Conceptual framework for the assessment of eircom's bundles

Adjustments to the net revenue test

Updated report prepared for
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to inform Decision

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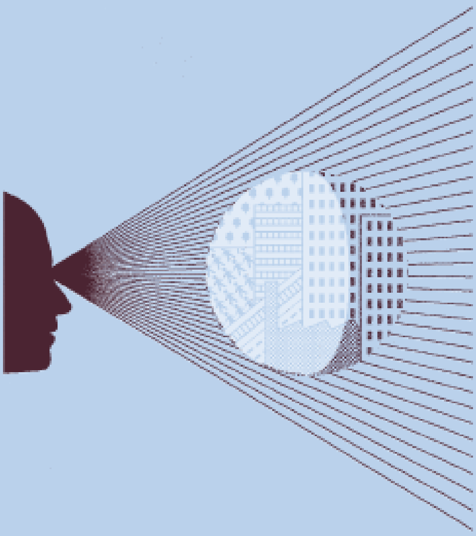

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1 Introduction

In January 2010 the Commission for Communications Regulation (ComReg) launched a consultation on the application of the net revenue test in the context of bundled products.[1] Following the responses received on the consultation documents, ComReg asked Oxera to assess whether, and how, the net revenue test currently applied could be modified to reflect the ongoing developments in product offerings and competition. Oxera's report for ComReg was taken into account in ComReg's subsequent consultations 11/72 and 12/63 (the latter being a supplementary consultation).[2] In this process, Oxera has advised ComReg by reviewing, and providing comments on, ComReg's draft consultation documents.

Separately, Oxera has advised ComReg on the pricing principles for next generation access (NGA) products, and carried out further detailed analysis on the pricing constraints arising from UPC's cable platforms.[3] Further, ComReg has clarified the regulation of wholesale broadband access (WBA, bitstream), and price floors applied on bitstream pricing, in particular.[4]

Building on the recent developments and the work conducted by ComReg and Oxera, this report is an updated version of Oxera's September 2011 report aiming to assist ComReg in the context of the application of the net revenue test for bundled products, given the regulator's objectives, and the prevailing regulatory framework and measures introduced in related markets.

1.1 Background and motivation

Oxera has previously developed an analytical framework to assess whether eircom's bundling of additional products with its line rental services could be considered 'unreasonable' as defined by ComReg's prevailing retail (narrowband) regulation,[5] although the economic rationale for the application of the net revenue test holds regardless of whether eircom has significant market power (SMP) in the retail access market, as long as it holds SMP in one or more of the wholesale input markets. Subsequently, Oxera has assessed the compliance of eircom's bundles in light of evidence provided by eircom on the actual experience of consumers' take-up and use of the bundles. These bundles have included broadband (with different speed options), and calls (with different offers for calls to fixed and calls to mobile, for example).

Since the initial framework was developed, the market has been undergoing developments that may warrant adjustments to the test over the next three years, notably the following.

– The significance of bundled offers has continued to increase—indeed, bundles of broadband and phone services have been central to all operators' product offering, and

[1] ComReg (2010), 'Consultation and Draft Direction: Further Specification of the Obligation not to Unreasonably Bundle Pursuant to D07/61', January 6th.
[2] ComReg (2011), 'Review of the appropriate price controls in the markets of Retail Fixed Narrowband Access, Wholesale Physical Network Infrastructure Access and Wholesale Broadband Access: Further specification of certain price control obligations in the markets of Retail Fixed Narrowband Access and Wholesale Physical Network Infrastructure Access', October 10th; ComReg (2012), 'Supplementary Consultation to ComReg 11/72 – Price regulation of bundled offers', June 15th.
[3] Oxera (2012), 'eircom's next generation access product – Pricing principles and methodologies', Report prepared for Commission for Communications Regulation, April.
[4] ComReg (2012), 'Wholesale Broadband Access: Further specification to the price control obligation and an amendment to the transparency obligation', document 12/32, April 5th.
[5] ComReg (2007), 'Market analysis: retail fixed narrowband access markets. Response to Consultation 06/39 and Consultation on Draft Decision', Document No. 07/26, May 4th.

bundles including TV (and other adjacent services) are becoming increasingly widespread.

– The expansion of UPC's cable footprint implies that eircom may face increasing competitive pressure at the retail level where UPC is present and hence bi-directional cable has been deployed. Indeed, as early as September 2011, 99% of UPC's broadband customers were upgraded to speeds of 20mbps or more, and the cable operator currently offers broadband at a minimum of 50 Mbps (download) and maximum of 100 Mbps—these speeds are faster than those offered by eircom in most areas within UPC's footprint.

– Other alternative operators (OAOs) have been migrating to local loop unbundling (LLU) at an increasing pace. While the LLU penetration is still relatively limited, there have been developments in selected urban areas, such as Sky's announcement to migrate its services to BT's wholesale platform (BT in turn unbundles eircom's copper loops).[6] However, where UPC has network footprint, all operators using DSL face increasing competitive pressure.

– eircom could provide voice services over 'Naked DSL', effectively offering equivalent bundles without relying on narrowband access. At present, the regulation of bundles stems from the obligations imposed on eircom in the market of narrowband access (Market 1).

– eircom has deployed next generation broadband (NGB) core network elements, and is in the process of introducing NGA solutions, as manifested first through FTTC and FTTH (fibre to the cabinet and fibre to the home, respectively) pilot projects in selected areas and more recently through a roll-out plan, whereby around 60% of Irish households will be provided with access to an NGA-level broadband. This network upgrade is likely to have implications for both the composition of bundles (eg, potential inclusion of IPTV) and the competitive dynamics between eircom and UPC.[7]

This (updated) report seeks to provide ComReg with an analytical framework to assess the reasonableness of eircom's bundles, taking into account the above developments. Given the ongoing technological progress, the following sections also touch on how the principle of technological neutrality could be accounted for in the application of the net revenue test. Furthermore, having regard to the regulator's concrete proposals published since the September 2011 report, this report provides ComReg with advice on potential approaches to the various aspects of the net revenue test.

1.2 Structure of the report

The structure of the report is as follows.

– Section 2 presents the economic rationale underlying the design of a net revenue (or margin squeeze) test and provides the basis for subsequent discussion of various dimensions of the test. The market developments are also described to inform the assessment.

– Section 3 considers whether, and under what conditions, the test could be undertaken assuming that entrants are 'equally efficient' as eircom, or on the basis of alternative

[6] Sky's announcement is available at: http://www.skyuser.co.uk/skyinfo/customers_to_enjoy_more_choice_and_better_value_as_sky_broadband.html.

[7] These competitive developments—in particular, the extent to which the retail competition may constrain eircom's wholesale pricing—are discussed in detail in Oxera (2013), ''Assessment of retail pricing constraints—Response to submissions on consultation 12/27: 'Next Generation Access ("NGA"): Proposed Remedies for NGA Markets', report prepared for Commission for Communications Regulation, January.

wholesale input costs. In this respect, Oxera has reviewed ComReg's proposed approach for the 'large exchange area' (LEA) considered to exhibit different structural characteristics relative to the rest of Ireland to an extent that adjustments to the net revenue test could be warranted.

– Section 4 discusses the timing of the net revenue test.

– Section 5 looks at the cost standard applied in the definition of an appropriate level of retail costs.

– Section 6 sets out principles on the degree of aggregation of the net revenue test—ie, whether, and to what extent, the test should be conducted for a wider range of services, as opposed to the current product-by-product approach.

– Section 7 examines how the Naked DSL product, and the provision of voice services over broadband, could be treated.

– Drawing on economic considerations and regulatory precedents, section 8 assesses how unregulated services could be treated in the net revenue test.

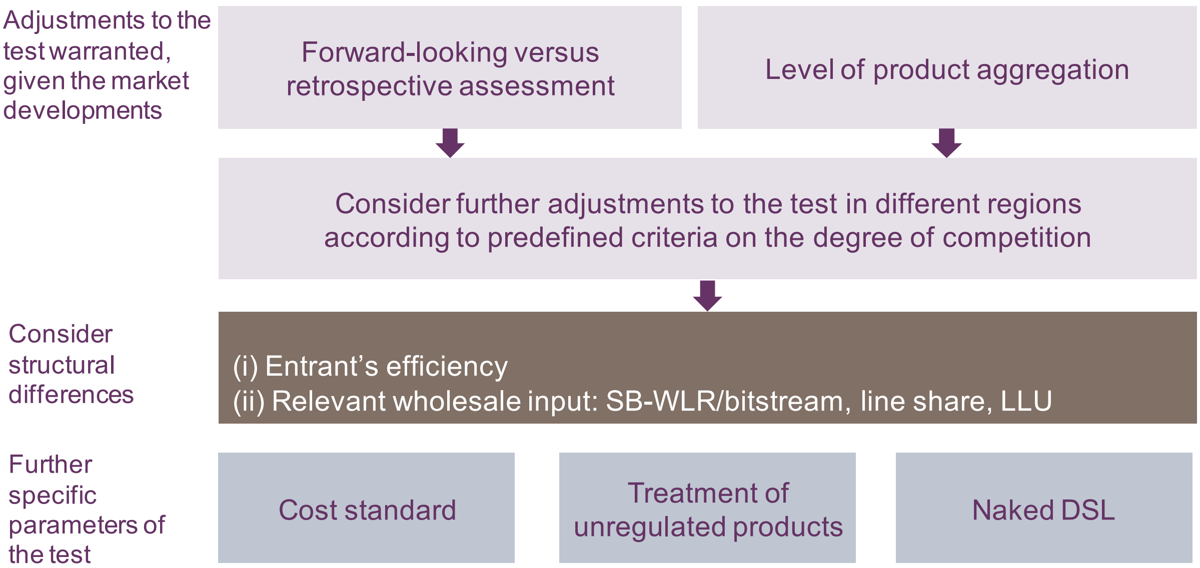
– Section 9 concludes and provides indicative recommendations.

2 Dimensions of the net revenue test

2.1 Principles of designing the net revenue test

The design of a net revenue (or margin squeeze) test involves methodological choices. A range of approaches could be used, which involve making decisions about the dimensions illustrated in Figure 2.1 below. For example, the choice between an ex ante or ex post net revenue test will reflect the regulator's objectives. If the objective is to promote entry, an ex ante setting can be used in which the regulator defines the parameters of the test to reflect the market conditions.

Figure 2.1 Designing a net revenue test



Source: Oxera.

As set out in Oxera's various submissions to ComReg, the objective of ex ante regulation is to promote competition in the regulated markets and, importantly, to ensure that the dominant provider does not leverage its market power (vertically or horizontally) to adjacent, otherwise more competitive, markets. This is the central underpinning behind the obligation not to unreasonably bundle, and therefore underlies the design of the specific parameters of the test.

Furthermore, the design of the test needs to take into account the overall regulatory context and remedies imposed on the markets of stand-alone products. As discussed in further detail below, structural differences appear to be particularly relevant to the bundle offerings; however, price regulation of wholesale products has been uniform across the country, as clarified in ComReg's bitstream price floors document.[8] Similarly, any potential adjustments to remedies may have implications for the provision of universal service and the associated costs.

[8] ComReg (2012), 'Wholesale Broadband Access: Further specification to the price control obligation and an amendment to the transparency obligation', document 12/32, April 5th.

2.1.1 Introducing adjustments to the net revenue test

Any assessment of whether, and under what circumstances, the net revenue test could be adjusted would need to recognise the objectives that are central to ex ante regulation. More specifically, before introducing a test akin to a competition law assessment, care should be exercised for a number of reasons.

– **Retail-minus regulation seeks to promote efficient long-term competition ex ante**. Ex ante regulation should provide entrants with prices that are not subject to uncertainty, and which ensure wholesale prices that are viable for entrants (without putting eircom's cost recovery at risk). This is not to say that ComReg's objective is to promote all forms of entry, even inefficient 'cherry-picking'. Nevertheless, any undue flexibility provided to eircom could force entrants onto a loss-making price trajectory that is not sustainable in the long run. This would not be consistent with the regulatory objective of promoting competition.

– **OAOs differ in their business models**. While the multi-national mobile operators (Vodafone and Telefónica) or UPC may be in a relatively sound position to compete with eircom (at least in certain geographic areas), ComReg's regulatory objectives may not be limited to ensuring sufficient entry conditions for these rivals. Furthermore, while Vodafone and Telefónica could be considered as relatively strong rivals to eircom, they have not yet gained as high market shares as ComReg expected at the time when the current regulatory framework was implemented.

– **eircom continues to have a strong position in the retail markets of telephony and broadband**. The focal products included in bundles—broadband and voice telephony—are not new, emerging products (as was the case in the European Commission's ex post market squeeze investigations). Therefore, a qualitative assessment of market dynamics cannot be carried out without recognising the underlying positions with respect to the sales of established stand-alone products. eircom's position continues to be strong relative to that of other operators that rely on its access network.

– **Entrants may have to undercut the incumbent**. While some of the entrants are currently providing bundles with lower prices than eircom, evidence of entrants undercutting eircom at a certain point in time is not sufficient to conclude that eircom should be allowed to reduce its prices to a level that would be below relevant costs. First, entrants may need to undercut the incumbent's prices by an amount equivalent to the end-customer's perceived cost of switching providers. Second, incumbents tend to have well-established brands in the supply of all the services included in the bundle, which it may not be possible to replicate with short-term marketing expenditure. Third, entrants may need to invest in the short term (by pricing at a loss) in order to gain sufficient market share to achieve the economies of scale that would enable them to operate profitability in the long run.[9]

The assessment of whether the net revenue test could be adjusted requires understanding of the competitive dynamics, as discussed below.

