

A price control for regulation of wholesale charges for non- geographic numbers

Final report for ComReg
Non-confidential version

11 November 2019

Contents

0 Issues raised at consultation	1
0.1 Prior report and consultation	1
0.2 Response to consultation comment.....	1
1 Introduction	6
2 Principles for wholesale pricing.....	9
3 1800 Freephone	15
3.1 Options for regulating wholesale origination rates for fixed and mobile calls to 1800.....	18
3.2 Conclusions.....	28
4 Non-freephone numbers	30
4.1 Current wholesale rates and payment flows.....	30
4.2 Case for intervention.....	36
4.3 WORs vs. WTRs.....	38
4.4 Assessment of the options	43
5 Conclusions.....	45
Annex A Implementation of the price control based on modelled costs.....	47

Tables & Figures

Table 1: 1800 wholesale origination rate (WOR) in the deemed-to-be regime	16
Table 2: BT and other fixed operators' 1800 wholesale origination rates after leaving the deemed to be regime	17
Table 3: Mobile operators' 1800 wholesale origination rates	17
Table 4: BT 1850 and 1890 WORs after leaving the deemed to be regime	31
Table 5: Mobile operators' 1850 wholesale originating rates:	32
Table 6: Mobile operators' 1890 wholesale originating rate	33
Table 7: Fixed and mobile to 0818 wholesale originating rate in the deemed to be regime	34
Table 8: Fixed and mobile to 076 wholesale originating rate in the deemed to be regime	34
Table 9: Summary of recommendations on the cost modelling approach	56
Figure 1: The NGN value chain	9
Figure 2: Revenues and costs by party	13

o Issues raised at consultation

o.1 Prior report and consultation

This document updates our previous report published in May 2019 on wholesale charges for non-geographic numbers (ComReg 19/46a) in the light of ComReg's consultation (ComReg 19/46).

In our view, this consultation did not raise any significant new issues requiring revision of our original report. Therefore, we have re-issued the original report, but with this additional introductory section discussing the views of respondents where they touched on issues discussed in the original report.

We have also made a small number of minor amendments to our previous report. These include a reference in Section 3 to cost modelling now completed by Analysys Mason. We have also elaborated on our conclusions.

o.2 Response to consultation comment

Glide path

Two respondents (Tesco and Virgin Media) objected to our recommendation that price levels for mobile origination of calls to 1800 numbers should be reduced to a regulated rate with relatively little notice. These respondents proposed that a glide path would mitigate harm to operators.

In our May report, we explicitly considered the option of a glide path. However, when we considered the magnitude of the price change required, the likely limited scale of impact on typical operators' profitability, and the potential benefit from elimination of significant harm to SPs due to existing rates, we concluded that it was not proportionate to continue to allow rates to remain significantly above the modelled costs for an extended period. We noted that there would be no need for the revision of contracts, and as this assessment applies to freephone numbers, no need for any retail price adjustments. For all of these reasons, we emphasised that harm arising from existing wholesale origination rates of calls to 1800 numbers should be addressed as quickly as possible.

It is clearly true, as the two respondents pointed out, that WORs for mobile 1800 origination will need to fall more than WORs for fixed operators. However, this is the consequence of mobile operators

having set particularly high WORs, requiring larger adjustments to eliminate current harm.

We note that only a small minority of originators proposed that a glide path was necessary for 1800 origination. Further, no significant new evidence or substantial argument in support of a glide path was provided by consultees.

Our original recommendation was in any case based on a balance of competing considerations. We were mindful of the potential profitability impact on originators, but found that this was limited relative to the scale of the likely harm that would continue if an extended glide path were used. Given this, we see no reason to revise our original recommendation.

Countervailing bargaining power of terminators

One respondent (Tesco) queried a statement in our May Report that it claimed implied that an MVNO has the ability to increase wholesale origination rates at will and independently of others, without any analysis of the negotiating process between the MVNO and transit and terminating operators.

In our May report, we stated that *"[t]he ability to set WORs independently of other OOs, as seen in the range of wholesale prices currently being charged, provides further evidence of the absence of a constraint on WORs from competitors or end users."* We have also set out explicitly and in detail in an earlier report (ComReg 18/65a) why terminating operators for NGN calls cannot exert countervailing bargaining power against originating operators. Specifically, on page 16 of ComReg 18/65a, we say:

"It is typically not possible for TOs to exert a significant degree of countervailing power against specific OOs due to the requirement to maintain end-to-end connectivity and the desire of SPs to be reachable by callers on every network. This provides OOs with the potential to raise wholesale prices with little loss of volume."

Therefore, terminators (or transit operators) do not have the threat of not accepting calls from a particular origination with high WORs. Furthermore, the incentives of terminators to seek lower WORs from any one originator may be diluted by the fact that charges to services providers will typically be determined by an average of different WORs across different originators. It is not necessary for us to consider the detail of negotiations between any particular operator and terminating operators (or transit operators), as this is not sufficient to constrain the originator's market power significantly.

We accept that the costs of transit and termination may differ between operators. However, as Table 3 (in Section 3 below) shows, all mobile operators, whether they are large or small, whether an

MNO or an MVNO, charge wholesale rates for the origination of calls to 1800 numbers that are excessive. This is consistent with both MNOs and MVNOs having the ability to price WORs independently of competitive constraints.

For the avoidance of any doubt, we do not see any significant difference in these conclusions between MNOs and MVNOs as originators of NGN calls. If an MVNO simply recharges its host network's WOR, then we must ask whether the host network's WOR is excessive. If an MVNO sets a different WOR to its host network, then the arguments above about originator market power apply with as much force to an MVNO as to an MNO.

Regulatory predictability

One respondent (Tesco) raised concerns that regulatory predictability was being undermined, as our previous report had highlighted three different legal routes to creating remedies to address the current excessive WORs. The respondent considered that a relevant market should be defined and, by implication as this was not explicit in the respondent's comments, any remedy should flow from a finding of significant market power within that relevant market. The respondent said that ComReg's approach runs contrary to that within the EC's Recommendation on Relevant Markets and the EECC, where a relevant market subject to ex ante regulation should be identified.

In our view, having a number of routes within the EU regulatory framework that could be taken to remedy excessive WORs does not undermine the justification for intervention, but rather enhances it. This multiplicity of potential routes does not create regulatory uncertainty, as these different approaches do not lead to different conclusions regarding appropriate remedies for WORs.

ComReg has chosen to focus on the potential for high WORs to threaten end-to-end connectivity as its primary justification for intervention. In our view, there is solid evidence of detriment to end-to-end connectivity seen in the decline in the use of NGNs (at a much faster rate than voice calls generally) set out in one of our earlier reports (ComReg 17/70a) and evidence of service providers ceasing to use NGNs or being prepared to cease use because of excessive charges.

One route open to ComReg would be to define a relevant market and make an SMP designation within that market, then formulate remedies to constrain that market power. However, ComReg is not under obligation to do this where alternative routes are available within the EU regulatory framework. Indeed, ComReg has a statutory objective to promote the interests of end users; given this and the immediate harm being caused by high WORs, eroding

connectivity between callers and SPs, it is appropriate for ComReg to take an expeditious approach.

Carry over of obligations on eir

One respondent (Tesco) claimed that we have been 'unduly influenced' by the price control obligations imposed on eir, and that it was not appropriate to impose a standard that applied under the Framework Regulations to an SMP operator on an obligation applied under the Access Regulations.

Our report clearly set out the options available to ComReg for addressing excessive WORs. At the start of the project, we considered what comparators may be relevant in the absence of modelled costs for mobile operators. This included an assessment of eir's regulated charges as a possible comparator, though we were clear to acknowledge the potential for cost differences between fixed and mobile networks. As the overall review of NGNs has progressed, ComReg has undertaken modelling of actual mobile origination costs, which meant that our previous analysis of potential comparators has become redundant. For the avoidance of any doubt, the remedies for mobile operators currently proposed by ComReg are not based costs for a fixed operator.

Approach to legacy 1850 and 1890 numbers

One respondent (Colt) raised concerns about proposals for 1850 and 1890 numbers and expressed a view that this approach amounted to 'regulatory forbearance'. While the respondent agreed that there would likely be short-term harm, it noted that the degree of exposure depends on the size of operator. Its view was that larger operators would internalise their wholesale origination/termination charges, as a large share of traffic is on-net. Business-only small operators, with mostly inbound terminating traffic are most exposed to the harm from excessive WORs for NGNs.

ComReg is currently implementing a set of retail measures that include 1850 and 1890 numbers (See ComReg 18/106) and which will shortly come into force. Therefore, any 'regulatory forbearance' now being exercised by ComReg is limited to its proposal not to impose additional wholesale measures for 1850 and 1890 numbers. The reason that ComReg is not proposing additional wholesale measures for 1850 and 1890 numbers is simply that these numbers will be withdrawn. This approach is consistent with encouraging SPs to move away from 1850 and 1890 numbers, potentially towards 0818 or 1800 numbers that would have in place a combination of both retail and wholesale remedies, protecting both SPs and callers.

Colt's description of potential short-term harm that would be caused if WORs for 1850 and 1890 were increased to a level where TOs could not cover their cost of service provision is correct. However, this risk

was explicitly set out and considered in our May report. It is also correct that smaller operators that terminate but do not originate traffic from 1850 and 1890 numbers would be most exposed to such risk. While recognising this short-term harm, it is also the case that SPs and TOs can limit any adverse effect by migrating to a more suitable alternative number range.

The retail measures that ComReg is now implementing require the retail tariff for calls to 1850 and 1890 numbers to be no more than the tariff for a call to a geographic number. This measure comes into force at the end of 2019 and will fully address excessive charges to retail customers. The consolidation of non-freephone NGN numbers has not been challenged, and this is now in the process of being implemented by ComReg. SPs, OOs and TOs have all been provided with reasonable notice that the 1850 and 1890 ranges will be withdrawn and have a reasonable length of time to migrate to alternative number ranges. In these circumstances, we would not consider it necessary to impose additional wholesale measures on 1850 and 1890 numbers.

1 Introduction

In previous reports for ComReg (17/70a and 18/65a), we presented evidence demonstrating the harm arising from high retail and wholesale charges for calls to non-geographic numbers (NGNs) set by originating operators (OOs) holding bottleneck control over access to their customers.

On the wholesale side, problems are particularly noticeable for freephone (1800) numbers, where excessive wholesale origination rates (WORs) set by OOs can lead to high costs for Service Providers (SPs) providing voice services over NGNs to their customers. These excessive WORs may result in some SPs shifting away from the use of freephone numbers to numbers where the caller must cover the cost of the call or even ceasing to offer services altogether; even where SPs continue to provide service over freephone numbers, the expense may diminish resources available for improving services and reduce incentives to develop such services. This is a particular issue where the services being provided are valuable to vulnerable members of society.

Although, at present, eir's wholesale origination charges (including those for NGNs) are regulated,¹ other fixed and mobile operators are not subject to any regulation for these services. We presented evidence of the differences between the regulated cost-oriented wholesale origination rate charged by eir and the wholesale charges imposed by other fixed and mobile operators. All operators charge wholesale rates for 18XX NGNs that are higher than eir's cost-oriented rate, but the scale of the excess varies between operators.

The ability to set WORs independently of other OOs, as seen in the range of wholesale prices currently being charged, provides further evidence of the absence of a constraint on WORs from competitors or end users. In our previous report², we provided evidence of the harm that excessive wholesale prices cause in the market, notably the impact on the decision of SPs not to provide services over NGNs and the high costs faced by SPs who have no choice but to offer services over NGNs (for example, charities offering services over freephone numbers).

