an approach is most likely to overestimate the opening value of the subscriber base as it assumes that all customers acquired at the beginning of the period are 'new' or have zero age.

An alternative approach was also modelled, whereby the subscriber base was revalued annually using the evolution of the SAC over time—ie, indexed using the price index calculated as the evolution of SAC (per subscriber) over time. Under this approach, the value of the subscriber base represented the replacement costs of subscribers in every year. This approach is referred to as 'replacement costs—annual revaluation'.

To summarise, two valuation approaches were considered.

– **Replacement costs—year of investment**: customers acquired in the past are valued in line with the costs incurred by Sky in acquiring these customers. This approach aims to capture the cost of past investments made by Sky to acquire its current asset base.

– **Replacement costs—annual revaluation**: customers are revalued every year on the basis of the evolution of subscriber acquisition costs (ie, revaluation gains/losses are implicitly recognised in the asset base). This approach takes into account changes in the SAC over time—ie, the rate of change of the SAC is implicitly applied to the already capitalised subscriber base.

The main difference between the two approaches is the treatment of holding gains/losses associated with existing customers. Revaluing the existing subscriber base in every year based on the SAC in that year includes holding gains/losses into the asset base. It should be noted that such an approach may better reflect the costs that would be incurred by a hypothetical entrant to replicate Sky's subscriber base. Recording the value of existing customers at historical SAC maintains the replacement cost value of the subscriber base at the cost of the year of investment.

Table 3.4 illustrates how the components of the subscriber acquisition model were assembled to provide an estimate of the overall value of the subscriber base. For clarity of presentation, the estimation of subscriber acquisition costs has been shown according to the CC's precedent on the treatment of marketing costs.

Table 3.4 Illustration of subscriber base capitalisation approach: base case—CC precedent

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Subscriber numbers ('000)														
Opening customer base	**2,541**	**2,893**	**3,247**	**3,532**	**3,547**	**3,460**	**4,513**	**5,453**	**6,101**	**6,845**	**7,355**	**7,787**	**8,176**	**8,582**
Customers left (depreciation)[1]	323	347	396	411	394	365	451	545	573	664	758	864	1,014	893
Net additions[2]	352	354	285	15	–87	1,053	940	648	744	510	432	389	406	398
Gross additions (total CAPEX)[3]	675	701	681	426	307	1,418	1,391	1,193	1,317	1,174	1,190	1,253	1,420	1,291
Closing customer base	**2,893**	**3,247**	**3,532**	**3,547**	**3,460**	**4,513**	**5,453**	**6,101**	**6,845**	**7,355**	**7,787**	**8,176**	**8,582**	**8,980**
Marketing costs														
Sky's statutory accounts (£m)	59	76	102	168	666	440	378	417	401	396	527	622	734	743
Capitalised marketing costs														
CC precedent (£m)[4]	20	25	34	56	222	147	126	139	134	132	176	207	245	248
Implied SAC (£)[5]	29	36	50	131	117	103	91	116	101	112	148	165	172	192
Total value of subscriber base														
Replacement cost (year of investment, £m)	**47**	**64**	**87**	**129**	**146**	**271**	**360**	**449**	**519**	**574**	**662**	**765**	**889**	**995**
Replacement cost (annual revaluation, £m)	**73**	**100**	**147**	**373**	**311**	**373**	**402**	**575**	**555**	**649**	**888**	**1,035**	**1,140**	**1,302**

Note: [1] Based on churn rate in the same year. [2] This represents the difference in closing and opening customer base in a given year. [3] Gross additions in any year are equal to the sum of customer depreciation and net additions in that year. [4] In the SME inquiry, the CC capitalised one-third of total marketing costs. The figures presented are therefore calculated as one-third of total marketing cost shown in Sky's statutory accounts. [5] Estimated by dividing capitalised marketing costs by gross customer additions.
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

As can be seen from the table, the value of the subscriber base estimated using the replacement cost (annual revaluation) approach is higher than under the replacement cost (year of investment) approach. The size of the difference reflects holding gains/losses associated with the evolution of the SAC over time. Given that the value of acquired subscribers is decreasing relatively quickly over time (due to depreciation), the impact of holding gains/losses is not very large.

These valuation approaches seem to explore the costs of creating the subscriber base in more depth than in past CC inquiries. The CC typically considered marketing costs and capitalised a proportion of them, given the assumed useful life and steady-state investments.[33] This analysis involved making assumptions about some of the key parameters of the intangibles valuation model. The analysis carried out in this study estimates these parameters from the observed data (eg, economic life).

[33] CC (2006), 'Home Credit Market Investigation', November.

Another aspect of the CC's analysis is the assumption about the split between costs that represent an investment in the intangible assets and costs that maintain the assets. The CC's precedent has typically been to assume a given split.[34]

In addition to assuming a given split, this study analysed Sky's management accounts to identify the appropriate split: under one scenario, the changing split over time was modelled, such that, in earlier years, the greater proportion of marketing costs was treated as an investment and in the later years this proportion reduced.

All years and scenarios show growth in the value of the subscriber base, which is driven by growth in total subscriber numbers. The exception is 1999, when the total number of subscribers and value of the subscriber base declined. In all the scenarios reported in Table 3.5 below, the replacement cost of the subscriber base based on annual revaluation is higher than the historical cost based on the year of investment. This is a result of the upward trend in SAC per new subscriber acquired over this time.

As described in section 3.3.2, under the base case scenario the subscriber base is valued using two approaches to exclude marketing costs not related to the acquisition of subscribers. The first uses the relationship between the proportion of marketing acquisition costs in total marketing costs and the churn rate to estimate historical marketing acquisition costs. The second assumes that one-third of total marketing costs relate to subscriber acquisition, with the remainder relating to maintenance of the subscriber base, consistent with the CC's approach in the SME inquiry.[35]

The 'base case—churn' results are lower than in the conservative case because of the exclusion of subscriber management costs and specific marketing cost items not related to the acquisition of subscribers, such as retention marketing. The excluded cost items accounted for approximately [✂]% of the total marketing and subscriber management costs for 2008. The 'base case—CC precedent results' generate asset values that are lower still, as only 33% of marketing costs are capitalised compared with [✂]% in the 'base case—churn' results.

[34] CC (2002), 'The Supply of Banking Services by Clearing Banks to Small and Medium-sized Enterprises: A Report on the Supply of Banking Services to Small and Medium-sized Enterprises within the UK', Cm 5319, March 14th.
[35] CC (2002), 'The Supply of Banking Services by Clearing Banks to Small and Medium-sized Enterprises: A Report on the Supply of Banking Services to Small and Medium-sized Enterprises within the UK', Cm 5319, March 14th, paragraph 2.313b.

Table 3.5 Value of the capitalised subscriber base under different approaches (£m)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Conservative														
Replacement costs—year of investment	311	427	550	723	776	1,302	1,743	2,205	2,612	2,989	3,448	3,997	4,717	5,412
Replacement costs—annual revaluation	469	670	837	1,732	1,413	1,642	1,982	2,930	3,014	3,772	4,644	5,441	6,300	7,586
Base case—churn[1]														
Replacement costs—year of investment	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Replacement costs—annual revaluation	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Base case—CC precedent[2]														
Replacement costs—year of investment	47	64	87	129	146	271	360	449	519	574	662	765	889	995
Replacement costs—annual revaluation	73	100	147	373	311	373	402	575	555	649	888	1,035	1,140	1,302

Note: [1] The relationship between the proportion of marketing acquisition costs in total marketing costs and the churn rate was estimated and used to infer marketing acquisition costs for years from 1995-2005, based on historical churn rates; [2] CC precedent is based on assuming one-third of total marketing costs relates to subscriber acquisition.
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom); CC SME inquiry; Oxera's analysis.

3.4.2 Valuation of contractual obligations

In addition to the customer base, another intangible asset corresponding to future contractual obligations which are not already included in the asset base needs to be valued. At the end of every year, Sky has contractual obligations stretching several years into the future. For example, according to the statutory accounts for 2007/08, obligations extended up to eight years into the future.[36] FAPL rights constituted the majority of future programming obligations. To identify how much of these obligations to capitalise, it is important to understand the nature of the underlying contracts.

[✂]. Therefore, under both the conservative and base case scenarios, future contractual obligations have been valued as the NPV of payments for FAPL rights due in the next year, discounted at a rate of 15%.[37] For example, the capitalised value of contractual obligations in 2008 is the NPV of the value of 2009 contractual obligations with FAPL.

Table 3.6 shows the NPV of Sky's contractual obligations for the following year in relation to FAPL rights; these are not included in Sky's book asset values in accounts. The NPV of the subsequent year's obligations follows a volatile growth path, reflecting the discrete nature of a small number of large contractual obligations.

[36] Sky Annual Report 2008.

[37] 15% has been used for illustrative purposes. 10% and 20% discount rates were also considered as sensitivities. If the 10% discount rate is assumed, then the IRR from 2004 to 2008 is [✂]%; the IRR from 1995 to 2008 remains unchanged. If the 20% discount rate is assumed, then the IRR from 2004 to 2008 is [✂]%; the IRR from 1995 to 2008 is [✂]%.

Table 3.6 Value of programming contractual obligations over time (£m)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
NPV of cash flows in subsequent year	456	721	576	485	560	913	820	625	467	718	652	789	799	757

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

Oxera has also tested the sensitivity of the IRR estimates to the exclusion of contractual obligations. The results are presented in Table A1.1 in Appendix 1.

3.4.3 Valuation of past losses

The starting point for the analysis of profitability has been taken as the year of Sky's flotation, and as such a cost-based analysis of intangible asset value captures expenditure and asset creation since 1994. Before then, Sky incurred losses. In general, it could be argued that past losses should be included in the opening asset base. In this case, however, it may not be appropriate since the analysis revalued Sky's opening asset base at replacement costs, and hence any asset value that might have been related to past losses may already be included.

Therefore, in this study past losses were not capitalised as part of the asset base under either the conservative or base case scenarios; however, in order to understand the potential impact on results, they were analysed as part of a separate sensitivity analysis.

The total amount of past losses accumulated before 1993 is estimated at £1,538m. This comprises:

- £305m of the opening balance of losses in 1991 (mainly driven by costs of programming and administrative expenses in 1990);
- £181m of losses in 1991 before exceptional items and interest;
- £464m of exceptional items in 1991 (mainly driven by the write-off of Marcopolo satellites and provisions for commitments associated with the acquisition of Sky);
- £112m of net interest in 1991;
- £491m of the write-off of goodwill associated with acquisition of Sky Television in 1991;
- £47m of operating loss pre-exceptional items and pre-interest in 1992;[38]
- £17m of net interest in 1992.[39]

To test the sensitivity of profitability estimates to past losses, it is important to identify the share of total past losses that could be associated with investments in the acquisition of customers.

In general, marketing costs for 1990–92 appear to have been relatively low compared with total accumulated losses (approximately £20m per year in 1990–1992). This seems to suggest that past losses may not have been driven by clearly identifiable costs that represent investments in customers over this period.

One approach to estimating the value of the subscriber base in this case is to consider the value of goodwill that was created at the acquisition of Sky Television. This goodwill, which represents the difference between the book and the transaction value of assets, could reflect the value of the subscriber base (given that it is not included in the book value of assets). Although not all of the goodwill would reflect the value of subscribers (eg, it may potentially

[38] In 1992 exceptional items and net interest were positive (effectively representing cash inflow from Sky's perspective).

[39] Sky's annual reports for 1991 and 1992.

include some monopoly rents), one potential scenario for the sensitivity analysis could be the inclusion of goodwill in the valuation of the opening asset base. This amounts to £491m.

Alternatively, the value of the subscriber base could be estimated by considering losses associated with operating activities and adjusting them for items that would not be expected to be associated with investments in the customer base.

The starting point for this analysis is the sum of (a) total losses before interest and exceptional items for the period prior to 1991 (£305m), (b) operating losses for 1991 and 1992 (£228m), and (c) exceptional items and interest accumulated prior to 1991 and for 1991 and 1992 (£512m). This amounts to £1,045m. The write-off of goodwill in 1991 is not included in this amount since it does not appear to represent a loss associated with investments in customers.

The figures that would not be expected to be associated with investments in customers were subtracted from this amount. These include write-off of Marcopolo satellites and depreciation of assets (which appear to relate largely to the written-off satellites). This amounts to £284m. Hence, under an alternative scenario, £761m of past losses were included in the valuation of intangibles.[40]

The estimated relevant share of past losses under two scenarios (£491m and £761m) was included in the SAC used to value the opening asset base. This analysis can be considered as conservative because the resulting customer acquisition costs used to value the opening asset base are high relative the SAC in the future years. The results are presented in Appendix 1. Overall, the IRR does not appear to be significantly affected. This is partly driven by the fact that the opening asset base is depreciated relatively quickly given the estimated economic life of customers.[41]

3.5 Summary of results and sensitivities

This sub-section presents estimates of the intangible asset value for Sky under the base case scenario.

Table 3.7 presents the replacement cost estimates of the intangible asset base value and its three components (subscriber base; contractual obligations; book intangibles) under the base case scenario. The existing subscribers have been valued at replacements costs (year of investment), while future contractual obligations have been valued as the NPV of the cash flows in the subsequent year.

The value of intangible assets based on the market value of Sky group minus the market value of investments and the book value of tangible assets is also displayed in Table 3.7. The asset value under the replacement cost approach is lower than the market value in every year.

[40] These costs appear to be associated with the promotion of Sky's programme schedule to the public.

[41] Past losses are factored in the opening asset base in 1992, while the starting point of estimates of the IRR is the end of 1995 (hence, past losses are depreciated over three years prior to being included in the opening asset value of the IRR calculation).

Table 3.7 Value of intangible assets included in the analysis (base case—churn rate, £m)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Capitalised intangibles														
Capitalised subscriber base[1]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Capitalised contractual obligations	456	721	576	485	560	913	820	625	467	718	652	789	799	757
Total capitalised intangibles	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Intangibles recognised on Sky's books														
Book intangibles	0	0	0	0	0	0	789	657	536	417	301	218	261	303
Goodwill	0	0	0	0	0	0	0	0	0	0	0	623	741	852
Total book intangibles	**0**	**0**	**0**	**0**	**0**	**0**	**789**	**657**	**536**	**417**	**301**	**841**	**1,002**	**1,155**
Total intangibles included in capital employed														
Total capitalised intangibles	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Total book intangibles	0	0	0	0	0	0	789	657	536	417	301	841	1,002	1,155
Less														
Goodwill	0	0	0	0	0	0	0	0	0	0	0	623	741	852
Total intangibles	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Implied market value of intangible assets														
MV of assets[2]	5,865	8,641	8,712	8,513	11,766	24,407	14,424	14,278	15,006	14,268	12,080	13,826	14,116	11,920
Less														
Book value of tangible assets	391	489	758	847	1,110	3,129	3,087	1,544	1,489	1,947	2,019	2,932	2,918	2,927
Implied MV of all Sky's intangibles	**5,474**	**8,152**	**7,953**	**7,666**	**10,656**	**21,278**	**11,337**	**12,734**	**13,517**	**12,321**	**10,061**	**10,894**	**11,198**	**8,993**

Notes: [1] 'Base case—churn' scenario, with replacement costs based on historical subscriber acquisition costs;
[2] Excluding investments in joint ventures (JVs).
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

4 Aggregate profitability

The results of the analysis of Sky's aggregate profitability are presented below, showing first the estimates of asset values and cash flows, followed by the profitability metrics under a range of scenarios.

The section is structured as follows:

– section 4.1 presents estimations of the value of Sky's asset base and capital employed under three asset valuation approaches;

– section 4.2 presents the estimated cash flows and operating profits consistent with the asset valuation approaches taken;

– Section 4.3 presents estimates of profitability based on both the IRR and ROCE, under different asset valuation approaches and over two different time periods.

4.1 Estimation of asset values

Sky's assets are valued according to the following approaches: market value; replacement cost; and book cost. Each of these is discussed in turn below.

Under the **market value approach**, assets are valued using the market value of Sky's equity and book value of Sky's debt.[42] The estimates of asset values under this approach are presented in Table 4.1, with the book value of debt separated into its components.

Table 4.1 Estimates of market value of Sky's assets (£m)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
MV of Sky's equity	**4,708**	**7,568**	**7,569**	**7,419**	**10,157**	**23,590**	**12,919**	**11,910**	**13,012**	**12,077**	**9,851**	**10,272**	**11,218**	**8,273**
Book debt														
Borrowings	808	688	687	583	715	1,426	1,770	1,578	1,152	1,076	1,076	1,988	2,030	2,446
Trade payables	333	394	483	555	612	826	998	915	948	1,150	1,165	1,313	1,379	1,361
Provisions	19	15	11	0	405	226	43	4	3	0	13	25	26	49
Derivative financial liabilities	0	0	0	0	0	0	0	0	0	0	0	258	294	243
Total	**1,159**	**1,097**	**1,181**	**1,138**	**1,733**	**2,478**	**2,811**	**2,498**	**2,103**	**2,226**	**2,254**	**3,584**	**3,729**	**4,099**
MV of Sky's assets														
MV of Sky's equity	4,708	7,568	7,569	7,419	10,157	23,590	12,919	11,910	13,012	12,077	9,851	10,272	11,218	8,273
Book debt	1,159	1,097	1,181	1,138	1,733	2,478	2,811	2,498	2,103	2,226	2,254	3,584	3,729	4,099
Less														
Investments in JVs	2	24	38	44	124	1,661	1,306	129	109	35	25	30	831	452
Total	**5,865**	**8,641**	**8,712**	**8,513**	**11,766**	**24,407**	**14,424**	**14,278**	**15,006**	**14,268**	**12,080**	**13,826**	**14,116**	**11,920**

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

[42] The market value of equity is estimated as at June 30th in order to align equity valuation with the end of the financial year.

Under the **replacement cost approach**, Sky's assets are valued as the combination of assets recognised on its balance sheet with additional capitalised intangible assets. The following key assets recognised on the balance sheet were included in the analysis:

– property, plant and equipment (PPE);
– inventories and trade receivables;
– cash;
– intangible assets (eg, software and licences) associated with Sky's subsidiaries.

These have been valued at book values in the current analysis. Ideally, all assets should be revalued at replacement cost, but the majority of assets recorded on Sky's balance sheet are already presented either at current cost, fair value or tested for impairment on annual basis (the exception being PPE, which represents only [✂]% of the total asset base including capitalised intangibles in 2008).

The additional capitalised intangible assets include the subscriber base and contractual obligations, as discussed in section 3.

Under the **book value approach**, assets were valued in accordance with the figures reported in Sky's statutory accounts. However, this approach does not take into account the full economic value of the intangible assets not recognised on Sky's accounts. As such, it may not provide meaningful estimates of profitability in this context, given that Sky's business is associated with significant intangible assets.

Figure 4.1 presents the value of Sky's asset base over time estimated under the different asset valuation approaches.

Figure 4.1 Value of Sky's asset base under different valuation approaches (£m)

[✂]

Note: Replacement cost values are based on the costs capitalised under the base case scenario, where relevant costs have been estimated using the relationship between churn rate and marketing acquisition costs, as discussed in section 3.3.2.
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

Figure 4.1 illustrates that the value of Sky's asset base when subscribers are valued on the basis of 'replacement costs—annual revaluation' are higher than when subscribers are valued on the basis of 'replacement costs—year of investment'. This difference, which is driven by increasing subscriber acquisition costs over time (and associated holding gains on existing subscribers), is relatively small compared with that between the replacement cost, market value and book value approaches. This is because of a combination of a growing subscriber base and a relatively rapid depreciation of existing subscribers, which implies a relatively small difference between historical and replacement costs on average across the asset base in every year**.**

The valuation of Sky's assets based on replacement costs is significantly higher than the book value. This difference reflects the estimated value of Sky's customer base and contractual obligations, and highlights that it does not seem appropriate to estimate profitability relative to book values of assets, as the latter approach does not incorporate the full economic value of intangible assets.

Figure 4.1 suggests that, from flotation up to 2008, the estimated market value of Sky's assets was significantly higher than the estimated replacement cost value (measured both in the year of investment and on the basis of annual revaluation).[43] The ratio between results

[43] In 2008, market value was similar to replacement cost value under the 'conservative' scenario for the valuation of the subscriber base. However, this scenario is likely to overstate the value of the customer base given that customer acquisition

under the two valuation approaches has been decreasing over time (with the exception of the dot.com bubble, when the market valuation rose significantly). This might indicate that the profitability of additional customers has been falling, which might be expected as a consequence of increasing customer acquisition costs, relative to future cash flows.[44]

4.1.1 Capital employed

The definition of capital employed that is typically used for estimating profitability is total assets less current liabilities—or, equivalently, non-current assets plus net working capital. Sky's balance sheet is structured such that current liabilities represent a significant share of total liabilities.[45] As such, in this study current liabilities were included in capital employed when estimating returns. The assumption underlying this approach is that Sky uses current liabilities as a source of financing for its assets.

A conventional definition of capital employed, which excludes current liabilities, would therefore provide a lower estimate than those presented in Figure 4.1, and higher estimates of the return on capital (under both ROCE and IRR measures).[46]

In recent years, Sky has had significant cash balances on its books. Their inclusion in capital employed (and the introduction of a corresponding adjustment to cash flows) would be appropriate under the assumption that these cash balances are held efficiently and are required to generate cash flows from operating activities. To the extent that the cash balances are inefficiently large, the estimates of capital employed would be too high, and profitability would be underestimated. Results with cash balances excluded from capital employed are presented in Table 4.7 at the end of the section.

As the objective of the analysis is to assess the profitability of Sky's pay-TV operations, an attempt was made to exclude assets not associated with pay-TV operations from the estimates of capital employed.

Although it was not possible to exclude Sky's subsidiaries (eg, Amstrad and Easynet), given that they are consolidated in the Group balance sheet, investments (and the associated goodwill) were excluded from capital employed (investment income was treated consistently in the cash flows and profits). The exclusion of investments (eg, the stake in ITV) allows more accurate estimates to be obtained for the capital employed by Sky's pay-TV operations compared with using a definition based on total assets less current liabilities.

The estimates of asset value presented in Figure 4.1 are based on the capital employed by Sky's pay-TV operations. These values are likely to be higher than would be estimated under approaches generally followed for the estimation of economic profitability. This is because of the treatment of current liabilities and cash.

In summary, the definition of capital employed used in this report is total assets (including additional capitalised intangibles) less investments in securities and JVs (including goodwill).