2.2 An overview of the dynamics of competition

This sub-section presents an overview of how competition in bundled telecoms products in Ireland has evolved over recent years. There is currently a range of broadband, telephony and TV products, offered by a number of competing providers, and using a variety of technologies. Box 2.1 below provides an illustrative overview of the current product offerings.

[9] Laffont, J.-J. and Tirole, J. (2000), *Competition in Telecommunications*, The MIT Press, p. 123.

Box 2.1 Illustrative examples of product differentiation and pricing in the bundles offerings

For illustrative purposes, it is helpful to compare some key offerings provided by different operators in the Irish market. There are a large number of fixed broadband products on offer, and the main dimensions along which these services can be differentiated include:

– the Internet connection speed;
– bundling of voice telephony and/or IPTV services; and
– bundling of 'free' inclusive minutes.

The table below summarises some of the broadband offers available in September 2011.

Typical fixed broadband offers

	Type of connection	Maximum headline speeds offered (Mbps)	IPTV offered	Voice telephony included
eircom	ADSL	24	Yes	Yes
UPC	Cable	150	Yes	Yes
imagine	Wi-Max	10	No	Yes
Vodafone	ADSL	24	No	Yes
Magnet	ADSL	100	Yes	Yes

Source: Operator websites as at December 2012.

Furthermore, the table below provides an illustration of the current price differences observed in the most competitive areas of the bundles offerings in Ireland.

Examples of prices of bundles with high-speed broadband

	Bundle name	Bundle includes	Speed	Free calls (Y/N)	Price/month
eircom	Ultimate broadband & home phone bundle	Unlimited off-peak local and national landline calls, 30 off-peak minutes to any Irish mobile operator	Up to 24Mbs	Y	€60.00
UPC	Fibre Power Ultimate	Unlimited download, TV with recording, home phone with 100 free minutes to Irish mobiles, landlines and selected international fixed lines	Up to 100Mbs	Y	€79.00
imagine	The anytime bundles	Unlimited internet usage, free local and national calls, top 30 countries at 3 cents/min calls	Up to 10Mbs	Y	€65.00
Vodafone	Ultimate Broadband + Talk Anytime	Free national anytime calls + 200 minutes to 3 nominated Vodafone numbers	Up to 24Mbs	Y	€59.00
Magnet	Magnet Force Max	Free national anytime calls, 30 minutes of free calls to Irish mobiles	Up to 24 Mbs	Y	€60.99

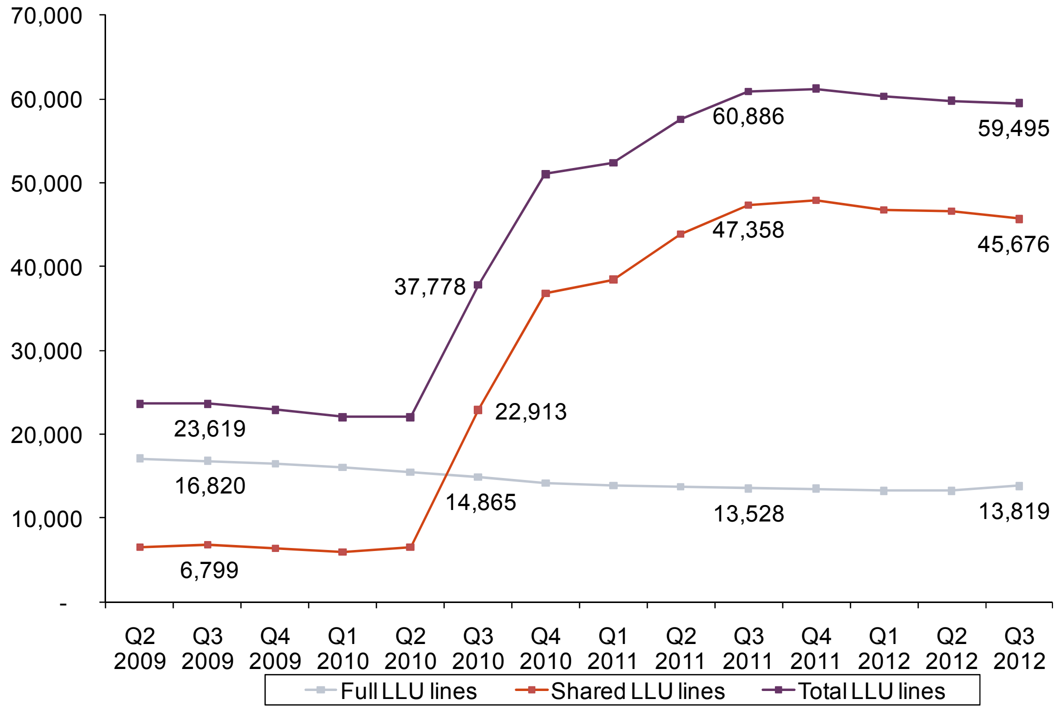
Source: Operator websites as at December 2012.

Data from ComReg's quarterly reports shows that ADSL lines provided by eircom retail remain the most popular form of broadband Internet connection in Ireland. There has been a fall in the number of wholesale bitstream connections, as some OAOs have migrated customers to LLU connections. Nevertheless, eircom's position relative to OAOs using the copper loop (ie, wholesale bitstream and LLU operators) has remained relatively unchanged over the past three years, with the difference in the number of connections remaining relatively constant. eircom's position relative to cable, in particular, has worsened, notably in areas where UPC has footprint. Satellite and fibre remain fairly insignificant in scale, and fixed wireless access is steadily declining.

Data on net additions provides further insight into the dynamics of competition in the areas where UPC is active. As explained in detail in Oxera's report on retail pricing constraints,[10] it is apparent that consumers are responding to UPC's relatively attractive product offering, putting pressure on both eircom and its wholesale customers.

As Figure 2.2 illustrates, the growth in LLU has been driven by sharp growth in the number of line-share connections, starting in the second half of 2010, while the number of full LLU connections has declined slightly over the period.

Figure 2.2 Number of LLU connections ('000)



Source: ComReg Quarterly Reports.

The differences in take-up of each type of connection can partly be explained by the economies of density (business case for unbundling may vary across exchanges). While eircom's broadband products are available virtually everywhere in Ireland, the current use of LLU is much more limited.

eircom's NGA-based products are also predominantly concentrated in the areas where UPC and LLU operators have footprint. It is Oxera's understanding that eircom's NGA will cover a greater number of exchanges than the UPC/LLU footprint, while the number of households covered by NGA, but not by UPC/LLU, is relatively small.

These findings on competitive dynamics and structural differences are taken into account in the following assessment of whether, where and how the net revenue test could be adjusted.

[10] Oxera (2013), 'Assessment of retail pricing constraints - Response to submissions on consultation 12/27: 'Next Generation Access ("NGA"): Proposed Remedies for NGA Markets', report prepared for Commission for Communications Regulation, January.

3 Generic approaches for applying the net revenue test

This section discusses the assumption on an entrant's efficiency that underlies the net revenue test, and the wholesale input on the basis of which the test is undertaken. Crucially, any consideration of relaxing the test with respect to these parameters is contingent on the extent and form of competition in the market.

First, the section assesses whether, and under what circumstances, ComReg might consider it appropriate to apply the 'equally efficient operator' (EEO) assumption in the net revenue test across all underlying wholesale inputs, followed by a discussion on whether the test could be conducted on the basis of alternative wholesale inputs, namely line share (combined with single-billing wholesale line rental, SB-WLR) or full LLU.

3.1 Assumption on an entrant's efficiency

In line with the definition in the European Commission's 'Notice on the applications of competition rules to access agreements', the principal efficiency measures that could be applied in the context of margin squeeze assessments are the following.[11]

– The **'as-efficient operator'** or EEO test considers whether the incumbent operator's own retail arm would be able to trade profitably in the market if it had to rely on the profit margin given by the difference in the wholesale input prices charged to competitors and its own price charged in the retail market.

– The 'reasonably efficient operator' (REO) or 'similarly efficient operator' (SEO) test considers whether a 'reasonably' (or 'similarly') efficient hypothetical competitor would be able to trade profitably if it had to rely on the profit margin given by the difference in the wholesale input prices of the incumbent and the incumbent's retail price. This test tends to be favourable for entrants, given that an entrant would be expected to have lower economies of scale than the incumbent.

The EEO approach requires data on eircom's costs and is based on eircom's scale of operations. In general, the EEO test may be more suitable where there are concerns about the investment and innovation incentives of the incumbent operator, or indeed its ability to compete. Furthermore, the EEO approach—typically applied in ex post antitrust assessments—is more appropriate in the context of markets where there is a realistic prospect of future competition or evidence of significant actual competition. Also, the EEO test could be applied if entrants in the Irish market exhibited equal, or almost equal, economies of scale to eircom.

In contrast, a REO/SEO approach in an ex ante context may be better suited to promoting competition and entry since the hypothetical competitor is theoretically 'less efficient'. Thus the benefits of entry and increased competition are assumed to outweigh any efficiency costs from the hypothetically less-efficient entrant.

In relation to the current practice in Ireland, it is noted that the test that ComReg uses employs a combination of retail-minus tests applied in the regulation of SB-WLR and WBA. The former is an EEO test, whereas the latter element—stand-alone broadband—is regulated on the basis of SEO.

[11] 'Notice on the application of the competition rules to access agreements in the telecoms sector', OJ 1998 C 265/2, para 117–18.

For reference, Box 3.1 summarises a selection of international precedents.

Box 3.1 Examples of regulatory precedent where the net revenue test has been designed explicitly to meet the regulatory obligations

The following reviewed precedents are useful in this context.

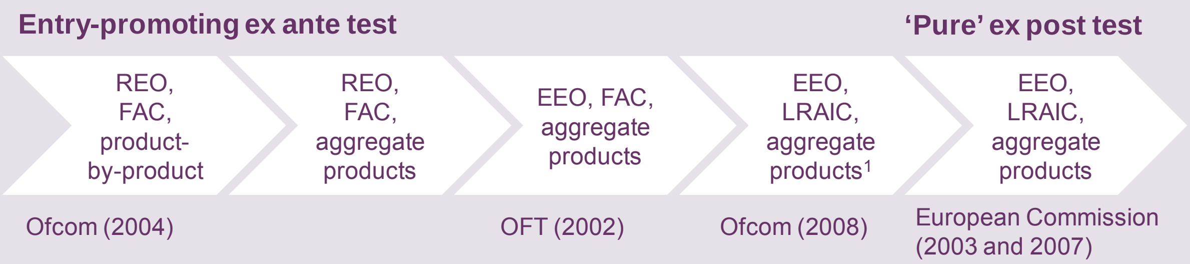
– In Ofcom's ex ante WBA case, the REO standard was deemed appropriate. Ofcom advocated the inclusion of common costs (which form part of the FAC and LRIC+ cost standards) because it found that entrants' economies of scope were substantially lower than those of incumbents.

– Ofcom's approach to retail-minus regulation was reaffirmed in a recent decision in which it determined a separate wholesale price for each combination of premium channels that BSkyB makes available in the UK market. Specifically, Ofcom's decision was to determine the margin 'on the basis of an ex ante margin squeeze rule which takes account of scale effects, DTT transmission costs and a 10.3% return on investment'. Ofcom explicitly acknowledged that the margin is likely to be somewhat higher than the margin that might be derived under a competition law test, but that it is nonetheless entirely consistent with the objective of ensuring fair and effective competition.

– Retail-minus regulation is not applied by all national regulatory authorities (NRAs), but it is noted that, in Belgium, for example, an EEO approach is taken, although this is in the form of general guidelines rather than a specific test; and in Italy and Greece the EEO approach is also used.[12] In the context of leased lines, the Belgian regulator, IBPT, has considered a REO approach.[13]

– In ex post settings, by contrast, competition authorities have tended to follow approaches that are in many ways more favourable to the incumbent. For example, the European Commission has implemented the test as an EEO–LRAIC aggregate portfolio (*Telefónica ruling*). There are strong pro-competitive reasons for this approach, in that promoting less-efficient entry carries the risk of lessening the investment incentives and pricing freedom of the incumbent operator.

The figure below illustrates how the margin squeeze test has been applied in the UK and by the European Commission.



Note: [1] Different levels of aggregation to reflect differences in entrants' business models.
Source: Oxera, based on Ofcom (2004), 'Direction Setting the Margin between IPStream and ATM interconnection Prices', August 24th; Ofcom (2008), 'Complaint from Energis Communications Ltd about BT's Charges for NTS Call Termination', August Office of Fair Trading (2002), 'BSkyB Investigation: Alleged Infringement of the Chapter II Prohibition', OFT Decision, CA98/20/2002, December 17th; European Commission (2007), '*Wanadoo España vs. Telefónica*', Case COMP/38.784; and *Deutsche Telekom AG* v *Commission of the European Communities*, Case T-271/03, Judgment of April 10th 2008.

It is ComReg's objective to design the test with the aim that it ensures adequate entry conditions; however, by applying a hybrid test, it has not favoured entrants with regard to all parameters, and the test is arguably less stringent than that previously applied by other regulators—eg, Ofcom. ComReg could provide eircom with further pricing flexibility, should it be considered that the market conditions warrant such an adjustment.[14] Specifically, the price

[12] Information provided to Oxera by ComReg.

[13] IBPT (2009), 'Décision du conseil de l'IBPT du 8 avril 2009 concernant le test de ciseaux tarifaires des lignes louees ethernet', April 8th, p. 10.