¹ As provided for in ComReg Decision No. D05/15, Eir's Fixed Voice Call Origination (FVCO) charge is capped at cost, calculated using a forward looking, top-down, Long Run Average Incremental Cost Plus (LRAIC+) model. The cap is a remedy imposed on the fixed access and call origination (FACO) markets (for all types of calls, including calls to 'Number Translation Codes' or NGNs), in which Eir has been designated with SMP. For NGN call origination, Eir is additionally allowed to recover its unavoidable retail cost related to billing and bad debt incurred as a result of providing NGN telephony services. The sum of the FVCO charge and the uplift for unavoidable retail charges is together known as the "retention rate".

² ComReg 18/65a.

Therefore, there is a competitive failure to be remedied in the wholesale market, namely the exercise of originator market power leading to excessive WORs. In turn, this compromises the ability of SPs to use the NGN platform to make their services available to callers, especially for freephone numbers where SPs have fewer alternatives, as the NGN platform is providing a distinctive capability (i.e. that the SP pays for the voice call it receives) that may be difficult for the SP to replicate in any other way. The overall effect of high WORs is to reduce the effectiveness of the NGN platform in allowing SPs to connect to callers.

In ComReg Document 18/65a, we considered a number of options available to ComReg to impose specific controls on the wholesale charges set by OOs that would directly address this problem. We recommended that ComReg should consider imposing a price control on wholesale charges set by originating operators. Any such price control should at minimum ensure that both originating operators and terminating operators would be able to cover their efficiently-incurred costs on an incremental basis, ensuring they are no worse off from providing NGNs. However, in addition, any price cap should not distort SPs choices by making NGNs more attractive than geographic numbers, for instance by eliminating a contribution to providers' common costs that they might already be reasonably recovering on geographic calls.

Such a wholesale price control would have the effect of significantly lowering the costs of using NGNs for SPs (especially for freephone). In ComReg 18/65a we set out why this form of intervention has the potential to bring the greatest benefits to SPs and end users amongst the various options available to ComReg and would be a proportionate measure given the identified competitive failure.

Whilst we recommended that ComReg consider imposing such a wholesale price control, the specific form and details of how such a price control would be structured and applied were not discussed in detail, as they were to be assessed as part of a separate consultation. Therefore, ComReg has now asked DotEcon to provide a detailed assessment of how such a wholesale price control might be further specified, which we provide in this report. Specifically:

- In **Section 2** we outline the principles that should determine efficient wholesale charges;
- In **Section 3** we provide a recap of the issues identified for wholesale rates on 1800 Freephone numbers and provide an assessment of the options available to ComReg regarding the form of the price control;
- In **Section 4** we provide a recap of the issues identified for wholesale rates on the other, non-freephone NGNs and provide an assessment of the options available to ComReg regarding the form of the price control;
- In **Section 5** we conclude giving a summary of our recommendations on the form of price control to apply to

wholesale rates for 1800 freephone and the other non-freephone NGNs; and

- In **Annex A**, we provide some recommendations on the key parameters to be considered in developing modelling required to establish operators' costs of originating calls to NGNs should ComReg choose to impose a cost-orientation obligation on wholesale origination rates for NGNs.

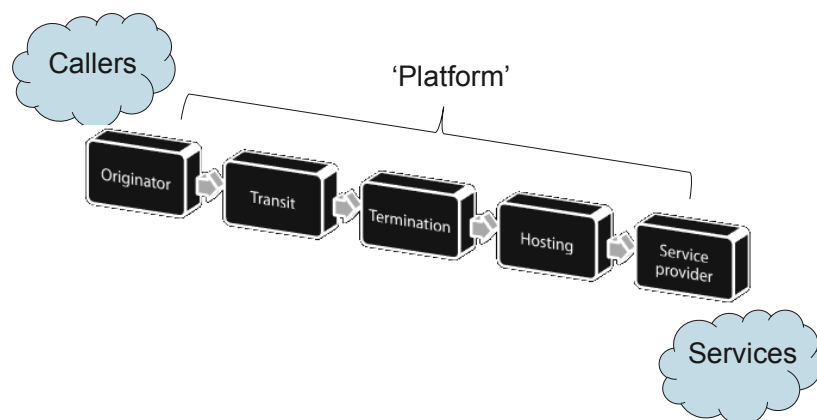
2 Principles for wholesale pricing

In our earlier reports for ComReg (ComReg 17/70a and ComReg 18/65a) we have shown evidence of various market failures in NGN calls – on both the retail and wholesale sides - deriving from the bottleneck control of originators within the NGN value chain. In this report we focus on the wholesale consequences of that bottleneck control.

The origination bottleneck and the need for intervention

The NGN platform provides, especially for freephone numbers, a mechanism for service providers (SPs) to reach potentially callers who may be customers of various different originators. A simple representation of the value chain is shown below. Our earlier report for ComReg³ provides a detailed discussion of the economic framework for NGN calls and how they differ from geographic calls (see Section 2 in particular). We do repeat this discussion here, but note that NGN calls, especially freephone numbers, allow SPs to make themselves available to callers. For freephone numbers, the costs of the call are borne by SP. Other number ranges may have different functions depending on the price scheme.

Figure 1: The NGN value chain



Considering for a moment freephone numbers, from the perspective of an SP, or a terminating operator (TO) serving an SP, each originator is unavoidable, as the SP is using a freephone number to make itself available to all potential users regardless of network. For example, a freephone number might be used as a product support number, for marketing responses, helplines or charities.

Because SPs need to be universally accessible, each and every OO is in a bottleneck position. An individual OO can raise its wholesale origination rate (WOR) without SPs or TOs having an effective response, as they need to accept calls from that OO. Faced with high

³ "Strategic Review of Non-Geographic Numbers in Ireland", August 2017, ComReg-1777a.

WORs on a sufficient proportion of their incoming traffic, SPs may have limited options to respond, other than ceasing to use NGNs. This situation is different to geographical numbers, where competition problems arise primarily in regard to the ability of terminators to raise their termination rates.

Similar logic applies to other NGNs, not just freephone numbers. Even where a caller pays for a call, an NGN might be memorable, avoiding a link to a particular location (which might be useful for a nationally offered service) or avoiding the need to be changed if an organisation moves. These are all features of NGNs that serve the need of the SP to be easily contactable.

In this report we are focussing on wholesale pricing arrangements. In passing, we note that there are also retail consequences of wholesalers' bottleneck control over access to their customers (discussed at length in ComReg 17/70a and ComReg 18/65a). Whilst freephone numbers have been under an obligation for originators not to charge callers, it has been possible for originators to raise retail prices for other NGNs and capture part of the benefit that callers enjoy from the services being delivered. In turn, this may undermine consumer confidence in what prices callers might pay when ringing an NGN, reducing calling and making NGNs less useful for SPs. These retail level problems have been addressed by ComReg's remedies within the retail market (ComReg 18/106 and Decision No. D15/18).

Risks in wholesale markets without intervention

Without intervention, originating operators could continue to exploit their individual bottleneck control and set unfavourable WORs for TOs; in turn this would lead to price distortions that might affect service providers' choices between different NGN ranges, and between NGNs and geographic numbers. Ultimately, the only response that SPs have to excessive WORs is to not use the affected NGN range. Bottleneck control of origination has an impact on connectivity, and eventually end-to-end connectivity between SPs and callers would be compromised if SPs were discouraged from using NGNs. Although originators are under a general regulatory obligation to interconnect with terminators (potentially through intermediaries), end-to-end connectivity is nevertheless challenged by high wholesale prices, as ultimately SPs might withdraw from the NGN platform due to high costs and callers would be unable to access their services.

This connectivity failure is particularly evident for freephone numbers, where it is clear that NGNs are providing a distinctive feature that allows SPs to reach out to callers by covering the costs of the call. Therefore, freephone numbers create additional connectivity between callers and SPs, allowing callers to access services of many types delivered over NGNs. Excessive wholesale charges leading SPs to switch to deliver services in other ways therefore compromise this additional connectivity. Whilst it may be possible for some services to be delivered over geographical

numbers or in an entirely different way (e.g. web-based systems), these alternatives may lack the universality, ease and attractiveness to callers that NGNs may offer to SPs.

Proposed retail remedies

ComReg has now published a Response to Consultation and Decision on the remedies to be imposed in the retail market (ComReg 18/106 and Decision No. D15/18). In particular, ComReg is imposing:

- a geo-Linked retail tariff condition for 1850, 1890, 0818 and 076 NGNs to be brought into force by 1 December 2019; and
- a consolidation measure implemented over a period of three years. During the transition period the 1850, 1890 and 076 NGN ranges will be withdrawn. Only the 1800 and 0818 NGN ranges will remain at the end of the transition period (December 2021).

Previous comments on wholesale remedies

However, in Sections 6 and 7 of ComReg 18/65a we also made the case for intervention in the wholesale side of the market, in particular the need for a price control WORs to control the exercise of market power by originators.⁴

In considering potential remedies for the wholesale market, it is helpful first to consider what the main principles for an efficient wholesale pricing regime should be. These are that:

- both originating operators and terminating operators should be able to cover their costs on an incremental basis and so are no worse off from providing NGN services;
- regulatory-induced distortions that might affect the choice of SPs between different NGN number ranges and between NGNs and geo-numbers should be avoided, such as a price cap that leads to NGNs being more attractive than geographic numbers for SPs; and
- an approach for wholesale charges should work well with the new retail regime specified in the ComReg 18/106 and Decision No. D15/18,⁵ but also could cope with the phased introduction of those changes that might leave significant surplus within the overall value chain to be shared amongst the various parties in an equitable manner.

Recovering incremental cost

The principle of incremental cost recovery for originating operators and terminating operators does not necessarily fix reasonable WORs uniquely and may only determine a range of reasonable values. In particular, if revenues in the system as a whole (i.e. call revenue plus revenue from SPs) were to exceed overall end-to-end costs (origination plus termination on an incremental basis, transit and

⁴ Specifically, we outline the recommended approach in Section 7.3 of ComReg 18/65a.

⁵ Previously set out in ComReg Consultation 17/70 and the response to consultation document (18/65). For example, some of the issues raised in response to the retail consultation around the ability for originators to cover costs if the wholesale regime remains unchanged and the proposed retail measures come into force.

number of translation costs), there would be a 'system margin'. Therefore, a question would arise about how this system margin would be split between originators and terminators through a particular choice of wholesale rates.

Notice, however, that if NGNs functioned well without the exercise of market power anywhere in the value chain, this system margin would be limited. In this case, the principle of each side of the market at least recovering incremental cost becomes much more effective in determining a narrow range for the wholesale rate(s) that should apply.

LRIC vs LRAIC+

The principle of incremental cost recovery alone does not determine whether it is reasonable for the originator to retain LRIC or LRAIC+. It might be reasonable for there to be an element of the system margin to allow some recovery of common costs.

We do not want SPs to be discouraged from using NGNs due to high cost, but neither do we want to make NGNs more attractive than geographical numbers. If originators were forced down to a combination of retail and wholesale prices that only allowed them to recover pure LRIC, then this could make a geo-linked (i.e. same retail pricing as for a geographic call) NGN call cheaper on an end-to-end basis than a geographic call, where originators would expect to recover some margin over pure LRIC. Therefore, we consider that an additional principle to be applied is that of avoiding distorting choices of SPs about which types of numbers to use to deliver services.