Table 4.2 presents the key elements of capital employed at both the Group and operating activities levels.

costs under this scenario include cost lines that do not appear to create an intangible asset (eg, the cost of installing set-top boxes over and above the subsidy).

[44] To the extent that there are any learning-by-doing effects from the point of view of a hypothetical entrant, the costs of acquiring customers would be even higher.

[45] In 2008, current liabilities accounted for 45% (or £1.9 billion) of total liabilities.

[46] The impact of excluding current liabilities from capital employed was also tested. The results are presented in Table 4.7 at the end of the section.

Table 4.2 Capital employed (£m)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Group level														
Total assets[1]	391	489	758	847	1,110	3,129	3,877	2,202	2,025	2,364	2,320	3,773	3,920	4,082
Capitalised intangibles[2]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Capital employed	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Operating activities level														
Less														
Goodwill	0	0	0	0	0	0	0	0	0	0	0	623	741	852
Investments in JVs[3]	2	24	38	44	124	1,661	1,306	129	109	35	25	30	831	452
Capital employed	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Note: [1] As per accounts. [2] Including capitalised subscriber base and programming contractual obligations under the 'base case—churn' scenario with existing subscribers valued at historical acquisition cost. [3] These figures also include available-for-sale investments. No adjustment to capital employed has been made for deferred tax assets.
Sources: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

4.2 Estimation of cash flows and profits

This sub-section presents the results from the estimation of cash flows and operating profits for Sky. Cash flows are required to measure profitability according to an IRR approach, while operating profits are required for alternative profitability metrics, such as the ROCE and return on sales (ROS).

4.2.1 Cash flows

Table 4.3 reports estimates of cash flows according to the approach outlined in section 2.3, for the period 1995–2008 based on Sky's statutory accounts. The cash flows reported in the table are pre-tax nominal cash flows before financing costs, and can therefore be used to calculate an IRR based on total capital employed (defined as discussed in section 4.1.2).

Pre-tax cash flows have been used as these allow profitability—and hence competitive constraints—to be assessed at the level of operating activities, rather than taking into account interactions with financing policies and the tax system. This is the approach that the CC generally adopts in profitability assessments.

Table 4.3 Aggregate pre-tax nominal cash flows (£m)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Group level														
CFO	255	303	261	407	243	–223	44	259	671	893	1,029	1,054	1,062	1,051
Less														
Net CAPEX	25	33	57	126	210	511	312	107	106	526	222	423	1,410	420
Net increase in cash balances	–100	–10	30	5	–15	217	–44	–173	–3	89	50	766	–1,013	367
Cash flow	**329**	**280**	**174**	**276**	**47**	**–951**	**–224**	**325**	**568**	**278**	**757**	**–135**	**665**	**264**
Operating activities														
Less														
Interest and dividends receivable	2	2	2	3	4	10	5	9	7	11	40	50	55	54
Net investments in JVs	–5	–5	–18	–45	–135	–454	–137	–6	–8	–394	19	–2	–950	–12
Cash flow	**332**	**283**	**190**	**318**	**178**	**–507**	**–91**	**323**	**569**	**661**	**698**	**–183**	**1,560**	**222**

Note: Results relate to 'base case–churn' scenario, with existing subscribers valued at historical acquisition cost. An increase in cash flows from operating activities in 2007 is the result of adding back in investment in ITV at cost. Given that volatility of cash flows in the later years is driven by changes in cash balances, sensitivity to exclusion of cash balances from capital employed and cash flows has been tested (see Table 4.7).
Sources: Sky's annual reports and Oxera's analysis.

In Table 4.3, deductions from cash flow from operations are made to account for net CAPEX and the net increase in cash balances. Then, to estimate cash flows relevant to pay-TV activities, interest and dividends receivable and net investments in JVs and associates have been excluded. This is because the interest receivable and net investments in JVs reflect financial implications from Sky's investment activities. The resulting definition of cash flows corresponds directly to the way in which the capital employed at operating activities level was defined (see section 4.1.2). However, only investments clearly identifiable as not related to pay-TV were excluded from the estimates of capital employed and cash flows. Therefore, there may be other assets and cash flows not related to pay-TV that were not excluded. That said, given that these are likely to be relatively small compared with the operating asset base, it is unlikely that they will have a material impact on the profitability results.

4.2.2 Operating profits

As discussed in section 2.1, a company's profitability can also be assessed on the basis of accounting measures such as the ROCE. In this case, a definition of profits is required.

The estimates of operating profits or EBIT are reported in Sky's profit and loss accounts. These EBIT figures were used when measuring ROCE on the basis of book values of assets.

When measuring ROCEs according to replacement cost asset values, it is necessary to adjust the EBIT to reflect the capitalisation of costs related to the creation of intangible assets embodied in the subscriber base and the subsequent depreciation of these assets. Therefore, where costs associated with the acquisition of new customers have been capitalised, the same amount of costs have been added back into the estimate of EBIT. The depreciation of the capitalised subscriber base was then subtracted from the value of EBIT.

Table 4.4 provides a comparison of EBIT as per the statutory accounts and adjusted EBIT reflecting the capitalisation of costs. For the purpose of estimating profitability against book or market values of assets, the former measure of EBIT was used. Profitability based on replacement costs of assets was based on adjusted EBIT.

Table 4.4 Aggregate operating profit (£m)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
EBIT (for ROCE at book values)	**237**	**315**	**374**	**341**	**–271**	**–20**	**93**	**55**	**248**	**481**	**822**	**877**	**815**	**724**
Plus														
Capitalised OPEX (base case—churn)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Less														
Depreciation of capitalised intangibles (base case—churn)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
EBIT (for ROCE at replacement cost values)	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Note: Results relate to 'base case—churn' scenario, with subscribers valued at replacement cost–year of investment.
Sources: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

4.3 Estimates of aggregate profitability for Sky

Table 4.5 presents the results of an assessment of the profitability of Sky at the aggregate level.

Table 4.5 Aggregate profitability estimates

	Market value	Replacement cost (base case—churn)		Replacement cost (conservative)		Book value
		Year of investment	Annual revaluation	Year of investment	Annual revaluation	
IRR (pre-tax, nominal)						
1995–2008	9%	[✂]%	[✂]%	[✂]%	[✂]%	54%
2004–2008	0%	[✂]%	[✂]%	[✂]%	[✂]%	27%
ROCE						
1995–2008	3%	[✂]%	[✂]%	[✂]%	[✂]%	26%
2004–2008	6%	[✂]%	[✂]%	[✂]%	[✂]%	29%

Sources: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

On the basis of profitability analysis at the aggregate level, the following observations can be made.

– **Estimates of returns under different approaches to asset valuation**: the analysis suggests that the estimates of returns (both IRR and ROCE) are lowest under the market value approach to asset valuation and highest under the book value approach. Profitability estimates based on the replacement costs of assets are between these two approaches.

– As discussed above, profitability estimates based on book values of assets may not provide meaningful results in this context given that these values exclude a number of intangible assets that represent a relatively high proportion of the total asset base.

– Estimates based on market values of assets may provide downward-biased estimates of economic profitability relevant in the context of the competition policy analysis because asset values may capitalise potential monopoly rents. Indeed, according to the value-to-the-owner principle, the appropriate asset valuation approach in this context seems to be replacement costs, given that they are below market values.

– Under the conservative scenario, the downward bias in the ROCEs (relative to the 'true' economic profitability) may be more significant than under the base case scenario. This is because growth in the asset value under the conservative scenario is more significant than under the base case scenario and the ROCEs do not take into account the resulting holding gains in the numerator of the formula.

– **Evolution of returns over time**: the estimates of the IRR under the replacement costs approach seem to have been decreasing over time. Over the period of analysis (1995–2008), the lowest estimates of the IRR are observed for the period from 2001 to 2008 (around [✂]%) and the highest from 1995 to 2008 (around [✂]%, Table A1.2 in Appendix 1). Low returns from 2001 are consistent with Sky's significant investments in its subscriber base and customer management software (2000 and 2001 were the two years when gross additions to Sky's customer base were highest; these were also the years when Sky introduced the customer management software on its balance sheet).

– The reduction in the IRR over time seems to be driven by the fact that subscriber acquisition costs were increasing over time relative to cash flows generated by additional subscribers.[47] While each additional subscriber may have been becoming less profitable over time, the acquisition of additional subscribers still appears to be profitable in 2008, given that the Tobin's Q ratio is higher than 1 (see Figure 4.1).[48]

– **Overall range of returns based on the IRR**: the IRR under the replacement cost valuation approach ranges from [✂]% to [✂]%, depending on the starting date of the period chosen and the specific scenario adopted for estimating the replacement costs. (for period shown in Table 4.5 above, under the base case scenario, the IRR ranges from 20% to 28%). Given the variation and frequency of occurrence of different estimates (as can be seen from Table A1.2), a reasonable range appears to be [✂]–[✂]%. Returns over a longer period would be towards the upper end of the range, while if measured over a more recent time period, they would be towards the lower end of the range.

– **Estimates of returns based on ROCE**: these are generally lower than the estimates of the IRR. Under the base case, the average ROCE is in the range [✂]–[✂]% over the last five years and [✂]–[✂]% over the longer-term period. (for period shown in Table 4.5 above, under the base case scenario, the ROCE ranges from 16% to 22%). This relationship between average ROCEs over different time periods is driven by the fact that, from 1999 to 2003, ROCEs were low to negative. This, in turn, seems to have been driven by Sky's significant investments in its subscriber base and customer management software. (ROCEs tend to be biased downwards during periods of significant investments.) Furthermore, the estimates of the ROCEs under the replacement cost approach to asset valuation do not include holding gains/losses in the numerator; if these were included, the ROCEs would be even higher.

The sensitivity of the aggregate profitability results to a number of alternative assumptions was tested. In particular, the following four sensitivities were tested.

[47] To the extent that there are any learning-by-doing effects from the point of view of a hypothetical entrant, customer-acquisition costs would be even higher. It should be also noted that the extent of such effects may be limited given the increasing SAC over time.

[48] Tobin's Q = market value of capital/replacement value of capital. See Tobin, J. (1969), 'A general equilibrium approach to monetary theory', *Journal of Money Credit and Banking*, **1**:1, 15–29.

– **Asset valuation based on comparator market values**. In addition to estimates of asset value based on bottom-up capitalisation of costs, an alternative approach based on market value multiples of comparators has been applied. This is similar in concept to the approach used by the CC in the CDAS market investigation.[49]

– The choice of comparators for this analysis was informed by the results of the benchmarking analysis (see Table 4.6 below).

Table 4.6 Estimates of profitability based on valuation metrics for closest comparators, 2004–08 (IRR)

	Group 1&3 (aggregate)[1]	Group 2&4 (aggregate)[1]
EV/(OPEX+CAPEX)		
TV comparators	14%	14%
Non-TV comparators	18%	17%
EV/(book value)		
TV comparators	24%	24%
Non-TV comparators	26%	35%

Note: [1] See Table 6.6 in section 6 for details.
Sources: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom); Bloomberg, companies' annual accounts and Oxera's analysis.

– Table 4.6 shows that, based on the ratio of enterprise value (EV) to the sum of OPEX and CAPEX for comparators, the IRRs (2004–08) range from 14% to 18% compared with an IRR of [✂]% based on a bottom-up capitalisation of costs. These results should be interpreted in the context of the evolution of this ratio for Sky relative to comparators. For example, the ratio of EV/(OPEX+CAPEX) for Sky in 1997 was approximately 12x (and higher in the earlier years), while for the comparators with available data, it was around 2x. In 2007, the ratio was reduced to 3.6x for Sky; for the same comparators it was approximately 3.0x. This highlights the profile of profitability over time. The IRRs based on the ratio of EV to book value for comparators range from 24% to 35%.

– Analysis based on multiples for comparators may provide conservative estimates of the returns. This is because some of the comparators may have a degree of market power, in which case the market value-based ratios could biased upwards compared with competitive levels (and hence lead to downward-biased returns).

– Overall, this suggests that the IRRs based on bottom-up analysis of replacement costs are not out of line with returns based on the analysis of comparators. As with any benchmarking analysis in the context of profitability assessment, these results need to be interpreted with caution, however.

– **Inclusion of current liabilities in capital employed**. As discussed in section 4.1.1, a conventional definition of capital employed would exclude current liabilities. However, given that current liabilities represent a substantial share of total liabilities on Sky's balance sheet, the results in section 4.3 were presented on the basis of including current liabilities in capital employed. Table 4.7 below demonstrates that, by including current liabilities, IRR estimates are increased. Under the base case, the IRR increases from [✂]% to [✂]% for the period 1995–2008, and from [✂]% to [✂]% for the period 2004–08.

[49] CC (2006), 'Classified Directory Advertising Services market investigation', December 21st.

– **Exclusion of cash from capital employed**. The significant cash balances that Sky has held recently were discussed in section 4.1.1. To the extent that these were inefficiently large, downward adjustments to capital employed would be required. Table 4.7 below reports that, under the base case, the exclusion of cash balances from capital employed results in IRR estimates increasing from [✂]% to [✂]% for the period 1995–2008, and from [✂]% to [✂]% for the period 2004–08.

Table 4.7 Additional profitability sensitivities (IRR, year of investment)

	Replacement cost (base case–churn)	Replacement cost (conservative)
Cash is excluded from capital employed		
1995–2008	[✂]%	[✂]%
2004–2008	[✂]%	[✂]%
Current liabilities are excluded from capital employed		
1995–2008	[✂]%	[✂]%
2004–2008	[✂]%	[✂]%

Sources: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

Overall, the sensitivity analysis suggests that the IRRs presented in Table 4.7 are conservative with respect to the definition of capital employed, and are not out of line with the results based on a top-down valuation of assets based on comparators.

5 Disaggregate profitability

This section discusses the results of the disaggregate profitability analysis for a number of Sky's activities, specifically the retail and wholesale activities, with disaggregation into returns for the provision of basic and premium channels, as well as premium sports and movies channels.

The objective of this disaggregate profitability assessment is, where possible, to seek to better understand the drivers of Sky's returns observed at the aggregate level. Given this objective, the results should be interpreted in terms of the relative relationship between returns for different activities, as opposed to the absolute levels of returns.

Unlike analysis at the aggregate level, which uses directly observed data, disaggregate profitability analysis relies on assumptions about the allocation of costs, revenues and assets, and hence is inherently more uncertain. The results presented in this section should therefore be interpreted in the context of the underlying costs and revenue allocation approaches.

To assess whether results are driven by an assumed allocation approach, as opposed to the 'true' underlying economic profitability, this study relies on scenarios and sensitivity checks, which are discussed throughout the section (as well as in Appendix 2). Where changes in the allocation approach or sensitivity checks affected the relative returns between activities, the evidence was treated as insufficiently robust to support a particular conclusion.

Overall, the results of the disaggregate analysis can be summarised as follows.

- Returns for wholesale activities appear higher than for retail activities. In this analysis, a significant share of wholesale revenues (comprising the internal charge from wholesale to retail) was calculated using third-party wholesale prices. These results seem to hold under a number of cost allocation approaches and sensitivity checks.

- The assessment of returns for basic and premium channels suggests that, at the wholesale level, returns for basic channels appear lower than for premium channels. Although this relative relationship seems to be consistent for different approaches to cost and revenue allocation, the results should be interpreted as indicative given the adopted allocation approaches. At the retail level, the analysis seems to provide inconclusive results since, depending on the approach to cost allocation, basic channels appear either more or less profitable than premium channels.

- As there are several plausible approaches to the allocation of cost and revenues between sports and movies channel. The results of the analysis at this level of disaggregation are not sufficiently robust to conclude on the profitability of movies and sports channels, although the analysis seems to provide some weak evidence that movies channels may have higher margins than sports channels (given the adopted approaches to cost and revenue allocation).

The remainder of the section is structured as follows.

- Section 5.1 describes the scenarios of disaggregate profitability assessment reviewed in this report.

- Section 5.2 presents profitability results for Sky wholesale and Sky retail.

– Section 5.3 presents profitability results at the basic and premium levels for wholesale and retail activities.

– Section 5.4 presents estimates of profitability for sports and movies channels.

5.1 Scenarios for disaggregate profitability results

The analysis of profitability at the disaggregate level considers various levels of disaggregation.

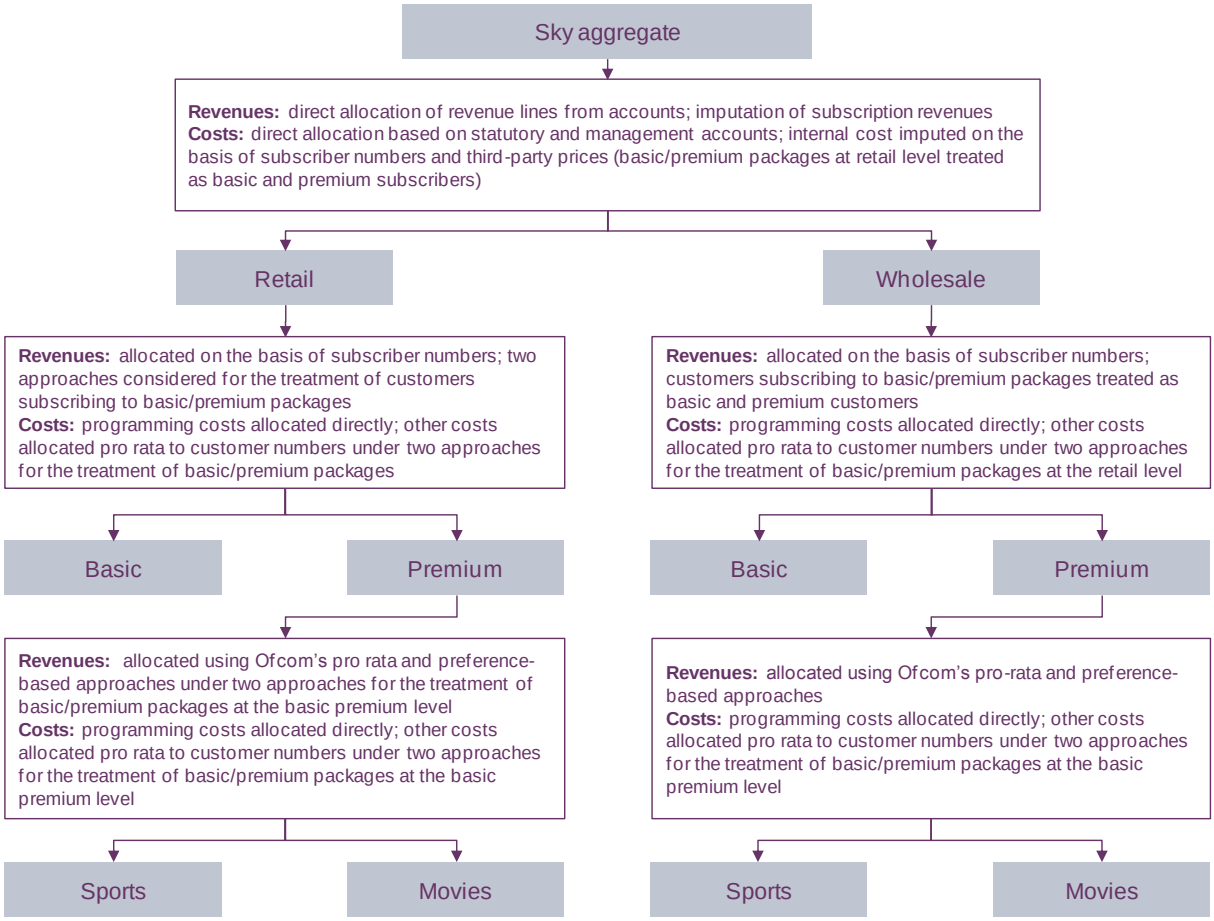
– First, relative returns for Sky's wholesale and retail activities are considered, measured using IRR, ROCE and ROS. As discussed in section 2, the IRR requires robust data on cash flows and asset values. While the quality of data at the aggregate level seems sufficient for estimation of the IRR, at the disaggregated level it seems more appropriate to place more weight on alternative profitability measures (ie, ROCE and ROS). This should not significantly affect the robustness of conclusions given that the objective of the analysis is to assess relative returns between different activities, as opposed to estimating the absolute level of returns.

– Second, relative returns associated with the provision of basic and premium channels, implied by a number of approaches for the allocation of costs and revenues, were analysed separately for wholesale and retail activities. Two profitability metrics have been employed in this case: margins over direct costs, where direct costs were defined as the costs of programming content; and ROS, where, in addition to the costs of programming content, other types of costs were included.

– Third, relative returns between the provision of premium sports and movies channels were considered. Similar to the analysis of basic and premium channels, returns were measured using margins over direct costs and ROS.

Figure 5.1 below illustrates these disaggregate scenarios and associated cost and revenue allocation approaches.

Figure 5.1 Overview of allocation approaches



Source: Oxera.

5.2 Profitability of wholesale and retail activities

The scope of wholesale and retail activities was defined according to Ofcom's description of the value chain.[50] As defined by Ofcom, wholesale activities include the acquisition of content from content providers, the packaging of the acquired content into channels, and the subsequent distribution of channels among retailers, including third parties and implicitly Sky retail.

The retail activities include the provision of pay-TV services to commercial and residential subscribers (this includes purchasing of channels from Sky wholesale and third parties, packaging channels into bundles, and subsequent sale of bundles to customers). The provision of platform services and transmission-related functions was also included within the scope of retail activities.

Using an intuitive approach, costs were allocated between retail and wholesale activities in order to assess relative returns between these activities at a fairly high level, rather than attempting to estimate the level of returns. The analysis was based on Sky's statutory accounts, management accounts and specific data on subscriber numbers and prices. This allocation is described in detail in Appendix 2. After the allocation, the results were cross-checked with those from the detailed cost allocation analysis carried out by Analysys Mason on behalf of Ofcom.

[50] Ofcom (2008), 'Profitability and investor returns: Annex 9 to second pay-TV market investigation consultation', September 30th, p. 12. Ofcom (2007), 'Pay TV market overview: Annex 8 to pay-TV market investigation consultation', December 18th, p. 7. Ofcom (2007), 'Pay TV market investigation: Consultation document', December 18th, p. 27.

Table 5.1 presents the results of the profitability assessment of retail and wholesale activities.