[14] Changing the assumption on an entrant's relative efficiency is likely to have a material impact on the pricing flexibility provided to eircom.

of WBA could be determined on an EEO (rather than SEO) basis when offered in a bundle that includes retail fixed narrowband access. Indeed, there would be some benefits in applying the EEO approach across the board.

Competitive dynamics for bundled products may be different to those in the stand-alone broadband market. As described above, competition for the sale of bundles exhibits characteristics that are not present in the same way in the sale of stand-alone products. More specifically, the bundles offerings may not be limited to bundles of voice telephony and broadband (in which eircom has a stronger position), but may include bundles that increasingly include components for which other providers are better positioned (eg, mobile and cable TV). Furthermore, regulatory consistency would be better achieved if all wholesale products underlying the bundle were regulated according to the same economic principles.

However, caution should be exercised before it is deemed appropriate to relax the test.

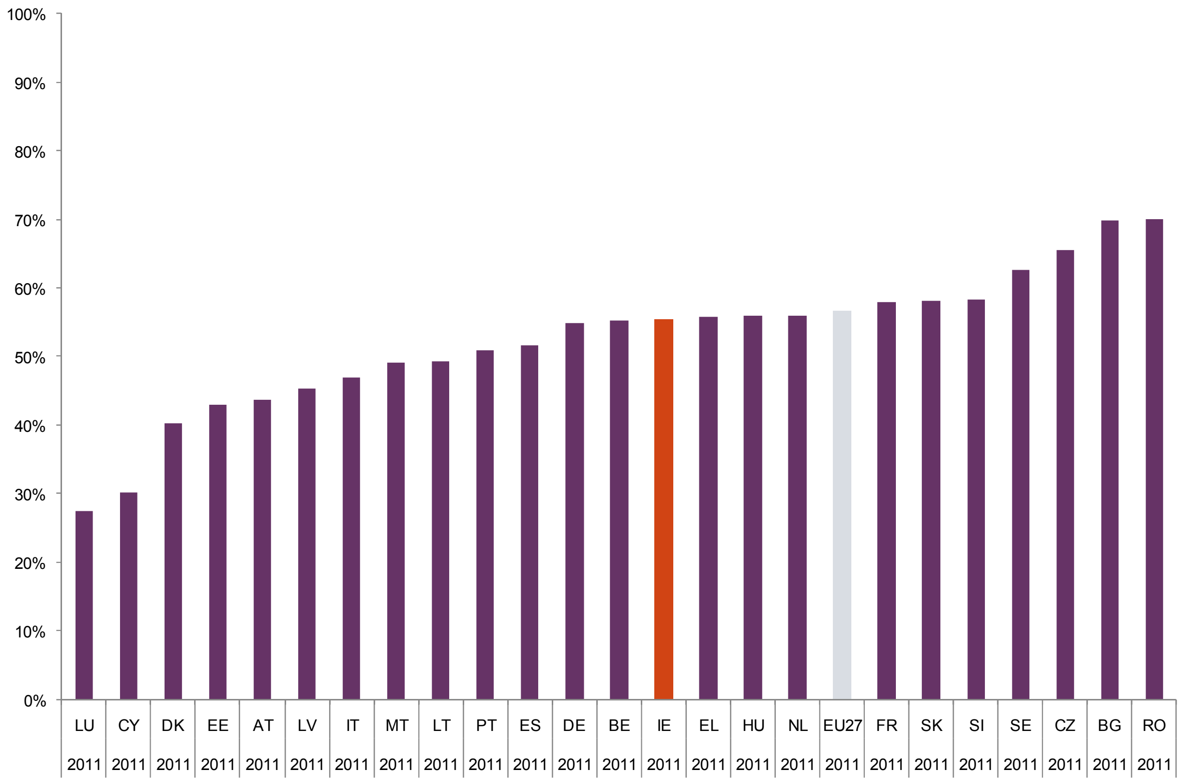
– There may be some cost advantages for operators in adjacent markets providing other communications services. This is because these operators may benefit from *scope* economies (ie, their unit costs of providing bundles are lower since they exhibit cost advantages from providing other related products). However, the unit costs of provision of broadband services depend also, and to a significant extent, on the scale of connections provided. In other words, the SEO test is based on the notion that entrants do not benefit from the same level of scale economies as the incumbent.

– Economies of scope relate closely to the cost standard employed in the test, while the assumption on an entrant's efficiency depends on whether it is considered reasonable to assume that an entrant can operate at the same scale (at the same point in the cost curve) as the incumbent.

– The underpinning of the prevailing SEO applied for broadband is that entrants' unit costs are higher than those of the incumbent.[15] More specifically, it is Oxera's understanding that the model assumes that the hypothetical efficient OAO would achieve 25% market share in the broadband market (of DSL connections). As shown in Figure 3.1 below, OAOs' market share in the Irish broadband market has still been lower than in many other Member States. These market dynamics can inform the design of the test by indicating the entrant's actual scale and efficiency relative to the expectations underlying the pricing model.

[15] ComReg (2006), 'Retail-minus wholesale price control for the WBA market', Document No. 06/01, January 13th.

Figure 3.1 Market shares of entrants into the broadband market in Europe (%)



Source: European Commission (2012), 'Digital Agenda Scorecard', available at the Commission's website.

OAOs in Ireland are currently relying on wholesale inputs (SB-WLR and bitstream) to a notable extent, and their business models are based on the prevailing wholesale prices. A step change to EEO would have a negative impact on the profitability of OAOs' current customers (over their respective lifetimes), potentially putting some OAOs at risk. Furthermore, employing an EEO test for bitstream would be inconsistent with the rationale underlying ComReg's bitstream pricing model.

Therefore, on balance, there are reasons to suggest that the application of the EEO test at this stage of the market development would not be fully in line with ComReg's objectives to promote entry onto the DSL platform. Hence, a threshold (in terms of market share or subscriptions) above which the EEO test would be introduced for bitstream could be considered.

3.2 Appropriate wholesale input

At present the net revenue test uses SB-WLR and bitstream as the appropriate wholesale inputs reflective of current competition. Bundles combining line rental and broadband could, however, be provided over a combination of SB-WLR (for telephony) and LLU line share (for broadband), or both services could be offered through a fully unbundled local-loop access, or alternatively over virtual unbundled access (VUA) in the NGA environment. To ensure that eircom is not put at a commercial disadvantage if there were to be a significant take-up of 'passive' physical access products or virtual unbundling in Ireland, this section assesses the implications resulting from employing an alternative wholesale input mix—referred to as the wholesale network input (WNI)—in the net revenue test.

3.2.1 Implications of using LLU/line share or VUA as the basis for the net revenue test

In practice, should LLU/line share or VUA be used as the basis for the net revenue test, ComReg would need to assess the costs associated with broadband and/or line rental service (ie, the minimum price floors for bitstream, as specified in the document12/32).[16] As competition evolves, it might be more appropriate to use unbundled lines as the input.

This issue addresses whether the bundle is replicable using WLR, and whether an equally efficient entrant would be able to replicate the same retail product by means of unbundling and relying more on its own infrastructure. (The use of alternative inputs for the net revenue test can be viewed as a particular example of a 'secondary assessment'. If a bundle fails the net revenue test when resale wholesale inputs are used, a secondary test may be employed that uses LLU products as the input to the test.) As discussed below, there are circumstances under which a blended test, with weights applied to WLR and LLU/line-share/VUA inputs, might be appropriate.

Should the net revenue test be based on LLU/VUA and line-share products, the following considerations seem necessary.

1. The economic case for physical and virtual LLU would be dictated by economies of density and scale.

   – First, as discussed above, alternative wholesale inputs are most appropriate in territories where sufficient scale can be achieved. If the test is applied uniformly throughout Ireland, there is a risk that entrants will be excluded in sparsely populated territories where unbundling (LLU or VUA) is not a viable form of entry.
   – Second, the test would be akin to an EEO test, and the investments associated with LLU/line share need to be incorporated in the regulatory price-setting. ComReg determines an appropriate scale and the anticipated customer lifetime over which the relevant costs are recovered. (This could be achieved through margin squeeze tests that ensure sufficient economic space, as discussed briefly in section 5).

2. To ensure sufficient entry conditions for entrants that do not have resources to unbundle local loops, ComReg may consider the application of a blend of LLU, line-share, VUA and resale wholesale (eg, both legacy and NGA bitstream) products as the applicable wholesale input cost.

These reasons, coupled with the significance of basing the test on LLU/line share/VUA, may raise regulatory concerns since they would undermine the prospects of entering the market over managed bitstream and SB-WLR, which are still important wholesale products used by all entrants. As a consequence, ComReg may consider other options for how the test would be adjusted in this respect. Box 3.2 below summarises the options available.

[16] ComReg (2012), 'Wholesale Broadband Access: Further specification to the price control obligation and an amendment to the transparency obligation', document 12/32, April 5th.

Box 3.2 Options for alternative wholesale network input adjustment

The options to adjust the test with respect to wholesale input are described below.

- **Option 1** would involve setting wholesale prices on the basis of LLU/line-share/VUA costs throughout the country. In addition to simplicity, this approach has the advantage that it would encourage entrants to deploy independent infrastructure. On the other hand, the costs of LLU differ significantly across Ireland, and the risk is that competition would be concentrated to limited geographical zones and precluded in others.
- **Option 2** would involve estimating a blended WNI based on the weights of SB WLR/bitstream versus physical and/or virtual unbundling, which would be chargeable to all buyers of wholesale inputs.
- **Option 3** would involve introducing a blended WNI (Option 2) in most competitive geographic areas (the definition of which is discussed further below). Following the reasoning presented in section 2, such geographic areas could be defined by exchange areas, reflecting the footprint of LLU operators and UPC and eircom's NGA footprint. This approach has been preferred and further elaborated by ComReg (as explained in further detail below in section 3.4).

All options could be implemented by introducing the adjustment as a glide path, rather than as a step change and could be based on either actual or 'efficient' take-up. On the latter point, as the discussion in section 3.2.2 makes clear, there are good reasons to base the test on a wholesale product mix considered as 'efficient' by ComReg where there is a risk that basing the test on actual usage would cause uncertainly and instability in both retail and wholesale pricing.

These adjustments have the potential to lead to additional price reductions by entrants if they decide to pass on some or all of the reduction in wholesale input prices, and, furthermore, would enable more pricing flexibility for eircom.

Finally, it is noted that there are examples of LLU being included as a wholesale input. In Spain, for example, a weighted average of bitstream and LLU is used as the wholesale input cost, and in Italy, the LLU is used for all areas for which it is available.[17]

3.2.2 ComReg's approach and Oxera's comments on responses

It is Oxera's understanding that ComReg is following an approach consistent with the 'option 3' outlined above—ie, basing the net revenue test on a price that reflects a blended mix of wholesale products used by OAOs. Specifically, the 'wholesale network input' (WNI) will be calculated with reference to the average wholesale network input of an 'efficient' operator and based on the actual usage of the various wholesale inputs used by OAOs in the LEA. Oxera reviewed ComReg's Consultation (12/63) and the various responses.[18]

eircom raised a number of arguments highlighting the 'unfair advantage' that OAOs have over eircom. According to eircom, the OAOs can, in effect, charge much lower prices at the retail level and, furthermore, have incentives to 'game the system'. It seems, however, unrealistic to assume that OAOs' strategic decision to unbundle would be driven by its implications for the product mix assumption embedded in the net revenue test. Moreover, for such gaming to be effective, OAOs would need to coordinate their investments and product portfolios, which at present seems unlikely.

eircom further considered that 'the best way to remedy this problem [to allow sufficient pricing flexibility] is to include the UPC lines in the LEA areas as part of the weighting factors in the WAWI'. However, the net revenue test is a remedy to ensure replicability of eircom's

[17] Information provided to Oxera by ComReg.

[18] eircom (2012), 'Response on behalf of eircom Ltd to ComReg Consultation 12/63: Price Regulation of Bundled Offers', August 29th. BT communications Ireland (2012), 'BT communications Ireland Limited ("BT") Response to ComReg's Supplementary Consultation Price Regulation of Bundles Offers', August; Response by Magnet Networks. Vodafone (2012), 'Vodafone Response to ComReg Document 12/63 Supplementary Consultation to ComReg 11/72: Price regulation of bundled offers' (August). ALTO (2012), 'Response to Supplemental Consultation – Supplementary Consultation - Price Regulation of Bundled Offers Ref:12/63', submission by ALTO, August 29th.

bundles using eircom's network inputs; it should not be confused with UPC or any other platform that may, to some extent, constrain eircom's pricing at the retail level.

WNI for NGA and legacy bundles

The inclusion of NGA wholesale inputs as part of WNI seems largely reasonable from an economic perspective. As established by ComReg, it seems reasonable to: a) treat NGA bundles consistently with legacy bundles; and b) take virtual unbundled access (VUA) services into account in the WNI product mix. Having said that, it does not seem appropriate to treat all NGA lines as if the wholesale input was (only) VUA, even if other wholesale products (such as Bitstream Plus) are used. VUA is an untested product and there is no reason to treat NGA and legacy-level services differently in this respect—in particular, given that the economic characteristics of Bitstream Plus/VUA are analogous with (legacy) bitstream/LLU.

However, there are circumstances in which ComReg might consider using a different WNI for NGA and legacy-level services in the early stages of NGA roll-out (and take-up).

First, if the net revenue test was based on a WNI covering both legacy and NGA wholesale products, eircom could base the pricing of its NGA retail services on a (weighted average) wholesale product price reflective of legacy, rather than NGA environment. However, the WNI reflects the wholesale input take-up of legacy wholesale access products, which can not be used to replicate NGA-based retail services. To illustrate this concern, suppose that the WNI was based on most OAO connections provided by using LLU. This would result in a low WNI (given the price of LLU). However, the comparable product in the NGA environment is VUA, the price of which is higher, and which requires migration investments by an LLU operator. Therefore, at an early stage of NGA roll-out, it would seem advisable not to base the WNI on legacy wholesale input usage where NGA has been rolled out.