Interaction between retail and wholesale remedies

There is an inevitable degree of interaction between retail pricing conditions and wholesale charges. We see this already with differences between 1800 and other number ranges in terms of wholesale pricing, where WORs for 1800 numbers are higher (in the absence of retail revenues) than WORs for other NGN number ranges.⁶ Ideally, the contributions from the calling and the called party to the originator should be sufficient to cover reasonable costs and no more. Therefore, the SP will only be paying to cover the costs of the call that are not covered by the retail price charged to the caller and should be content to do so where the NGN meets its other requirements.⁷

⁶ The retail pricing for NGN calls is a numbering condition. The prefixes and associated retail prices need to be clear for callers and to provide what service providers need. This is the basis for the proposal for rationalisation to Freephone and geo-linked NGN call types only; there is no obvious need for any more complex retail pricing models (e.g. 1850 or some splitting of charges between caller and SP).

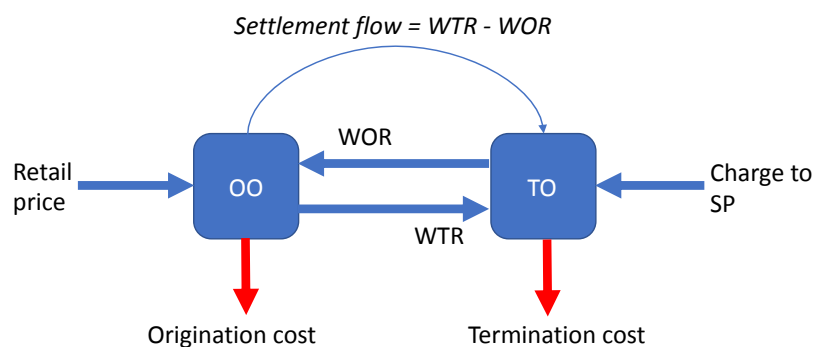
⁷ Note, that in line with the proposed retail market reforms, such "shared costs" numbers would no longer exist, with all non-freephone NGNs being "geo-linked" and the caller contributing to the entire cost of the call as with geographical numbers. Therefore, the SP should not contribute to the cost of the call, as with calls to geographic numbers.

When discussing the financial flows involved between the parties, we make the following definitions:

- The originating operator (OO) sets a **retail price** for an NGN call (already required to be zero for 1800 calls, but for other NGNs this would be required to be the same as a comparable national geographical call if out of bundle, or deducted from bundle of national geographic call minutes);
- The OO sets a **wholesale origination rate (WOR)**, which is a charge made to the terminating operator (TO) by the originating operator (OO) for originating the call. This charge might be passed through to transit operators intermediate between the TO and the OO.
- Therefore, from the OO's perspective, it receives both the retail price and the WOR for an NGN call. The OO's **gross margin** on the call is the sum of the retail price and the WOR, less its **origination cost** (measured on a pure LRIC basis). This gross margin might make a contribution towards recovery of the OO's common costs, but the concern is that this margin might be excessive.
- The **settlement rate** (referred to in our previous reports) is the overall **financial flow** from the OO to the TO, which is usually simply the negative of the WOR. Wherever we use the term "financial flow" we adopt the convention that this is a flow *from* OO to TO. A payment from TO to OO would, therefore, be a negative financial flow under this convention. At least in theory, it is possible for the TO to set a **wholesale termination rate (WTR)** for an NGN call, though this has not been part of market arrangements in Ireland. If that occurred, then the overall financial flow from OO to TO would be the WOR less the WTR.

This terminology is illustrated below, showing receipts to the various parties as incoming arrows and costs as outgoing arrows. We also show settlement as a *net* flow from OO to TO.

Figure 2: Revenues and costs by party



Given the slightly different issues associated with the regulation of wholesale rates for 1800 and for non-freephone numbers, we consider these number types separately in this report. However, regardless of the retail pricing model, the primary concern on the wholesale side is that the OO's **wholesale origination rate** should be cost reflective (i.e. the originator should cover the reasonable costs of origination and no more taking into account any retail revenue).

In the case of 1800 freephone numbers, the caller does not contribute to the costs of the call. A positive WOR is intended to cover origination cost of the OO, as there is no retail price chargeable. The main question is then about the level at which the WOR should be regulated.

However, for non-freephone NGNs – 1850, 1890, 0818 and 076 - where there is a retail price for calls to these numbers. This needs to be distributed through the system as a whole to cover both origination and termination costs. In the absence of an explicit WTR set by the terminator, the WOR needs to be negative, in effect covering the terminator's reasonable costs through a positive financial flow initiated by the originator. In this case, the WOR needs to be at a level such that originator can cover its reasonable origination costs (out of the retail price plus the *negative* WOR) and the terminator can cover its reasonable termination costs.

An assessment of the form of wholesale intervention to apply in this case of non-freephone NGNs must take into account that any wholesale price control made by reference to the current retail price may be difficult to calculate, monitor and/or enforce. This is especially true if calls are included in bundles. With bundles, it may be difficult to determine what the effective retail 'price' for a call to a particular number will be. There are a number of different ways this might be calculated; there is no single 'correct' measurement methodology and rather the approach needs to be chosen to fit the context.

We must, therefore, consider a number of options available to ComReg, recognising these practical difficulties whilst ensuring that the chosen wholesale remedy is consistent with the general principles of an efficient wholesale pricing regime outlined above.

3 1800 Freephone

The 1800 range is free to call for both fixed and mobile callers, with the SP paying for the entire cost of the call. Therefore, the OO does not receive any retail revenues from callers and has to recover its cost from the TO.

For calls to 1800, the OO receives a payment from the TO in order to recover its origination costs. In effect, the OO is setting a positive charge for the TO, which we call the wholesale origination rate (WOR).

The current regulatory regime

At present, eir's Fixed Voice Call Origination (FVCO) charge is capped at cost, calculated using a forward-looking, top-down, Long Run Average Incremental Cost Plus (LRAIC+) model. The cap is a remedy imposed on the fixed access and call origination (FACO) markets (for all types of calls, including calls to 'Number Translation codes' or NGNs), in which eir has been designated with Significant Market Power (SMP).

For NGN call origination, eir is additionally allowed to recover its unavoidable retail cost related to billing and bad debt incurred as a result of providing NGN telephony services.⁸

As noted in ComReg 15/82:

"A price control obligation of cost orientation for calls to non-geographic numbers (sometimes referred to as calls to Number Translation Codes or 'NTCs'), whereby Eircom is allowed to retain the costs not only of FVCO (based on TD-FL LRAIC+ above), but also additional charges that relate to an uplift or 'retention' that is intended to allow Eircom to recover its reasonable billing costs associated with the service; and an additional bad debt surcharge to reflect the higher incidence of bad debt for calls to certain non-geographic numbers (together known as the 'Retention Rate'⁹)"¹⁰

ComReg's Decision Instrument confirms that: *"Eircom shall ensure that it recovers no more than its actual incurred costs adjusted for efficiencies (plus a reasonable rate of return) for the following:... (iv)*

⁸ In this case, the sum of the FVCO charge and the uplift for unavoidable retail charges is together taken as the retention rate.

⁹ More specifically, the Retention Rate refers to the administrative costs associated with the provision of FVCO to non-geographic numbers and is comprised of billing, credit control, cash collection and management of bad debt.

¹⁰ Paragraph 9.174(c) of ComReg 15/82, "Market Review Wholesale Fixed Voice Call Origination and Transit Markets Response to Consultation and Decision", 24 July 2015.

Retention Rate associated with the provision of FVCO for Number Translation Codes¹¹

Therefore, Eir's WOR (which, in the 1800 case is the wholesale price that it charges TOs for call origination) is regulated. Table 1 below shows the current WOR for eir for calls to 1800.

Table 1: 1800 wholesale origination rate (WOR) in the deemed-to-be regime

Euro cents per minute	Peak	Off-Peak	Weekend
Fixed operators (except Airspeed, BT, Smart, Digiweb, Verizon and Intellicom) (effective from 1 Sept 2015)	0.80	0.40	0.48

Source: Table 301 of STRPL v 155.o. This lists the payment to the Originating Operator (less transit fee where appropriate)

At present, no other operators apart from eir have regulated rates and are free to set their own wholesale charges. Up until the end of 2014, all fixed operators voluntarily set their WORs at the same level as eir¹² as part of a voluntary "deemed to be regime", yet this voluntary regime has since unravelled. With effect from 1 November 2014, BT left the deemed to be regime and set its own WORs for 1800, 1850 and 1890 NGNs. Following suit, Smart, Digiweb and Verizon (from 1 June 2015), Airspeed (from 1 August 2014) and most recently Intellicom (from 1 September 2015) also left the deemed to be regime and adopted BT's new WORs for 1800.

For these fixed operators, the new WORs for 1800 (shown in Table 2 below) are significantly higher than those under the deemed to be

¹¹ Paragraph 12.5 of Appendix H Decision Instrument, ComReg 15/82, "Market Review Wholesale Fixed Voice Call Origination and Transit Markets Response to Consultation and Decision", 24 July 2015.

Note that in our previous reports on NGNs for ComReg we have used the term "retention" differently to ComReg's use here. We used the term to indicate that part of an OO's retail revenue for an NGN that is not passed on to the TO by a wholesale financial flow, but rather "retained" by the OO to cover its origination costs. To avoid any potential confusion, we avoid use of the term "retention" throughout this report.

¹² We understand that there are a number of reasons as to why operators were willing to adopt this pricing structure on a voluntary basis. For example, this facilitated accounting simplicity, as a cascading accounting system applied for wholesale billing of these calls. Having everyone on the same rate meant that the system need only focus on volumes and greatly simplified the billing system required. Also, it led to pricing simplicity as TOs could charge SPs a single rate for calls originating from different fixed operators.

regime and do not vary between peak, off-peak and weekend periods.

Table 2: BT and other fixed operators' 1800 wholesale origination rates after leaving the deemed to be regime

Euro cents per minute	Peak	Off-Peak	Weekend
Originating from Airspeed, BT, Smart, Digiweb, Verizon, Intellicom (effective from 1 Sept 2015)	2.73	2.73	2.73

Source: Table 301(A) of STRPL v 155.o. This lists the payment to the Originating operator (less transit fee where appropriate)

Mobile operators have never been part of the deemed to be regime nor are their WORs regulated by ComReg. Therefore, they set their own, individual, WORs for calls to the 1800 range. Mobile WORs for 1800 are an order of magnitude higher than that charged by fixed operators (either by BT or under the "deemed to be" regime), as shown in Table 3 below.

Table 3: Mobile operators' 1800 wholesale origination rates

Euro cents minute	Peak	Off-Peak	Weekend
Vodafone	18.41	12.06	9.52
O2	30.50	30.50	30.50
Hutchison 3G	30.50	30.50	30.50
Meteor	34.28	18.73	15.24
Tesco	34.28	18.72	15.23
Virgin/UPC Mobile	34.28	18.72	15.23
Carphone Mobile	34.28	18.73	15.24

Source: Table 303 of STRPL v 155.o. This lists the payment to the Originating Operator. 1800 charges for mobile (less transit where appropriate)

Therefore, as shown above, the fixed operators that have left the deemed to be regime and mobile operators set 1800 WORs higher than eir. For mobile operators, the difference is considerable.

We understand that in the past, the mobile operators have cited higher costs associated with processing calls to these numbers relative to the fixed operators.¹³ However, this difference is not sufficient to justify WORs at these levels.

ComReg commissioned Analysys Mason to model the costs of mobile voice call origination (see ComReg 19/46b). This found mobile voice origination costs in 2017 on a LRIC+ basis to be 1.35 cents/minutes for off-net calls, or about 1.3 cents/minute on average for all calls (and falling in subsequent years).¹⁴ Therefore, mobile operators have been setting WORs for 1800 calls as high as about 25 times the level of level of the modelled cost (see Table 3 above). Therefore, the evidence of excessive wholesale price is compelling.

3.1 Options for regulating wholesale origination rates for fixed and mobile calls to 1800

Given the concerns raised above, we consider that the 1800 WOR needs to be set at a level that could allow for the recovery of reasonable costs of origination and nothing more. Below we consider a number of options as to how such a rate could be calculated.