Table 5.1 Results of the disaggregate profitability analysis, 2004–08

	IRR[1]	ROCE[2] (average)	ROS (average)
Profitability based on high-level cost allocation			
Retail	[✂]% ([✂]%)	[✂]%	[✂]%
Wholesale	[✂]% ([✂]%)	[✂]%	[✂]%
Profitability based on Analysys Mason cost allocation			
Retail	[✂]% ([✂]%)	[✂]%	[✂]%
Wholesale	[✂]% ([✂]%)	[✂]%	[✂]%

Note: [1] Measured on the basis of replacement costs—annual revaluation and replacement costs—year of investment; the former is shown in the brackets. [2] Estimated on the basis of replacement costs—year of investment.
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

The results of the profitability analysis for retail and wholesale activities seem to suggest that returns for Sky's wholesale activities (where the internal revenue between wholesale and retail activities was estimated on the basis of Sky's wholesale prices) are higher than for Sky's retail activities. (The results shown in Table 5.1 above indicate that the difference in the IRRs, ROCEs and ROSs between retail and wholesale activities is around 6%, 4% and 10% respectively).

5.3 Profitability of basic and premium channels

The estimates of margins and ROS for premium and basic channels are presented below. Appendix 2 provides a detailed discussion of how costs and revenues were allocated between basic and premium channels. Tables 5.2 and 5.3 present the estimates of ROS and margins over cost of content for basic and premium channels.

The results are presented under two approaches for the allocation of costs, relating to the treatment of customers subscribing to basic/premium packages:

– **approach 1**: Sky subscribers who buy basic/premium packages are treated as premium, and those who buy basic packages only are treated as basic;

– **approach 2**: all Sky subscribers were treated as basic, and those who buy basic/premium packages are treated as premium.

This affects the allocation of common costs at the retail and wholesale levels which is carried out pro-rata to number of basic and premium subscribers.

Similarly, two approaches for the allocation of revenues at the retail level also relate to the treatment of customers subscribing to basic/premium packages. The issue in retail is that retail prices are observed for bundles of basic and premium customers (ie, there are customers who purchase only basic channels and those who purchase basic and premium channels). This raises a question of how to treat the revenue from customers who purchase basic and premium channels in a bundle.

– Under one approach (approach 1), these customer are treated as premium customers. Thus, from the profitability perspective, the costs of basic channels are recovered from basic packages only, while costs of premium channels are recovered from basic/premium bundles. This approach represents one extreme, insofar as here basic

channels receive the lower end of the possible range for the revenue and premium channels receive the upper end.

– Under an alternative approach (approach 2), the premium component of the basic/premium package could be delineated on an incremental basis. This means that customers subscribing to basic/premium bundles would be treated as basic customers who generate revenue under the basic price, as well as premium customers who generate revenues under the price which is calculated as the difference between the price of the bundle and the basic price. This provides another end of the spectrum for the possible treatment of basic/premium packages. Under this approach, basic packages receive the upper end of the possible range for the revenue, while premium channels receive the lower end.

These approaches affect the allocation of revenues between basic and premium channels at the retail level.

Table 5.2 Estimates of ROS for basic and premium channels, 2004–08

		Common cost allocation	
		Approach 1	Approach 2
Retail			
Revenue allocation	**Approach 1**		
	Basic	[✂]%	[✂]%
	Premium	[✂]%	[✂]%
	Approach 2		
	Basic	[✂]%	[✂]%
	Premium	[✂]%	[✂]%
Wholesale			
	Basic	[✂]%	[✂]%
	Premium	[✂]%	[✂]%

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

Table 5.3 presents estimates of margins (over cost of content) for basic and premium channels.

Table 5.3 Estimates of margins over direct costs for basic and premium channels, 2004–08

	Revenue allocation	
	Approach 1	Approach 2
Retail		
Basic	[✂]%	[✂]%
Premium	[✂]%	[✂]%
Wholesale		
Basic	[✂]%	
Premium	[✂]%	

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

The assessment of returns for basic and premium channels suggests that, at the wholesale level, returns for basic channels appear lower than for premium channels. Although this relative relationship seems consistent for different approaches to cost and revenue allocation, the results should be interpreted as indicative, given the allocation approaches adopted (in particular given that this analysis involves allocating revenues from packages combining basic and premium channels separately to basic and premium channels). At the retail level, the analysis seems to provide inconclusive results since, depending on the approach to cost allocation, basic channels appear either more or less profitable than premium channels.

5.4 Profitability of premium sports and movies channels

The estimates of margins (over costs of content) and ROS for sports and movies channels are considered below. The analysis involves two stages: first allocation of costs and revenues between basic and premium channels and, second, subsequent allocation of costs and revenues for premium channels between sports and movies.

The results presented below are derived under two approaches for cost and revenue allocation at the basic/premium level (as discussed above). In addition, two approaches were considered for the allocation of revenues from packages that combine sports and movies channels between these types of channels separately: preference-based and pro-rata approaches. See Appendix 2 for a discussion of these approaches.

Table 5.4 presents estimates of ROS for sports and movies channels under the preference-based allocation approach. Profitability results under the pro-rata approach are similar to those below, and are presented in Appendix 2.

Table 5.4 Estimates of ROS for sports and movies channels—preference-based allocation, 2004–08

Retail			
		Common cost allocation at basic and premium level	
		Approach 1	**Approach 2**
Revenue allocation at basic and premium level	**Approach 1**		
	Sports	[✂]%	[✂]%
	Movies	[✂]%	[✂]%
	Approach 2		
	Sports	[✂]%	[✂]%
	Movies	[✂]%	[✂]%
Wholesale			
	Sports	[✂]%	[✂]%
	Movies	[✂]%	[✂]%

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

Table 5.5 presents estimates of margins (over cost of content) for sports and movies channels under the preference-based allocation approach. The results under the pro-rata approach are similar to those below, and are presented in Appendix 2.

Table 5.5 Estimates of margins over direct costs for sports and movies channels—preference-based allocation, 2004–08

	Revenue allocation at basic and premium level	
	Approach 1	Approach 2
Retail		
Sports	[✂]%	[✂]%
Movies	[✂]%	[✂]%
Wholesale		
Sports	[✂]%	
Movies	[✂]%	

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

At the retail level, the results seem to suggest that sports channels have higher returns than movies channels. Results also vary significantly (in terms of levels of returns) depending on the approach adopted for allocation of revenues between basic and premium channels.

At the wholesale level, the results seem to suggest that sports channels appear less profitable than movies channels. The difference between returns for sports and movies channels seems sensitive to the adopted approach to the allocation of revenues from packages combining sports and movies channels to these channels separately. This is evident from the analysis of additional revenue allocation approaches, as discussed below.

Additional revenue allocation approaches at the wholesale level

An alternative approach for allocation of revenues between sports and movies channels was considered at the level of Sky's wholesale activities.

Under this approach revenues from packages that combine sports and movies channels (subscription revenues excluding commercial revenues) were allocated to these channels separately on the basis of incremental prices. Specifically, revenues allocated to sports (movies) channels were estimated as the difference between package prices and stand-alone prices for movies (sports) channels.

In relation to commercial revenues, the analysis assumed that they are primarily generated through the provision of sports channels, as some commercial premises, such as public houses, are not allowed to buy movies channels. Therefore, commercial revenues were allocated to movies channels on an incremental price basis.[51] Advertising revenues were allocated on the same basis as in tables 5.4 and 5.5.

Table 5.6 presents the resulting estimates of ROS and margins for sports and movies channels.

[51] As before, pricing band D was chosen as the basis for calculating commercial revenue. This effectively means that [✂]% of commercial revenues are allocated to sports channels.

Table 5.6 Estimates of ROS and margins over direct costs for sports and movies channels using an incremental prices approach, 2004–08

	Revenue allocation at premium sports and movies channels level		
	Preference-based allocation (Tables 5.4 and 5.5)	**Allocation to movies based on incremental prices**	**Allocation to sports based on incremental prices**
ROS			
Sports	[✂]**%**	[✂]%	[✂]%
Movies	[✂]**%**	[✂]%	[✂]%
Margins			
Sports	[✂]**%**	[✂]%	[✂]%
Movies	[✂]**%**	[✂]%	[✂]%

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

It could be argued that the incremental price approach provides the upper and lower ends of the range for the allocation of revenues between sports and movies channels. In particular, the approach where revenue allocated to movies channels is estimated on the basis of the price of the package less stand-alone price of sports channels could be seen as the *lower* end of the range for revenues that could be allocated to movies. Similarly, the approach where revenue allocated to movies channels is estimated on the basis of stand-alone price of movies channels could be seen as the *upper* end of the range.

The results under the incremental price approach suggest that movies channels appear to have higher margins and ROS than sports channels at both ends of the range for revenues allocation. For one end of the range the different between margins (over costs of content) is significant (in excess of [✂]%), while for another end of the range the difference between margins is lower (approximately [✂]%

On balance, the results of the analysis at this level of disaggregation are not sufficiently robust to conclude on the profitability of movies and sports channels, although the analysis seems to provide some weak evidence that movies channels may have higher margins than sports channels (given the adopted approaches to cost and revenue allocation).

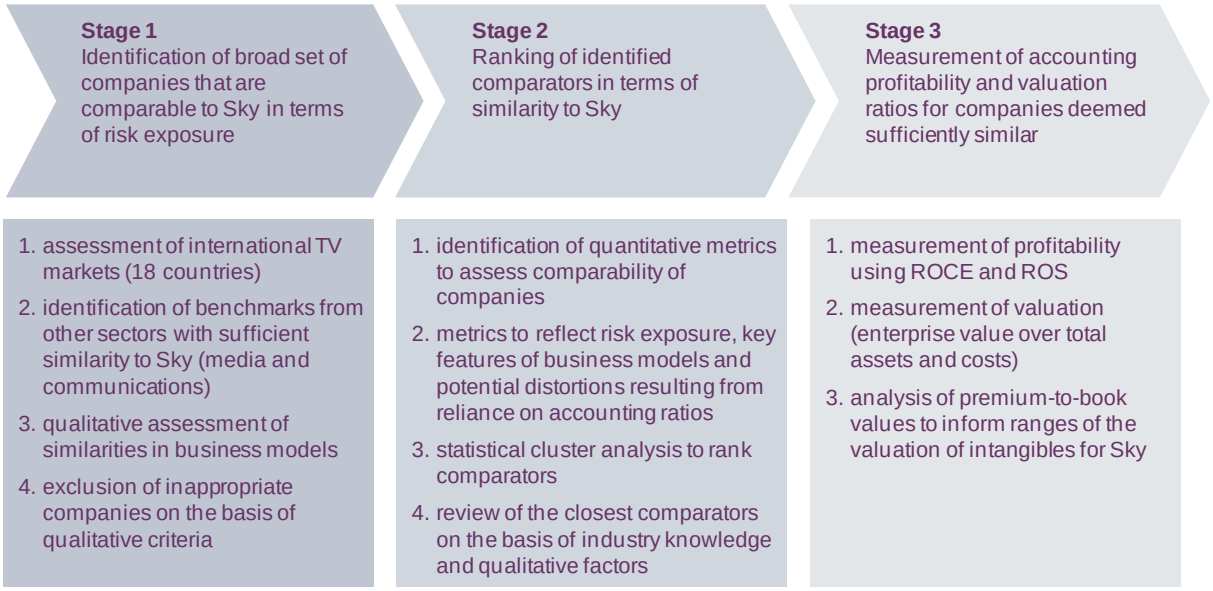
6 Benchmarking

This section presents the results of the benchmarking analysis, which provides further evidence to support the results of the profitability analysis. While the conceptually appropriate benchmark for profitability may be the cost of capital, comparator analysis could provide some indication about the level of Sky's returns.[52] The results of the benchmarking analysis were also used to provide a high-level sense-check on the bottom-up asset valuation conducted in section 4.

The comparator analysis is designed to produce reasonable ranges for returns, rather than accurate point estimates of profitability. This is because it is recognised that it may be difficult to identify firms with business characteristics identical to Sky's pay-TV business.

The benchmarking analysis presented below encompasses three key stages, illustrated in Figure 6.1 and discussed further below:

Figure 6.1 Stages of benchmarking analysis



Source: Oxera.

– The first part of the analysis identifies a broad set of companies with business activities that are characterised by risk drivers similar to those of Sky.

– Qualitative selection of the broad set of comparators is followed by a quantitative cluster analysis, whereby companies are ranked using metrics that reflect their business risk, and that seek to control for distortions arising from different business models.

– The third element involves comparisons of accounting and valuation ratios for the identified comparators with Sky. The comparisons are undertaken separately for Sky's aggregate business, as well as for Sky's notional retail and wholesale activities.

[52] On the general use of benchmarking as part of profitability analysis, see Oxera (2003), 'Assessing profitability in competition policy analysis', a report prepared for the OFT, July, pp. 117–19. As part of its response to the second consultation of the pay-TV investigation, Sky compared the returns of premium wholesale business against a set of benchmark companies. Sky (2008), 'Response by British Sky Broadcasting Group plc to Ofcom's consultation document "Pay TV second consultation: Access to premium content" of 30 September 2008', January.

6.1 Choice of comparators

Selecting suitable comparators is the first step in the benchmarking analysis. The choice of benchmarks was informed by the principle that, in the long term, returns should be in line with risk. Hence, appropriate comparators need to be selected according to their risk exposure. More specifically, characteristics that would need to be taken into account are the competiveness of comparators' markets and specific features of the business model that may distort accounting ratios, as follows.

– **Risk exposure**—the benchmarked returns should be those of companies that are exposed to a similar degree of risk, given that higher risk is reflected in higher required returns by investors. Indeed, in theory, over the long term, returns should on average be expected to be in line with risk. There are a number of operational and financial risk drivers. For example, the selection of appropriate comparators recognises the differences that arise from firms having different degrees of capital intensity, as those with high fixed assets require higher return on turnover to meet the required CAPEX. As explained further below, both financial and operational risk characteristics were entailed as part of the qualitative and quantitative analysis.

– **Competitiveness—**it has been acknowledged that benchmarking analysis should be conducted against comparators that operate in markets that are deemed to be reasonably competitive. However, the analysis presented here has not involved an assessment of the competitiveness of the markets in which the selected comparators operate. Therefore, it may well be that at least some of the comparators chosen have market power and that their achieved rates of return may reflect their market position. As a result, the profitability ratios of benchmark comparators may be biased upwards compared with a competitive level, and, hence, the results can be considered conservative.

– **Accounting distortions**—different business models may distort the comparisons of accounting ratios of profitability. Indeed, ROCE is sensitive to the share of current liabilities, where the ratio of current to total liabilities informs about differences in short- versus long-term funding, and is thus not directly related to economic profitability. To address biases resulting from different business modes, quantitative metrics reflecting different practices have been employed as part of the selection of comparators.

Ofcom has previously noted that identifying appropriate benchmarks for the UK pay-TV market and for Sky is particularly challenging, given the specific characteristics that are likely to influence the profitability of different market players along the value chain. Specifically, it has noted that, in the UK context, the differences in the composition of Sky and other UK pay-TV companies have hindered like-for-like comparisons of returns.[53] Accordingly, for comprehensiveness, the approach to the benchmarking analysis has not been limited to the UK TV markets, but has included benchmarks from:

– international pay-TV markets;
– other media and communications sectors.

For both samples of comparator companies, the following approach has been employed. First, the initial sample companies have been identified to contain key players in a given industry. Second, the initial sample has been narrowed down by applying qualitative criteria to exclude companies that differ from Sky to an extent that renders comparisons invalid; or where sufficient data to benchmark business models quantitatively or measure returns is not available. The third stage of selection has involved statistical clustering analysis to identify

[53] Ofcom (2008), 'Profitability and investor returns, Annex 9 to second pay-TV market investigation consultation', September 30th.

the closest comparators to Sky by employing selected quantitative metrics which reflect a range of risk drivers inherent in Sky's business model.

6.1.1 TV companies

The initial sample includes 136 TV companies from 18 countries. Ofcom's previous review (in its 'Spectrum report') has been used to form the basis,[54] supplemented by a selection of key TV companies from additional countries with established pay-TV markets. Countries included in the sample are Australia, Austria, Belgium, Canada, Finland, France, Germany, Ireland, Italy, Malaysia, New Zealand, Netherlands, Singapore, South Africa, Spain, Sweden, UK and USA. Companies in countries further to those explored in the Spectrum report have been selected as follows:

– the European Commission's MAVISE database has been employed to identify key players in European markets;[55]

– for the other countries, industry commentaries and annual reports have been used to select appropriate broadcasters;

– comparator companies are selected so that they represent the different parts of the TV market value chain (free-to-air, pay-TV retailers, vertically integrated pay-TV channel providers).

It should be acknowledged that business models in international TV markets are not homogeneous, and that different countries exhibit different characteristics. For example, aspects that vary across countries include companies' revenue and cost composition (eg, reliance on advertising versus subscription revenues, relative size of marketing costs) and mechanisms for allocating content rights (eg, historical differences in the concentration of sports rights sales). Hence, comparators have been selected using a set of objective criteria and analytical steps to ensure that those chosen best reflect Sky's (aggregate and disaggregate) characteristics and the associated business risks.

As a first step in deriving the final sample, the initial sample of 136 companies has been narrowed down by excluding the following, less relevant, categories:

– **public service broadcasters with public/licence funding or government-owned non-profit broadcasters**—licence-based funding is considered to be exposed to considerably less volatility than revenues generated by commercial TV activities (advertising and subscribers);

– **companies for which broadcasting is not the main activity**[56]—given that many TV companies have activities in adjacent markets, diversification of the business model is controlled further as part of the quantitative analysis;

– **companies for which sufficient data is not available**—companies for which there are no statutory accounts available, or whose accounts are not comprehensive.

As a result, 29 companies have been identified as suitable comparators to be included in the clustering analysis.[57]

[54] Spectrum/Value Partners (2007), 'Summary profiles of pay-TV in France, Germany, Italy, Spain, Sweden and United States', December 18th.

[55] The MAVISE database is available at http://mavise.obs.coe.int/

[56] This implies exclusion of telecoms providers that generate the majority of their revenues from telecoms activities rather than recently launched IPTV services.

[57] The iterative process of selecting comparators on the basis of the above criteria is presented in Appendix 3.

6.1.2 Other sectors

Comparators have been selected from a wide range of communications sectors to reflect different activities in Sky's value chain. In order to identify suitable sets of comparators, different sub-sectors within media industry have been assessed in terms of similarities and differences to Sky's business model, and highlighting sectors considered similar to Sky's activities along the value chain.

Comparator companies/sectors have been selected on the following basis.

- **Content-driven industries**—an important driver of Sky's business risk is its exposure to programming costs, and the extent to which customers are ultimately interested in the underlying content. Many of the media companies are exposed to similar cost risks and carry out similar activities in aggregating raw content and adding value to it.

- **Subscriber-based business model**—industries with subscriber-based business models (acquisition and maintenance) are considered appropriate comparators for Sky. Costs associated with maintaining the existing customer base, and acquiring new customers, are similar in the telecommunications and pay-TV industries.

The wide set of companies from other sectors has been selected by identifying the ten largest companies (in terms of turnover) from the following sectors to reflect Sky's business divisions along the value chain.[58]

- **Commercial radio**—this is similar to Sky's wholesale activities in that raw content is acquired, aggregated and broadcast. A key difference to Sky is the high dependence of commercial radio on advertising, rather than subscriber-based revenue.

- **Book publishing**—similarly, long-term contracts for content acquisition and exclusivity of content are characteristics that expose book publishers to risks similar to those inherent in (wholesale) broadcasting.

- **Newspapers—**revenues here are, to a variable extent, driven by subscribers and advertising revenues, as for TV companies.

- **Fixed and mobile telecommunications operators**—the inclusion of these operators in the sample of comparators is premised on the subscriber-based business model, alongside the ongoing convergence of media and telecoms. Indeed, telecoms operators compete increasingly in the content distribution markets by broadcasting over IPTV.

- **Alternative operators (altnets) and mobile virtual network operators (MVNOs)**—these generate revenues through subscriptions and have a cost structure and capital intensity similar to that of Sky's (notional) retail arm.[59]

As with the TV sample, inappropriate comparators, as well as companies for which no data is available, have been excluded. The final sample of non-TV companies used in the clustering analysis consists of 39 companies.

6.1.3 Quantitative analysis to identify closest comparators

To find the closest comparators, statistical clustering analysis has been employed. This technique enables statistically different groups (ie, 'clusters') in data to be identified by employing a number of metrics to select comparator companies with business risk characteristics similar to Sky's. The three types of risk reflected in the metrics are revenue risk, cost risk and operational gearing:

[58] Comprehensive mapping of media industry in terms of similarities and differences to Sky's business model is presented in Appendix 3.

[59] In relation to altnets (retail comparators) and MVNOs, the initial sample has been derived by identifying key players in each country and excluding those owned by the incumbent operator.

– **revenue risk: cyclicality and uncertainty of demand**—eg, revenue volatility and revenue mix (advertising versus subscription revenues);

– **cost risk: uncertainty over future costs**—eg, length of contracts with content providers, evolution of customers' demand and implications for customer acquisition costs;

– **operating leverage (fixed costs/variable costs)**—sensitivity of net cash flows with respect to changes in revenue.

For the purposes of statistical analysis, a set of metrics that would quantify these types of risks has been developed. In addition, metrics have been identified to reflect any differences in business models and consequent accounting ratios to ensure informative comparisons of economic profitability. Metrics employed in the analysis, and their respective implications for risks or business model, are presented in Table 6.1.

Table 6.1 Metrics employed in the clustering analysis

Metric	Implications	Measurement
Subscription revenue as a proportion of total revenue	Revenue risk—exposure to subscription-based revenue as opposed to more cyclical advertising revenue	Full-year 2007 values
Revenue volatility	Revenue risk—historical fluctuations in demand	Normalised standard deviation of changes in quarter-on-quarter revenue, 2003–07
Ratio of OPEX to total assets	Business model—asset intensity. Comparisons of ROCE and ROS informative insofar as cost structures are similar among comparator companies	Full-year 2007 values
Ratio of programming cost to OPEX	Cost risk—reflects the extent and source of value-added in producing raw material into final aggregated content	2007 values. Programming costs are identified as expenses. Acquisition or amortisation of content rights has not been used
Ratio of depreciation to OPEX	Operational gearing (ratio of fixed to variable costs)—a higher share of fixed to variable costs exposes firms to greater business risk in relation to demand shocks	Full-year 2007 values
Exclusive premium content	Revenue risk—holding of exclusive content is likely to reinforce customer loyalty and mitigate revenue volatility	Binary variable (0 or 1) based on qualitative assessment of TV and non-TV companies
Ratio of marketing costs to OPEX	Revenue risk—extent and source of value-added	Full-year 2007 values
Cost volatility	Cost risk—historical fluctuations in costs	Normalised standard deviation of changes in quarter-on-quarter costs, 2003–07
Ratio of current liabilities to total assets	Business model—the extent to which the business tends to finance its activities through current liabilities rather than through borrowings alters the capital employed (affecting the ROCE)	Full-year 2007 values

Source: Oxera.