Second, if the test was based on the actual wholesale product mix of OAOs, there is a potential concern that, during the early stages of take-up, OAOs' decisions to migrate parts (or all) of their customer base to NGA may cause disproportionate fluctuations to the level of WNI. If strictly based on actual usage of NGA-based inputs, the WNI would change (potentially significantly) as a result of every migration decision by the OAOs. Again, not only would the issue arise in the context of migration between legacy and NGA, but the WNI would also be sensitive to the choice of wholesale inputs within the NGA platform. The implications of this are as follows:

– the WNI would not mimic the wholesale product usage of an 'efficient' entrant but would be dependent on the timing of legacy-to-NGA migration of certain individual OAO(s);

– the consequent fluctuations in the level of VUA could result in uncertainty for both eircom and OAOs. eircom's retail pricing flexibility depends on the precise level of WNI, and the net revenue test should not result in unnecessarily frequent changes in retail prices. OAOs, in turn, base their investment and pricing strategies on the expected costs of wholesale inputs, which may become difficult to predict if the WNI fluctuates.

It therefore follows that a separate WNI for legacy and NGA may be appropriate and, at least over the transition period, it appears reasonable to apply a WNI based on an assumption about what a hypothetical 'efficient' OAO could use as its wholesale inputs, given the progress of NGA footprint and take-up.

In all, ComReg's approach set out in Consultation 12/63 seems reasonable and the review of responses did not reveal new arguments or evidence that would require further changes to the proposed approach, apart from the WNI amendment discussed above.

3.3 Principles for criteria to adjust the net revenue test

Given that remedies should be commensurate with the competition issues identified, ComReg could consider relaxing the test, should competition evolve in the markets. To provide sufficient incentives, the criteria would need to be sufficiently simple, and specified clearly ex ante.

To some extent, such criteria (or a threshold) would be arbitrary (ie, defining the exact number of lines that would trigger adjustments to regulation). Nevertheless, there are sound reasons to introduce a sufficiently simple threshold mechanism:

– a transparent and simple set of criteria could be designed to provide the incumbent with sufficient incentives to comply with the processes associated with the provision of wholesale inputs and LLU services. In order to provide the right incentives, the threshold would therefore need to recognise the trade-off between wholesale and retail revenues;

– the thresholds would be consistent with the expected take-up reflected in the regulatory pricing models. Put another way, it would not be consistent to introduce a threshold that is inconsistent with the assumptions underlying current pricing models;

– the threshold could be determined so that it reflects the competitive dynamics in the market. More specifically, it is appropriate that the threshold (whether determined as a market share or an absolute number of lines) be defined on the basis of the prevailing situation and realistic projections of entrants' ability to acquire customers.

Indeed, such trigger mechanisms have proven efficient in similar contexts outside Ireland, as discussed in Box 3.3 below.

Box 3.3 International precedents of regulatory trigger mechanisms

The following examples illustrate how regulators have used specific thresholds to incentivise regulated companies to comply with ex ante regulation.

– In the UK, together with a variety of other regulatory modifications, Ofcom and BT established a threshold whereby when a threshold of 1.5m lines had been unbundled, adjustments in BT's bitstream prices were allowed. More specifically, to achieve price stability between LLU and IPstream, BT committed to no further price changes in its bitstream prices until 1.5m LLU lines were installed; followed by a reduction of 75p per month until April 2007.[19]

– When introducing sub-national geographical markets to the WBA market, Ofcom specified a criterion according to which certain geographical areas (defined on the basis of LLU footprint) would be deregulated. This provides the market with an indication that regulatory remedies are, and will be, scaled back where competition exists.[20]

– Outside the telecoms sector, the Civil Aviation Authority has applied CAPEX triggers in regulating UK airports.[21]

The introduction of the threshold mechanism for the two relevant aspects of the test is discussed below.

3.3.1 Threshold for employing EEO for bitstream access

Following the reasoning above, there are reasons to suggest that ComReg would introduce the EEO assumption across all wholesale inputs as soon as a predefined threshold is

[19] Ofcom (2005), 'A new regulatory approach', June 23rd.

[20] Ofcom (2010), 'Review of the wholesale broadband access markets', October 1st.

[21] See, for example, Civil Aviation Authority (2009), 'Gatwick Airport—CAA decision on the specification of CAPEX triggers', March.

achieved. While it is beyond the scope of this report to determine the precise threshold, in light of the above reasoning it would seem advisable to set the threshold based on a realistically achievable OAO DSL market share.

An approach consistent with the current bitstream pricing model could be to employ the EEO test once the entrants have a market share equal to what is assumed in the model about the 'efficient scale'. However, this would reflect a tough regulatory stance, since it does not seem realistic that this target would be achieved in the near future, given current evidence. The threshold would need to take into account entrants' prospects of acquiring DSL broadband customers, in light of the competition from alternative platforms.

ComReg could also consider using OAO market shares observed in other countries as a benchmark. Benchmarking would need to identify countries where (intra-platform) competition has evolved, and which are sufficiently similar to Ireland.

3.3.2 Threshold for basing the test on LLU or line share

In this assessment, it is important to recognise the specific way in which competition has evolved. Entrants' market shares alone are not a sufficient indicator of such competition that would warrant relaxation of the test.

– **Explicit numbers of unbundled lines**. As presented in Box 3.3, there is UK precedent where the pricing of the BT wholesale product (IPstream) was tied to the number of local loops unbundled. In addition to being a straightforward indicator of facilities-based competition, the attractiveness of this approach stems from its transparency. LLU penetration is monitored and the respective figures published regularly. The threshold based on the number of unbundled lines could be defined to be consistent with the forecasts inherent in the BU-LRIC model underlying LLU pricing.

  A potential disadvantage of using an explicit number of unbundled lines as a threshold is that, in principle, it could incentivise entrants to avoid exceeding the threshold. However, this seems unlikely, given that the business case of LLU is driven by scale.

– **Number of operators present in an exchange**. An alternative way to determine the threshold would be to base it on the number of operators in an exchange in a given geographical area. This approach—analogous with principles adopted by some NRAs with respect to geographical market definition—would take into account structural differences in competition. This would require sub-national pricing. ComReg's approach is akin to this option and is discussed in further detail below.

A further, and increasingly important, driver of competition in Ireland is UPC's cable offering. While cable may constrain eircom's retail pricing to some extent (as identified in the WBA SMP decision), thus far its significance has not influenced ComReg's decision to define national geographical markets, and eircom has been found to have SMP on a national level. Furthermore, the purpose of the net revenue test, and access regulation in general, is to promote entry by OAOs; the existence of a bi-directional cable footprint does not have implications for the ease of entry without own-access network infrastructure. UPC's presence may, however, constrain eircom's retail, and therefore wholesale, pricing. Therefore, ComReg's approach to LEA does take into account cable-based competition, but the presence of cable is not in itself a sufficient condition to include an exchange in the LEA—discussed further below.

3.4 Implementing adjustments to the test in practice—the LEA

The determination of the appropriate threshold for relaxing the test with respect to the assumption on entrants' efficiency and wholesale inputs requires understanding of the competitive situation. Notably, while the presence of cable is an important consideration in assessing the degree of retail market competition, when setting the threshold, more weight should be given to LLU-based entry than to cable penetration.

While the evidence presented above shows that there are indeed signs of significant offerings that are independent of eircom's service-level wholesale products (namely SB-WLR and bitstream), the OAOs' market share has remained low relative to projections envisaged in the WBA pricing model, and many international comparators. ComReg may consider it appropriate to determine a threshold reflecting these points of reference. Once there is a sufficient degree of competitive DSL penetration, the EEO principle could be introduced to cover the broadband element of the test as well.

With regard to the potential threshold for altering the test for wholesale inputs, the progress in terms of unbundling is the most appropriate proxy of the economic viability of further unbundling going forward. On the basis of the market information provided, and consistent with the regulatory precedent, the following combinatorial threshold would seem to be recommendable:

– apply alternative wholesale inputs after a predetermined number of lines are unbundled;
– apply alternative wholesale inputs with respect to local exchanges with a predetermined number of active operators and a realistic prospect of further entry.

ComReg may consider relaxing the test by basing it on unbundling once a predetermined threshold has been met. Given that competition has evolved in certain areas, and additional pricing flexibility may be required to ensure competitiveness of the DSL platform (not only for eircom but also for the OAOs), the blended rate of different wholesale options could be considered as a practical interim measure, as discussed above (taking into account the up-front costs of deploying necessary network elements and ensuring consistency across remedies).

NRAs have the option to adjust remedies on a sub-national basis, even if markets are defined as national. In its responses to national regulators, the European Commission confirmed that the 'regulatory framework does not preclude the imposition of different remedies in the same relevant market'.[22] ComReg's approach is therefore in compliance with the EU framework. As Oxera noted previously, from an economic perspective the definition of sub-national remedies should follow principles consistent with a market definition exercise, in that both supply- and demand-side factors should be examined. In this respect, ComReg has undertaken detailed exchange-by-exchange analysis on structural conditions in the market, and has established a set of criteria to define an LEA.

Given the market situation in Ireland, ComReg is not proposing to scale back regulation in full in any area; however, it is proposing to adjust remedies to ensure that, where UPC and LLU are present, eircom's competitiveness is not undermined. By defining a clear set of criteria, ComReg provides the industry with transparency, which is again consistent with both international precedent and Oxera's previous recommendations.

This principle is also endorsed by the OECD, whose recommendation is fully consistent with the approach employed by ComReg:

> In some countries, competitive conditions may vary within the national market, but not to the extent that warrants a definition of sub-national geographic markets. In this case it may be appropriate to differentiate remedies within the national market. However there are concerns that the definition of a threshold between sub-national geographically segmented regulation and conditions warranting the differentiation of remedies within a single national market is unclear and that this could give rise to arbitrary decisions by national regulators. Clear guidelines that precisely specify the conditions under which

[22] European Commission (2009), 'Telecoms: Commission calls on Slovenian telecoms regulator to review its broadband market analysis', IP/09/1579, October 26th.

each of the two distinct approaches (geographically segmented regulation or differentiation of remedies) should be used are needed.[23]

The approach employed by ComReg seems reasonable in light of available evidence on market developments, and is consistent with regulatory precedents and the guidance provided by the European Commission, as well as the OECD.

3.4.1 ComReg's approach and Oxera's comments

Since Oxera's 2011 report was published, ComReg has conducted detailed analysis to define boundaries within which structural competitive conditions are sufficiently developed so that adjustments to the net revenue test could be warranted. Specifically, based on an exchange-by-exchange analysis, ComReg has defined LEAs as follows:

(i) Criterion 1: An exchange area in which:

(a) at least one AIP [Alternative Infrastructure Provider[24]] is providing telecommunications services at the retail level to End-Users; and

(b) at least one OAO (not being an AIP) is providing telecommunications services at the retail level to End-Users from the relevant exchange using LLU or VUA (either by means of direct provision by that OAO to End-Users or via a wholesale service provided to that OAO by another OAO by means of LLU or VUA),

subject to the condition that the said AIP(s) and the said OAO(s) using LLU or VUA must, all taken collectively, have a reasonable market share and reasonable market coverage in the relevant exchange area;

(ii) Criterion 2: An exchange area in which at least two OAOs (not being AIPs) are providing telecommunications services at the retail level to End-Users from the relevant exchange using LLU or VUA (either by means of direct provision by those OAO(s) to End-Users or via a wholesale service provided to those OAO(s) by another OAO by means of LLU or VUA) - subject to the condition that the said OAOs using LLU or VUA must, taken collectively, have a reasonable market share and reasonable market coverage in the relevant exchange area;

(iii) Criterion 3: An exchange area in which:

(a) at least one AIP is providing telecommunications services at the retail level to End-Users; and

(b) Eircom (and OAOs relying on wholesale inputs provided by Eircom) are providing retail fixed broadband services to less than 20 per cent of the premises in that exchange area,

subject to the condition that the said AIP(s) must, taken collectively, have a reasonable market share and reasonable market coverage in the relevant exchange area;

(iv) Criterion 4: An exchange area in respect of which Eircom has provided six months prior notification on its publicly available Wholesale website (in accordance with Section 9.13(i)

[23] Organisation for Economic Co-operation and Development (2010), 'Geographically segmented regulation for telecommunications', June 22nd.

[24] ComReg defines AIP as 'an Undertaking providing high-speed retail broadband services to End-Users at a fixed location by means of alternative infrastructure. For the purposes of this definition, services are deemed to be provided by means of "alternative infrastructure" when the relevant AIP does not rely on any wholesale access inputs from Eircom in respect of the Local Loop (e.g. including Wholesale Line Rental (WLR), Bitstream, VUA or LLU) in order to provide services to End-Users in a particular exchange area'.

of the Decision Instrument contained in Annex 1 of ComReg Decision D03/13 and/or Section 9.13(i) of the Decision Instrument contained in Annex 2 of ComReg Decision D03/13) regarding the launch of NGA services by Eircom in cabinets in the relevant exchange area, subject to those proposed NGA-enabled cabinets serving at least a reasonable number of lines in that exchange area;

(v) Criterion 5: exceptionally, and subject to case-by-case assessment by ComReg, an exchange area in which the relevant exchange:

(a) Is surrounded by Qualifying Exchanges; or

(b) Serves fewer than 500 residential premises and is located either adjacent to, or in reasonable proximity to, Qualifying Exchange(s); or

(c) Is determined, to the satisfaction of ComReg, to have an economic affinity with adjacent Qualifying Exchange(s), subject to the total residential premises served by Qualifying Exchanges under this sub-criterion 5(c) not exceeding 5% of the total residential premises in the Larger Exchange Area (excluding those residential premises which are served by Qualifying Exchanges under sub-criterion 5(b) above).