3.1.1 Type of price control

In ComReg Document 18/65a we considered a broad range of options available to ComReg to address originator market power in the wholesale NGN market. On balance, we recommended that ComReg should directly address excessive wholesale origination charges by means of a price control on wholesale rates for NGNs. Before considering our recommended approach, we summarise the

¹³ For example, Telefonica noted in its response to ComReg's Call for Input on NGN wholesale charges that mobile retail charges were generally higher than fixed retail charges and given retail charges for NGN calls are capped by ComReg or in the case of 1800, free to call, mobile operators had to charge higher origination charges to compensate for the retail revenue forgone. A similar point was made in Vodafone's response who noted that the differentiation in mobile versus fixed origination charges for Freephone mirrors the retail price difference that exist between out of bundle calls from mobile to national and fixed to national numbers. See ComReg, Update on Treatment of Non-Geographic Numbers, ComReg 14/130, page 30, 5 December 2014.

¹⁴ See ComReg 19/46b, Figure E.2.

options set out, focussing in this section on WORs for fixed and mobile calls to 1800.

No price controls

In the absence of a price control, operators would continue to set their own WORs without restriction. This does nothing to address the excessive wholesale pricing identified. Without intervention, this could at best result in no change to harm and at worst lead to worsening of the situation where origination rates rise and fewer SPs offer freephone services, instead switching to other NGNs or geographic numbers that are less costly for them, but require customers to pay for access to such services. This would deny SPs the benefit of the option to pay for calls they receive and so make them less accessible to potential callers. Furthermore, there may be disputes between the parties involved in the NGN value chain that would need regulatory resources to resolve. Therefore, not setting a price control would not be in line with ComReg's statutory objectives to promote competition and protect consumers, in that the NGN platform could be made unattractive for SPs and end users would lose out on services delivered by SPs over the platform, as we have discussed in Section 2 above.

Guidance on what is 'fair and reasonable' but only direct involvement in price setting if there is a dispute

Whilst we considered that an alternative approach might be for ComReg to give guidance on fair and reasonable pricing and then only be directly involved with price setting if a dispute arose, we concluded that the issues would be more adequately dealt with through ex ante remedies. On its own, providing guidance may not be sufficient to remedy the issues identified in a timely manner, especially as guidance is not legally binding and operators may continue to set wholesale charges at their current level given uncertainty about how any hypothetical dispute about the levels of wholesale pricing might resolve. This would leave SPs open to significant uncertainty about how much they might have to pay for NGNs (especially freephone numbers) and undermine SPs' incentives to invest in delivering services over NGNs.

Nevertheless, issuing guidance does not preclude ComReg from adopting any of the other options discussed below and these are not mutually exclusive alternatives. For example, guidance might be an appropriate interim measure indicating the likely consequences of any continuing excessive pricing, whilst the exact details of any further regulation in the wholesale market is consulted upon.

3.1.2 WOR controls for fixed operators

ComReg could impose specific price controls on the WORs set by OOs, limiting OO's ability to raise these to excessive levels. This would set a cap that allows OOs to recover their reasonable costs.

Such a cap could be set directly through a cost-orientation obligation on WORs based on the results of a cost model. This seeks to estimate the reasonable costs of 1800 call origination for a

hypothetical operator using a broad class of technology (e.g. fixed vs. mobile), rather than the actual costs of each specific operator. This approach provides opportunity for out-performing the cap if an operator's actual cost is lower than this cap. It also avoids unreasonably compensating operators if their actual incurred costs are inefficiently high.

*Fixed NGN
origination costs*

For fixed operators, there is already a model for these costs, as eir is already subject to cost-oriented regulation on its origination charges for these numbers. ComReg could set the level of origination charges for all other fixed operators with reference to eir's regulated rates for origination on the 1800 number (as specified in the FVCO regulation for number translation services described above).¹⁵

This would in essence return the market to a position akin to the "deemed-to-be" regime where all operators set their origination rate (equivalent to the settlement rate in the 1800 case) at the eir level. However, this time it would be enforceable, rather than voluntary.

If fixed OOs do not set their origination rates at this level, the burden would be on the OO to demonstrate why its costs are different to those of eir and why it should be allowed to set its origination rates at a different level. However, it would seem unlikely that an efficient operator would have such a case. In particular, if its origination costs vary significantly from eir's modelled origination costs, that operator could have brought a principled objection to the "deemed-to-be" regime, which operators initially accepted.

3.1.3 WOR controls for mobile operators

ComReg has undertaken cost modelling that provides corresponding estimates of origination costs for mobile operators. We discuss the questions of exactly what increment and cost standard should be used for determining the costs of origination below.

However, at the start of this project, this cost model had not been completed and, as a result, we considered whether there were other feasible approaches available to ComReg based on constraining WORs relative to other wholesale prices or cost proxies. Although these alternative approaches have now been overtaken by the availability of origination cost estimates for mobile operators, in our view these alternatives were feasible and would have been able to deliver an improvement on the current situation where mobile WORs are particularly high.

Even in the absence of a mobile origination cost model, there are available options for setting a WOR control.

¹⁵ ComReg 15/82, "Market Review Wholesale Fixed Voice Call Origination and Transit Markets Response to Consultation and Decision", 24 July 2015.

Common WORs for fixed and mobile

First, in the absence of evidence of significantly higher costs for mobile voice origination than for fixed, the current regulated eir rate (FVCO) could be applied as a common cap on NGN WORs for both fixed and mobile operators. However, to the extent there are material differences in the costs of origination between fixed and mobile operators, we acknowledge that eir's regulated rate may not be a suitable comparator for the costs facing mobile operators.

Termination rates as an upper bound

Second, mobile termination rates (MTRs), which are already regulated, provide a clear upper bound on mobile origination costs. Therefore, an alternative option would be to cap mobile wholesale 1800 NGN origination costs at the level of regulated mobile geographic termination charges that can be observed.¹⁶

Ofcom has recently proposed an analogous approach to imposing charge controls on termination to 070¹⁷ numbers in the UK. Ofcom's recent market review of 070 considered that a 'benchmark' charge control should be introduced on termination to 070 numbers, which would cap the termination rate for calls to 070 numbers at the level of the Mobile Termination Rate. Ofcom argued that modelling operators' costs was not necessary, highlighting that the objectives of bottom-up cost modelling could be achieved by linking the 070 wholesale termination charge to the regulated MTR¹⁸.

Therefore, the existence of a cost model is not essential to being able to design controls on NGN WORs that would improve the current situation and at the same time ensure that OOs could recover at least their reasonable costs. However, the use of upper bounds such as MTRs on origination costs to set wholesale charge controls would leave significant headroom to raise WORs above cost. Such an approach is likely to be less effective than using modelled cost estimates, which are now available following Analysys Mason's work (see ComReg 19/46b).

3.1.4 Cost standard: LRAIC+ vs pure LRIC

Several choices of cost standard could be used for calculating the costs of NGN origination. In many contexts, long run incremental

¹⁶ Mobile termination rates are regulated as mobile operators have SMP in termination of geographic calls on their own networks.

¹⁷ 070 numbers are used in the UK for personal or 'follow-me' services. While this is a different service to those considered in this report, the pricing principles are similar, and the harm caused in the market by excessive pricing is similar to the NGNs examined here.

¹⁸ Ofcom 'Personal numbering: review of the 070 number range', Draft Statement, 15.08.2018

costing methodologies are appropriate, as they can provide adequate long-term incentives by ensuring that prices are sufficient to incentivise capacity-expanding investments.

Long run incremental cost can be defined in two complementary ways:¹⁹

- it is the additional cost a firm incurs in the long run in providing a particular service as a whole, assuming all its other production activities remain unchanged;
- it is the total cost a firm would avoid in the long run if it ceased to provide the service.

In addition, there is a question whether any mark-up should be applied to incremental cost to allow some degree of recovery of joint and common costs that are not incremental to any particular service. The most common long run incremental costing methodologies to be considered are described below. It is common regulatory practice to tailor the approach taken to application of mark-ups to the specific context in which they are being used; there may be specific reasons why some services should bear a greater share of common cost recovery and other services a smaller share. Fortunately, we do not need to delve into potentially complex questions of regulatory design here, as the principle of avoiding distortions between geographic and NGN numbers largely determines the appropriate choice of cost standard, as we explain below.

¹⁹ ERG Common Position: Guidelines for implementing the Commission Recommendation C (2005) 3480 on Accounting Separation & Cost Accounting Systems under the regulatory framework for electronic communications.

LRIC vs LRAIC vs LRAIC +

Long Run incremental Costs (LRIC) refers to the cost of producing a specified additional product, service or 'increment' and captures the costs directly caused by the provision of that service over and above the other services the firm produces. Simply put, it is the difference between total costs in a situation where the service is provided and total cost where it is not. It is typical for the increment to be the entire volume of a particular service, though the definition of the increment may vary in different regulatory applications.

LRAIC (Long-run average incremental cost) is closely related to LRIC, but some elements of cost common across a number of services are allocated amongst those services. This may arise where the increment involves a number of services or because some categories of cost have been allocated across a number of services as the specific incremental cost of each individual service is not identified. For example, some aspects of network cost associated with multiple streams of traffic using a network resource may be allocated in line with traffic routing factors. To the extent that network cost models involve allocation of some costs associated with assets that provide multiple services, they typically estimate LRAIC cost, rather than pure LRIC. Therefore, most practical estimates of LRIC are typically some form of LRAIC, as at least some costs will have been calculated using a multi-service increment and then allocated to specific services.

In general, the terms LRIC or LRAIC need to be understood in the context of the specific volume, service or service group increment being used in particular application.

LRAIC+ (or LRIC+) adds one or more mark-ups to recover a share of common costs (typically joint and common costs at the enterprise level, such as overheads, that are common across all services provided).

If all services were priced using LRIC or LRAIC then common costs would not be recovered.

If services are priced using LRAIC+ then there can be common cost recovery (assuming that mark-ups are set to ensure this), but there is also potentially some welfare lost due to the lower volume consumed as a result of higher pricing.

Scale of the relevant volume increment

Given that the provision of NGNs relies on much of the network infrastructure and costs associated with provision of geographic numbers, then the additional cost a firm incurs in the long run in providing NGN services, assuming all its other production activities remain unchanged, will be small. An increment of just NGNs alone

may therefore result in costs close to the marginal cost of provision (at least for some aspects of the network resources being used).

However, given that all originating operators provide access to NGNs and that provision is largely inseparable from provision of geographic calls (and in line with the imposed retail market proposals NGNs should be treated equivalent to all other geographic calls), we consider that the increment to be taken should be **all voice call origination** on the network, and should identify the cost of the originated leg of the call (since the objective here is to calculate the wholesale charge levied by the originating operator, terminating aspects of calls should be excluded). Network cost models would typically estimate this on a LRAIC basis in that the costs of certain network assets would be allocated across different services (e.g. voice termination and origination) based on the services' average usage of network assets (based on usage factors).

Should a mark-up for common costs be applied?

The next question is whether a mark-up for common costs should be applied (i.e. LRAIC+ rather than LRAIC).

As discussed above, at present, eir is regulated for fixed calls to NGNs (and geographic numbers). We understand that eir's Fixed Voice Call Origination (FVCO) charge is capped at cost, on the basis of LRAIC+ and so includes a contribution to common costs.