In addition to the metrics presented in Table 6.1 above, other metrics were tested in the analysis but were excluded due to inconsistencies observed when running the statistical clustering.

6.1.4 Results of clustering analysis—closest comparators

To identify closest comparators, several scenarios with different combinations of metrics were tested (see, further, Appendix 3). Some of these have been tested to identify the closest comparators to Sky in terms of the different combinations of metrics employed in the clustering analysis. Furthermore, scenarios have been tested to benchmark Sky's wholesale and retail activities against comparator companies that exhibit similarities to Sky along different layers of the value chain.

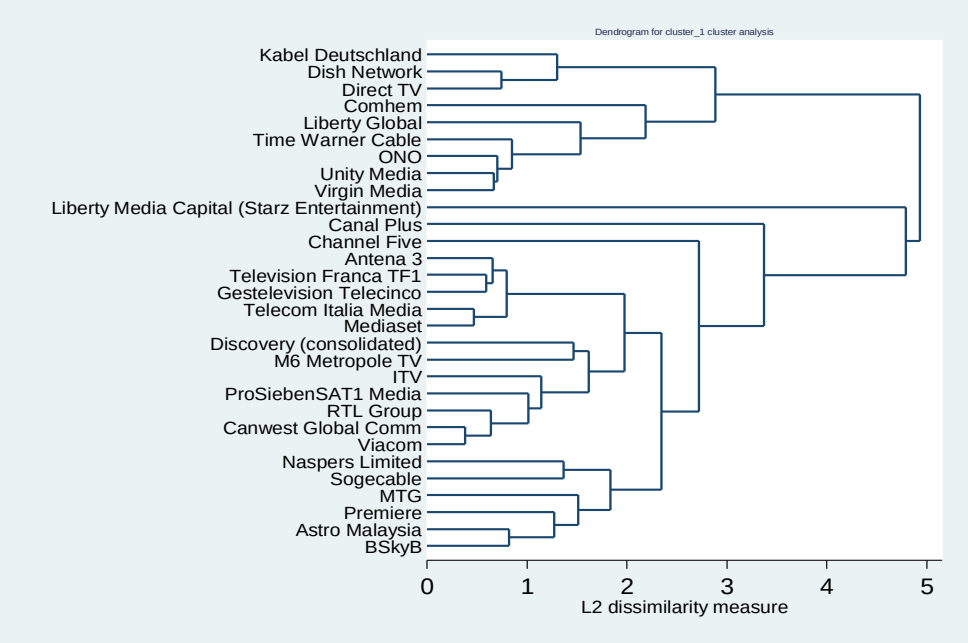
The results of clustering scenarios are reported in the Appendix 3. Box 6.1 provides an illustration of how the outputs of clustering analysis—the dendrogram and grouping of comparators by dissimilarity measure—are interpreted.

Box 6.1 Output of clustering

As discussed above, clustering analysis ranks comparators with reference to a dissimilarity measure, and the number of clusters in the data depends on the level of dissimilarity used. For example, at dissimilarity level 0 (ie, search for companies that are similar), each company is a cluster by itself, whereas at dissimilarity level 5, all TV companies form part of the same cluster. In scenario 1, using dissimilarity level 1 as a reference, five clusters was derived (see below). Sky, which is the reference company, is included in cluster 1. Hence, TV companies in cluster 2 companies are used as the closest comparators of Sky.

As can be seen from the dendrogram, in addition to European pay-TV providers, a Malaysian company has been identified as a close comparator to Sky. While this company seems similar to Sky in terms of financial and operational risk metrics, there may be a concern that it may not provide an appropriate comparator because it operates in markets that are potentially riskier than the UK. However, this would be expected to contribute further to the conservative nature of the analysis (higher country risk requires higher returns for investors). Indeed, the valuation ratios for this company are the highest among the closest identified comparators.

Output dendrograms for all scenarios are shown in the Appendix 3.



Note: The metrics used in the clustering analysis are subscription revenue as a proportion of total revenue; total revenue volatility; the ratio of OPEX to total assets; the ratio of content cost to OPEX; and the ratio of depreciation to OPEX.
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

Table 6.2 shows the groups of closest comparators, highlighted by the clustering analysis.

Table 6.2 Closest comparators identified in the clustering analysis

Scenario/group	Metrics	TV companies	Non-TV companies
Aggregate			
Group 1	Subscriptions revenue as a proportion of total revenue; total revenue volatility; ratio of OPEX to total assets; ratio of programming cost to OPEX; ratio to depreciation to OPEX	Astro Malaysia, Sogecable, Premiere, Modern Times Group, Naspers Ltd	-
Group 2	Same as group 1 and exclusivity of content; ratio of marketing costs to OPEX; cost volatility; ratio of current liabilities to total assets	Astro Malaysia, Sogecable, Premiere, Modern Times Group	-
Group 3	Same as group 1	-	EMI, Sony BMG
Group 4	Same as group 1 and exclusivity of content, ratio of marketing costs to OPEX; cost volatility; ratio of current liabilities to total assets	-	Reed Elsevier, Warner Music Group, Pearson plc, Sony BMG UK, EMI
Retail			
Group 5	Same as group 1	All companies	-
Group 6	Total revenue volatility; ratio of OPEX to total assets; ratio of depreciation to OPEX	Kabel Deutschland, Dish Network, Direct TV, Com Hem	-
Group 7	Same as group 1	-	Virgin Mobile, Talk Talk, Smart Telecom, Tesco Mobile, Vonage
Group 8	Total revenue volatility; ratio of OPEX to total assets; ratio of depreciation to OPEX	-	Belgacom, Telia Sonera, Vonage, KPN, Deutsche Telekom, Telecom Italia, Telefónica, France Telecom, Vodafone
Wholesale			
Group 9	Ratio of programming costs to OPEX; ratio of depreciation to OPEX; ratio of marketing costs to OPEX; exclusivity of content	Canal Plus, Premiere	-
Group 10	Subscription revenue as a proportion of total revenue; total revenue volatility; ratio of programming cost to OPEX; ratio of depreciation to OPEX	-	EMI, Sony BMG

Note: Key metrics include subscriptions revenue as a proportion of total revenue; total revenue volatility; ratio of OPEX to total assets; ratio of content cost to OPEX; ratio to depreciation to OPEX. 'All metrics' include key metrics and, additionally, reliance on exclusive premium content (0 or 1); ratio of marketing costs to OPEX; cost volatility; and ratio of current liabilities to total assets.
Source: Oxera analysis.

Table 6.2 indicates that certain types of companies consistently result in being the closest comparators for Sky.[60]

– TV companies identified as the closest comparators for Sky aggregate are vertically integrated pay-TV companies with subscription-driven revenues, high programming costs and low capital intensity—they are similar to Sky in that they operate a satellite platform (eg, playout) but do not own the satellite fleet. The share of programming costs

[60] The dendrograms for the different scenarios demonstrating the grouping of comparators is presented in Appendix 3.

is fairly high among these companies. Non-TV companies closest to Sky aggregate are, again, content-driven businesses. It is noteworthy that, in addition to European pay-TV providers, Astro Malaysia and Naspers Ltd (South Africa) are found to be close comparators to Sky in terms of operational and financial risk characteristics (both are vertically integrated pay-TV providers). As addressed in Box 6.1, these companies are likely to operate in markets with higher country risk, and their inclusion could bias the results upwards, consistent with the overall conservative approach to this analysis.

– The closest retail comparators are pay-TV retailers (without channel provision) and telecommunications operators. In particular, alternative (virtual) operators appear to be close comparators to Sky retail because, in addition to having a subscriber-driven business model, they operate with low capital intensity and high variable costs.

– The closest wholesale comparators from TV markets are those companies also identified as the closest companies for Sky aggregate (ie, vertically integrated pay-TV operators). This result appears to be driven by low operational gearing (depreciation over OPEX) and high share of programming costs. Subscription revenue (which is zero for Sky wholesale and relatively high for the closest comparators) does not drive the results significantly.

As presented further below, the accounting profitability and valuation ratios of companies found in the clustering analysis to be the closest comparators have been compared with Sky aggregate alongside Sky's notional retail and wholesale divisions.

6.2 Accounting and valuation ratios for comparators—aggregate

The results of the benchmarking analysis are shown below by:

– illustrating how the ROCE and ROS of Sky aggregate compare with the identified benchmarks;
– presenting the valuation ratios (EV over total assets and EV over OPEX plus CAPEX) of comparator companies against those of Sky.

6.2.1 Benchmarking accounting ratios

ROCE and ROS are selected as appropriate accounting ratios for the purposes of comparator analysis. The data underpinning both ratios is available from published accounts. Hence, the use of ROCE and ROS enables comparisons without a comprehensive asset valuation exercise, and without information on cash flows over time. Even though these comparisons do not, strictly speaking, constitute an economic analysis of rates of return, the two ratios provide proxies for economic profitability and therefore form a basis for comparing companies with different business models in terms of asset intensity.

ROS is defined as the ratio of operating profit (EBIT) and turnover for Sky and the comparator companies. A conservative approach was used to benchmark the ROCE, using two specific types of calculation. First, capital employed for Sky (at the aggregate level) was defined as total assets less investments, while for comparators it was defined as total assets. The exclusion of investments for comparators, if relevant, would increase the ROCE estimates. Second, book and replacement cost asset values (year of investment) were considered for Sky, while, for comparators, only book values were considered. Valuation of comparators' assets at replacement cost would be expected to increase further the ROCE estimates.

Table 6.3 presents estimates of the accounting profitability for the full sample of comparators, calculated as five-year averages.

Table 6.3 Estimates of accounting profitability for the full sample of comparators, average, 2003–07

	ROCE	ROS
TV		
Number of comparators	*29*	*29*
Standard deviation	9.7	17.1
Mean	7.5	8.3
Median	**6.9**	**11.4**
Non-TV		
Number of comparators	*33*	*33*
Standard deviation	15.7	15.0
Mean	6.8	8.6
Median	**6.3**	**10.8**
Sky aggregate (based on book asset values)[1]	**26.0**	**16.0**
Sky aggregate (based on replacement cost—year of investment asset values)[2]	[✂]	

Note: [1]In the case of Sky, capital employed (the denominator in the ROCE formula) is defined as total assets less investments in JVs. [2] Capital employed (the denominator in the ROCE formula) is defined as total assets less investments in JVs. Total assets are valued at replacement cost asset values. For the comparators, capital employed is defined as total assets. This represents a conservative approach since excluding investments for comparators, if relevant, would further increase the returns. The time period applied in the benchmarking is 2003–07 for Sky and all comparator companies. Vonage and Mecom Group have been excluded from the calculations because their accounting ratios are significantly lower (highly negative) than those of other comparators. Doing so increases the mean and median of the ROCE and ROS for the comparators, and could be seen as a conservative approach. Comparators for which there is no consistent data have also been excluded from the calculation.
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

While the range of both ROCE and ROS is wide, the results appear to suggest that Sky's returns seem higher than those of its comparators. The full sample encompasses companies whose business models and risk drivers may be different from those of Sky. Hence, while the less relevant benchmark companies have been excluded as part of the qualitative assessment, comparisons may not be fully informative before clustering analysis has been conducted and the closest comparators identified.

By employing the quantitative metrics presented above, clustering analysis has been undertaken to identify the closest comparators in terms of business model and risk exposure. Companies in the same groups are expected to exhibit similar business characteristics and therefore earn similar profits, subject to differences in market power. Table 6.4 presents accounting ratios for the closest comparators of Sky aggregate.

Table 6.4 Estimates of accounting profitability for the closest comparators (aggregate), average 2003–07

	Group 1 (aggregate)	Group 2 (aggregate)	Group 3 (aggregate)	Group 4 (aggregate)
Comparators	**TV**	**TV**	**Non-TV**	**Non-TV**
ROCE				
Number of comparators	*5*	*4*	*2*	*5*
Standard deviation	6.8	6.5	5.4	3.1
Mean	6.1	4.4	7.0	6.7
Median	**8.8**	**4.9**	**7.0**	**5.3**
Sky aggregate (based on book asset values)[1]	**26.0**			
Sky aggregate (based on replacement cost—year of investment asset values)[2]	[✂]			
ROS				
Number of comparators	*5*	*4*	*2*	*5*
Standard deviation	9.4	8.6	1.1	5.1
Mean	7.5	4.9	8.4	10.5
Median	**10.8**	**5.5**	**8.4**	**9.2**
Sky aggregate	**16.0**			

Note: [1] Capital employed (the denominator in the ROCE formula) is defined as total assets less investments in JVs. Total assets are valued at book values. [2] Capital employed (the denominator in the ROCE formula) is defined as total assets less investments in JVs. Total assets are valued at replacement cost asset values. For comparators, capital employed is defined as total assets, with total assets valued at book values. Given that ROCE at replacement costs would be expected to increase compared with ROCE at book values, the comparison of Sky's returns on replacement cost values with comparators' returns at book values could be seen as conservative. Furthermore, exclusion of investments from Sky's capital employed further contributes to the conservative nature of the analysis.
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

Overall, the results of the benchmarking analysis provide a consistent indication that Sky's returns (measured on the basis of accounting ratios) seems higher than for the comparators from the media and telecoms sectors.

6.2.2 Benchmarking valuation ratios

The results of benchmarking analysis for the valuation ratios (EV over total assets and EV over OPEX plus CAPEX) are presented below. Table 6.5 provides estimates of the selected valuation ratios for the full sample of comparators. Ratios are calculated as five-year averages.

Table 6.5 Estimates of valuation metrics for the full sample of comparators, average over 2003–07

	EV/total assets	EV/(OPEX+CAPEX)
TV		
Number of comparators	*24*	*24*
Standard deviation	1.0	3.1
Mean	1.7	3.7
Median	**1.5**	**2.7**
Non-TV		
Number of comparators	*28*	*28*
Standard deviation	1.6	0.9
Mean	1.4	2.0
Median	1.0	1.9
Sky aggregate	**5.2**	**4.1**

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

The evidence in this table suggests that the valuation ratios for comparators are on average lower than for Sky. On balance, it can be observed that the difference is higher in the case of EV to total assets ratio.

To compare Sky with companies with the closest risk characteristics and business models to Sky, valuation ratios have been compared against the closest comparators, as identified in the cluster analysis. Table 6.6 shows valuation ratios for the closest comparators to Sky.

Table 6.6 Estimates of valuation metrics for the closest comparators, average 2003–07

	Group 1 (aggregate)	Group 2 (aggregate)	Group 3 (aggregate)	Group 4 (aggregate)
Comparators	**TV**	**TV**	**Non-TV**	**Non-TV**
EV/total assets				
Number of comparators	*5*	*4*	*1*	*4*
Standard deviation	0.8	0.8	n/a	0.4
Mean	1.9	2.1	1.7	1.2
Median	**2.1**	**2.2**	**1.7**	**1.0**
Sky aggregate	**5.2**			
EV/(OPEX+CAPEX)				
Number of comparators	*5*	*4*	*1*	*4*
Standard deviation	1.6	1.8	n/a	0.5
Mean	2.8	2.9	1.6	1.8
Median	**2.3**	**2.6**	**1.6**	**1.7**
Sky aggregate	**4.1**			

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

Table 6.6 demonstrates that, for the closest comparators, the valuation ratios appear lower than for Sky.

6.3 Disaggregate results

To assess Sky's disaggregate profitability relative to its comparators, clustering analysis has been carried out for Sky wholesale and Sky retail using the revenue, cost and asset allocation underlying the profitability analysis. Different parts of Sky's value chain have been benchmarked against the two broad samples of comparators (TV and non-TV).[61]

Table 6.7 Estimates of accounting profitability for the closest comparators (retail and wholesale), average 2003–07

	Group 6 (retail)	Group 7 (retail)	Group 8 (retail)	Group 9 (wholesale)	Group 10 (wholesale)
Comparators	TV	Non-TV	Non-TV	TV	Non-TV
ROCE					
Number of comparators	4	4	9	2	2
Standard deviation	4.3	46.2	4.9	7.0	5.4
Mean	7.3	12.9	9.8	2.0	7.0
Median	**6.8**	**2.9**	9.5	**2.0**	**7.0**
Sky (based on book asset values)[1]	[✂]			[✂]	
Sky (based on replacement cost—year of investment asset values)[2]	[✂]			[✂]	
ROS					
Number of comparators	4	4	9	2	2
Standard deviation	3.4	28.5	3.8	6.0	1.1
Mean	11.1	–7.7	18.9	–0.6	8.4
Median	**12.0**	**0.7**	**19.7**	**–0.6**	**8.4**
Sky	[✂]			[✂]	

Note: [1] Capital employed (the denominator in the ROCE formula) is defined as total assets. Total assets are valued at book values. [2] Capital employed (the denominator in the ROCE formula) is defined as total assets less investments in JVs. Total assets are valued at replacement cost—year of investment asset values. For comparators, capital employed is defined as total assets; total assets are valued at book values. Given that ROCE at replacement costs would be expected to be higher than ROCE at book values, the comparison of Sky's returns on replacement cost values with comparators' returns at book values could be seen as conservative. Vonage has been excluded from the calculations (clusters 7 and 8) because its accounting ratios are significantly lower (highly negative) than those of other comparators. Doing so increases the mean and median of the ROCE and ROS for comparators, and could be seen as a conservative approach.
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

The ROCE of Sky retail is higher than those of its closest TV comparators. In relation to Sky retail's ROS, on the other hand, there is not clear evidence: it appears to be similar to that of benchmark companies from the TV markets and either higher or lower than for non-TV companies depending on the choice of the cluster.

[61] As all comparators have been included in the sample, no pre-classification of comparators to wholesale and retail has been made in the clustering analysis.

In relation to Sky wholesale, accounting ratios appear higher than for the identified comparators.

On balance, it would seem appropriate not to draw firm conclusions about Sky retail's profitability compared with the retail comparators. However, the evidence that Sky's aggregate profitability may be driven by its relatively high wholesale returns is further reinforced in light of the above analysis.

A1 Aggregate profitability analysis

Table A1.1 Estimates of aggregate profitability—sensitivity to exclusion of contractual obligations (base case–churn, %)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
IRR (£761m of past losses added to SAC in 1992)										
Replacement costs—year of investment	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Replacement costs—annual revaluation	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
IRR (£496m of past losses added to SAC in 1992)										
Replacement costs—year of investment	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Replacement costs—annual revaluation	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Sources: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

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Table A1.2 Estimates of aggregate profitability—rolling IRR and ROCE under different approaches to valuation of the subscriber base (%)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	1995–2008	2004–2008
IRR (end date: 2008)																
Conservative																
Replacement costs—year of investment	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]						
Replacement costs—annual revaluation	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]						
Base case—churn	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]						
Replacement costs—year of investment	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]						
Replacement costs—annual revaluation	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]						
Base case—CC precedent	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]						
Replacement costs—year of investment	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]						
Replacement costs—annual revaluation	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]						
ROCE																
Conservative																
Replacement costs—year of investment	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Replacement costs—annual revaluation	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Base case—churn	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Replacement costs—year of investment	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	1995–2008	2004–2008
Replacement costs—annual revaluation	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Base case—CC precedent	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Replacement costs—year of investment	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Replacement costs—annual revaluation	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Book value of assets	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
Total assets	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

Sources: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis..

A2 Disaggregate profitability analysis

A2.1 Allocation of costs, revenues and assets between retail and wholesale

A2.1.1 Allocation of costs

Using an intuitive approach, costs were allocated between retail and wholesale activities in order to assess relative returns between these activities at a fairly high level, rather than attempting to estimate the precise level of returns. The allocation involved three main types of analysis:

– identification of costs unrelated to pay-TV operations;
– allocation of remaining costs between retail and wholesale activities;
– estimation of implicit costs between Sky retail and wholesale operations.

Having undertaken this allocation, the results were cross-checked against those of the detailed cost allocation analysis carried out by Analysys Mason on behalf of Ofcom.

Identification of costs unrelated to pay-TV operations

Costs unrelated to pay-TV operations were taken from Sky's management accounts provided by Ofcom, in which Sky identified specific cost lines that should be treated as unrelated to pay-TV business. These cost lines were then excluded.

Given that management accounts were not available on a consistent basis over time, the analysis relied on the accounts for 2007/08. From these, the proportion of non-pay-TV costs in each cost category was estimated and applied retrospectively to earlier years. The result was the proportion of total costs per cost line in the statutory accounts (programming, subscriber management, marketing, transmission and administration costs) that were allocated to non-TV operations.

Allocation of costs observed in statutory accounts

Once the proportion of non-TV costs was identified, the analysis allocated the remaining costs between retail and wholesale activities, starting from the statutory accounts. The five cost lines observed in the statutory accounts[62] were categorised into those that:

– can be allocated to retail and whole activities directly;
– can be allocated directly on the basis of breakdowns from management accounts;
– cannot be allocated directly and need to be allocated as common costs.

Costs assumed to belong to the first category are **transmission** and **subscriber management costs**; these were fully allocated to retail.[63] Transmission costs were allocated to retail because most of these relate to platform services, which were included within the scope of retail activities. As subscriber management costs primarily comprise the costs of installing the equipment, it seems appropriate to allocate them to retail.

Programming costs and marketing costs were assumed to belong to the second category.

[62] The costs in the statutory accounts are broken down into five major categories: programming costs, subscriber-related costs, management costs, transmission costs and administration costs.

[63] Some transmission costs may support wholesale functions (eg, the provision of wholesale platform services). As a stress test, 50% of transmission costs were allocated to wholesale. This had a limited impact of the profitability results (In the case of wholesale, the change led to a [✂]% reduction to the IRR of [✂]% from 2004 to 2008. The ROCE and ROS also decreased by [✂]% and [✂]% to [✂]% and [✂]% respectively. In the case of retail, the change led to a [✂]% increase to the IRR of [✂]% from 2004 to 2008. The ROCE and ROS also increased by [✂]%, to [✂]% and [✂]% respectively.).

– Using management accounts, **programming costs** were broken down into the acquisition of content directly from content providers and from third-party providers. The former was directly allocated to wholesale as it constitutes the main wholesale activity, while the latter was allocated to retail as it mainly consists of basic channels included by Sky retail in its retail packages. The proportion of third-party programming costs in total programming costs, estimated using 2007/08 management accounts,[64] was applied retrospectively to earlier years.