Oxera has reviewed these criteria and assisted ComReg in assessing whether they are in line with economic principles and established international precedents, and, if so, to what extent. Specific considerations reflecting on operators' responses are presented as follows.

UPC's presence is not a sufficient condition in itself to relax the net revenue test. eircom claimed that the proposed definition of LEA does not give it sufficient flexibility to compete against other platforms (ie, UPC's cable network) and is too complicated to work in practice.[25] eircom emphasised that its competitiveness against UPC could be undermined by the LEA approach proposed by ComReg. Given this, eircom claimed that UPC's presence (without necessarily any LLU) would suffice to render an exchange area to be classified an LEA. The relevant question for ComReg is whether there is market (supply- and demand-side) evidence to suggest that certain exchanges are prospectively not capable of being unbundled. The presence of UPC is not, in itself, informative of entrants' ability to invest and compete by LLU rather than active access inputs.

NGA deployment may be indicative of prospects of infrastructure competition. ComReg's approach takes into account eircom's comment that the exchanges that will be covered by NGA are, by definition, such that unbundling is feasible. If the economies of scale and density of an exchange are such that eircom finds it economical to deploy FTTC and associated VDSL equipment, it seems reasonable to assume that OAOs could be in a position to use VUA as the wholesale input in these exchanges (as opposed to NGA bitstream), or LLU over the transition period.

Rural customers would not be worse off relative to the status quo. Oxera understands that eircom would not be allowed to offset any potential revenue losses in the LEA (that are due to competition) by increasing its pricing above set price ceilings in other areas. Put another way, consumers outside the LEA footprint will not cross-subsidise competitive areas (to an extent they would be worse off than in the status quo), regardless of the imposition of sub-national remedies or definition of the LEA. Sub-national pricing is driven by structural differences in market conditions, and it is reasonable to adjust remedies accordingly. As regards societal and distributional concerns, ComReg and the Irish government have rigorous measures to ensure that certain services are available to all Irish citizens (such as the universal service obligation, USO).

[25] eircom Ltd (2012), 'Response on behalf of eircom Ltd to ComReg Consultation 12/63: Price Regulation of Bundled Offers', August 29th.

Number of LLU operators per exchange reflects the supply-side economics of LLU. If it is feasible to unbundle an exchange (and this has been done), the marginal cost to serve additional customers in that exchange area is significantly lower than it would be in the case of using WLR/WBA. The cost of unbundling is largely fixed and sunk, and the OAOs using LLU or line share have the incentive to maximise their customer base with the lowest possible price that allows recovery of their variable costs and a contribution towards fixed costs. Therefore, the presence of unbundlers in an exchange is likely to be a useful indicator of structural supply-side differences. In some cases, despite being unbundled, the OAO market share may be very low (for example, in the direct aftermath of unbundling). It therefore appears reasonable not to include exchanges in the LEA unless there is evidence of OAOs achieving reasonable take-up. At the same time, the market share threshold should not be too high, as this could unduly constrain eircom's pricing and discourage unbundling. This is also reflected in ComReg's first LEA criterion, which stipulates that the AIP (like UPC) and another OAO need to have a reasonable collective market share. This seems reasonable: even if the OAO market share were very low, ComReg may consider it appropriate to include an exchange in the LEA insofar as UPC is very strong in that exchange area and therefore likely to constrain eircom's pricing significantly. Also, the requirement for a reasonable collective market share enables ComReg to exclude exchanges where both UPC and OAOs are present, but both have negligible market share.

ComReg's criterion is also 'future-proof' in that the AIP can, in principle, be any alternative infrastructure operator. While UPC is the most relevant operator at the moment, other infrastructure providers may enter the market through alternative technologies going forward.

4 Timing of the net revenue test

The net revenue test could be modified to capture estimates of costs and revenues associated with bundles for a predefined (monthly) period. Indeed, from an economic perspective, there is apparent merit in basing the test on forecasts, given that, from the perspective of an investing operator, what matters is the cost recovery over the lifetime of the investment (including, in this case, subscriber acquisition). Furthermore, the asset prices and operating costs are forecast to exhibit ongoing changes (as reflected in ComReg's LLU and WBA pricing models), together with more certain cost changes manifested through reductions in termination charges. It is Oxera's understanding that eircom has not identified significant movements in the relevant retail (operating) costs apart from movements in interconnection charges.

Drawing on selected precedents, the economic considerations related to timing are presented in Box 4.1. This is followed by discussion of the relative merits of introducing a more 'forward-looking' element to the test applied in the context of bundles.

Box 4.1 Forward-looking versus retrospective assessment of margin squeeze—precedent

Broadly, there are two high-level approaches to measuring profitability which combine choices on the use of a historical or a forward-looking approach, and whether a multi-period discounted cash-flow or a period-by-period profitability analysis is used.

– **Forward-looking discounted cash-flow (FL-DCF) approach**—this would require projections of the costs that an operator would incur, and revenues that it would generate over a number of years, and discounting these to obtain a measure of the net present value (NPV) of the service/product in question. Additional choices need to be made regarding the time period of the analysis (usually related to the lifetime of the assets required to undertake the retail activity), modelling the terminal value in the last period of analysis (to ensure that profitability is not being overestimated), and the cost of capital to discount the cash flows.

– **Historical financial accounting approach**—this would require historical data from the previous years' accounts in order to measure profitability, through either a period-by-period or a multi-period DCF approach.

In general, regulators tasked with having to determine margin on an ex ante basis have used the FL-DCF approach. For example, in telecoms this has been the case with Ofcom, ComReg and the CMT. One exception is the Dutch regulator, OPTA, which sets a minimum margin with reference to the incumbent's costs at any point of time.

FL-DCF is particularly suited to markets where costs and revenues are expected to change over time (due to scale economies, introductory offers, etc), as well as, more generally, markets in their early stages of maturity (where scale economies are significant and accounting distortions related to the depreciation of relatively new assets, compared with their economic depreciation, can be greatest).

On the other hand, there is no clear trend in the approach adopted during ex post cases. For example, in the *Telefónica* case (2006), the European Commission assessed profitability using the telecoms company's historical costs for the period 2001–06, employing both a period-by-period and a DCF approach. This was done to ensure that profitability was not being overestimated through the use of a DCF approach—a concern that has been raised on a number of occasions by the Commission (eg, in the *Wanadoo/France Telecom* case), as well as by the UK Office of Fair Trading (OFT), the UK Competition Appeal Tribunal (CAT) and Ofcom.[1]

The potential concern arises because the DCF approach may produce a cash-flow profile in which negative flows in the early periods are more than compensated for by positive flows in the later periods of the analysis. This profile of cash flows has the problem that it is consistent with a successful margin squeeze/predatory pricing strategy, even though the NPV is positive during the overall period of analysis. To counter this concern, care needs to be taken when modelling the profile of prices over time that would be expected in a competitive market, as Ofcom did in the ex ante WBA case.[2]

In the BSkyB case, the OFT rejected the use of a forward-looking approach, basing its reasoning on the high degree of uncertainty of forecasting future cash flows and terminal values for investments. The OFT also alleged that:

> Specifically, an interpretation of such an analysis could be that by squeezing rival distributors in early periods and thereby dampening competition, BSkyB could anticompetitively accelerate its acquisition of digital subscribers to enable early achievement of its minimum efficient scale.[3]

[1] European Commission (2007), '*Wanadoo España vs. Telefónica*', Case COMP/38.784, p. 95.
[2] See Ofcom (2004), 'Direction Setting the Margin between IPStream and ATM interconnection Prices', August 24th.
[3] Office of Fair Trading (2002), 'BSkyB Investigation: Alleged Infringement of the Chapter II Prohibition', OFT Decision, CA98/20/2002, December 17th, p. 98.
[4] Ofcom (2004), op. cit.

In addition to the question of whether the test should be ex ante or ex post, or both, as in the current situation, there is the practical issue that the estimates of forward-looking costs (if introduced to the test) would need to be audited. This would introduce time lags from when the bundle was introduced to when an assessment of whether the bundle passed or failed the margin squeeze test was carried out (and would apply to both the ex ante and ex post net revenue tests).

From ComReg's perspective, it is noted that a fully fledged DCF model applied for a longer period (based on historical evidence on the volumes and cost and the customer and asset lifetimes) could have some advantages. It would provide the industry with entry signals on a forward-looking basis, although DCF models may require adjustments in later periods. For new bundles, which exhibit significant demand uncertainty, frequent (monthly) retrospective assessments might be needed, however (in addition to forward-looking cost estimates), given the regulatory objective to provide OAOs with regulatory certainty.

Indeed, from a practical point of view, the net revenue test would be conducted every month for the period immediately preceding it, in order to avoid any lag in which enforcement action might be needed if the bundle were to fail the test. A well-specified checking process could be set up to facilitate instant monitoring. ComReg would need to discuss with eircom the extent to which it is able to provide information on a 'live' basis, to avoid the drawbacks discussed above. If such instant monitoring were not possible, the described trade-off would need to be considered in order to ascertain which method of conducting the net revenue test would have the least detrimental impact.

4.1.1 eircom's incentives to comply with and outperform the expectations—a conceptual framework

In other regulated industries, the sectoral regulator will often provide incentives for the firm to outperform the expectations inherent in the regulatory pricing model. Insofar as one or more of the underlying wholesale inputs of the net revenue test are regulated on a retail-minus basis, a different approach to standard RPI – X price regulation would seem to be necessary in order to introduce incentive mechanisms. Put another way, eircom should have incentives to minimise its wholesale costs and to operate efficiently at the retail level. Thus a key question is whether the test can be tailored to incentivise eircom to 'outperform' relative to expectations, which would be expected to lead to lower retail prices, to the benefit of consumers.

It is recognised that, while discussed extensively in the past, eircom is now proposing that the test be based on audited (historical) account information on retail costs. As a consequence, the framework presented here should be interpreted as a conceptual one, which could be adopted if and when sufficiently robust projections of costs and revenues could be obtained. Similarly, while the monthly supervision seems appropriate at the moment, projections of costs and revenues may become more relevant if less frequent monitoring intervals become relevant. Thus, if the ex post assessment shows that eircom's retail costs are below the ex ante forecast, the test could be adjusted for the subsequent periods. This would not mean that any excess margin could not be 'stored' for future use—such an inter-temporal cost-recovery scheme would be, first, difficult to implement in practice, and, second, would undermine the net revenue test, which is intended to provide transparent and predictable entry signals ex ante.

In contrast, if the margin squeeze test is passed, the regulator could make adjustments in the opposite direction. Bundles that fail the test (ex ante or ex post) should be blocked and/or withdrawn, although the following considerations are necessary.

– If the bundle fails the test ex ante, its launch would not be accepted. However, if the relevant cost base proves lower (relative to expectations embedded in the forward-looking cost model) during the future periods, the same bundle may be launched at a later stage.

– To protect consumers, ComReg may need to have at its disposal a variety of enforcement actions, ranging from obliging the incumbent to withdraw the bundle from existing customers, to stopping the incumbent actively selling the bundle (but allowing existing customers to remain on the bundle). The latter would be preferable for the incumbent since it would allow the incumbent to recover sunk costs, such as product development and marketing. However, this may give the incumbent an incentive to repeatedly launch bundles that appear to pass the net revenue test ex ante, but fail it ex post. The range of enforcement actions available may also depend on whether regulation is applied bundle-by-bundle, or on a portfolio basis (see below).

  Thus, if the bundle passes the ex ante test, but is found to fail ex post, ComReg would have two options: mandate the withdrawal of bundles going forward (but allow existing customers to retain their subscription on initial terms); or withdraw the bundle in question altogether and oblige eircom to adjust its pricing for existing customers so that the net revenue test is complied with.

Requiring eircom to withdraw bundles from existing subscribers is one way to deter it from repeatedly launching bundles that fail the net revenue test ex post, since there will be no benefit in launching a bundle that will ultimately fail.

5 Cost standard used in the net revenue test

5.1 Economic framework for assessing an appropriate cost basis

In assessing possible revisions to the net revenue test model, three cost standards have been put forward:

1) average total cost (ATC);

2) ATC less common costs; and

3) ATC less common costs and less some fixed indirect costs.