If WORs for NGNs were capped on the basis of pure LRIC, rather than LRAIC+, this would create a discrepancy between the treatment of eir's geographic voice calls and NGN calls. NGN calls would be cheaper²⁰ on an end-to-end basis than a national geographic call, as a mark-up for common costs would be disallowed for origination in the former case (the FVCO is regulated at LRAIC+²¹), but not the latter. This would risk distorting the choices of SPs between geographic numbers and NGNs. This is primarily an issue for non-freephone NGNs (e.g. 0818) if the WOR were lower than for a geographic number, encouraging SPs to use the NGN instead as this might provide a cheaper alternative to a geographical call, even though the overall system cost of providing a 0818 call was not less than that of the geographical call. This would amount to an inefficient incentive to use NGNs rather than geographic numbers.

Such a difference in treatment of NGNs and geographic calls could create risks for originators if geographic calls are substituted by NGN calls (especially 0818 calls) due to increased usage of NGNs by SPs; the former would make a contribution to common costs, but the latter would not. Therefore, if the extent of such substitution were material, the originators' ability to contribute to their common costs

²⁰ This assumes that number translation is a tiny cost of NGN origination and is not significantly different from the costs of translation associated with connecting a geographic call in the case of number portability.

²¹ See ComReg 1582, Market Review Wholesale Fixed Voice Call Origination and Transit Markets - Response to Consultation and Decision, 24 July 2015.

from voice call origination would be reduced. Furthermore, in response to such a risk, originating operators might take steps to further discourage calls to NGNs by, for example, affecting the quality of service to discourage the diversion of traffic away from geographic numbers (for which they would be permitted to recover a larger share of the costs of provision).

We want to avoid creating any such distortions to service provision and further reductions in the perception of quality and therefore the usage of valuable NGNs. As stated in Section 2 above (where we set out the principles for a wholesale regime), we should avoid creating regulatory distortions that might affect either the choice of SPs between different NGN number ranges and between NGNs and geographic numbers, or operators' treatment of these various different number ranges. Therefore, there are good reasons to allow for cost orientation using LRAIC+ to ensure consistency with geographic numbers and so avoid any such distortions.

Pure LRIC

At the same time, we recognise that allowing for recovery of costs over LRAIC (or LRIC more generally) could, theoretically, have some downsides. A potential argument for setting the retention rate at the level of LRAIC rather than LRAIC+ is linked to possible cross-subsidisation between originating and terminating sides of the market. This issue is somewhat analogous to the reasons for applying a pure LRIC cost standard for regulated geographic termination rates (described in Box 1 below).

Box 1: The argument for regulating geographic termination rates to LRIC

For termination of geographic calls, where traffic flows are asymmetric, it might be that smaller operators pay out a lot more in termination rates than they receive, and by analogy, the larger operators receive more in termination rates than they pay out. This depends on the balance of inbound and outbound traffic varying across operators of different sizes, for example due to stronger calling circle effects from on-net discounting on larger networks. Whilst these effects are arguably reducing given the growing importance of data services and declining voice traffic, these patterns for voice traffic have been observed in many EU markets.

For a larger operator, there may be a larger share of "on-net" calls that originate and terminate on its own network. For on-net calls, the costs of termination are internalised and effectively charged at LRIC. In contrast, the smaller operator would have a large share of calls terminating on a competitor's network (off-net calls) and if termination rates are set above LRIC it will be at a competitive disadvantage relative to the larger firm, facing a higher average cost of termination. The larger network, facing lower overall costs of termination for on-net calls and receiving large termination rate payments from other operators terminating calls on its network would be in a better position to cross-subsidise other services, including retail prices, to levels that smaller operators may not be able to compete with. The incentives of larger operators to retain may be enhanced at the expense of the incentives of smaller operator to acquire new customers.

As noted by the European Commission: "*Termination rates that are set above an efficient level of cost result in higher off-net wholesale and retail prices. As smaller networks typically have a large proportion of off-net calls, this leads to significant payments to their larger competitors and hampers their ability to compete with on-net/off-net retail offers of larger incumbents. This can reinforce the network effects of larger networks and increase barriers to smaller operators entering and expanding within markets.*"²²

In that case, the further termination rates move away from incremental cost, the greater the competitive distortions could become. This is a key reason for the move to regulating geographical voice call termination rates at pure LRIC within the EU.²³

The analogy for NGNs is that a large integrated operator (that originates and terminates a large share of NGN calls) can internalise the costs of providing these calls. For example, in the case of freephone numbers, for an integrated operator, the terminating end would only 'pay' the originating end an effective origination rate at marginal cost for NGN calls that originate and terminate on its

²² See Commission Staff Working Document accompanying The Commission Recommendation on The Regulatory Treatment of Fixed And Mobile Termination Rates In The EU - Explanatory Note. Available at: http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2009/sec_2009_0600_en.pdf

²³ As is currently the case in Ireland.

network (as for an integrated operator this is just an internal transfer). If this operator were allowed to charge high wholesale origination rates for calls originating on its own network but terminating on another operator's network, then a smaller terminating operator might face significant out-payments to their larger competitors and be at a competitive disadvantage when competing for, say, incremental NGN traffic from a new service provider.

This argument provides an additional reason to be concerned about excessive WORs, as they might be used by integrated operators present in both origination and termination, to compete unfairly for SPs against non-integrated operators present only on the termination side. However, once WORs were reduced to recover only LRAIC+, any further improvement in terms of avoiding competitive distortions on the termination side by reducing WORs yet further to pure LRIC would be relative small, as the further reduction in price from eliminating the common cost mark-up would be small by comparison with current high WORs for freephone charged by some mobile originators. Furthermore, in the larger picture of integrated operators competing for corporate telecoms business, often through bespoke offers for integrated multi-service bundles, it is not clear that NGN services for SPs form that large a component for typical customers. Therefore, although there may be some competitive benefit in reducing WORs toward pure LRIC (in terms of neutrality between integrated and termination-side only operators), this needs to be balanced against creating perverse incentives to substitute NGN calls for geographical calls, with the associated risks for originators discussed above.

Conclusion: LRAIC+ rather than pure LRIC

In light of these arguments, we consider that it would be preferable to prioritise limiting any significant differences in the recovery of costs between provision of geographic and non-geographic numbers. Although there is a theoretical risk of residual competitive distortions through allowing recovery of costs greater than LRAIC by applying a mark-up, we recognise that for freephone numbers there are not any significant asymmetries in termination minute share²⁴ between the main terminating operators that would lead these concerns about internalisation and cross-subsidisation to outweigh the concerns about asymmetric treatment of NGN and geographic call origination. Therefore, should ComReg impose a cost orientation obligation on origination with reference to modelled costs, we consider that it would be more appropriate to use LRAIC+ than LRAIC as the cost standard.

²⁴ Based on data collected as part of our initial review (in document 17/70a), in 2015, []

3.1.5 Cost standard: additional mark-ups

Is it appropriate to include any additional uplift?

As noted above, under the current FVCO regulation, for NGNs eir is also allowed an **additional mark up** for “*reasonable billing costs associated with the service; and an additional bad debt surcharge*”. As part of our assessment of what costs would be allowed for under the regulation on other originating operators (and any changes to the obligations/regulation applied to eir), we must consider the reasonableness of allowing for any such additional mark ups over LRAIC+.

On initial assessment, we consider that there should be no bad debt for Freephone (given the retail price is zero) so allowing a mark-up for this appears not to be appropriate in this case.

It might be argued that billing costs are more limited in the case of Freephone, as call records do not need to be passed through to the retail billing system. However, call records still need to be maintained for the originator to initiate wholesale charges.

We recognise that it is not sufficient to consider only the costs of the network operator in assessing the costs of providing freephone, and that additional retail costs may be incurred. For this reason, we propose that an additional mark-up of costs over and above LRAIC+ can be considered where a clear basis for the allocation of retail and billing costs to Freephone numbers can be demonstrated by operators.

3.2 Conclusions

Based on the assessment above, there are clear advantages to imposing a price control on freephone WORs over the alternative options of not imposing any control, or only issuing guidance about how ComReg would view any dispute between the parties involved.

Our recommendation is that ComReg should impose a price control on the WORs for 1800. The main questions are how this might best be achieved, and the level at which ComReg could set regulated rates.

ComReg now has access to cost estimates of voice origination costs for both fixed and mobile operators that provide a basis for setting caps on WORs. Given these estimates are available, the use of proxies (such as using MTRs to cap freephone WORs for mobiles) is not necessary, though in our view would have been feasible had cost estimates not been available. Using modelled costs is transparent, provides greater certainty to SPs and also is likely to be more effective in controlling the incentives of OO’s to raise WORs.

Further recommendations on the specific parameters of the cost modelling exercise are set out in more detail in Annex A of this report.

Would the same rate, or a different rate be applied to fixed and mobile origination?

The principles to be applied and the approach taken to regulating fixed originating operators and mobile originating operators should be consistent. The purpose of the price control should not discriminate against whether the call originates on a fixed line or a mobile phone and is purely intended to ensure that the originator can recover costs of origination for these calls but cannot take advantage of its power and set higher wholesale rates.

Applying consistent costing principles may not *necessarily* result in the derivation of similar costs where there are inherent cost differences between fixed and mobile services in NGN origination. However, based on operators' responses to the data collection undertaken as part of the work on ComReg's Consultation 17/70, no evidence has yet been provided of any significant differences in originating costs across fixed and mobile. Any further justification for why the costs of origination might reasonably be different between mobile and fixed operators, requiring two separate caps on WORs, would need to be raised by operators during this consultation process, and the cost modelling will help inform this.

Even where there are minor differences in costs, this does not justify setting highly individualised caps on WORs for specific operators or groups of operators (other than possibly a fixed vs. mobile distinction, to the extent that a material difference in origination costs is found). To do so would risk compensating operators for their actual costs, which might include possible inefficiencies. Therefore, the standard regulatory practice of setting prices for a hypothetical efficient operator of some particular broad class should be maintained.

4 Non-freephone numbers

Unlike freephone numbers, for fixed and mobile calls to 1850, 1890, 0818 and 076, there is a retail price for calls to these numbers.

During the preparation of this report, ComReg published its Decision for the retail market (ComReg 18/106 and Decision No. D15/18). Key elements of this Decision are that all non-freephone numbers should be priced in the same way as a geographic number, and that number ranges will be consolidated. Only 1800 and 0818 ranges will remain, and 1850, 1890 and 076 will be withdrawn. Therefore, in the remainder of this section, we consider the options for wholesale intervention on non-freephone numbers assuming the implementation of retail measures for number consolidation and requirement for retail prices to be equivalent with geographic calls.

4.1 Current wholesale rates and payment flows

Payment flows for 0818, 076 and fixed to 1850 and 1890

For fixed and mobile to 0818, 076 and fixed to 1850 and 1890, under the current structure of wholesale charges, the caller pays the OO a retail rate for these calls, of which the OO will *retain* a portion to cover its origination costs and pass the rest on to the TO through a **negative WOR**.²⁵ Therefore, for these call types, there is a now a payment flow from OO to TO.

Payment flows for mobile to 1850 and 1890

At present, for mobile calls to 1850 and 1890, the payment flow is reversed, flowing from terminating operator *to* the originating operator (i.e. the same direction as for Freephone numbers). In this case the OO sets a **positive WOR** and is receiving payment from *both* the caller and the TO.²⁶

The current regulatory regime

Deemed-to-be regime

We understand that eir's allowed **origination rate** for fixed call origination for all of these non-freephone numbers is currently regulated on the basis of cost orientation²⁷ with a payment then being paid to the TO.

²⁵ As mentioned in our retail NGNs report, the TO may in a small number of cases recover additional sums from the SP even though these numbers are not designated as 'shared-cost' numbers.