– It is reasonable to expect that **marketing costs** contribute to retail and wholesale activities. According to management accounts, these costs could be broken down into four categories: marketing costs associated with consumer acquisition, general consumer marketing, retention marketing and other marketing. Given the description of costs in management accounts, acquisition costs, general consumer marketing and retention marketing were allocated to retail.[65] Other marketing costs were allocated to wholesale; these could be interpreted as costs aimed at supporting customer awareness of Sky's channels, regardless of which retail provider distributes them.[66]

The last category listed in statutory accounts is **administration costs**. These were allocated between retail and wholesale using the equi-proportionate mark-up approach (EPMU)—ie, pro-rata to costs already allocated to retail and wholesale.[67] The resulting allocation is presented in Table A2.1 below.

Given that the cost allocation was based on statutory accounts, where depreciation is shown as part of individual cost lines, no additional adjustment for the allocation of depreciation was not needed.

Cross-check: Analysys Mason allocation

On behalf of Ofcom, Analysys Mason undertook detailed cost allocation between retail, wholesale and platform activities. Similar to the above approach, certain cost lines were allocated directly (with direct costs allocated using a more disaggregated cost breakdown than in the Oxera analysis); while others were treated as common. Common costs were allocated between platform ([✂]%), retail ([✂]%) and wholesale ([✂]%). These weightings were estimated by the number of subscribers that are (implicitly or explicitly) serviced by identified Sky activity.

The two allocations are compared in Table A2.1 below. For the purposes of comparing Oxera's and Analysys Mason's allocations, costs allocated by Analysys Mason to platform were aggregated with retail.

[64] The proportion is equal to [✂]% (or £[✂]m in 2008) of total programming costs in 2008.

[65] Marketing acquisition costs aim to acquire new subscribers, and hence are allocated to retail. General consumer marketing and retention marketing are allocated to retail because the former aim to increase general consumer awareness of Sky products and the latter to reduce churn rates. Marketing acquisition costs represent [✂]% (or £[✂]m in 2008) of total pay-TV-related marketing costs. Consumer marketing represents [✂]% (or £[✂]m in 2008) of total pay-TV-related marketing costs. Retention marketing costs represent [✂]% (or £[✂]m in 2008) of total pay-TV-related marketing costs. It could be argued that a proportion of general consumer marketing also relates to wholesale. As sensitivity, [✂]% of general consumer marketing costs were allocated to wholesale. The impact on profitability estimates is limited (around [✂]% in IRR terms).

[66] Other marketing costs represent [✂]% (or [✂]m in 2008) of total pay-TV-related marketing costs.

[67] Costs allocated to retail before allocation of administration costs, but including internal programming costs, represent [✂]%.

Table A2.1 Allocation of costs to Sky retail and Sky wholesale under different cost allocation scenarios, 2007/08 (£m)

	Oxera high-level allocation		Cross-check: Analysys Mason cost allocation[1]	
	Retail[2]	Wholesale	Retail[2]	Wholesale
Programming	[✂]	[✂]	[✂]	[✂]
Subscriber handling	[✂]	[✂]	[✂]	[✂]
Transmission	[✂]	[✂]	[✂]	[✂]
Marketing	[✂]	[✂]	[✂]	[✂]
Administration	[✂]	[✂]	[✂]	[✂]
Depreciation (including amortisation)			[✂]	[✂]
Total costs (excluding depreciation)			[✂]	[✂]
Total costs (including depreciation)	[✂]	[✂]	[✂]	[✂]

Note: High-level allocation is based on Sky's management accounts provided by Ofcom. [1] Excludes depreciation and amortisation, which was £[✂]m in 2008. [2] Retail programming costs do not include internal costs (£[✂]m) payable to Sky wholesale for the provision of channels.
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

As seen from the table, the two allocations are broadly similar in terms of total costs. The difference in total cost allocation is around [✂]% (or £[✂]m) in the case of retail and around [✂]% (or £[✂]m) in the case of wholesale.[68]

Overall, as can be seen from Table A2.1, Analysys Mason allocates fewer costs to wholesale and retail activities in total compared to Oxera high-level allocation. This is due to allocation of a greater proportion of costs to non-TV operations. As a result, AM cost allocation leads to higher estimates of returns for both wholesale and retail activities than Oxera high-level allocation (see Table 5.1 in section 5.2).

Internal cost imputation

When Sky's aggregate business is split between retail and wholesale activities, it is important to recognise that Sky wholesale transacts with third-party retailers as well as implicitly with Sky retail. Therefore, from the perspective of Sky retail, an important cost line is payment to Sky wholesale for the provision of channels. As these costs are not directly observable in Sky's accounts, they need to be imputed.

The estimation of costs that Sky retail implicitly pays to Sky wholesale was based on the number of Sky's retail subscribers and the wholesale prices that Sky charges to third-party retailers (retail subscribers) and wholesale commercial prices (commercial subscribers). The approach assumed that Sky retail pays Sky wholesale for channels on a per subscriber basis; this is consistent with the approach Sky uses to charge third-party retailers.

The analysis has been carried out separately for residential and commercial subscribers, given that different types of data need to be used.

– **Residential subscribers**: the estimation of the internal cost for residential subscribers relied on third-party prices and the number of residential subscribers for Sky retail. Third-party prices (per subscriber) for premium channels were provided by Sky; third-party prices for basic channels were estimated using Sky's data on revenue derived

[68] In the case of transmission cost, where the largest difference between two allocations is observed, an alternative allocation has been tested.

from basic channels sold to third parties and the number of third-party basic subscribers. The data on residential subscriber numbers was also provided by Sky.

– The observed subscriber numbers could not be readily matched with the observed data on wholesale third-party prices. This is because wholesale prices are observed for individual channels that Sky wholesale charges to third-party retailers, while subscriber numbers at the retail level are observed for a larger number of packages which contain mixes of individual channels. Hence, the analysis needed to identify how to map wholesale channels to retail packages and to treat appropriately packages that combine a number of channels (in particular, basic and premium channels).

– The first issue arises when wholesale prices are mapped on retail packages. The matching has been done on the basis of the types of channel included in each package.

– The second issue arises when estimating how much retail would pay to wholesale for customers subscribing to basic/premium packages. In this study customers who subscribed to packages that represent a combination of basic and premium packages were treated as both basic and premium subscribers.

– The combination of prices, numbers of residential subscribers and the mapping mechanism were then used to estimate the implied retail costs associated with purchasing channels from Sky wholesale.

– **Commercial subscribers**: similar to the treatment of residential subscribers, the internal costs of Sky retail associated with packages sold to commercial subscribers were estimated using a combination of subscriber numbers and wholesale prices per subscriber. The average number of commercial subscription at the retail level was provided by Sky. Wholesale commercial price were taken from Sky's rate-card.[69]

– There are two specific issues in this analysis:

  – the data was not available for all years for which profitability measures were calculated;

  – the data on the number of retail commercial subscribers was provided for two types of subscribers: those who purchase packages that contain sport channels and that contain sports and movies packages, while wholesale commercial prices are available for a greater variety of packages. Hence, the analysis needed to estimate commercial subscriber for those years where data was not available; and map customer numbers onto the available wholesale prices.

– It was assumed that commercial subscriber follow constant historical trend. Therefore, the number of customers, in years where customer data was not available, was informed by a trend in commercial subscriber numbers in years where the data is available.

– Given that data on the number of retail commercial subscribers was provided for two types of subscribers: those who purchase packages that contain sport channels and that contain sports and movies packages, the wholesale price for provision of channel to commercial subscribers was based on two channel packages: dual sports, and dual sports and dual movies. As a detailed breakdown of commercial subscribers was not

[69] Sky (2007), 'Commercial wholesale rate card (applicable from September 1st 2007').

available, the wholesale was based on the rate-card of pubs&clubs as these types of commercial premise generate around [✂]% of Sky's total retail commercial revenue.[70]

Table A2.2 presents imputed internal costs to Sky retail.

Table A2.2 Imputed internal costs to retail (£m)

	2004	2005	2006	2007	2008
Retail subscription	[✂]	[✂]	[✂]	[✂]	[✂]
Commercial subscription	[✂]	[✂]	[✂]	[✂]	[✂]
Total	[✂]	[✂]	[✂]	[✂]	[✂]

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

Given that the costs shown in the table above represent the costs to retail arising from purchasing channels from wholesale, these correspondingly represent revenues for wholesale.

Summary of cost allocations

Table A2.3 compares costs allocation adopted in the analysis with costs stated in the statutory accounts.

Table A2.3 Allocation of costs to wholesale and retail activities, 2008 (£m)

	Wholesale	Retail	Wholesale + retail	Statutory accounts[1]
Programming	[✂]	[✂]	[✂]	[✂]
Subscriber-related	[✂]	[✂]	[✂]	[✂]
Transmissions and related functions	[✂]	[✂]	[✂]	[✂]
Marketing	[✂]	[✂]	[✂]	[✂]
Administration	[✂]	[✂]	[✂]	[✂]
Total	[✂]	[✂]	[✂]	[✂]

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

A2.1.2 Allocation of revenues

Consistent with the analysis of costs, the starting point for the allocation of revenues was the statutory accounts.

Revenues observed in the statutory account are divided into six groups: retail subscription, wholesale subscription, advertising, installation of hardware and software, Sky betting and other revenues. These revenue lines were classified into three categories:

– those that need to be excluded as they may not relate to pay-TV operations;
– those that can be allocated between wholesale and retail directly;
– those that need to be imputed as they are not observable in the statutory accounts.

[70] Pricing band D was chosen as a basis. See Sky (2007), 'Commercial wholesale rate card (applicable from September 1st 2007)', Table 2.1, p. 7. The price for dual sports package used in the analysis was £293 per month, and for dual sports and dual movies £300 per month. These were cross-checked against weighted average revenue per commercial subscriber. It is estimated to be £372 per month. When the actual weighted average revenue per subscriber is compared against the retail rate-card available for Sky website, it falls in pricing band F pubs&clubs. Therefore, the assumption in this analysis appears, if anything, to be conservative. See Sky (2007), 'Subscription information: Pubs&clubs UK', July 1st, p. 10.

Revenues unrelated to pay-TV operations

Two revenue lines were treated as unrelated to wholesale and retail activities: Sky betting and other revenues. These were not allocated to retail or wholesale activities.

It could be argued that some of the 'other' revenues represent Sky's revenues for the provision of platform services and hence should be allocated to retail. However, from the breakdown of other revenues in management accounts, it was not possible to identify robustly which revenue lines relate to platform and transmission.[71]

Furthermore, such allocation, where a component of revenues is not allocated (while all costs are allocated), could be seen as conservative in terms of the resulting estimate of the level of returns (although not necessarily the relative returns between activities).

Revenues allocated directly between retail and wholesale

It seems appropriate to allocate a number of revenue lines observed in the statutory accounts directly between retail and wholesale activities. Such lines include advertising, installation, retail and commercial subscription revenue.

Advertising revenues were allocated to wholesale. As identified by Ofcom in the description of the value chain, as part of wholesale activities, advertisements are packaged into channels, and are therefore a product of wholesale activities along with channel provision.

Installation revenues were allocated to retail. These revenues are associated primarily with installation of Sky digital boxes. Since these digital boxes are an essential part of the retail subscription, these revenues were allocated directly to retail.

While retail and wholesale subscription revenue could be allocated directly to retail and wholesale respectively, in this study these revenues were estimated on the basis of the observed subscriber numbers and prices. The objective of this calculation was to enable the subsequent allocation of these revenues between further levels of disaggregation: basic and premium, and sports and movies channels.

Retail and wholesale subscription revenues were imputed using numbers of subscribers (Sky's subscribers in the case of retail, and third-party subscribers in the case of wholesale), and retail (in the case of retail subscription revenues) and third-party wholesale prices (in the case of wholesale subscription revenues). Subscriber numbers and prices were provided by Sky.[72]

Internal revenue imputation

As discussed in the context of cost allocation, Sky wholesale implicitly charges revenue to Sky retail for the provision of channels. This revenue needs to be imputed as part of the analysis. From the retail perspective, these revenues represent the costs of channels. Hence, the imputation of internal revenue associated with the provision of channel packages by wholesale to retail is the same as the imputation of internal costs (as described in section A2.1.1).[73]

Summary of revenue allocation

Table A2.4 below compares revenue allocation adopted in the analysis with revenue stated in the statutory accounts.

[71] As a sensitivity check, it was assumed that £[✂]m relate to platform revenue, and were therefore added to overall retail revenues. The impact of adding £[✂]m to retail revenue in every year is marginal.

[72] Sky has provided information on the number of DTH subscribers per package of channels, as well as retail monthly price per package by subscriber. Sky also provided information on the number of third-party subscribers and wholesale monthly third-party price per package of channels per month.

[73] Ofcom (2008), 'Second pay-TV consultation', Annex 9.

Table A2.4 Allocation of revenues to wholesale and retail activities, 2008 (£m)

	Wholesale	Retail	Wholesale + retail	Statutory accounts[1]
Advertising	[✂]	[✂]	[✂]	328
Wholesale subscription	[✂]	[✂]	[✂]	181
Internal revenue	[✂]	[✂]	[✂]	
Retail subscription	[✂]	[✂]	[✂]	3,769
Commercial subscription	[✂]	[✂]	[✂]	
Installation	[✂]	[✂]	[✂]	276
Sky betting	[✂]	[✂]	[✂]	44
Other revenue	[✂]	[✂]	[✂]	354
Total (including internal revenue)	[✂]	[✂]	[✂]	**4,952**
Total (excluding internal revenue)	[✂]	[✂]	[✂]	**4,952**

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

A2.1.3 Allocation of assets

The measures of the return on capital (IRR and ROCE) require capital employed to be allocated, as well as costs and revenues. In this study this allocation was carried out at a high level to inform the relative analysis of returns on capital; the estimates of ROS for wholesale and retail are not affected by the allocation of assets.

The asset allocation approach adopted in the analysis involved two steps:

– identification and allocation of asset types that could be directly attributed to retail or wholesale activities;
– pro rata allocation of assets between wholesale and retail to allocated operating costs.

Direct allocation between retail and wholesale

The following asset types were allocated directly on the basis of their underlying functionality.

– **Wholesale**: TV programming rights included in inventories (the remainder of inventories other than programming content was allocated to retail), a share of trade receivables (pre-paid programming and agency rights) and contractual obligations were allocated to wholesale. These costs cover [✂]% of the wholesale asset base (including intangibles) in 2008.

– **Retail**: intangibles already recognised on the balance sheet (allocated to retail as they mainly consist of subscriber-related software), a share of trade receivables (trade debtors and accrued income) and inventories not recognised as part of wholesale. These costs cover [✂]% of the retail asset base (including intangibles) in 2008.

Trade receivables were allocated between wholesale and retail in two steps. First, categories of trade receivables that can be directly allocated to wholesale or retail were identified. The categories that were allocated to wholesale include pre-paid programming and agency rights, as discussed above; whereas pre-paid transponder rentals, trade debtors and accrued income were directly allocated to retail activities. Second, the remainder of trade receivables was allocated to wholesale and retail pro rata to the directly allocated trade receivables. Of total trade receivables, [✂]% was allocated to retail and [✂]% to wholesale. Allocated trade receivables represent [✂]% and [✂]% of wholesale and retail asset base in 2008 (including intangibles).

Allocation on the basis of operating costs

Other asset types (PPE and cash) were allocated proportionately to operating expenditure including internal costs (see section A2.1.1 for discussion of cost allocation). These asset categories amount to [✂]% (or £[✂]billion in 2008) of Sky's asset base (including intangibles), of which [✂]% was allocated to retail and correspondingly [✂]% to wholesale.[74]

Intangibles associated with capitalised subscriber acquisition costs were allocated on the basis of allocation of the relevant cost lines.[75] Under the base case scenario, [✂]% of capitalised intangibles were allocated to retail, and [✂]% (including capitalised contractual obligations) to wholesale.

The asset allocation approach described here could be seen as conservative. This is because all assets recognised on Sky's books were fully allocated to retail and wholesale. This in turn assumes that no assets are allocated to non-TV operations. This assumption is likely to overestimate the relevant asset base associated with retail and wholesale activities, and, therefore, underestimate the return on capital. Table A2.5 shows the results of the asset allocation.

Table A2.5 Allocation of assets to retail and wholesale activities, 2007/08 (£m)

	Based on high-level cost allocation	
	Retail	Wholesale
Tangible assets	[✂]	[✂]
Subscriber base	[✂]	[✂]
Contractual obligations	[✂]	[✂]
Total assets	[✂]	[✂]

Note: Figures in brackets represent percentages of Sky's total—eg, [✂]% of Sky's total assets were allocated to retail activities. High-level allocation is based on Sky's management accounts provided by Ofcom, which do not present figures for non-TV components of Sky's business.
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

A2.2 Allocation of costs and revenues between basic and premium channels

The allocation of costs involves two main steps. First, direct costs associated with the provision of basic and premium channels were allocated. Programming costs (at the wholesale level) and the internal charge between wholesale and retail (at the retail level) were treated as direct costs. These could be allocated directly using the observable data. Second, other types of cost, which could not be directly allocated, were allocated pro rata to customer numbers on the basis of direct cost allocation and common cost allocation.

Direct cost allocation

Direct costs were allocated separately at the wholesale and retail levels. At the wholesale level, programming costs (ie, the costs of acquiring content) were treated as direct costs. Programming costs were allocated between basic and premium content based on the breakdown of programming costs as per the 2007/08 management accounts. Of total programming costs, those associated with movies and sports content were allocated to

[74] Retail operating costs in 2008 are £[✂]billion, including £[✂]billion of internal costs; wholesale operating expenditure in 2008 equalled £[✂]billion.
[75] In 2008, retail's capitalised subscriber base was £[✂]billion, whereas wholesale's capitalised intangibles (excluding capitalised contractual obligations) it was equal to £[✂]m.

premium,[76] with the remainder allocated to basic. The proportion of premium and basic programming costs was applied retrospectively to earlier years.

At the retail level, costs incurred by Sky retail for purchasing content from third parties and from Sky wholesale were treated as direct costs. Third-party content costs were allocated to basic. For internal costs, these were allocated to basic and premium according to subscriber numbers and the price of providing each type of content.

One particular issue in the allocation of internal costs is the treatment of customers who, at the retail level, purchase packages that combine basic and premium channels. In such cases, it was assumed that Sky retail pays Sky wholesale for basic and premium content (hence, in effect, such customers were treated as two customers, one of whom purchases basic-only content and another purchases premium-only content). This treatment seems consistent with Sky's pricing policy in relation to third-party retailers.

Common cost allocation

Common costs include subscriber management, marketing, transmission and administration costs. Section A2.1.1 described how these were allocated between retail and wholesale activities. Hence, in order to analyse basic and premium returns, these costs need to be further allocated between basic and premium channels separately within wholesale and retail.

These cost categories was allocated proportionally to basic and premium residential subscriber numbers in the total number of subscribers at Sky retail and Sky wholesale.

At the retail level, two approaches for the treatment of customers subscribing to packages combining retail and wholesale channels were adopted:

– **approach 1**: Sky subscribers who buy basic/premium packages are treated as premium, and those who buy basic-only packages are treated as basic;
– **approach 2**: all Sky subscribers are treated as basic, and those who buy basic/premium packages are treated as premium.

Table A2.6 below details the resulting cost allocation between premium and basic segments.

[76] In 2008, programming costs associated with movies and sports content represent £[✂]billion or [✂]% of total wholesale programming costs.

Table A2.6 Allocation of costs between basic and premium segments, 2008 (£m)

	Wholesale		Retail	
	Approach 1	Approach 2	Approach 1	Approach 2
Basic				
Programming/internal	[✂]		[✂]	
Third-party	[✂]		[✂]	
Subscriber handling	[✂]	[✂]	[✂]	[✂]
Transmission	[✂]	[✂]	[✂]	[✂]
Marketing	[✂]	[✂]	[✂]	[✂]
Administration	[✂]	[✂]	[✂]	[✂]
Total	[✂]	[✂]	[✂]	[✂]
Premium				
Programming/internal	[✂]		[✂]	
Third-party	[✂]		[✂]	
Subscriber handling	[✂]	[✂]	[✂]	[✂]
Transmission	[✂]	[✂]	[✂]	[✂]
Marketing	[✂]	[✂]	[✂]	[✂]
Administration	[✂]	[✂]	[✂]	[✂]
Total	[✂]	[✂]	[✂]	[✂]

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

As seen from the table above, the allocation of costs in retail depends on the allocation of subscribers between basic and premium segments.

A2.2.1 Allocation of revenues

Similar to the allocation of costs, the allocation of revenues between basic and premium channels was undertaken separately for Sky wholesale and retail activities. In relation to wholesale, three main types of revenues need to be allocated: advertising revenue, third-party wholesale revenue and internal revenue from Sky retail (residential and commercial). Advertising revenue was allocated between basic and premium proportionally to the combined number of third parties' and Sky's basic and premium subscribers (customers subscribing to basic and premium packages were treated as both basic and premium).

Third-party and internal residential subscription revenues were allocated directly based on the data on wholesale prices and subscriber numbers (customers subscribing to basic and premium packages were treated as both basic and premium).

Wholesale revenue associated with commercial revenue at the retail level (eg, internal charge) was treated as premium.[77]

[77] According to data provided by Sky, basic-only packages account for [✂]% of total commercial revenue.

Table A2.7 Allocation of revenue between basic and premium channels: wholesale (£m)

	2004	2005	2006	2007	2008
Basic					
Advertising	[✂]	[✂]	[✂]	[✂]	[✂]
Third-party subscription	[✂]	[✂]	[✂]	[✂]	[✂]
Sky retail subscription (residential and commercial)	[✂]	[✂]	[✂]	[✂]	[✂]
Premium					
Advertising	[✂]	[✂]	[✂]	[✂]	[✂]
Third-party subscription	[✂]	[✂]	[✂]	[✂]	[✂]
Sky retail subscription (residential and commercial)	[✂]	[✂]	[✂]	[✂]	[✂]
Total	[✂]	[✂]	[✂]	[✂]	[✂]

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

In relation to retail, the following types of revenue need to be allocated: residential subscription, commercial subscription and installation of hardware and software. Installation revenue was allocated between basic and premium proportionally to the number Sky's basic and premium subscribers. As described in the previous section, there are two approaches to allocate Sky's customers between basic and premium at the retail level, and installation revenue allocation will depend on which approach is adopted.