The proposed approach would require that the ATC of each of the portfolios is recovered through the corresponding revenues. A discussion of the economic cost concepts requires certain terms to be defined. Indeed, it appears useful to clarify the main concepts, which would ensure that the definitions above can be examined in light of established principles and regulatory best practice.[26]

'Attributable cost' is a core theoretical concept in the calculation of standard cost measures such as long-run average incremental cost (LRAIC), and serves as a practical means for classifying the costs in accounting systems to be included or excluded from the calculations. It is defined as follows:

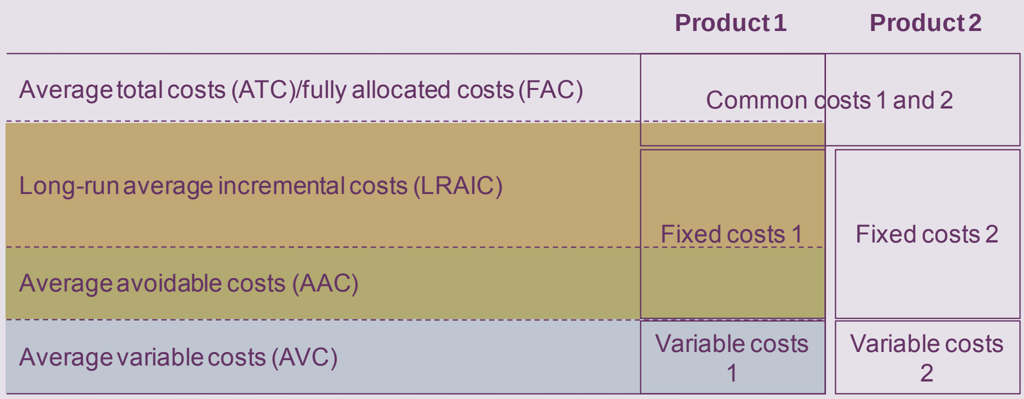
> Attributable cost is the cost per unit that would be avoided, on the average, if a product or function were discontinued entirely without changing the supporting organisation infrastructure.[27]

However, the concept can be generalised to include incremental approaches (namely additional costs deriving from a new service). More specifically, a bottom-up model can be constructed with knowledge of cost causality of business processes, and the use of forward-looking, as opposed to historical, costs, thereby supporting the wide range of LR(A)IC calculation approaches. There are three categories of attributable costs: short-run variable costs; divisible fixed costs; and indivisible costs traceable to a particular product.

Box 5.1 below shows how the different types of cost can be built up.

[26] For example, for an economist, 'direct cost' implies a relation to a single product, while, for an accountant, it implies that the process costs can be directly allocated to one or many products.
[27] Shillinghaw, G. (1963), 'The Concept of Attributable Cost', *Journal of Accounting Research*, **1**:1, pp. 73–85.

Box 5.1 Cost standard variants



Source: Oxera.

– AVC—only costs that vary with output. Usually refers to small, short-term output changes.

– AAC—costs that can be avoided if the production of a given increment (could be a product) ceases. AAC may include a proportion of fixed costs if the increment is large and the time horizon long.

– LRAIC—costs that can be avoided in the long run if the provision of a given increment (eg, a product) ceases. It includes all fixed costs of the increment, and may include some common costs if these would be avoided in the long run were the increment no longer to be produced.

– ATC—similar to fully allocated costs (FAC), ATC would cover LRAIC plus a larger proportion of common costs allocated to the product in question (sometimes referred to as LRAIC+).

The choice of cost standard applied in the net revenue test (the 'minus' element) needs to recognise the trade-off between promoting service-based entry and providing entrants with sufficient incentives to invest in facilities and to migrate to LLU. This compromise may lead to an element of judgement in selecting the preferred economic parameter on which to base cost calculations, especially with regard to the inclusion of common and fixed costs. This has already been recognised by both ComReg and eircom, and Table 5.1 presents the advantages and potential shortcomings of the different cost standards that can be used with the net revenue test.

Table 5.1 Advantages and disadvantages of different cost standards that could be applied in revised net revenue test model

Cost definition	Advantages	Disadvantages
Historical cost accounting (HCA) ATC	Practical to implement (eircom's accounts) Ensures recovery of fixed and common costs and facilitates entry (long-term benefits)	Not aligned with recent competition law guidelines Allocation of common costs is arbitrary and, by definition, produces a higher cost estimate than incremental cost when applied to a single product
FL-ATC—could be comparable with FAC and LRIC+, depending on how common costs are allocated	Seeks to identify the costs that are relevant from an entrant's perspective on a forward-looking basis, and hence mimics competitive market outcomes Mimics competitive markets, while providing ability to recover fixed (as well as variable) costs and some common costs Incorporates forward-looking termination rates	Requires ex ante specification of the cost model, and a sufficiently robust retrospective monitoring mechanism Requires volumes and costs to be forecast robustly (FL-ATC) Requires identification of relevant common costs Gives less room for entrants to compete
AAC	Mimics competitive markets, while providing the ability to recover fixed (as well as variable) costs Approach favoured in European Community case law (Telefónica)[1] Cost standard employed in antitrust predation cases	Requires revision of the costing methodology (ATC) applied in the regulatory accounts and previous retail-minus price settings Given the likely exclusion of a large share of fixed costs, and economies of scope, it would not promote competition to a similar extent as the previously applied ATC

Note: [1] The European Commission found LRAIC to be the appropriate method to estimate relevant costs incurred.
Source: Oxera.

To inform ComReg's approach, and given the variety of cost standards used, it is useful to explain what is included in and excluded from different cost standards, according to established definitions.

– ATC will vary depending on whether it is measured against all output, or only the 'contestable' units. In addition, by forecasting volumes and costs, an FL-ATC can be estimated. Variations based on this FL-ATC can be made where common costs can be excluded, as well as indirect fixed costs. An FL-ATC excluding both common costs and non-volume-related indirect costs would apply to individual bundles, since the production of a marginal bundle would not require these costs to be recovered.

– LRIC is the change in total costs resulting from the production of an increment in the quantity of output, which can be the whole output of the product in question or just the incremental output associated with the conduct under investigation. LRIC includes all product-specific fixed costs, even if those costs were sunk before the period of exclusionary conduct. Although pricing below LRIC might be due to exclusionary conduct, it might also be economically rational. This is because the firm could still be covering variable costs and sunk fixed costs with a positive cash flow. LRIC serves in most cases as a price floor, above which concerns about exclusionary below-cost pricing are unlikely to materialise. LRIC+ includes a mark-up for common costs based on the assumption that the firm would recover some common costs from the relevant service (in this case, a bundle).

– AAC includes all per-unit costs (variable costs and product-specific fixed costs) that could have been avoided if the firm had not produced a discrete amount of additional output—ie, the amount avoided by not participating in a specific activity. Since this cost standard includes all costs related to additional output, the judgement as to whether a cost is fixed or variable is unnecessary. Avoidable cost has been employed in antitrust cases, since it enables analysis of the profit 'sacrifice' made by a firm accused of pricing at an anti-competitively low level. The firm would have been better off producing nothing (with costs avoided) than producing the units of output at a price below AAC. While AVC is suggested as a more workable proxy for marginal cost and normally associated with the short term, as time passes, fixed costs tend to become variable and a judgement as to whether a cost is fixed or variable is required. One potential issue is that AVC is generally calculated over the total output, not just the incremental output that might be related to any possible exclusionary conduct.

The application of a cost standard could reflect the competitiveness of the service. A lighter regulatory stance might be appropriate where competition has evolved, and an approach analogous to competition law might be warranted. Indeed, as explained below, there are benefits in introducing a degree of flexibility in the test by using a less stringent cost standard (LRIC) for the calls element of individual bundles, while ensuring that the ATC of the relevant product portfolio is recovered.[28]

In addition to selecting the appropriate cost standard, variations on any such cost could be made to include or exclude specific types of cost depending on whether it was appropriate for cost recovery. For example, if the net revenue test was being applied to an individual bundle, in principle common and indirect fixed costs could be excluded. This is because these costs would not apply to the production of a single, marginal bundle. Therefore, it is of some importance to develop a theoretical framework, first for establishing the economic principles behind a particular cost standard, and, second, for the inclusion or exclusion of specific types of cost during calculation. It is important that this framework integrates the relevant economic and accounting concepts.

5.2 Treatment of specific cost elements

Direct costs are those that vary directly with the number of bundles sold. In contrast, common costs are those costs that relate to the production of the bundles, but are not directly proportional to output of a specific bundle. Fixed indirect costs, according to the proposal for the revised net revenue test model, do not relate specifically to products or bundles being sold.

5.3 Oxera conclusions on the cost standard

As noted above, there are reasons to apply a less stringent cost standard with respect to individual bundles as long as the recovery of ATC over a broader portfolio is ensured. (the test for individual products would resemble competition law assessments.) To this end, ComReg is introducing a combinatorial test whereby the wider portfolio must enable recovery of ATC—ie, a sufficient contribution towards common costs—and the replicability of each individual bundle should allow for recovery of at least LRIC of the calls element. This approach is consistent with Oxera's reasoning presented above.

[28] Section 6 discusses in further detail how the portfolio approach could be implemented.

6 Degree of product aggregation in the net revenue test

From ComReg's perspective, deciding on whether and how to implement an aggregate/portfolio (hereafter referred to as 'portfolio') approach in its net revenue test is a policy question related to its objective of promoting entry into the retail access and broadband markets. Hence, the considerations it should take into account to make this decision are similar to the criteria for relaxing the test on other fronts (EEO/SEO and cost standard).

A combinatorial test is being considered: a portfolio approach for passing (FL-) ATC. Therefore, if an individual bundle is very popular within the suite (ie, accounts for most of the volume), that individual bundle will have to recover its FL-ATC so that the suite of bundles as a whole recovers its FL-ATC.

Identifying the appropriate level of product aggregation for the test is conceptually consistent with defining the relevant product market. Here, it is important to identify sub-groups of products, or products sold in certain geographic areas, with similar demand or supply characteristics. For example, broadband products could be considered within the same group of products, but differentiated by broadband speeds. Alternatively, demand- and supply-side characteristics may vary across different areas to such an extent that it is appropriate to define the boundaries of portfolios on the basis of geographic units.

This section discusses the relative merits of the product-by-product versus portfolio approach in the net revenue test, and the implications of using a combinatorial test.

6.1 Product-by-product versus portfolio approach

There are a number of reasons underpinning the use of a product-by-product test in an ex ante setting which are consistent with the regulatory objective to provide entry assistance to markets dominated by eircom.

– It may not be realistic to 'require' a new entrant to replicate all, or a large part, of eircom's product mix, or, at the extreme, its entire product portfolio.

– Carrying out the margin squeeze analysis at the individual product level provides for a range of competitive outcomes. Conducting the test on a portfolio basis requires ComReg to specify the products included in the portfolio on a forward-looking basis, which can prove challenging in practice.[29]

– A product-by-product test approach may be appropriate where there might be: 'a new offer giving rise to a margin squeeze, which is currently subsidised by other profitable offers but whose volumes could increase substantially in the future, subsequently leading to an overall negative margin in the future'.[30]

However, from an economic perspective, there are efficiency gains that could be achieved through the portfolio approach.

– A welfare-maximising pricing structure of a multi-product firm with market power is one where common costs are recovered such that there is an inverse relationship between

[29] This reasoning underpinned Ofcom's decision to implement a form of product-by-product test. Ofcom (2004), 'Direction Setting the Margin between IPStream and ATM interconnection Prices', August 24th, p. 22, para 2.48.
[30] European Commission (2007), *Wanadoo España vs. Telefónica*, Case COMP/38.784, para 387, p. 109.

prices and elasticities of demand. This would suggest that, as long as the overall portfolio passes the net revenue test, the portfolio approach would be beneficial for consumer welfare.

– As an entrant gains market shares, its decision-making process entails an assessment of the profitability of its investment across its entire product range offering in the market, which suggests that the portfolio test should be applied.

Thus, there are sound economic reasons for first relaxing the test along the product–aggregation dimension—ie, before relaxing the cost standard assumption applied in the test. Given this, the use of a combinatorial test that ensures the recovery of the total costs by the portfolio could provide eircom with sufficient pricing flexibility without distorting entry conditions.

6.2 Conceptual framework to define appropriate bundle portfolios

Conceptually, defining which products are included in the relevant portfolios is analogous to a market definition exercise. More specifically, the definition of portfolios should recognise the demand and supply conditions of individual bundles, and the grouping should be conducted by identifying those bundles that are considered substitutable. However, there are practical challenges in undertaking a detailed market definition exercise for every bundle launched (requiring consumer survey information, for example).

As a consequence, more practical approaches could be considered, while recognising that the following attributes would be informative.

– Consumers consider bundles included in the portfolio to be relatively close substitutes (or there is a realistic prospect of a chain of substitution). Historical evidence on the demand of bundles, or the relevant stand-alone components, could inform ComReg's decision in this respect.

– Bundles included in the portfolio are such that the operators can switch to provide any of the bundles within the portfolio without incurring significant costs (eg, the bundles would not rely on different infrastructure and/or wholesale inputs).

Practical implementation of the portfolio approach is discussed further below.

6.3 Applying the portfolio approach in practice

Should ComReg consider that competition is sufficiently developed in the Irish market to warrant an alternative approach to product-by-product, the next question for ComReg is how to use make sure that consumers receive the full benefits of the alternative approach and that it cannot be abused by eircom or lead to foreclosure of competitors. There are several options:

– applying the test separately for a portfolio of voice-only bundles, and a portfolio of bundles that includes broadband connection;
– defining the portfolios on the basis of the type of end-customer (business or residential);
– defining the portfolios on the basis of broadband connection bandwidth;
– defining the portfolios depending on the underlying bitstream access products;
– defining the portfolios on the basis of whether the bundle is provided over a legacy or NGA network;
– defining the portfolios on the basis of the prospects of competition in a given exchange area. (The degree of LLU-based competition may be related to the NGA footprint, although the current LLU pricing model assumes that there are fewer exchanges that would be unbundled than in the case where eircom is deploying NGA infrastructure).

The decision on which option to use could be linked to considerations of what the relevant retail market(s) are and the level of competition within them, the markets that are of most concern to ComReg, and the extent to which eircom could cross-subsidise losses in some bundles with gains in others, leading to foreclosure of rivals.

– For example, line rental, calls and broadband are separate retail markets. This could suggest that, to avoid cross-subsidisation between different relevant markets, different portfolios could be defined—eg, voice-only bundles versus broadband bundles.