²⁶ Recall that this is the current structure of payments, and that under the existing NGN regime, 1850 and 1890 are "shared cost" numbers where the cost of the call is contributed to by both the caller and the called party. This may in part, explain the direction of the payment flows for 1850 and 1890 on mobile originated calls, but could also be a very clear example of mobile originators fully exploiting their originator power. We explore the issues of mobile calls to 1850 and 1890 in more detail below.

²⁷ ComReg "Market Review: Wholesale Fixed Voice Call Origination and Transit Markets", Paragraphs 12.2 to 12.5 of Appendix H, D05/15, 24 July 2015

For 1890 and 1850, some fixed and all mobile operators set their own wholesale origination rates at different levels to eir and are no longer in the deemed to be regime.

For fixed operators that have left the deemed to be regime, the financial flows through to the terminating operators are less than at eir's regulated rates. For example, upon leaving the deemed-to-be regime, BT has set its (negative) WORs for off-peak and weekend periods for 1890 and for peak periods for 1850 higher (i.e. less negative) than the equivalent WORs under the deemed to be regime. This represents paying out less in these periods to TOs than its counterparts still within the deemed to be regime (i.e. it is setting more preferable rates for itself). In the case of peak 1890 calls and off-peak and weekend 1850 calls, BT has set positive WORs which represents demanding a payment from TOs, similar to the mobile operators (as shown in Table 4 below).

Table 4: BT 1850 and 1890 WORs after leaving the deemed to be regime

Euro cents	Peak	Off-Peak	Weekend
1850 (per call)	-0.02	0.62	0.74
1890 (per minute)	2.46	-1.18	-1.05

Source: Table 204A and 205A of Eir's STRPL Issue v155 (the off-peak and weekend rates are the payment to the terminating Operator for the services listed in this table for calls that originated on the BT network). The same off-peak and weekend charges in Table 204 (A) are levied on the originating Operator (BT) for the services listed in this table. The peak rate is the payment to the Originating Operator (BT) for the services listed in this table. The same peak charge in Table 204 (A) is levied on the terminating Operator for the services listed in this table).

For 1850 and 1890, mobile operators are currently demanding positive WORs from the terminating operators. Together with the retail revenues, this has resulted in overall revenues to cover origination costs being at a level much higher than currently afforded to eir through regulated origination rates.

For example, Table 5 and Table 6 below show the WORs for mobile operators for calls to these numbers. These payments to the originating operator, received from the terminating operator, are *in addition* to the high retail charges for these numbers. They demonstrate a clear over-recovery of origination costs and provide an example of mobile originators exploiting their ability to sustain

prices above cost.²⁸ It is also noted that, as of 1 March 2019, both Hutchison 3G and O2 significantly increased their WORs for 1850 and 1890.²⁹

Table 5: Mobile operators' 1850 wholesale originating rates:

Euro cents per call	Peak	Off-Peak	Weekend
Vodafone	15.60	9.52	9.52
O2	26.90	26.90	26.90
Meteor	16.74	9.32	9.29
Hutchison 3G	26.90	26.90	26.90
Tesco	16.74	9.31	9.12
UPC Mobile	16.74	9.31	9.12
Carphone mobile	16.75	9.32	9.13

Source: Table 305 of eir STRPL v156.00. Lists the payment to the Originating Operator for the services listed in this table. Rates are quoted in Euro cent. 1850 Charges for Mobile - less transit fee where appropriate.

²⁸ This may, in part also be influenced by the fact that there are no vertically integrated mobile operators that also terminate these calls, so the mobile originators are not exposed to retaliation from vertically -integrated fixed operators (providing origination and termination) who may otherwise wish to reciprocate by settling very low or negative settlement rates to mobile terminating operators. As there are no mobile terminators for these numbers this is not possible. The terminating operators cannot influence the settlement rates in other ways, so fixed operators cannot retaliate.

²⁹ Eir STRPL version 155.0

Table 6: Mobile operators' 1890 wholesale originating rate

Euro cents per call	Peak	Off-Peak	Weekend
Vodafone	4.16	2.54	2.54
O2	13.00	13.00	13.00
Meteor	4.16	2.54	2.54
Hutchison 3G	13.00	13.00	13.00
Tesco	4.16	2.53	2.53
UPC Mobile	4.16	2.53	2.53
Carphone mobile	4.16	2.54	2.54

Source: Table 307 of eir STRPL v156.00. Lists the payment to the Originating Operator for the services listed in this table. Rates are quoted in Euro cent. 1890 Charges for Mobile - less transit fee where appropriate.

0818 and 076 rates still within the deemed-to-be regime for now

In contrast, for 0818 and 076, **all operators** use the same WOR,³⁰ which is negative and involves a payment from originator to terminator. Notably, BT has not left the deemed to be regime for 0818 or 076 and uses the same rate as other fixed operators.

Although they have never formally signed up to the wider deemed-to-be regime, mobile operators also pass on these same wholesale originating rates to TOs for these number ranges. However, we note that this is a voluntary arrangement, and is subject to the same issues that led to the unravelling of the previous deemed to be regime. This means that we cannot rely on the regime for 0818 and 076 that is currently in place being maintained; operators are not bound by it and could withdraw if they saw fit.

The latest published wholesale originating rates for 0818 and 076 are provided in Table 7 and Table 8 below.

³⁰ We understand that the use of identical wholesale originating rates is motivated by the practicalities associated with the cascading accounting system used for the billing of these calls amongst operators. It provides for a simple and transparent inter-operator charging mechanism, making wholesale billing simpler

Table 7: Fixed and mobile to 0818 wholesale originating rate in the deemed to be regime

Euro cents per call	Peak	Off-Peak	Weekend
All operators	4.62	2.58	2.04

Source: Source: Table 202 of STRPL v 155.o. This lists the payment to the Terminating Operator. The same charges in Table 202 are levied by open eir on the originating operator for the services listed in that table. open eir then levies the transit fee in Table 002 on the terminating operator for the call. Rates are quotes in Euro cent.

Table 8: Fixed and mobile to 076 wholesale originating rate in the deemed to be regime

Euro cents per call	Peak	Off-Peak	Weekend
All operators	4.92	1.35	1.58

Source: Source: Table 208 of STRPL v 155.o. Rates are quotes in Euro cent. This lists the payment to the Terminating Operator. The same charges in Table 208 are levied by open eir on the originating operator for the services listed in that table. open eir then levies the transit fee in Table 002 on the terminating operator for the call. Rates are quoted in Euro cent.

Therefore, for 076 and 0818, each OO should be recovering its origination cost on similar terms to eir (if it were at least as efficient as eir), **provided its retail rates are also similar.**

Excess returns for mobile originated calls

However, we know that for **mobile operators**, retail prices are typically much higher for calls to 0818 than they are for eir (and other fixed operators),³¹ suggesting that mobile operators make a higher margin on origination when passing on the same rate as eir. Similarly, any operator with retail rates lower than eir might see their margins squeezed if it also adopts the same wholesale origination rate.

While the 0818 and 076 regimes are not as problematic as the 18xx numbers (in terms of the varying range and excessive levels of wholesale rates, especially for mobile operators), it is possible that at current retail prices mobile operators are retaining more of the retail revenues than required to cover origination costs than eir is under its regulated origination rates.

Potential for adverse changes in wholesale rates

Furthermore, there is no reason why operators (fixed or mobile) could not change their WORs for 0818 or 076 calls if they wanted to. We note that the current rates are set as part of a voluntary arrangement, and that is subject to the same disadvantages described above where a regime depends on goodwill. We cannot rely on the regime for 0818 and 076 that is currently in place because

³¹ In ComReg 17/70a, we showed that mobile calls to 0818 numbers were up to 45¢pm (with a set-up/connection fee of up to 9¢) compared with eir charges of up to 9.66¢pm (with a set-up/connection fee of up to 5.25¢)

operators could withdraw if they saw fit and deviate from the current WORs set under the deemed-to-be regime. Indeed, the current wholesale pricing for 1850 and 1890 shows this potential, with originators receiving, rather than paying, wholesale charges. This possibility arises because each originator has a degree of bottleneck control, as SPs and TOs cannot switch away from an OO who raises its WOR, as discussed in Section 2 above.

One reason that wholesale pricing has been less problematic for 0818 may be that this range has historically had small volumes. To date there may have been only a small benefit to originators in adjusting their wholesale origination rates for this number range and some risk of triggering disputes or regulatory attention (potentially applying more widely to other NGN prefixes and affecting much greater revenue). However, volumes of 0818 calls would be greatly increased once the new retail measures are implemented and 0818 is being used as the sole geo-linked NGN prefix. Without intervention on the wholesale side of the market, originating operators might seek to retain a larger amount (through an increased origination rate) and subsequently lower the rates passed through to TOs (as we observed with BT upon leaving the deemed-to-be regime for 1850 and 1890).

Given the planned regulatory changes to the retail market and their likely effect of lowering retail prices, originating operators might seek to increase their WORs to try to claw back any reduction in retail margins. This possibility was noted by a number of respondents to ComReg's Consultation Document 17/70. Again, OOs have the ability to do this because of their bottleneck positions.

This would be a particular issue if the WORs were increased (i.e. made less negative) to a level that would not be sufficient for TOs to cover their costs of service provision (or even set positive WORs as we saw with BT with 1850 and 1890 numbers upon leaving the deemed to be regime). If TOs cannot cover their costs from WORs alone, then either their incentives to market and provide NGN services will be dramatically reduced (leading to a welfare loss for SPs and those callers needing to access services over NGNs), or they will have to seek greater contributions from the SPs for meeting the costs of service provision, increasing the overall costs faced by SPs. Ultimately this would lead to the number range becoming ineffective in allowing service providers and callers to connect to each other through NGNs.

Therefore, even though it is entirely possible that the *current* wholesale rates for calls to 0818 (and other non-freephone numbers) are not reflective of OOs taking advantage of their bottleneck power, operators have the ability and incentive to increase their rates and this might even be triggered by reform on the retail side as call volumes for this number range increases and retail prices are constrained to be equivalent to geographic calls. Therefore, NGN

users need be protected from any such behaviour materialising in the future.

4.2 Case for intervention

There are a broad range of options available to ComReg to address originator market power in the wholesale NGN market (which we discussed in more detail in ComReg Document 18/65a). However, we re-cap on some of these issues in the context of the retail market regulations that will come into force, as established in ComReg 18/106 and Decision No. D15/18.

No price control

If ComReg were not to impose a price control on WORs for non-freephone NGNs, then the immediate risk is that the reduced retail margins on these numbers (as a result of the retail price proposals) might lead OOs to seek increased margins by increasing WORs (i.e. if they are negative, making them less negative or even positive). Eliminating economic rent on the retail side can be expected to lead to less favourable WORs for TOs in the absence of any other constraint. Requiring lower retail prices is likely to need corresponding wholesale price adjustments (reduced payments to TOs, or higher charges for TOs to pay OOs), if OOs are not to make a loss. This point was raised in a number of responses to the consultation, making it clear there is a risk that OOs might respond to loss of retail margins by increasing WORs, with potential harm to NGN users (as discussed above). This is a strong argument for wholesale intervention being needed alongside retail interventions.

At the very least, if ComReg were not to impose a control on WORs for non-freephone NGNs, originating operators could continue to exploit their bottleneck control and set unfavourable WORs for TOs; in turn this would lead to price distortions that might affect service providers' choices between different NGN ranges, and between NGNs and geographic numbers. Bottleneck control of origination therefore has an impact on connectivity, and eventually end-to-end connectivity between SPs and callers is compromised. Although originators are under a general regulatory obligation to interconnect with terminators (potentially through intermediaries), end-to-end connectivity is potentially challenged by high wholesale prices, as ultimately SPs would withdraw from the NGN platform due to high costs and callers would be unable to access their services. This is particularly the case for mobile originators and the wholesale origination rates they charge to TOs for calls to 1850 and 1890.