As in the case of wholesale, basic and premium residential and commercial subscription revenues were calculated using the price Sky retail charges to residential and commercial subscribers for basic and premium packages of channels. However, in the retail case, a number of specific issues arise, which are reviewed below.

Retail prices are observed for bundles of basic and premium customers (ie, some purchase only basic channels and others purchase basic and premium channels), thus raising the question of how to treat revenue from customers who purchase the bundle of basic and premium channels.

– **Approach 1**: treat customers as premium customers. This means that, from the profitability perspective, the costs of basic channels are recovered from basic packages only, while the costs of premium channels are recovered from the basic/premium bundles. This approach represents one extreme insofar as, here, basic channels receive the lower end of the possible range for the revenue, while premium channels receive the upper end of the possible range.

– **Approach 2**: delineate the premium component of the basic/premium package on an incremental basis. Customers who subscribe to basic/premium bundles would be treated as basic customers who generate revenue under the basic price as well as premium customers who generate revenues under the price which is calculated as the difference between the price of the bundle and the basic price. This provides another end of the spectrum for possible treatment of basic/premium packages. Under this approach, basic packages receive the upper end of the possible range for the revenue, and premium channels receive the lower end of the possible range.

Results under both approaches are presented in Table A2.8 below.

Table A2.8 Allocation of revenue between basic and premium channels (retail, £m)

	2004	2005	2006	2007	2008
Basic					
Approach 1					
Retail subscription	[✂]	[✂]	[✂]	[✂]	[✂]
Commercial subscription	[✂]	[✂]	[✂]	[✂]	[✂]
Installation	[✂]	[✂]	[✂]	[✂]	[✂]
Approach 2					
Retail subscription	[✂]	[✂]	[✂]	[✂]	[✂]
Commercial subscription	[✂]	[✂]	[✂]	[✂]	[✂]
Installation	[✂]	[✂]	[✂]	[✂]	[✂]
Premium					
Approach 1					
Retail subscription	[✂]	[✂]	[✂]	[✂]	[✂]
Commercial subscription	[✂]	[✂]	[✂]	[✂]	[✂]
Installation	[✂]	[✂]	[✂]	[✂]	[✂]
Approach 2					
Retail subscription	[✂]	[✂]	[✂]	[✂]	[✂]
Commercial subscription	[✂]	[✂]	[✂]	[✂]	[✂]
Installation	[✂]	[✂]	[✂]	[✂]	[✂]
Total (approach 1)	[✂]	[✂]	[✂]	[✂]	[✂]
Total (approach 2)	[✂]	[✂]	[✂]	[✂]	[✂]

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

The approach to the treatment of basic/premium packages does not affect the overall retail revenue and only affects the allocation of revenues between basic and premium channels.

A2.3 Allocation of costs and revenues between premium sports and movies channels

A2.3.1 Allocation of costs

As in the case of profitability of basic and movies channels, the ROS calculation requires allocation of all operating costs, whereas estimation of margins requires allocation of direct costs only. Therefore, cost allocation was broken down into two steps: allocation of direct costs and allocation of common costs.

Programming costs (at the wholesale level) and the internal charge between wholesale and retail (at the retail level) were treated as direct costs, as these could be allocated directly using the observable data. Other types of cost, which could not be allocated directly, were allocated pro rata to customer numbers for sport and premium channels.

The resulting value of common costs allocated to sports and movies would also depend on the value of common costs allocated to premium channels (there are two approaches for allocating common costs at the basic/premium level, as discussed in section A2.2.1).

Direct cost allocation

The allocation of direct costs was carried out separately for the provision of premium channels at wholesale and retail levels. For wholesale, programming costs were allocated

between sports and movies channels according to a breakdown of these costs as per the 2007/08 management accounts.[78] The proportion of sports and movies programming costs in 2007/08 was applied retrospectively to earlier years. At the retail level, costs incurred by Sky retail for purchasing content from Sky wholesale were treated as direct. (Since third-party content costs were allocated to basic, they are not accounted for in this case.) Internal costs were allocated to sports and movies on the basis of wholesale premium channels revenue allocation (see section below).

Common cost allocation

Common costs include: subscriber management, marketing, transmission and administration costs. Section A2.2.1 described their allocation between basic and premium activities. To analyse sport and movies returns, these costs need to be further allocated between sports and movies channels separately within wholesale and retail.

These cost categories were allocated in proportion to sports and movies residential subscriber numbers in the total number of premium subscribers (sport and movies) at Sky retail and Sky wholesale. Customers subscribing to packages combining sports and movies channels were treated as both sports and movies subscribers.

Table A2.9 summarises the cost allocation between sports and movies for wholesale and retail activities.

Table A2.9 Allocation of costs between sports and movies channels: common cost allocation approach 1, 2008 (£m)

	Wholesale	Retail
Subscribers ('000)		
Sports	[✂]	[✂]
Movies	[✂]	[✂]
Operating		
Sports		
Programming	[✂]	[✂]
Subscriber handling	[✂]	[✂]
Transmission	[✂]	[✂]
Marketing	[✂]	[✂]
Administration	[✂]	[✂]
Total	[✂]	[✂]
Movies		
Programming	[✂]	[✂]
Subscriber handling	[✂]	[✂]
Transmission	[✂]	[✂]
Marketing	[✂]	[✂]
Administration	[✂]	[✂]
Total	[✂]	[✂]
Total	[✂]	[✂]

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

[78] In 2008, programming costs associated with movies and sports content represented £[✂]m and £[✂]m respectively.

A2.3.2 Allocation of revenues

Revenues were allocated between sports and movies channels separately for wholesale and retail activities, although in both cases a similar approach is used.

All revenues could be divided into groups: subscription revenues and other revenues. The latter were allocated proportionally to sports and movies subscriber numbers in the total number of premium subscribers (sport and movies) at Sky retail and Sky wholesale.

The allocation of subscription revenues was informed by two approaches outlined in Ofcom's second consultation document:[79] preference allocation and pro-rata allocation.

– **Preference allocation** is based on Ofcom's consumer survey.[80] Under this approach weights are assigned to the two types of content. The weights are informed by the value consumers attach to either sports or movies channels: the lower incremental price of purchasing a premium channel, the greater value is attached to that channel. According to the survey, 50% of customers subscribing to sports/movies package buy the package because of the sports content, 25% buy bundled packages because of movies content, and the remaining 25% value sports and movies content in the bundles equally. For example, revenue allocated to sports channels is calculated as weighted average revenue. In this calculation, the results of the survey are used as weights:

  (sports incremental price * share of customers who prefer movies (25%)) + (price of stand-alone sports channel * share of customers who prefer sports (50%) + (bundle price * share of customers who equally sports and movies (25%)) * 0.5)[81]

  The resulting revenue allocation proportions are presented in Table A2.10 below.

– **Pro-rata allocation** of revenues was undertaken on stand-alone sales where sports and movies revenues were allocated directly to respective sports and movies channels. Mixed packages, such as dual sports and dual movies channel, were allocated pro-rata to average revenues per subscriber for separate sports and movies packages.

Table A2.10 below presents the ratios for allocation of revenues for different packages under these two approaches.

[79] Ofcom (2008), 'Second pay-TV consultation', Annex 8 and Annex 9.

[80] Ofcom (2008), 'Second pay-TV consultation', Annex 8

[81] Incremental price is calculated as the difference between the bundle price and the price of the stand-alone channel showing most preferred content. For example, the sports incremental price for a given bundle is the difference between the bundle price and the price of the stand-alone movies channel.

Table A2.10 Proportion of premium revenue allocated to sports channels under preference and pro-rata approaches (%)

Channel	Preference	Pro-rata
Single sport	[✂]	[✂]
Single movies	[✂]	[✂]
Single movies and single sport	[✂]	[✂]
Dual movies	[✂]	[✂]
Dual movies and single sport	[✂]	[✂]
Dual sports	[✂]	[✂]
Single movies and dual sports	[✂]	[✂]
Dual movies and dual sports	[✂]	[✂]
Sky Sports Xtra standalone	[✂]	[✂]
Sky Sports Xtra as a bonus	[✂]	[✂]

Source: Ofcom (2008), 'Second pay-TV consultation', Annex 8 and Annex 9.

Proportions shown in the table were applied to wholesale and retail subscription revenue (where retail packages were mapped onto the wholesale packages shown above).

The revenue generated by Sky wholesale from the provision of sports and movies channels to Sky retail represents an internal cost for Sky retail.

Table A2.11 presents revenue allocation between sports and movies channels for wholesale and retail activities under the preference allocation approach in 2008.

Table A2.11 Revenue allocated to sports and movies channels under preference allocation approach: revenue allocation approach 1[1], 2008 (£m)

	Wholesale	Retail
Sports		
Wholesale/retail subscription	[✂]	[✂]
Internal revenue/commercial subscription	[✂]	[✂]
Advertising/installation	[✂]	[✂]
Total	[✂]	[✂]
Movies		
Wholesale/retail subscription	[✂]	[✂]
Internal revenue/commercial subscription	[✂]	[✂]
Advertising/installation	[✂]	[✂]
Total	[✂]	[✂]
Total	[✂]	[✂]

Note: [1] Approach 1 refers to allocation of revenues between premium and basic channels at the retail level; under this approach, customer purchasing basic channels only were treated as basic subscribers.
Source: Ofcom (2008), 'Second pay-TV consultation', Annex 8 and Annex 9; Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

Table A2.12 presents revenue allocation between sports and movies channels for wholesale and retail activities under pro-rata allocation approach in 2008.

Table A2.12 Revenue allocated to sports and movies channels under pro-rata allocation approach: revenue allocation approach 1[1], 2008 (£m)

	Wholesale	Retail
Sports		
Wholesale/retail subscription	[✂]	[✂]
Internal revenue/commercial subscription	[✂]	[✂]
Advertising/installation	[✂]	[✂]
Total	[✂]	[✂]
Movies		
Wholesale/retail subscription	[✂]	[✂]
Internal revenue/commercial subscription	[✂]	[✂]
Advertising/installation	[✂]	[✂]
Total	[✂]	[✂]
Total	[✂]	[✂]

Note: [1] Approach 1 refers to allocation of revenues between premium and basic channels at the retail level; under this approach, customer purchasing basic channels only were treated as basic subscribers.
Source: Ofcom (2008), 'Second pay-TV consultation', Annex 8 and Annex 9; Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

Table A2.13 presents estimates of the ROS for sports and movies channels for wholesale and retail activities under the pro-rata allocation approach in 2008.

Table A2.13 Estimates of ROS for sports and movies channels: pro-rata allocation, 2004–08 (%)

Retail			
		Common cost allocation at basic and premium level	
		Approach 1	**Approach 2**
Revenue allocation at basic and premium level	**Approach 1**		
	Sports	[✂]	[✂]
	Movies	[✂]	[✂]
	Approach 2		
	Sports	[✂]	[✂]
	Movies	[✂]	[✂]
Wholesale			
	Sports	[✂]	[✂]
	Movies	[✂]	[✂]

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

Table A2.14 presents estimates of margins over direct costs for sports and movies channels for wholesale and retail activities under the pro-rata allocation approach in 2008.

Table A2.14 Estimates of margins over direct costs for sports and movies channels: pro-rata allocation 2004–08 (%)

	Revenue allocation	
	Approach 1	Approach 2
Retail		
Sports	[✂]	[✂]
Movies	[✂]	[✂]
Wholesale		
Sports	[✂]	
Movies	[✂]	

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

An alternative revenue allocation approach (based on incremental prices) at the wholesale level is discussed in section 5.4. Table A2.15 shows the results of revenue allocation under this approach.

Table A2.15 Revenue allocated to sports and movies channels under an alternative allocation approach: wholesale, 2008 (£m)

	Allocation to movies based on incremental prices	Allocation to sports based on incremental prices
Sports		
Wholesale subscription	[✂]	[✂]
Internal revenue(including commercial)	[✂]	[✂]
Advertising revenue	[✂]	[✂]
Total	[✂]	[✂]
Movies		
Wholesale subscription	[✂]	[✂]
Internal revenue(including commercial)	[✂]	[✂]
Advertising revenue	[✂]	[✂]
Total	[✂]	[✂]
Total	[✂]	[✂]

Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom) and Oxera's analysis.

A3 Benchmarking analysis

A3.1 Selection of comparators

As presented in section 6, the selection of broad samples of comparators builds on an iterative process whereby a qualitative criterion is employed to exclude companies that are considered inappropriate for the final sample.

A similar process has been carried out for TV and non-TV companies. The selection process for TV companies is presented below.

Table A3.1 Sequential process for selecting comparators from TV markets

Country/company	Initial sample	Publicly funded (non-profit) PSBs	Main activity not in broadcasting	Lack of data on relevant activities
UK				
Virgin Media	Virgin Media	Virgin Media	Virgin Media	Virgin Media
Setanta	Setanta	Setanta	Setanta	
Top Up TV	Top Up TV	Top Up TV	Top Up TV	
ITV	ITV	ITV	ITV	ITV
Tiscali	Tiscali	Tiscali		
BBC	BBC			
BT Vision	BT Vision	BT Vision		
Channel 4	Channel 4			
Five	Five	Five	Five	Five
Sweden				
SVT	SVT			
4	4	4	4	
MTG	MTG	MTG	MTG	MTG
SBS	SBS	SBS	SBS	
TeliaSonera	TeliaSonera	TeliaSonera		
Canal Digital	Canal Digital	Canal Digital		
ComHem	ComHem	ComHem	ComHem	ComHem
Sollentuna TV	Sollentuna TV	Sollentuna TV	Sollentuna TV	
Fast TV	Fast TV	Fast TV	Fast TV	
Bredbandsbolaget	Bredbandsbolaget	Bredbandsbolaget		
Spain				
RTVE	RTVE			
Telecinco	Telecinco	Telecinco	Telecinco	Telecinco
Antena 3	Antena 3	Antena 3	Antena 3	Antena 3
Sogecable	Sogecable	Sogecable	Sogecable	Sogecable
laSexta	laSexta	laSexta	laSexta	
Ono	Ono	Ono	Ono	Ono
Telefónica	Telefónica	Telefónica		
Italy				
Sky Italia	Sky Italia	Sky Italia	Sky Italia	
FastWeb	FastWeb	FastWeb		
RAI	RAI			
Mediaset	Mediaset	Mediaset	Mediaset	Mediaset
TIM	TIM	TIM	TIM	TIM

Country/company	Initial sample	Publicly funded (non-profit) PSBs	Main activity not in broadcasting	Lack of data on relevant activities
Germany				
Premiere	Premiere	Premiere	Premiere	Premiere
Kable Deutschland	Kable Deutschland	Kable Deutschland	Kable Deutschland	Kable Deutschland
Unity Media	Unity Media	Unity Media	Unity Media	Unity Media
ARD	ARD			
ZDF	ZDF			
RTL	RTL	RTL	RTL	RTL
ProSieben SAT1	ProSieben SAT1	ProSieben SAT1	ProSieben SAT1	ProSieben SAT1
TOnline	TOnline	TOnline		
THome	THome	THome		
Arcor	Arcor	Arcor		
Alice	Alice	Alice		
France				
CanalPlus	CanalPlus	CanalPlus	CanalPlus	CanalPlus
Noos Numericable	Noos Numericable	Noos Numericable	Noos Numericable	
Orange	Orange	Orange		
Freebox	Freebox	Freebox		
Neuf TV	Neuf TV	Neuf TV		
Alice TV	Alice TV	Alice TV		
France Television	France Television			
TF1	TF1	TF1	TF1	TF1
M6	M6	M6	M6	M6
USA				
Disney	Disney	Disney		
News Corp	News Corp	News Corp	News Corp	
NBC	NBC	NBC	NBC	
Time Warner Cable	Time Warner Cable	Time Warner Cable	Time Warner Cable	Time Warner Cable
Viacom	Viacom	Viacom	Viacom	Viacom
Comcast	Comcast	Comcast		
Echostar	Echostar	Echostar		
AT&T	AT&T	AT&T		
ESPN	ESPN	ESPN	ESPN	
Discovery	Discovery	Discovery	Discovery	Discovery
Starz Entertainment	Starz Entertainment	Starz Entertainment	Starz Entertainment	Starz Entertainment
Belgium				
Canal Plus	Canal Plus	Canal Plus	Canal Plus	
Belgacom	Belgacom	Belgacom		
Telenet	Telenet	Telenet		
VOO	VOO	VOO	VOO	
Kinopolis	Kinopolis	Kinopolis	Kinopolis	
RTBF	RTBF			
Een	Een			
VTM	VTM	VTM	VTM	
RTL	RTL	RTL	RTL	
Netherlands				
Zigo	Zigo	Zigo	Zigo	
UPC	UPC	UPC	UPC	
SBS Broadcasting	SBS Broadcasting			
RTL Nederland	RTL Nederland	RTL Nederland	RTL Nederland	
Canal Digitaal	Canal Digitaal	Canal Digitaal	Canal Digitaal	
Liberty Global	Liberty Global	Liberty Global	Liberty Global	
Mine IPTV	Mine IPTV	Mine IPTV		
Versatel	Versatel	Versatel		

Country/company	Initial sample	Publicly funded (non-profit) PSBs	Main activity not in broadcasting	Lack of data on relevant activities
Austria				
UPC Telekabel	UPC Telekabel	UPC Telekabel	UPC Telekabel	
Aon Digital	Aon Digital	Aon Digital		
Premiere	Premiere	Premiere	Premiere	
ORF	ORF			
Puls TV	Puls TV	Puls TV	Puls TV	
Canada				
Direct TV	Direct TV	Direct TV	Direct TV	Direct TV
Dish Network	Dish Network	Dish Network	Dish Network	Dish Network
Bell Canada	Bell Canada	Bell Canada		
Canwest (GTV)	Canwest (GTV)	Canwest (GTV)	Canwest (GTV)	Canwest (GTV)
Star Choice	Star Choice	Star Choice	Star Choice	
TSN	TSN	TSN	TSN	
CBC	CBC			
SCN	SCN			
TFO	TFO			
TVO	TVO			
TFN	TFN			
Finland				
YLE	YLE			
MTV3	MTV3	MTV3	MTV3	
Nelonen	Nelonen	Nelonen		
Canal+	Canal+	Canal+	Canal+	
Digita	Digita	Digita		
Maxisat	Maxisat	Maxisat	Maxisat	
TeliaSonera	TeliaSonera	TeliaSonera		
Elisa	Elisa	Elisa		
DNA	DNA	DNA		
Swelcom Oy	Swelcom Oy	Swelcom Oy	Swelcom Oy	
Singapore				
SingTel	SingTel	SingTel		
StarHub TV	StarHub TV	StarHub TV		
MediaCorp TV Singapore	MediaCorp TV Singapore			
TVMobile	TVMobile	TVMobile	TVMobile	
ESPN Star Sports	ESPN Star Sports	ESPN Star Sports	ESPN Star Sports	
Australia				
ABC	ABC			
WIN Corp	WIN Corp	WIN Corp	WIN Corp	
SBS Television	SBS Television			
Austar	Austar	Austar	Austar	
Optus	Optus	Optus		
Foxtel	Foxtel	Foxtel	Foxtel	
Sky Australia	Sky Australia	Sky Australia	Sky Australia	
New Zealand				
Sky New Zealand	Sky New Zealand	Sky New Zealand	Sky New Zealand	
TVNZ	TVNZ			
Prime Television	Prime Television	Prime Television	Prime Television	
Telstra Clear	Telstra Clear	Telstra Clear		
Malaysia				
Astro Malaysia	Astro Malaysia	Astro Malaysia	Astro Malaysia	Astro Malaysia
Star TV	Star TV	Star TV	Star TV	
TV3	TV3	TV3	TV3	
Radio Televisyen Malaysia	Radio Televisyen Malaysia			

Country/company	Initial sample	Publicly funded (non-profit) PSBs	Main activity not in broadcasting	Lack of data on relevant activities
Ireland				
RTE	RTE			
Liberty Global	Liberty Global	Liberty Global	Liberty Global	Liberty Global
BSkyB	BSkyB	BSkyB	BSkyB	
TV3	TV3	TV3	TV3	
BBC	BBC	BBC	BBC	
ITV	ITV	ITV	ITV	
South Africa				
SABC	SABC			
Naspers Ltd	Naspers Ltd	Naspers Ltd	Naspers Ltd	Naspers Ltd
Mnet	Mnet	Mnet	Mnet	
e.TV	e.TV	e.TV	e.TV	

Source: Oxera.

A3.1.1 Mapping of media industry

A similar selection process was undertaken for companies from other media and communications. Figures A3.1–A3.3 demonstrate how different business characteristics influencing Sky's risk profile match with other TV and non-TV markets.

Figure A3.1 Mapping of communications sector: media

	Wholesale	Retail
Sky	1. limited content production, rather content packaging 2. reliance on exclusivity of content 3. limited reliance on advertising as revenue source 4. long-term commitments for acquisition of content 5. investments in marketing to encourage demand	1. subscription-based business 2. limited distribution network (third sales channel) 3. majority of network assets leased 4. investments in customer acquisition 5. volume risk transferred to wholesale
International TV companies	1. yes 2. lower reliance on exclusivity of content 3. greater reliance on advertising revenue 4. unclear whether similar/different 5. yes	1. yes (providing retail function is present) 2. yes 3. greater ownership of network assets 4. lower investments in customers 5. unclear whether similar/different
Newspaper groups	1. greater implicit content production 2. lower reliance on exclusivity of content 3. greater reliance on advertising revenue 4. lower commitments 5. yes	1. yes (increasing digital distribution) 2. yes (lower asset intensity as no support functions) 3. n/a 4. lower investments in customers 5. risk differentials less clear due to integration
Book publishers	1. greater implicit content production 2. yes 3. yes (but longer recovery period for content costs) 4. yes 5. yes (marketing of content, not of wholesale provider)	1. retail function absent or limited
Commercial radio	1. greater value-added through packaging 2. lower reliance on exclusive content 3. greater reliance on advertising revenue 4. lower commitments 5. yes	1. retail function absent

Source: Oxera.

Figure A3.2 Mapping of communication sector: entertainment

	Wholesale	Retail
Sky	1. limited content production, rather content packaging 2. reliance on exclusivity of content 3. limited reliance on advertising as revenue source 4. long-term commitments for acquisition of content 5. investments in marketing to encourage demand	1. subscription-based business 2. limited distribution network (third sales channel) 3. majority of network assets leased 4. investments in customer acquisition 5. volume risk transferred to wholesale
Record labels	1. greater implicit content production 2. yes 3. yes (but longer recovery period for content costs) 4. yes 5. yes (marketing of content, not of wholesale provider)	1. largely pay per purchase 2. yes (lower asset intensity as no support functions) 3. n/a 4. lower investments in customers 5. risk differentials less clear due to integration
DVD rentals	1. wholesale function absent	1. largely pay per purchase 2. greater asset intensity (physical distribution network) 3. n/a 4. lower investment in customers 5. volume risk transferred to retail
Cinemas	1. wholesale function absent	1. largely pay per purchase 2. greater asset intensity (physical distribution network) 3. n/a 4. lower investments in customers 5. volume risk shared between retail and wholesale

Source: Oxera.