– If, on the other hand, there were a relevant market for bundles, a portfolio approach for all types of bundle could be warranted. However, it is noted that, thus far, ComReg has not defined retail markets for bundles (nor indeed has any other NRA), and that doing so would be subject to European Commission approval.

Crucially, cross-subsidisation is not an issue in itself if such a scheme could be replicated by entrants and does not foreclose them.[31]

The following indicative evidence could inform the definition of portfolios for the net revenue test.

– On the basis of the evidence reviewed, there appear to be broadly consistent take-up patterns among different bundles with legacy-level broadband components (excluding NGA).[32] While there are some differences between speeds, it might be difficult to identify in practice bandwidth ranges that exhibit particular demand characteristics.[33] Furthermore, in 2011 Oxera observed that the margins earned on bundles are somewhat similar, suggesting similarities in demand conditions across Talker and Chatter bundles with broadband.

– Competition seems to be more intense in urban areas than elsewhere in Ireland. Certain exchange areas seem to be more profitable to unbundle, and, given the economies of density in these exchange areas, eircom's NGA footprint is also concentrating in these areas (see further discussion in section 2).

– Voice-only bundles, on the contrary, have exhibited higher margins, although these margins have been eroding over time. Higher margins could be indicative of a relatively limited degree of competition manifested through low churn rates among customers using only basic services. However, insofar as the margins continue to reduce over time, there may be less case to treat them differently in the net revenue test. ComReg considered these characteristics and concluded that treating voice-only bundles separately may not have a material impact.[34]

– On the supply side, the bundles currently in the market are replicable (given that eircom provides access to necessary wholesale inputs). However, there may be differences in the interface and pricing of bitstream services over eircom's NGA.

[31] Even ComReg's existing approach of testing individual bundle variants involves some degree of cross-subsidisation between elements of the bundle—for example, profits earned from international and out-of-bundle calls subsidising line rental and broadband components.

[32] eircom data provided by ComReg.

[33] It is possible that a 'chain of substitution' exists among these bundles.

[34] ComReg (2011), 'Review of the appropriate price controls in the markets of Retail Fixed Narrowband Access, Wholesale Physical Network Infrastructure Access and Wholesale Broadband Access: Further specification of certain price control obligations in the markets of Retail Fixed Narrowband Access and Wholesale Physical Network Infrastructure Access', October 10th, paragraph 4.32.

6.3.1 Ex ante versus retrospective assessment of portfolios

While an ex post competition law assessment would rely on data on realised market outcomes, a critical prerequisite for an ex ante test is a forecast of the mix of customers across loss- and profit-making bundles, and a predefined mechanism to address any discrepancy between actual levels relative to forecast. This may not be a significant issue currently, given the monthly monitoring done by ComReg.

At the time the bundles are launched, there is no information on the relative demand patterns of different bundles. The test is not based on overall revenues and costs, but rather the prices at a given point in time.

The realised revenues and costs could be retrospectively assessed against eircom's estimates after a predefined period (currently every month). Any differences between the two would be taken into account in the terms and conditions of subsequent periods. Should the test fail ex post, the respective bundles could be withdrawn if required.

There are some practical challenges in the implementation of the portfolio approach:

– the forecast volumes for the individual bundles may be incorrect and would affect the weighting of the various bundles; and/or
– the actual ATC may be different to the forecast ATC when setting price.[35]

As with any regulatory model based on projections of demand and costs, the net revenue test (even if product-by-product) is subject to a degree of uncertainty. While this is unavoidable to some extent, the distortions could be mitigated as follows:

– careful design of the relevant portfolios should address the first of the two concerns above to a large extent ex ante. In other words, bundles that face similar demand conditions would be expected to fail/pass the test consistently;
– insofar as the predefined portfolios include bundles that exhibit substantially different take-up relative to projections to the extent that the portfolio test fails, these bundles could be withdrawn from the portfolio without necessarily requiring eircom to stop providing the other bundles;
– the use of forward-looking ATC causes further uncertainty.

6.4 Oxera conclusions on the portfolio approach

On the basis of the above reasoning, and the indicative market information reviewed, Oxera concludes that the following options for portfolios could be appropriate.

Option 1:

1. Voice-only bundles.
2. Bundles with a legacy-level broadband component (non-NGA);
3. Bundles with a broadband component relying on NGA infrastructure.

Option 2:

1. Bundles with a legacy-level broadband component (non-NGA);
2. Bundles with a broadband component relying on NGA infrastructure.

[35] This is similar to the current net revenue test where a bundle could fail due to costs rising above expectations or volumes being lower or higher than expected.

Option 3 (included after the first 2011 report was published, reflecting on ComReg's consultations and additional analysis undertaken)

1. All bundles within the LEA area;

2. All bundles outside the LEA area.

Any of the above portfolios could include unregulated products, as discussed in section 8.

The above portfolios could be considered to exhibit sufficiently similar demand and supply characteristics (for example, in terms of underlying network elements). Given that, as noted above, the demand conditions for voice-only bundles may be different to some extent (as manifested through higher margins[36]), some caution should be applied in relation to Option 2. However, it is recognised that eircom must also pass an individual bundle test based on a lower cost standard than ATC for retail calls, and hence eircom should not be able to offer any particular bundle significantly below cost by cross-subsidising. Nevertheless, Options 2 and 3 could provide eircom with flexibility to recover its common and fixed indirect costs from voice-only offerings, which are not offered by entrants to any similar extent, and are likely to exhibit lower firm-level demand elasticity.[37]

A distinction between NGA and non-NGA areas was made in the 2011 report, since it is considered that the NGA footprint is likely to reflect the degree of competition (demand- and supply-side conditions in different areas). However, it is noted that the area where ComReg has considered LLU to be viable (as reflected in the LLU model) is smaller than eircom's NGA footprint. Consequently, ComReg could consider introducing either Option 1 or 2 on the basis of prospects of competition in a given exchange area. Indeed, while the presence of the NGA footprint is largely consistent with the footprint of unbundled exchanges, on the one hand, and the footprint of UPC's cable network, on the other, the provision of NGA-based products does not seem to fully capture the supply- and demand-side characteristics between different areas.

ComReg's approach is to apply the portfolio-based test in LEA areas and conduct the test on a bundle-by-bundle basis in areas outside the LEA.[38] ComReg's portfolio test would cover all bundles (voice-only, bundles including broadband, voice, and possibly other components). This approach has merits in that it captures the supply-side differences (costs, network technology) which in turn define the degree of competition and products offered by eircom and OAOs. Furthermore it is within the LEA where eircom and other DSL operators will need more pricing flexibility, given the somewhat intense retail competition with UPC. ComReg's approach is therefore consistent with Oxera's initial recommendations.

While eircom's offerings could be broken down further to narrower portfolios, this could undermine the company's pricing flexibility, which is a central economic underpinning of the portfolio approach.

[36] These margins may reduce over time in the context of FTR/MTR reductions that may result in downward pressure on retail prices for calls. In addition, the move to voice over broadband services may influence voice service margins over time.

[37] Oxera has not undertaken a formal market definition assessment.

[38] ComReg (2011), 'Review of the appropriate price controls in the markets of Retail Fixed Narrowband Access, Wholesale Physical Network Infrastructure Access and Wholesale Broadband Access: Further specification of certain price control obligations in the markets of Retail Fixed Narrowband Access and Wholesale Physical Network Infrastructure Access', October 10th; ComReg (2012), 'Supplementary Consultation to ComReg 11/72 – Price regulation of bundled offers', June 15th.

7 Bundles that do not rely on narrowband access—'naked DSL'

ComReg's regulatory powers with respect to bundles have pertained to products sold in conjunction with fixed narrowband services. There is, however, a realistic prospect that eircom would launch similar bundles, but instead of providing telephony over the PSTN network, voice access and call services would be offered over alternative means, such as mobile or voice over IP (VoIP) and the broadband component would be the 'naked' broadband connection. This is technically possible. Moreover, evidence from other countries shows that a VoIP service can meet the quality standards of publicly available telephone services (PATS) and hence be regarded as similar to standard PSTN.[39] VoIP is not, however, included in the fixed narrowband access (Market 1) market definition, and hence the obligation not to unreasonably bundle does not cover VoIP services.

A potential regulatory concern is that eircom could 'bypass' the obligation by providing similar bundles over 'naked DSL' connections. Indeed, eircom could introduce a 'Naked DSL product'. Under this scenario, the current obligations would not apply. The existing obligations underlying eircom's pricing of the regulated WBA and WPNIA products would need to be adjusted to take account of 'naked DSL'-based offers, albeit recognising that eircom should have sufficient incentives to innovate and launch new products. The form in which these adjustments are introduced to the existing decisions is essentially a legal question, and outside Oxera's remit. Nevertheless, from an economic perspective, there are a number of principles to which the regulatory framework should adhere when defining the appropriate remedies.

– Technology neutrality—regulation of (substitutable) SMP services should not depend on the underlying technology used to deliver those services. More specifically, insofar as eircom's SMP does not result from its position with respect to narrowband technology, but rather from its existing customer base, the technology over which services are provided would not seem to matter. As a consequence, the remedy obliging the incumbent not to bundle unreasonably would be warranted regardless of the underlying technology or wholesale product offering. Further assessment would be needed on the extent to which entrants are able to replicate bundles without SB-WLR service—eg, by relying on WBA and offering voice services over broadband, thus effectively bypassing wholesale line rental services.

  While bundles that do not have fixed-line telephony as the focal product do not fall under the scope of the obligation 'not to unreasonably bundle', there may be circumstances under which eircom can leverage its existing market power. More specifically, in principle, it could migrate existing fixed-line customers to naked DSL-mobile bundles with pricing that is not replicable by entrants.

– Ladder of investment—it would seem necessary to ensure sufficient economic 'headroom' between regulated prices of different access services in order to incentivise efficient entrants to invest in infrastructure as deep into the network as economically feasible.

The current retail-minus price control includes an obligation not to margin (price) squeeze, and is set on an SEO basis. Furthermore, eircom currently has a regulatory obligation not to margin (price) squeeze in the WPNIA market. In order to ensure sufficient economic headroom on a consistent basis, it seems advisable to use an approach that resembles

[39] See, for example, European Regulators Group (2005), 'ERG common statement for VoIP regulatory approaches', ERG (05) 12.

ComReg's principles and methodology on other related markets. Thus, in the case of WPNIA products, this would suggest basing the test on REO principles. The application of the REO approach would be in line with ComReg's reasoning underlying margin squeeze tests for other related wholesale products. Furthermore, it ensures sufficient economic headroom in circumstances where entrants do not enjoy comparable economies of scale and scope to eircom.

8 Treatment of unregulated products

This section discusses the implications of the inclusion of unregulated products, such as fixed or mobile voice calls, mobile broadband, (IP)TV, for the net revenue test. In particular, the application of the test for different types of unregulated products is considered, followed by discussion on the assessment of relevant costs underlying the additional service included in the bundle.

Central to this assessment is understanding whether eircom is in a position to horizontally leverage its market power. The incumbent may be pricing the bundle in order to leverage market power from one retail market (eg, line rental) into another, potentially competitive, market. In this sense, the combined retail price obscures too-high pricing of the former product (which captive consumers need) and too low a price being offered for the product that entrants are keen to supply. For example, the SMP product may be offered at a certain price, with the non-SMP product offered for free. However, given the economies of scope, network effects, strong complementarity of product offerings, and the fast-moving market, there is still the potential for leverage to be a credible strategy for an incumbent.

In the Consultation document (10/01), ComReg proposed a two-stage test, whereby:

– the net revenue test would first be undertaken using the retail price of the additional product as a basis (thus effectively assuming a zero margin from the additional service);

and, if the test is not passed;

– eircom would be obliged to provide evidence on the (positive) margin generated through additional products.

Indeed, it seems useful to clarify that Oxera recognises that retail charges may not be on a competitive level, and, when included in bundles, the incremental price may be below the price of a stand-alone product. Furthermore, from eircom's perspective, pricing the additional product at the same level as a stand-alone service is unlikely to be a viable strategy. Hence, retail price could be used as a proxy for relevant costs in the first stage of the assessment, simply in order to avoid a burdensome cost assessment where unnecessary.

Box 8.1 Using retail price as a basis

A potential approach that has been considered for treating unregulated products in the test would be to use the retail price as a benchmark of incremental cost. This assumes that the product market is competitive—ie, that all costs are being passed through to the consumer and thus incremental costs are reflected in the price. There are some considerations when using the retail price as a benchmark for unregulated product costs:

– evidence that the market is competitive is required, in order to avoid a situation where the starting point is not the competitive price;
– how can the competitive price be identified? In competitive markets, price is often equated to marginal cost; however, a large share of costs in the telecoms sector will be fixed costs with a relatively small proportion of marginal costs. Therefore, the retail price is likely to be higher than the marginal cost.

Given this, using retail price as a proxy could serve as the basis in the first stage of the test, but if the test is not passed, a more thorough analysis of the relevant cost base (and consequent margins) would be required. However, it would not be the primary approach, given the above concerns.

8.1 Rationale for considering unregulated products in the net revenue test

The fact that additional products are not provided over retail fixed narrowband access is not in itself a sufficient condition to conclude that eircom's bundles would not create competition problems. A potential concern is that eircom could leverage its market power to competitive markets (cross-subsidisation), and would therefore be able to undermine the effectiveness of ComReg's remedy. Furthermore, providing additional products at prices below relevant costs could further strengthen eircom's position in markets where it is likely to have market power. More specifically, the risk could be twofold:

– efficient providers of the additional products may be unable to compete with eircom if they do not have access to the relevant upstream input, rendering additional products non-replicable. Setting the incremental price of the additional unregulated product below its incremental costs may be profitable for eircom in the long term, given that potential rivals for standard bundles would not be able to compete on equivalent terms;

– consistent with the arguments presented above in relation to the portfolio approach, there are sound reasons why ex ante regulation should not require entrants to provide a product offering that is equal to that of the incumbent.