In the absence of any wholesale price control, operators would continue to be able to set their own wholesale origination rates. Indeed, the significant increase in rates for 1850 and 1890 numbers imposed by O2 and Hutchison 3G in March 2019 demonstrate operators' ability and incentive to set their own rates at excessive levels. Failing to impose a wholesale price control risks worsening

the situation if wholesale origination rates rise, resulting in fewer operators providing NGN services and does nothing to remedy the current situation. Furthermore, there may be disputes between the parties and the regulator. Therefore, not setting a price control would not be in line with ComReg's statutory objectives, particularly to promote competition and protect consumers.

Guidance on what is 'fair and reasonable' but only direct involvement in price setting if there is a dispute

ComReg might issue guidance that would apply if parties raised a dispute, clarifying what ComReg might treat as excessive WORs. However, on its own, it may not be sufficient to remedy the problems identified, especially as guidance is not legally binding. However, issuing guidance does not preclude ComReg from adopting any of the other options discussed.

Explicit price control

Imposing specific controls on the WORs set by OOs, directly prohibiting excessive WORs, should reduce current harm and also protect SPs against the risk of the costs of using such NGNs increasing in response to retail interventions. Therefore, wholesale price controls have potential to bring the greatest benefits. Given the principles for efficient wholesale pricing outlined in section 2 of this report, we re-iterate that originators should cover the costs of origination and no more.

Controls on 0818 only or on all 'geo-linked' NGNs?

Given proposals to rationalise these non-freephone numbers to a single geo-linked number (0818), it could be argued that by not controlling wholesale prices for the soon to be legacy ranges - 1850, 1890 and 076 - ComReg could encourage migration away from these numbers. Arguably, this could aid the transition to the two remaining NGNs, 1800 and 0818, by discouraging SPs from using these other ranges. It could also be argued that the retail measures remove the 'cost sharing' element of 1850 and 1890, as all costs would be recovered via the retail origination rate. This addresses a key source of harm to SPs under the current regime.

However, given the concerns raised to date and the evidence presented about the harm and excessive costs being faced by service providers and concerns about the ability of originating operators to respond to the retail pricing remedies in a way that could adversely affect NGN usage by SPs, there may be a case for ensuring that there is a consistent application of any wholesale measures simultaneously across all of the 'geo-linked' NGNs to avoid any further harm. If wholesale remedies were not applied to the legacy number ranges, there is a danger that SPs with high costs of transitioning quickly to different number ranges could be left exposed to price increases resulting from higher wholesale charges. Indeed, this might present an opportunity for originators to raise wholesale prices for legacy ranges, as they might consider that service providers ready to switch to 1800 and 0818 would do so (and so not be lost as customers) but remaining service providers using the legacy number ranges would be price inelastic and would tolerate higher charges.

Therefore, the wholesale approach needs to balance potential short-term harm that may be caused to SPs who may find that their costs increase but that they cannot quickly move from legacy 1850 and 1890 numbers, against a forward-looking focus on the 0818 NGN number range.

Recommendation

When considering the market in the presence of ComReg's retail regulation, our recommendation is that ComReg should prioritise wholesale arrangements for the non-freephone NGN (0818) that will remain after the retail proposals are fully implemented. In our view, this approach would be justified because some of the retail measures already reduce some of the harm, even for those NGNs that will be withdrawn. For example, the geo-linked measure applies to all NGNs, and will also remove cost sharing from 1850 and 1890. Further, termination to the 076 range is included in ComReg's Consultation on proposed price controls for FTRs and MTRs³². Nevertheless, we consider there is some risk of short-term harm to SPs using legacy ranges if originators raise wholesale prices; ComReg might want to issue guidance about this possibility to reduce incentives for originators to behave in this manner.

4.3 WORs vs. WTRs

*Methods for
constraining
wholesale charges*

Constraints on the ability of OOs to earn excessive margins overall (given their retail and wholesale revenues) could be achieved in a two largely equivalent ways:

- there could be a cap on the WOR at a sufficiently negative level to allow terminators to recover their reasonable costs and to ensure originators do not over-recover their origination costs given that they also receive retail revenue;
- in the absence of a WOR (i.e. with the WOR capped at zero), terminators could set a wholesale termination rate (WTR), which would need to be sufficient to allow terminators to recover their costs, but not too high to lead to originators failing to recover their origination costs.

4.3.1 Equivalent financial flows

These two approaches lead to the same overall situation in terms of the financial flow from originator to terminator, but in the first case the WOR is negative (pushing a payment to the terminator) whereas in the second there is a positive WTR (pulling a similar payment to the terminator).

³² ComReg 'Price Consultation: Further specification of proposed price control obligations for fixed and mobile call termination rates', Document 18/19, 13.03.2018

Under reasonable retail pricing conditions, there is compatibility between OOs setting a cost-oriented WOR and TOs recovering their costs. For this to hold, the retail price must be at least equal to the system-wide incremental costs, that is the incremental cost of origination (C_o), the cost of termination (C_T) (and any transit fees (C_{Tr})).³³ i.e.

$$P \geq C_o + C_T + C_{Tr}$$

Because the retail pricing condition is geo-linked (i.e. same price as if a geo call were made instead) provided the origination and termination costs are the same for geographic and non-geographical voice calls,³⁴ the average retail price can be expected to satisfy this condition.

³³ For calls to NGNs, the terminating operator is responsible for covering the costs of transit. There is no differentiation in transit rates between different call types. Transit rates are not subject to regulation following ComReg's market review of 'Wholesale Fixed Voice Call Origination and Transit Markets' in 2015, where it determined that Eir no longer has SMP in the transit market. Eir's transit rates are published in its Commercial Interconnection Services Price List (CISPL) document.

³⁴ In general, we note that NGNs differ from geographic numbers because the termination point of a NGN is not identifiable from the number structure. NGNs such as Freephone, Shared Costs and 0818 numbers have to be translated into other numbers type in order to reach real destinations. It may be that there are differences in the switching and forwarding functions or capabilities of different networks that result in some operators experiencing cost differences when routing a NGN versus geographic call and some not. However, in the original data request to ComReg 17/70a, and in the consultation process to date, no specific details of cost differences were provided by operators and overall, a greater number of operators supported that there are limited costs differences in network utilisation between geo and non-geo calls. Furthermore, this view received particular support from Eir which carries a lot of NGN traffic (and thus we may put more weight on its response) who stated that IN queries for routing an NGN call are also required for geographic calls. It would appear that maintaining these IN services is a 'normal cost' of operating in electronic communications markets. On this basis, we consider that there are no unilateral and significant differences in the costs of processing geo and non-geo calls.

For this condition to hold:

- **It is reasonable to ignore number translation costs on a per call basis**, as these are not considered to be material - from a technical point of view, we understand that calls to geographic numbers and calls to NGNs are both originated in very similar ways and both are switched services carried through the network. The TO then "translates" the dialled number in order to deliver the call. It could be argued that the translation costs of NGN are comparable to those associated with number portability for geographic calls. Therefore, the scope for genuine cost differences should be minimal and it is unlikely there is a cost-based justification for pricing NGN calls differently to calls to geographic numbers;
- **That any routing differences for geo and non-geo calls do not cause a significant difference in average transit costs**, which is very unlikely as transit costs are a small component over the overall end-to-end cost – we understand that non-geographic transit traffic can only be delivered to the open eir network at the Tertiary switches. We also understand that there is currently no differentiation in transit rates between different call types.³⁵ ³⁶ However, given that transit charges for geo and non-geo numbers are no longer regulated, there is a risk that transit rates could change at any time.³⁷ If the levels of transit rates for geographic and non-geographic numbers stay the same then the conditions presented here hold. If there is a risk that they could be differentiated, then ComReg may consider whether a non-discrimination obligation on transit would be necessary.³⁸

Ignoring for a moment cost differences across operators, if retail prices satisfy condition (1) below, there are no 'system margins', i.e. revenues match costs on an end-to-end basis.

$$(1) P = C_o + C_T + C_{Tr}$$

³⁵ The transit fee itself (for these numbers) is paid by the terminating operator. Open eir levies the "standard" open eir national transit fee on the terminating operator for the call (around 0.2 cpm at peak). There is no differentiation in transit rates between different call types. Historically, eir's transit rates are published in STRPL (and as of 1/7/18 in CISPL).

³⁶ ComReg's market review of the transit market recognised that charging and billing for transit of NGNs is different from geo numbers and mobiles. For geo numbers and mobiles, the transit charge is levied on the originating operator, while for NGNs it is levied on the terminating operator. This means that the purchaser of transit for NGN calls does not have control over the choice of transit provider, but is liable for the cost of the transit service. (ComReg 14/26, para 7.55)

³⁷ eir and BT are the two main operators that transit traffic to the NGN classes concerned though eir accounts for the vast majority of this transit traffic.

³⁸ i.e. an obligation that transit rates for geographic and non-geographic calls should be equivalent.

In this case, reducing the originator's total revenues to cost is equivalent to a financial flow from OO to TO equal to

$$C_T + C_{Tr}$$

Therefore, given condition (1) above, this financial flow can be implemented **either** from a WTR reflecting the termination side costs **or** by a WOR set on a retail-minus basis. These are equivalent under the assumption of no system margin, i.e.

$$P - C_o = C_T + C_{Tr}$$

We can therefore express the requirements on cost reflectivity in different ways:

- a cost orientation obligation which implies a negative cap on the wholesale origination rate related to the retail price (i.e. retail price less origination cost); and/or
- terminators receiving a WTR equal to their costs.

These methodologies only diverge in the case that there are system-wide margins (i.e. $P > C_o + C_T + C_{Tr}$), in which case:

- the system margin accrues primarily to the TOs if OO's are subject to a WOR cap set relative to the retail price;
- the system margin accrues primarily to the OOs if TOs set a cost-reflective WTR.

4.3.2 WOR cap

At present, 0818 calls largely fall under the deemed-to-be regime, so in most cases parties will simply conform to the wholesale tariff price list published by open air. This contrasts with the situation in 1850 and 1890, where the originator is typically setting the WOR at a higher level, leading to concerns discussed above about originators exploiting market power. Therefore, for 0818 it might be argued that to date neither originators nor terminators have exerted active control over the wholesale terms, though precedent from the other NGN number ranges suggests that originators might try to do so.

Difficulties of capping the WOR for 0818

Whilst a possible approach to limiting market power of originators is to cap the WOR at some negative amount (i.e. the WOR is negative and must be *below* some negative amount) to ensure that TOs recover their costs, this involves judging the reasonableness of a wholesale charge set by an OO against whether or not TOs recover their costs, rather than by reference to whether the OO is recovering or over-recovering its costs.

However, it would be practically difficult to test whether the WOR is cost-reflective for the OO. This is because the WOR also receives retail revenue, as well as the WOR. Cost-reflectivity would need to be assessed by comparing the sum of these revenues to origination costs. Therefore, the WOR should, if cost-reflective, be the retail

price of the NGN call, less the origination cost. However, in practice this retail price may be very difficult to assess if calls are sold in bundles.

4.3.3 WTR as a new market arrangement

Using a WTR instead for 0818

An alternative arrangement is to allow terminators to set a (positive) WTR and require the WOR to be at most zero. Providing this is reflective of termination costs, the end result in terms of the financial flow from OOs to TOs is similar. It also has the advantage that the wholesale rate is not set by the side of the market that has bottleneck control (i.e. originators). This would also mean that the wholesale payment regime for the geo-linked 0818 range would in the future conform to a similar structure to that for geographic calls.

Might TOs increase WTRs to inefficient levels?

However, this raises the question of whether there are any concerns about the potential for wholesale termination rates for NGNs (which have not been a feature of the market to date) to be raised above cost by terminators.