Figure A3.3 Mapping of communication sector: telecommunications

	Wholesale	Retail
Sky	1. limited content production, rather content packaging 2. reliance on exclusivity of content 3. limited reliance on advertising as revenue source 4. long-term commitments for acquisition of content 5. investments in marketing to encourage demand	1. subscription-based business 2. limited distribution network (third sales channel) 3. majority of network assets leased 4. investments in customer acquisition 5. volume risk transferred to wholesale
Fixed altnets	1. wholesale function absent (owner of the fixed telecoms network)	1. yes 2. yes (lower asset intensity as no support services) 3. yes 4. yes 5. yes
MVNOs	1. wholesale function absent (owner of the fixed mobile network)	1. yes 2. greater asset intensity (physical distribution network) 3. yes 4. yes 5. yes

Source: Oxera.

The following tables show the sequential process of excluding comparators from the media and telecoms sectors.

Table A3.2 Sequential process for selecting comparators from non-TV markets

	Main activities in the relevant sector	Not used in the pay-TV sample	Data availability
Alternative operators (MVNOs, fixed altnets)			
Carphone Warehouse	Carphone Warehouse	Carphone Warehouse	Carphone Warehouse
Virgin Mobile	Virgin Mobile	Virgin Mobile	Virgin Mobile
Tesco Mobile	Tesco Mobile	Tesco Mobile	Tesco Mobile
Easy Mobile	Easy Mobile	Easy Mobile	
Fresh			
Tele 2	Tele 2	Tele 2	Tele 2
Debitel			
Telmore	Telmore	Telmore	
Smartclub	Smartclub	Smartclub	
Vonage	Vonage	Vonage	Vonage
Cybercity			
EDPNet	EDPNet	EDPNet	
Scarlet	Scarlet	Scarlet	
Hansenet			
Versatel			
Talk Talk	Talk Talk	Talk Talk	Talk Talk
ONO			
Perlico			
Smart Telecom	Smart Telecom	Smart Telecom	Smart Telecom
Tiscali	Tiscali	Tiscali	Tiscali
Vertically integrated telecoms operators			
Vodafone	Vodafone	Vodafone	Vodafone
Telenor	Telenor	Telenor	Telenor
TDC	TDC	TDC	TDC
TeliaSonera	TeliaSonera	TeliaSonera	TeliaSonera
France Telecom	France Telecom	France Telecom	France Telecom
Deutsche Telekom	Deutsche Telekom	Deutsche Telekom	Deutsche Telekom
KPN	KPN	KPN	KPN
Telecom Italia	Telecom Italia	Telecom Italia	Telecom Italia
Telefónica	Telefónica	Telefónica	Telefónica
Belgacom	Belgacom	Belgacom	Belgacom
DVD rentals			
Blockbuster Video	Blockbuster Video	Blockbuster Video	Blockbuster Video
World of Video	World of Video	World of Video	
Videomix Syd AB	Videomix Syd AB	Videomix Syd AB	
Video Aktuellbetriebs	Video Aktuellbetriebs	Video Aktuellbetriebs	
Buylando AB	Buylando AB	Buylando AB	

	Main activities in the relevant sector	Not used in the pay-TV sample	Data availability
LOVEFiLM	LOVEFiLM	LOVEFiLM	LOVEFiLM
Greenwood Media Mediatheken	Greenwood Media Mediatheken	Greenwood Media Mediatheken	
Videomix i Boras AB	Videomix i Boras AB	Videomix i Boras AB	
Demotikos AB	Demotikos AB	Demotikos AB	Cineworld Group plc
Monev	Monev	Monev	
Cinema			
Cineworld Group plc	Cineworld Group plc	Cineworld Group plc	
Europalaces	Europalaces	Europalaces	
Vue entertainment	Vue entertainment	Vue entertainment	Vue entertainment
Odeon Cinemas Ltd	Odeon Cinemas Ltd	Odeon Cinemas Ltd	Odeon Cinemas Ltd
Kinepolis Group	Kinepolis Group	Kinepolis Group	Kinepolis Group
UGC CINE CITE	UGC CINE CITE		
Cinesa Compania	Cinesa Compania		
SF BIO AB	SF BIO AB		
Cinemaxx Cinema	Cinemaxx Cinema	Cinemaxx Cinema	Cinemaxx Cinema
Yelmo Cineplex S.L.	Yelmo Cineplex S.L.	Yelmo Cineplex S.L.	
Commercial radio			
GCap	GCap	GCap	GCap
Emap			
Chrysalis	Chrysalis	Chrysalis	Chrysalis
Radio France	Radio France	Radio France	
NRJ Group	NRJ Group	NRJ Group	NRJ Group
Largardere Active			
Axel Springer			
Hubert Burda Media			
Eruppo Editoriale			
Finelco Holding	Finelco Holding	Finelco Holding	
Book publisher			
Pearson plc	Pearson plc	Pearson plc	Pearson plc
Verlagsgruppe			
Hachette Livre	Hachette Livre	Hachette Livre	
Planeta Corporacion			
HM Publishers	HM Publishers Holdings Ltd	HM Publishers Holdings Ltd	
Holtzbrinck Publishers	Holtzbrinck Publishers Holdings Ltd	Holtzbrinck Publishers Holdings Ltd	
Reed Elsevier plc	Reed Elsevier plc	Reed Elsevier plc	Reed Elsevier plc
Verlagsgruppe Weltbild			
Grupo Santillana	Grupo Santillana De Ediciones SL	Grupo Santillana De Ediciones SL	
Macmillan Publishers	Macmillan Publishers Ltd	Macmillan Publishers Ltd	

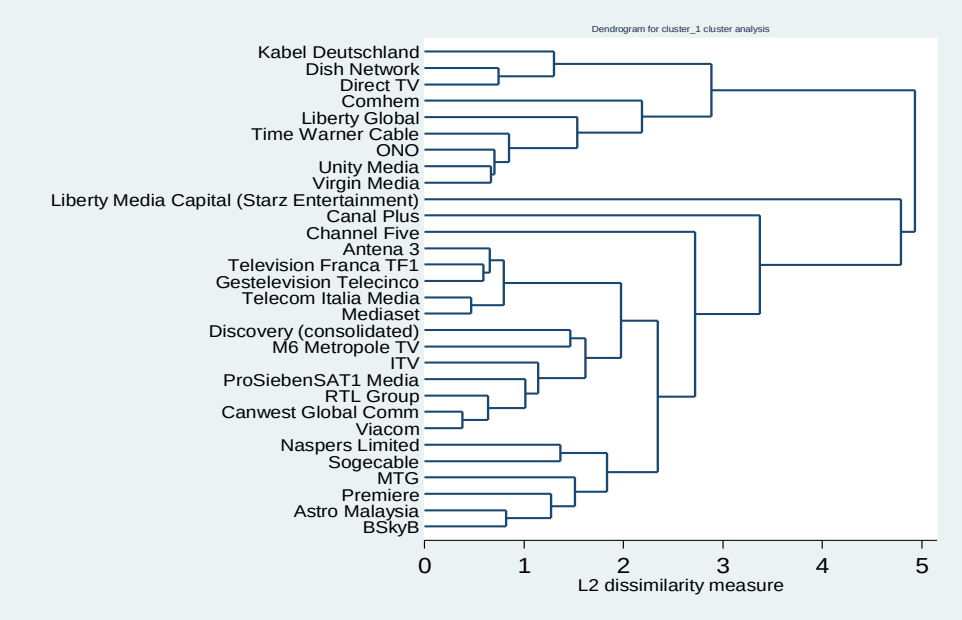
	Main activities in the relevant sector	Not used in the pay-TV sample	Data availability
Record companies			
Hama Hamaphot			
Universal Music	Universal Music	Universal Music	
Bavaria Media GMBH			
Sportive GMBH & CO.KG			
Constantin Film AG			
EMI Records Ltd			
Sony BMG Music	Sony BMG Music	Sony BMG Music	Sony BMG Music
EMI Music	EMI Music	EMI Music	EMI Music
The Walt Disney Company			
Gesellschaft zur verwertung von leistungsschutzr echten MBH (GVL)			
Warner Music	Warner Music	Warner Music	Warner Music
Newspaper publishing			
Daily Mail and General Trust plc	Daily Mail and General Trust plc	Daily Mail and General Trust plc	Daily Mail and General Trust plc
Axel Springer Aktiengesellschaft	Axel Springer Aktiengesellschaft	Axel Springer Aktiengesellschaft	Axel Springer Aktiengesellschaft
Newscorp Investments			
Mecom Group plc	Mecom Group plc	Mecom Group plc	Mecom Group plc
Trinity Mirror plc	Trinity Mirror plc	Trinity Mirror plc	Trinity Mirror plc
Associated Newspapers Ltd			
United Business Media	United Business Media	United Business Media	United Business Media
Newsgroup Newspapers Ltd	Newsgroup Newspapers Ltd	Newsgroup Newspapers Ltd	
Johnston press plc			
Johnston Publishing Ltd	Johnston Publishing Ltd	Johnston Publishing Ltd	Johnston Publishing Ltd

Source: Bloomberg, companies' accounts, AMADEUS database, Oxera based on annual reports.

A3.2 Results of clustering analysis

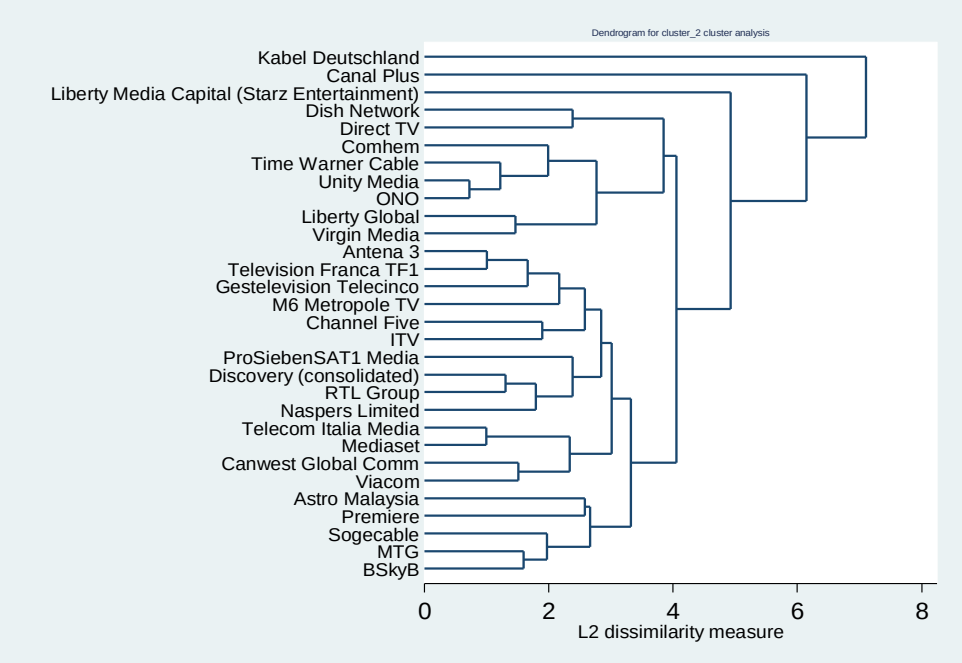
The resulting dendrograms for different scenarios are presented below.

Figure A3.4 Aggregate benchmarking, TV companies (Group 1)



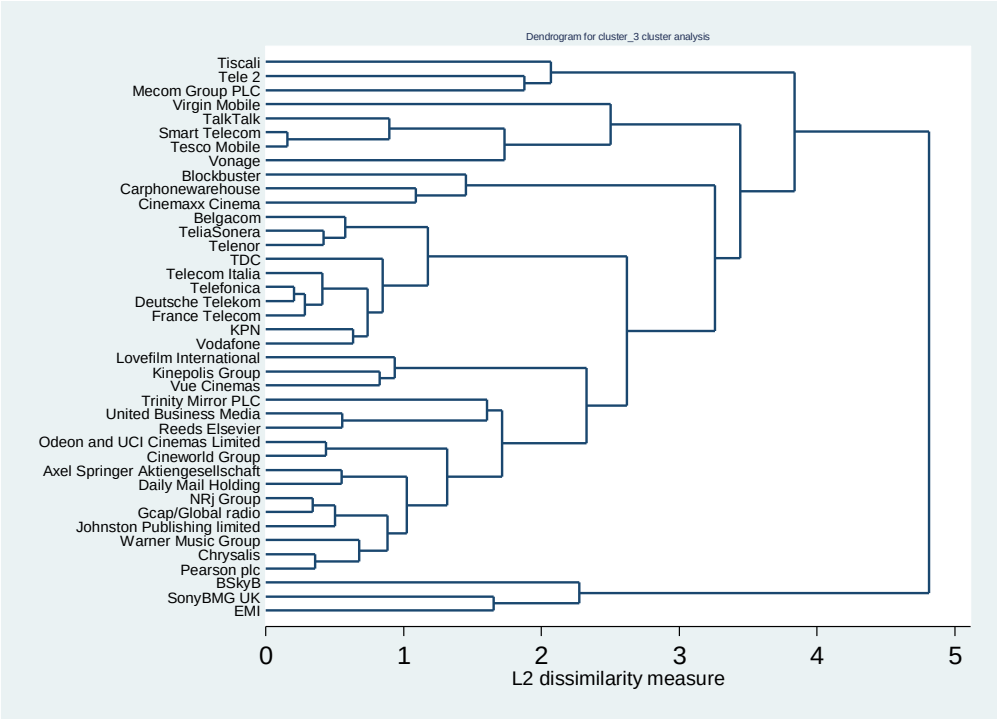
Note: Metrics: subscription revenue as proportion of total revenue; total revenue volatility; ratio of OPEX to total assets; ratio of content cost to OPEX; ratio of depreciation to OPEX).
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

Figure A3.5 Aggregate benchmarking, TV companies (Group 2)



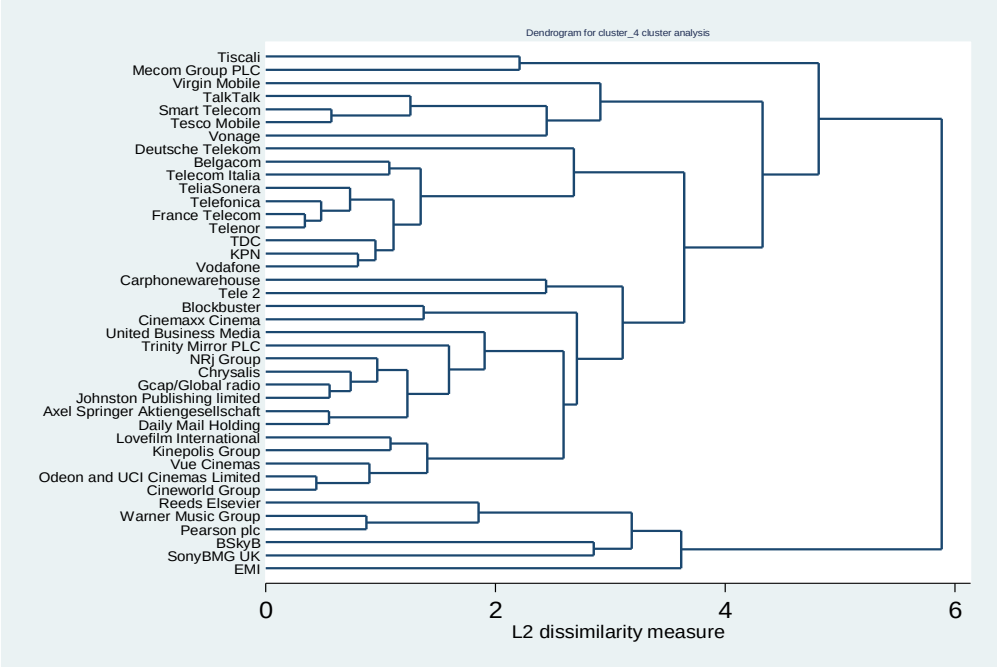
Note: Metrics: subscription revenue as proportion of total revenue; revenue volatility; ratio of OPEX to total assets; ratio of content cost to OPEX; ratio of depreciation to OPEX; exclusivity of content (0 or 1); ratio of marketing costs to OPEX; cost volatility; ratio of current liabilities to total assets).
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

Figure A3.6 Aggregate benchmarking, non-TV companies (Group 3)



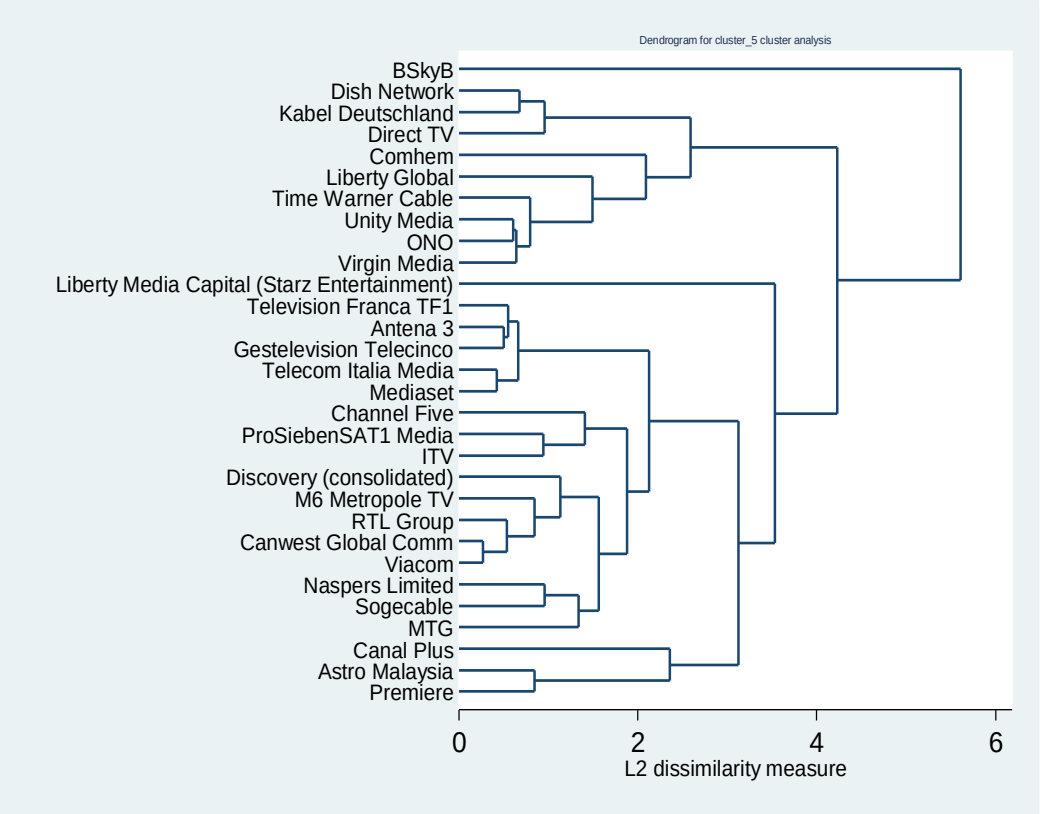
Note: Metrics: subscription revenue as proportion of total revenue; total revenue volatility; ratio of OPEX to total assets; ratio of content cost to OPEX; ratio of depreciation to OPEX).
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

Figure A3.7 Aggregate benchmarking, non-TV companies (Group 4)



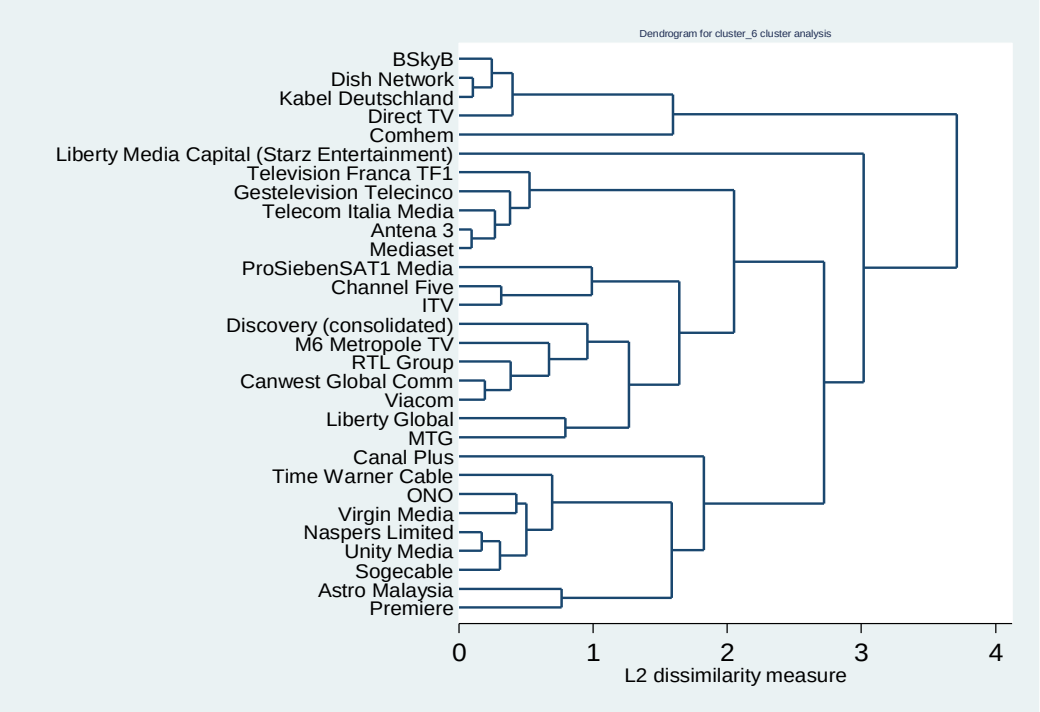
Note: Metrics: subscription revenue as proportion of total revenue; total revenue volatility; ratio of OPEX to total assets; ratio of content cost to OPEX; ratio of depreciation to OPEX; exclusivity of content (0 or 1); ratio of marketing costs to OPEX; cost volatility; ratio of current liabilities to total assets)
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