These concerns may be mitigated to some extent if the markets of unregulated products are not fully competitive—ie, other operators may have strong positions in markets such as mobile communications (whether voice or broadband) or indeed digital TV broadcasting transmission. Nevertheless, it would seem to be essential to assess the relative importance of the additional products in the market, and the extent to which these bundles could be replicated by entrants.

8.2 Net revenue test with additional communications products

In simple terms, to replicate a bundle that encompasses products that do not rely on SB-WLR, the maximum price that an entrant could set for the bundle is such that, together with the non-replicable component, it does not exceed eircom's price for the bundle. Algebraically:

$$P_{1,2} \geq P_1 + C_2 \qquad \text{(Inequality 1)}$$

$P_{1,2}$ refers to the prices of the replicable bundle, and the additional unregulated product, and C_2 to the costs of additional unregulated service. Furthermore, P_1 consists of the access price (A_1) and retail costs (C_1) of the regulated part of the bundle: $P_1 = A_1 + C_1$. Hence, the test becomes:

$$P12 \geq A1 + C1 + C2 \qquad \text{(Inequality 2)}$$

Put differently, the test on unregulated products is a question of whether the incremental price associated with the additional features compensates for the respective incremental costs. If the incremental price of an additional unregulated product were lower than its (long-run) incremental cost, two principal effects could emerge:

- competition might be distorted in the markets of stand-alone (unregulated) products—a situation analogous to predatory pricing;
- entrants might be foreclosed from the provision of bundled services because they would not have access to the relevant wholesale products.

Consequently, if the net revenue test were not passed, further adjustments to wholesale charges would be warranted. This is because, in effect, pricing of a bundle with unregulated elements can 'reveal' the efficient level of costs. It might be reasonable to apply such a discount to all wholesale prices, and not just those offers encompassing additional elements, to avoid any distortions in competition in the sales of stand-alone products.

If more than one unregulated element were to be included in the bundle, Inequality 2 could be generalised to include additional elements from which profits could be generated. Put another way, as long as the bundle could be replicated by entrants—ie, they would have access to the relevant wholesale inputs—the relevant question is whether the overall revenues associated with additional unregulated products exceed the respective incremental costs.

8.3 Appropriate cost standard for unregulated services

Two types of unregulated service warrant different approaches to derive C_2:

- **services sold on a stand-alone basis**—for these services (eg, mobile broadband), the retail price would be first used in the net revenue test as C_2. As set out above, if not passed when using the price as a proxy, the test should subsequently be conducted on the basis of relevant costs.

- **services not sold on a stand-alone basis**—for these services (eg, voice calls or an IPTV offer provided over xDSL), using the LRIC of the additional service would be the conceptually appropriate approach in the net revenue test.

Where costs are applied in the net revenue test, the **costs should be at least equal to the (long-run) incremental costs (LRIC)**. The costs are considered as LRIC, which means a long enough time period for all costs to be treated as variable (eg, customer lifetime). Correspondingly, the revenues associated with additional products would be those generated over a long enough time horizon (ie, average customer lifetime). The implication is that some additional products may warrant low pricing early in their life cycle (depending on the depreciation profile, for example).

However, there are practical challenges in implementing a rigorous estimate of LRIC of an unregulated service, given that these could be any services that are included in the bundles now and in the future. The application of a cost standard could reflect the competitiveness of the service. The assessment would involve two elements: whether the bundle can be replicated by entrants; and what relevant costs are associated with the additional product.

A lighter regulatory stance could be warranted with respect to new unregulated services, whereby eircom's SMP position in the narrowband access services does not provide it with an undue competitive advantage in the adjacent markets.

Where eircom holds a strong position in the market, the objective to promote entry may warrant the application of a cost standard that enables entrants to recover their fixed and common costs. The economic reasoning for the use of such a cost standard in markets where entrants have cost disadvantages relative to eircom stems from the notion that entrants, with significantly lower economies of scale and density, could not replicate eircom's services at the same level of unit costs; hence, a cost standard that incorporates all common and fixed costs could be warranted. Using the definitions of Box 5.1, LRIC+ could therefore be an appropriate cost basis. The mark-up for common costs ('+' element) may not be relevant if eircom does not enjoy cost advantages with respect to the unregulated service. In any case, the relevant fixed costs would need to be incorporated (as it is in LRIC). It is recognised, however, that eircom's position may not be strong with respect to new services such as TV and mobile broadband, where cable-TV and mobile operators are currently 'incumbents'. For example, Ofcom is proposing to apply the LRIC approach on additional services in the context of the retail-minus regulation of BSkyB.[40] Box 8.2 summarises some key conclusions of this relevant precedent, together with some other recent precedents.

Box 8.2 Treatment of additional services in Ofcom's retail-minus scheme for BSkyB

Central to Ofcom's reasoning is the notion that as long as the incremental price of an additional product is at, or above, its LRIC, there is no concern about distortions in the market.

> Efficient rival providers of the additional product would be able to compete, and consumers would have an undistorted choice between taking the additional product from Sky or from an alternative provider.

If this condition were not met, the bundle would not be replicable, while it could be profitable for BSkyB (in this context) for strategic reasons. Ofcom has not undertaken (or at least has not disclosed) a detailed analysis of BSkyB's incremental costs and incremental prices to confirm whether any of Sky's current bundles would give rise to concerns. However:

> To safeguard the effectiveness of the remedy, we propose that wholesale prices should be subject to a further adjustment in the event that Sky bundles additional retail products where the incremental price for the additional product is below its long run incremental cost.

Thus, Ofcom's decision seems to suggest that the assessment of replicability of bundles would be undertaken on a case-by-case basis. It does, however, refer to *incremental* costs.

Should ComReg choose to assess the price of the additional product against the cost of providing the product, the cost definition should be specified clearly ex ante, such that it would be applicable for a range of additional product types. In this context, a LRIC standard appears appropriate, since it is the lowest price level above which competition would be sustainable.

Benchmarking approach

Where costs cannot be estimated, or it would be disproportionate to estimate them, a proxy could be adopted using benchmarking techniques to estimate a margin earned on the competitive services, with that margin then subtracted from the stand-alone price. Appropriate benchmarks would be telecoms operators in other countries with a product offering and risk profile similar to that of eircom.[41] However, given the apparent challenges of

[40] Ofcom (2009), 'Pay TV Phase Three Document: Proposed Remedies', June, para 7.77.

[41] This is because higher risk is reflected in higher returns required by investors and, over the long term, returns should on average be expected to be in line with risk.

finding appropriate comparators, benchmarking would serve as a cross-check only in cases where evidence on costs is incomplete or ambiguous.

8.4 Promotional offers

Under some circumstances, the inclusion of additional elements in the bundles represents a form of promotional discounting, whereby short-term losses are recovered soon after the initial launch. The test set out above would be applicable for such offers.

ComReg has indicated that it now allows promotional discounts to be recovered over a minimum contract term of 12 months. This would allow eircom to sell a bundle at a lower introductory price for the first six months, when they commit to a 12-month contract. Furthermore, thus far, it has been ComReg's approach not to amend the net revenue test for promotional offerings, and it would be appropriate to apply this principle to bundles with unregulated services.

As discussed above, a forward-looking assessment could, in principle, indicate that the promotional offer is profitable over the (average) customer lifetime. However, while the DCF approach has merits in the context of ex post assessment and ex ante assessments for products whose costs and take-up can be forecast (see discussion above), predicting the take-up and associated cash flows of new bundles over several years can be challenging in practice.

8.5 Oxera's conclusions on additional unregulated products

On the basis of the above analysis, it seems that the conceptually appropriate basis for assessing the inclusion of unregulated products would be to estimate whether the incremental revenues (over the lifetime of the customer) exceed (at least) the corresponding LRIC. As recognised, there are apparent practical challenges and the following is therefore proposed.

– The incremental cost analysis would need to be undertaken on a case-by-case basis, and eircom would be obliged to provide cost estimates that take into account all relevant costs that an efficient entrant would incur.

– This evidence would be reviewed by ComReg and the assessment could be supplemented by benchmarking the level of returns generated through comparable services in Ireland and in other countries. However, given the apparent challenges of finding appropriate comparators, benchmarking would serve as a cross-check in cases where evidence on costs is incomplete or ambiguous.

– A distinction should be made between products that can be replicated by OAOs and those that the entrants cannot realistically offer owing, for example, to costs and demand characteristics.

9 Conclusions

This report has presented up-to-date evidence on the recent market developments in Ireland, and considered options for adjusting the net revenue test applied in the context of bundled products that include voice services provided by eircom. Oxera has concluded that the market dynamics have evolved since the initial net revenue test was developed and implemented, and it would seem advisable to adjust certain elements of the test. The report has been updated to reflect the market situation in Ireland in January 2013, and the additional analysis conducted to define areas in which structural competitive conditions warrant adjustments to the design of the net revenue test.

While eircom is facing competitive pressure from UPC at retail level where UPC is present, competition from alternative operators relying on eircom's infrastructure has not, thus far, developed to the extent that it could have. Furthermore, there are structural differences in terms of the footprints of UPC and unbundlers, as the two overlap and are both concentrated on densely populated areas. In summary, the framework presented in this report seeks to strike a balance between the following regulatory objectives.

– Ensure that eircom is provided with sufficient pricing flexibility so that it can compete effectively with cable offerings, and adjust its bundle specifications to meet competition. Given that OAOs' pricing is intrinsically linked with eircom's wholesale charges (whether LLU or SB-WLR/WBA), constraints on eircom affect the competitiveness of alternative operators.

– Ensure that efficient entrants with different product portfolios and financial resources have the ability to enter the fixed market and that the market does not lead to only eircom and UPC having strong position and viability.

– Ensure that the framework applied for bundles is consistent with the overall regulatory package and that there are sufficient incentives to provide bundles of services outside the most competitive areas.

Figure 9.1 summarises Oxera's proposed approaches to various elements of the net revenue test relative to the former net revenue test.

Figure 9.1 Summary of the proposed adjustments

	Current NRT	Proposed approach
OAO modelled *(EEO / REO / SEO)*	EEO for calls and PSTN, SEO for BB	EEO for calls and PSTN, SEO for BB
Portfolio versus product-by-product	Product by product	Combinatorial test: - ATC for portfolio - ATC for product by product in and outside LEA; LRIC for retail calls in LEA
Cost standard *(ATC, LRIC)*	ATC	
Relevant wholesale input *(WLR / Bitstream / LS / LLU)*	WLR + Bitstream	WLR + WBA outside LEA Blended wholesale price in LEA[1]
Retrospective / forward-looking	Retrospective	Forward-looking with retrospective monitoring
Unregulated products	Retail price	LRIC

Note: [1]Blended wholesale price based on legacy inputs for legacy-level bundles; blended wholesale price based on NGA inputs for NGA bundles.
Source: Oxera.

In conclusion, with regard to some elements of the current net revenue test, the benefits of relaxing the test seem sufficient to offset any potential risks to competition. In particular, Oxera has set out reasons why, and shown how, additional flexibility could be introduced by applying a less stringent cost standard for individual bundles, while ensuring that the total costs are recovered through predetermined portfolios of bundles. Furthermore, it would seem justifiable to employ forward-looking, rather than historical, cost estimates in the test to the extent that reliable cost estimates are available.

Caution should be exercised before the test can be undertaken on the basis of physical access products (LLU or line share). This is simply because evidence from the Irish market does not suggest that the entrants have yet found LLU to be a viable strategy for large-scale entry, although there have been promising developments in the take-up of line share. Therefore, Oxera proposes that a combinatorial threshold could be determined, whereby the test could be conducted on the basis of alternative wholesale inputs in those exchange areas where a sufficient number of competitors have a presence and a sufficient number of lines are unbundled in the overall market.

However, given that competition has evolved in certain areas (namely LEA), there may be reasons to base the test on a blended rate reflecting prices of different wholesale inputs. The rationale for such an interim measure stems from the fact that entrants' LLU footprint is concentrated on these areas, and, importantly, UPC's cable offerings constrain prices of all DSL operators in the same exchange areas. Thus, providing a degree of flexibility through the application of a blended rate could be considered as a means to ensure the ability of DSL operators (eircom and OAOs) to compete and respond to UPC's offers. In this respect, since the publication of the 2011 report, ComReg has conducted significant analysis to define the precise exchange areas where adjustments to the net revenue test could be warranted. As discussed in this updated report, these criteria strike the balance between practicality and granularity, and reflect supply- and demand-side conditions.

The LEA criteria is also consistent with the principles set out in Oxera's 2011 report. In particular, in its definition of LEA, ComReg does not consider the presence of cable networks to be a sufficient condition to relax the test; rather, it requires further evidence of infrastructure competition. Furthermore, ComReg has taken into account the ongoing roll-out of eircom's NGA, which has implications for the product offering, and provides an indication of the exchanges that could be reached by independent infrastructures.

Regarding the assumption on entrants' efficiency, given that their market shares in the DSL platform are not as high as they could be a predefined threshold could be introduced. Once achieved, an approach more closely aligned with competition law could be considered. There are regulatory precedents of similar incentive mechanisms in other sectors and countries.

Regarding the treatment of unregulated services, ComReg has defined principles that are consistent with competition law principles, and are unlikely to put eircom at a disadvantage relative to the OAOs.

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