Figure A3.8 Retail benchmarking, TV companies (Group 5)



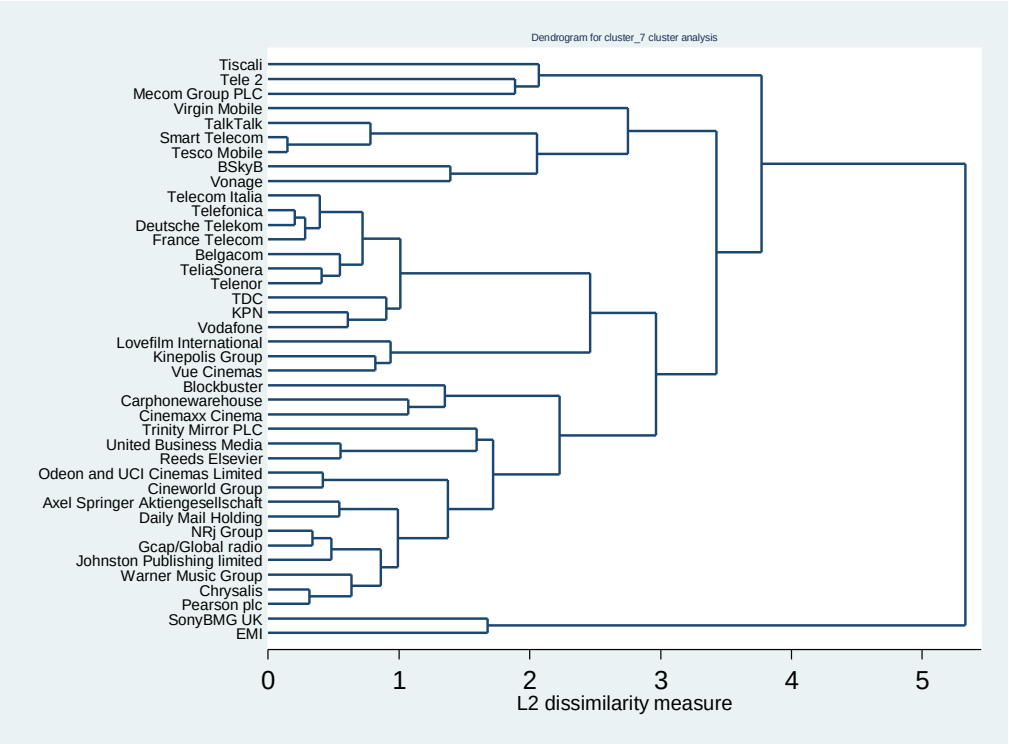
Note: Metrics: subscription revenue as proportion of total revenue; total revenue volatility; ratio of OPEX to total assets; ratio of content cost to OPEX; ratio of depreciation to OPEX.
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

Figure A3.9 Retail benchmarking, TV companies (Group 6)



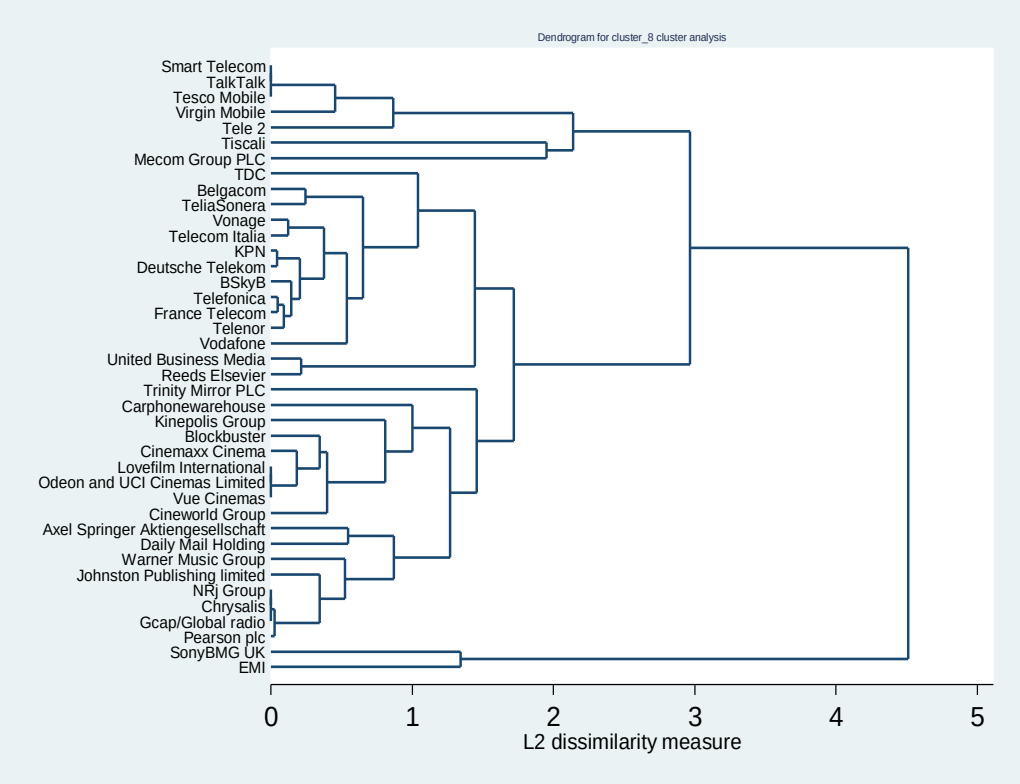
Note: Metrics: total revenue volatility; ratio of OPEX to total assets; ratio of depreciation to OPEX.
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

Figure A3.10 Retail benchmarking, non-TV companies (Group 7)



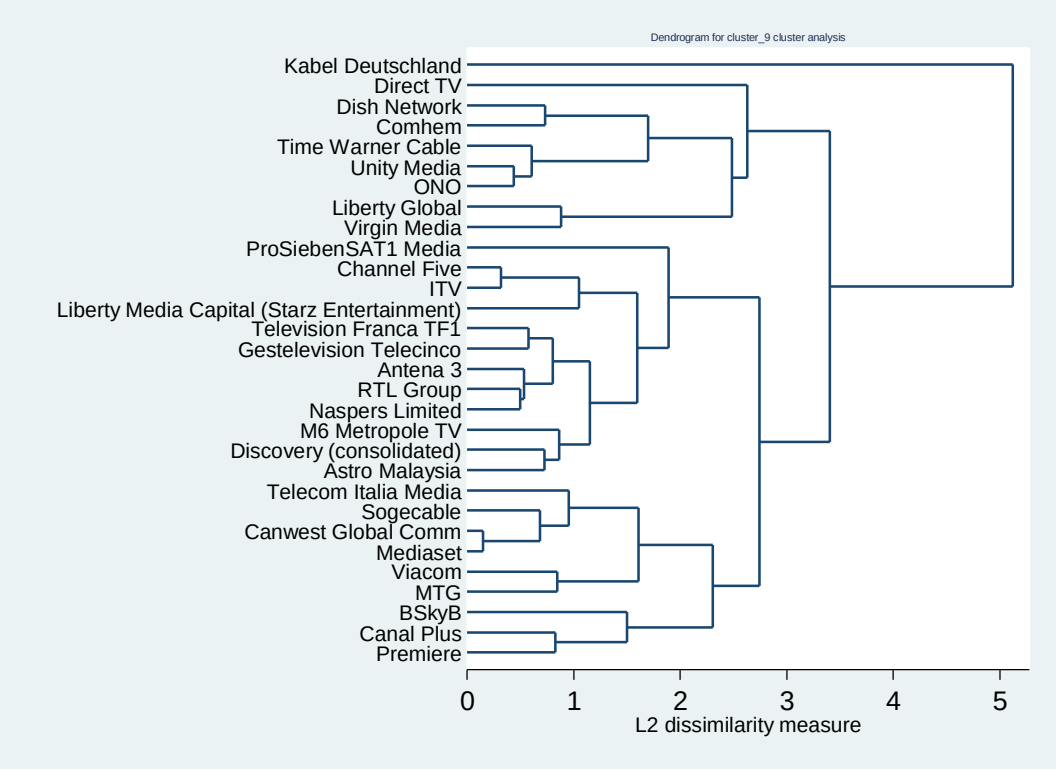
Note: Metrics: subscription revenue as proportion of total revenue; total revenue volatility; ratio of OPEX to total assets; ratio of content cost to OPEX; ratio of depreciation to OPEX).
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

Figure A3.11 Retail benchmarking, non-TV companies (Group 8)



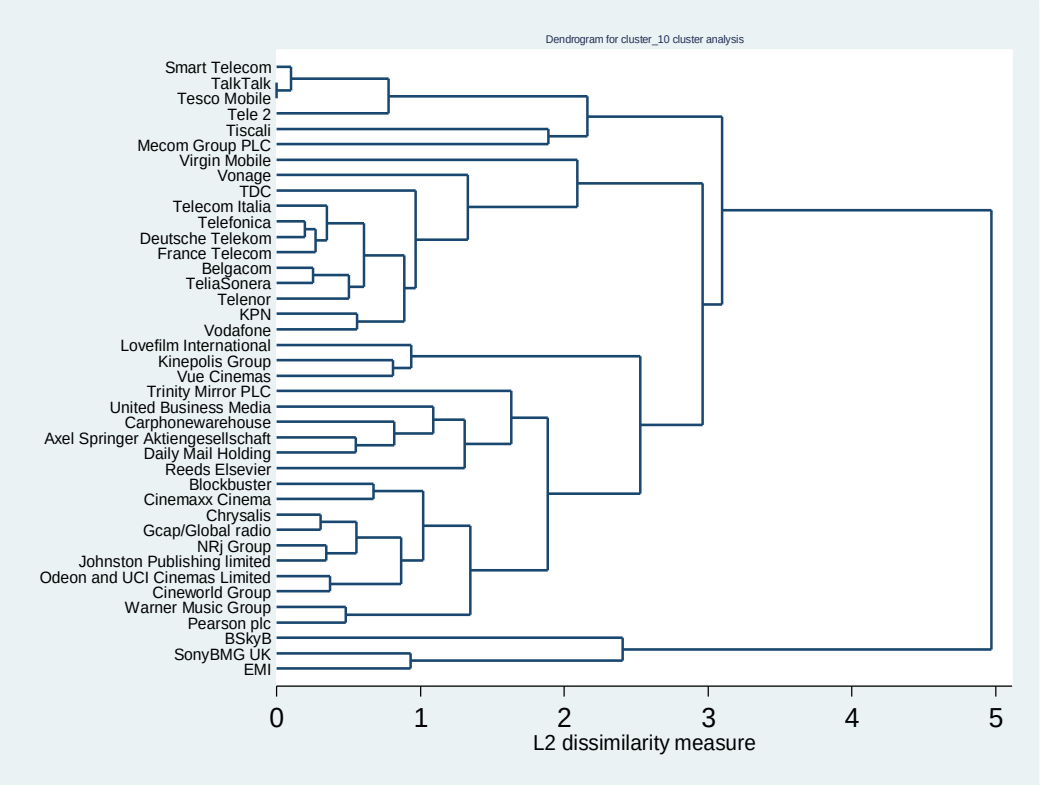
Note: Metrics: Total revenue volatility; ratio of OPEX to total assets; ratio of depreciation to OPEX.
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

Figure A3.12 Wholesale benchmarking, TV companies (Group 9)



Note: Metrics: Ratio of programming costs to OPEX; ratio of depreciation to OPEX; ratio of marketing costs to OPEX; exclusivity of content.
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

Figure A3.13 Wholesale benchmarking, non-TV companies (Group 10)



Note: Metrics: Subscription revenue as a proportion of total revenue; total revenue volatility; ratio of programming cost to OPEX; ratio of depreciation to OPEX.
Source: Sky's annual reports, Sky's responses to Ofcom's questionnaires (including where relevant additional specific data from Ofcom), Bloomberg, companies' accounts, Oxera calculations.

A3.3 Accounting profitability and valuation ratios of comparator companies

Tables A3.3 and A3.3 present ROCE, ROS, and the ratios of enterprise value over total assets and OPEX plus CAPEX for TV companies and non-TV companies, respectively.

Table A3.3 Accounting profitability and valuation ratios for TV comparators

TV companies	ROCE	ROS	EV/Total assets	EV/(OPEX+CAPEX)
Antena 3	25.6	27.4	3.2	4.7
Astro Malaysia	8.8	13.4	2.9	5.2
Cableuropa SA (ONO)	1.5	6.0	n/a	n/a
Canal Plus	6.9	3.6	0.8	0.5
Canwest Global Comm	8.3	17.2	0.9	2.2
Channel Five	–0.6	–1.3	n/a	n/a
Com Hem	2.6	14.1	n/a	n/a
Direct TV	6.6	6.3	1.6	1.9
Discovery	–0.1	–0.8	0.9	6.6
Dish Network	13.0	12.5	2.3	2.3
Gestevision Telecinco	39.8	39.8	4.8	7.7
ITV	4.6	11.7	0.8	2.3
Kabel Deutschland	7.0	11.4	n/a	n/a
Liberty Global	1.8	7.1	1.0	3.4
Liberty Media (Starz Entertainment)	–1.3	–33.2	0.9	16.1
M6 - Metropole TV	16.0	18.3	2.1	2.8
Mediaset	18.6	29.4	1.9	4.2
MTG	10.9	10.8	2.3	1.8
Naspers Limited	12.9	17.6	1.4	2.3
Premiere	–3.0	–4.8	1.0	1.3
Prosiebensat.1 media	15.0	16.8	1.9	2.5
RTL Group	7.0	11.2	1.3	2.2
Sogecable	1.1	0.3	2.1	3.3
Telecom Italia Media	–9.6	–46.8	1.4	2.9
Television Franca 1	9.8	12.1	1.6	2.2
Time Warner Cable	4.4	19.4	0.7	2.6
Unity Media GmbH	–1.5	-6.2	n/a	n/a
Viacom	11.8	25.3	1.7	4.1
Virgin Media	0.1	1.0	0.9	2.8

Source: Bloomberg, companies' accounts, Datastream and Oxera calculation.

Table A3.4 Accounting profitability and valuation ratios of non-TV companies

Non-TV companies	ROCE	ROS	EV/Total assets	EV/(OPEX+CAPEX)
Axel Springer	10.8	12.4	1.2	1.5
Belgacom	21.0	23.3	1.8	2.4
Blockbuster	3.1	2.4	0.6	0.4
Carphone Warehouse	5.7	3.4	1.3	0.8
Cinemaxx Cinema GmbH	–2.5	–0.3	0.7	0.5
Cineworld Group	6.3	8.7	0.8	1.1
Deutsche Telekom	5.3	11.0	0.9	1.8
EMI	10.9	9.2	1.7	1.6
France Telecom	9.5	19.6	1.0	2.2
Johnston Publishing Limited	12.1	33.0	1.1	4.1
Kinepolis Group	6.2	10.8	1.0	1.7
KPN	10.6	20.6	1.2	2.4
LOVEFiLM Ltd	–17.6	–22.4	n/a	n/a
Mecom Group Plc	–40.9	–280.9	0.4	3.9
Odeon and UCI Cinemas Ltd	2.5	0.6	0.3	0.4
Pearson plc	5.2	9.3	1.0	1.9
Reeds Elsevier	9.1	19.4	0.9	2.4
Smart Telecom	–31.9	–49.0	1.9	1.9
Sony BMG UK Entertainment	3.2	7.6	n/a	n/a
Talk Talk	6.3	2.1	n/a	n/a
TDC	6.6	13.4	1.0	2.1
Tele2	5.1	6.2	1.0	1.2
Telecom Italia	8.1	22.7	0.9	3.0
Telefónica	10.7	20.5	1.4	2.9
Telenor	10.5	17.3	1.4	1.9
TeliaSonera	8.7	19.7	1.2	3.0
Tesco Mobile	–0.6	–0.8	n/a	n/a
Tiscali	–6.2	–12.2	1.3	2.0
Trinity Mirror Plc	9.9	20.3	0.9	2.1
United Business Media	7.1	13.9	1.2	2.8
Virgin Mobile	77.5	16.7	9.6	1.8
Vonage	–53.3	–68.9	1.1	0.6
Vodafone	3.8	15.3	0.7	3.2
Vue Cinema UK Ltd	0.7	2.1	n/a	n/a
Warner Music Group	5.3	7.0	1.0	1.4

Source: Bloomberg, companies' accounts, Datastream and Oxera calculation.

A3.4 Values of metrics for TV and non-TV companies

Tables A3.5 and A3.6 show the values employed in the clustering analysis for the TV companies and not-TV companies, respectively.

Table A3.5 Values of metrics for TV comparators (%)

	Revenue volatility	Depreciation/ OPEX	Cost volatility	Marketing costs/OPEX	Exclusive rights (0,1)	Current liabilities/ total assets	OPEX/total assets	Programming costs/OPEX	Subscription revenue/ total revenue
BSkyB	12	3.7	19	18	1	46	104	41	76
Premiere	13	1.7	20	5	1	17	59	54	79
MTG	30	0.6	21	11	1	42	90	43	39
Viacom	44	3.7	46	16	1	23	46	37	10
Astro Malaysia	7	4.1	28	11	0	29	65	41	83
Canal Plus	43	0.7	47	1	1	76	164	66	91
Mediaset	82	2.5	38	7	1	35	46	35	3
Sogecable	39	9.0	60	7	1	49	70	35	63
Virgin Media	33	22.8	34	3	1	13	39	35	77
ONO	43	25.9	47	4	0	19	23	31	73
Time Warner Cable	43	20.5	47	4	0	4	23	27	87
Starz Entertainment	105	2.0	68	1	0	8	5	55	100
Liberty Global	13	26.3	13	7	1	12	25	35	44
Canwest Global Comm	41	3.8	14	7	1	11	35	35	11
Unity Media	43	23.1	47	5	0	19	36	35	56
Comhem	43	19.8	47	5	0	6	18	0	55
Direct TV	16	8.6	21	2	1	23	98	0	100
Naspers Limited	43	4.5	47	4	0	16	29	35	49
Kabel Deutschland	5	16.0	27	31	0	30	59	0	100
Dish Network	6	14.0	9	3	0	42	94	0	96
ITV	43	1.9	47	7	0	35	58	58	0
ProSiebenSAT1 Media	60	1.6	44	16	0	16	39	49	14
RTL Group	43	1.3	47	4	0	1	54	41	0
M6 Metropole TV	43	1.0	47	12	0	48	71	27	0

	Revenue volatility	Depreciation/ OPEX	Cost volatility	Marketing costs/OPEX	Exclusive rights (0,1)	Current liabilities/ total assets	OPEX/total assets	Programming costs/OPEX	Subscription revenue/ total revenue
Gestelevision Telecinco	89	0.3	104	**7**	0	25	57	31	0
Television Franca TF1	78	0.9	68	4	0	44	67	**35**	0
Antena 3	83	2.3	137	1	0	55	76	**35**	0
Channel Five	**43**	0.8	**47**	**7**	0	47	116	63	0
Discovery	19	5.6	117	**7**	0	2	40	**35**	0
Telecom Italia Media	82	5.3	55	2	1	40	54	**35**	12

Note: Averages marked in bold/red.
Source: Bloomberg, companies' accounts, Datastream.

Table A3.6 Values of metrics for non-TV comparators (%)

	Revenue volatility	Depreciation/ OPEX	Cost volatility	Marketing costs/OPEX	Exclusive rights (0,1)	Current liabilities/total assets	OPEX/total assets	Programming costs/OPEX	Subscription revenue/ total revenue
EMI	21	2	20	5	1	1	107	53	0
SonyBMG UK	21	1	20	6	1	71	33	39	0
Pearson plc	21	2	20	5	1	24	50	10	0
Reeds Elsevier	21	4	20	6	1	40	38	12	66
Cineworld Group	21	6	20	6	0	14	67	0	14
Vue Cinemas	21	11	20	6	0	12	64	0	0
Odeon and UCI Cinemas Limited	21	7	20	6	0	15	82	0	0
Kinepolis Group	13	13	20	6	0	22	51	0	0
Cinemaxx Cinema	19	3	20	6	0	38	128	0	0
Blockbuster	23	0	20	6	0	47	204	0	0
LOVEFiLM International	21	16	20	6	0	35	62	0	0
Warner Music Group	26	1	21	5	1	41	68	10	0
Daily Mail Holding	21	3	20	9	0	31	68	10	29
Axel Springer Aktiengesellschaft	15	3	18	9	0	31	68	10	29
Mecom Group plc	48	3	20	6	0	17	38	10	32
Trinity Mirror plc	7	5	20	6	0	13	39	10	37
United Business Media	20	2	20	6	0	46	50	10	70
Johnston Publishing limited	21	6	20	6	0	6	23	10	14
Gcap/Global radio	21	4	20	6	0	9	38	10	0
Chrysalis	21	2	20	4	0	17	27	10	0
NRj Group	21	6	20	6	0	32	42	10	0
Vodafone	10	16	20	4	0	17	22	0	74
Telenor	10	11	10	12	0	24	48	0	86
TeliaSonera	6	12	16	9	0	14	36	0	90
France Telecom	10	12	17	10	0	28	41	0	90
Deutsche Telekom	10	13	17	29	0	19	47	0	95

	Revenue volatility	Depreciation/ OPEX	Cost volatility	Marketing costs/OPEX	Exclusive rights (0,1)	Current liabilities/total assets	OPEX/total assets	Programming costs/OPEX	Subscription revenue/ total revenue
KPN	10	16	16	10	0	28	41	0	96
Telecom Italia	13	13	27	2	0	22	30	0	93
Telefónica	10	14	19	10	0	**24**	45	0	**90**
Belgacom	4	12	12	3	0	25	64	0	94
TDC	19	15	18	10	0	23	42	0	90
Tele 2	36	7	52	24	0	31	85	0	59
Vonage	14	**8**	54	38	0	97	236	0	97
Tiscali	56	6	62	10	0	38	59	0	93
Carphone Warehouse	16	2	**56**	24	0	43	144	0	40
Virgin Mobile	**30**	18	**56**	24	0	71	167	0	95
Tesco Mobile	**30**	**8**	**56**	24	0	**111**	218	0	**77**
Talk Talk	**30**	**8**	**56**	24	0	**81**	282	0	**77**
Smart Telecom	30	9	56	24	0	97	226	0	**77**
BSkyB	12	4	19	18	1	46	104	41	76

Note: Averages marked in bold/red.
Source: Bloomberg, companies' accounts, Datastream.

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