In particular, unlike 076, termination to the 0818 range is not included in the FVCT and MVCT markets defined on a preliminary basis in ComReg's Consultation on proposed price controls for FTRs and MTRs³⁹. This means that under the current proposals, wholesale termination rates for 0818 would not fall within a defined market and would not be subject to any remedies imposed on foot of an SMP finding. The reasoning for this decision is that SPs using 0818 are likely to be affected by any increases in termination rates that lead eventually to higher costs faced by originators and in turn higher prices for callers; this may be counterproductive for SPs wishing to be called.

Nevertheless, we consider that there are some residual concerns about the setting of MTRs for 0818 at inefficiently high levels. First, SPs interests are rather different than for Freephone numbers, as for 0818 they may be using an NGN for reasons such as providing a memorable number to call or avoiding being linked to a geographic area, rather than making themselves contactable for free. Second, because of the retail market reforms linking the retail price of 0818 calls to retail prices for geographic calls, an originator will need to set a common retail price for geographic and NGN calls. Therefore, an NGN terminator who raised its wholesale termination rate for 0818 calls only might then only have a small overall effect on the blended retail prices set by originators.

Whilst these are potential concerns, having TOs setting a WTR is likely to be less problematic than having OOs setting a WOR. We

³⁹ ComReg 'Price Consultation: Further specification of proposed price control obligations for fixed and mobile call termination rates', Document 18/19, 13.03.2018

have direct evidence of the problems OOs setting the WOR can cause from the 1850 and 1890 ranges.

We note that the option would remain open, if necessary, for ComReg to bring 0818 wholesale termination rates under a common framework of regulation with geographic termination rates at some future date if there were evidence of terminators setting excess rates. Even prior to that, the potential for parties to bring disputes to ComReg is likely to be disciplining, especially given the additional clarity on these issues that has resulted from ComReg's recent investigations and intervention in the NGN market.

4.4 Assessment of the options

Based on the assessment above, there are clear advantages to imposing a wholesale price control over the alternative option of not imposing any control. It is essential that end-to-end connectivity between SPs and callers is not compromised by SPs being incentivised to withdraw from using NGNs, and this is a risk without appropriate regulation.

ComReg could impose a cost orientation obligation on wholesale origination rates on the basis of modelled costs taking the same approach as to the cost orientation obligation on 1800 retention⁴⁰. However, as originators receive retail revenue and set WORs, there are very significant practical complications. As discussed above, any (negative) cap on the WOR needs to be set by reference to retail price, which is difficult to measure in a world where services are sold primarily in bundles.

Use of WTRs

Therefore, it is likely to be more practical to cap the WOR at zero and to allow TOs to set a WTR to recover their costs. This market arrangement has been absent to date (as the deemed-to-be rates have been used for 0818 and 076), but capping WORs at zero for 0818 calls would naturally lead to this outcome, as TOs would then need to set a WTR to recover their costs.

This would lead to an analogous wholesale arrangement for 0818 calls as for geographic calls. It is also not necessary to model origination costs under this approach (as opposed to Freephone numbers, where it is).

There are fewer reasons to be concerned about terminators setting excessive WTRs for 0818 than for geographic calls, but if this

⁴⁰ In line with the recommendations given for 1800, should ComReg impose a cost orientation obligation with reference to modelled costs of origination we recommend ComReg use the LRAIC+ cost standard. Further recommendations on the specific parameters of the modelling exercise are set out in more detail in Annex A of this report.

situation were to ever arise, it would be straightforward to bring 0818 termination under a common regulatory scheme with geographical calls.

Impact on OOs

Setting constraints at both retail and wholesale level simultaneously

We acknowledge that by setting constraints on both the retail and wholesale prices for these numbers, originators will receive lower revenues on these services than they have historically. Whilst it may be argued that originators will therefore seek to make-up for these lost margins by raising prices for other services (so called waterbed effects – see Box 2 below) we do not think that those arguments are credible or sufficient to undermine the justification for setting price controls on NGN calls.

Box 2: Waterbed effects

If retail revenues are lowered as a result of the retail pricing Decision (ComReg 18/106 and Decision No. D15/18) designed to reduce the excessive pricing for NGNs seen to date), and the wholesale market is controlled to prevent originating operators from substituting excessive retail margins for excessive wholesale margins, then it could be argued that we may expect to see price increases elsewhere and that without the sources of funds from excess NGN revenues certain other services currently cross-subsidised from excess NGN margins will suffer.

However, as noted in our original report for ComReg 17/70a, as a matter of principle, even if other services might be inefficiently cross-subsidised by excess revenues earned from NGNs, this is not in itself an argument for the status quo.

Furthermore, it is not necessarily the case that any excess margins earned from NGNs result in lower prices for other services to the benefit of consumers; such margins may be dissipated through costs of competition, such as expenditure on marketing, advertising or other activities aimed at winning or retaining customers that do not directly benefit customers.

Finally, in the case of changes to the pricing of NGNs, the impact on pricing of other service is likely to be very small. Revenues for fixed and mobile operators generated from customers calling NGNs amounted to around €30 million in 2015. In contrast, total retail revenues in the telephony market were around €2.9 billion in the 12 months to December 2015 (and around €2.9 billion in 12 months to December 2016).⁴¹ Given how small a proportion of total revenues NGN revenues account for, the price increase across all other services would have to be very small for it to be revenue neutral (c. 1%).

⁴¹ Based on fixed line retail revenue plus mobile retail revenues as displayed in Fig 1.1.1 of ComReg document 17/15(R), 'Irish Communications Market – Quarterly Key Data Report. Data as of Q4 2016', 16 March 2017. Available at: <https://www.comreg.ie/publication/irish-communications-market-quarterly-key-data-report-data-q4-2016/>

5 Conclusions

Based on our assessment above, there are clear advantages to imposing a price control on WORs for calls to NGNs over the alternative options of not imposing any control, or only issuing guidance on how ComReg might deal with a dispute between parties within the NGN value chain (most likely between an originator and termination). In the presence of the retail remedies already in place, our conclusions consider only 1800 and 0818, as the two remaining NGNs.

*Recommendations
for a price control on
wholesale rates for
1800 calls*

Our recommendation is that ComReg should impose a price control on the WORs for 1800, to control the level at which originating operators can charge terminating operators. The price control on origination rates should be based on modelled costs of call origination.

Such a price control set with reference to detailed cost modelling would be transparent, provide regulatory certainty and ensure that OOs cannot over-recover costs.

Should ComReg impose a cost orientation obligation with reference to modelled costs of origination we recommend that ComReg use the LRAIC+ cost standard. Including a mark-up for common costs ensures consistency with eir's regulation of geographic calls and avoids creating significantly different margins on NGN and geographic calls for originators, which could lead to perverse incentives. Further recommendations on the specific parameters of the cost modelling exercise are set out in more detail in Annex A of this report.

An allowance for relevant retail costs might be included, but no provision for bad debt is needed in Freephone costs.

There could be one agreed rate for fixed operators and one agreed rate for mobile operators to the extent that there is evidence of materially different origination costs. However, it would be inappropriate to individualise price controls to specific operators or groups of operators (other than a fixed vs. mobile distinction) as this would risk compensating operators for their actual costs, which might include possible inefficiencies. Therefore, we propose that the standard regulatory practice of setting price caps for a hypothetical efficient operator of some particular broad class be maintained.

This approach would mean that fixed operators other than eir would be subject to regulation of WORs on the basis of eir's costs. This could be problematic if another fixed operator had significant higher costs due to lack of scale economies (rather than any inefficiency). However, we do not see this situation as being particularly likely, as any fixed operator that was able to compete sustainably against eir in provision of voice origination services could not be at a large cost disadvantage with regard to LRAIC voice origination costs.

*Recommendations
for a price control on
wholesale rates for
non-freephone 0818
NGN calls*

Allowances for common and retail costs would also provide additional headroom.

We also recommend that ComReg impose price controls for calls to the non-freephone, geo-linked 0818 number range. Although operators have maintained “deemed-to-be” wholesale rates to date, there are strong incentives for originators to increase WORs once call volumes grow for this range as retail reforms come into place, and also to claw back lost retail revenues.

Applying a cost orientation condition on originators for 0818 is impractical as it would have a “retail-minus” character. Given this, a simple approach is that WORs for 0818 be capped at zero, and instead terminators create the necessary financial flow from originators to terminations by setting a WTR to cover termination costs.

However, this simple approach faces the practical problem that 0818 termination charges are not at present subject to price control. Clearly, it would be possible to extend the scope of termination charge price controls subsequently as part of a market review, but this would not have immediate effect.

Given that our concern is with the overall *net* financial flow from OO to TO (i.e. the WTR less the WOR), an alternative is to frame the price control on WORs for 0818 so that this *net* flow covers the regulated voice termination rate on fixed networks (as NGN calls terminate on fixed networks serving SPs), but no more. This would then not require any extension of termination charge price controls to 0818 calls.

This approach requires a ceiling on the WOR that depends on the WTR faced by the OO. An OO would have a WOR ceiling for a particular TO equal to the WTR that TO charges the OO, less the regulated fixed voice termination rate. This means that the net financial flow from OO to TO is equal to regulated fixed voice termination rate if the OO sets the WOR at its ceiling.

Formally, this approach would imply a negative ceiling for the WOR if the TO did not charge a WTR, or set a WTR less than the regulated fixed termination rate. However, in this case it should not be necessary to require the OO to make a payment to the TO, as the TO could set a WTR in order to recover its termination costs.

Therefore, our recommendation is that a WOR ceiling for an OO is set at the greater of zero and the TO’s WTR less the regulated fixed termination rate. This ensures that TOs can recover termination costs, but allows OOs to set countervailing WORs if any TOs attempt to raise WTRs above the regulated fixed termination rate.

Annex A Implementation of the price control based on modelled costs

Should ComReg choose to impose a price control on the wholesale origination rates for calls to freephone and/or non-freephone NGNs in the form of a cost-orientation obligation on originating operators with reference to modelled costs of origination, ComReg must consider the parameters of the cost model.

This Annex sets out the key parameters to be considered in developing modelling required to establish operators' costs in originating calls to freephone and non-freephone NGNs, including

- Model structure;
- Service increment;
- Cost standard;
- Cost base;
- Depreciation method;
- Scale;
- Demand forecasts; and
- Price path.

The key principle should be to ensure that the basis for modelled costs is as close as possible for those for models used for Fixed Voice Call Origination (FVCO), to ensure that there are no significant differences in the allowed prices of origination that could otherwise cause distortions in the provision of NGNs relative to geographic numbers.

In outlining recommendations for the modelling parameters below, we give due regard to regulatory best practice, including European Commission recommendations and ComReg's approach to modelling costs of provision of other services in Ireland to ensure consistency.

A.1 Model structure

NRAs have two broad options for model structure when undertaking cost modelling of networks to determine the cost of providing the telecommunication services subject to the price control:

- The **top-down approach** typically starts with a company's accounts and adapts the basis of calculation to meet the cost standard and/or to reflect the costs of modern assets. This can be used to determine an operator's own cost base, but might not be the best approach for estimating the costs of a hypothetical efficient operator;

- Under a **bottom-up approach**, a cost accounting model is developed by establishing the network asset base based on the expected demand in terms of subscribers and traffic. It then assesses the network design and related costs based on these assumptions, accounting only for the assets required to handle that demand (and so, inefficiencies are excluded).

Developing a top-down model based on an actual company's accounts (say eir, in the case of fixed services), might present difficulties associated with determining costs of detailed network elements from accounting costs and may incorrectly take into account the costs of legacy assets, introducing inefficiencies into the model. Furthermore, for regulatory purposes the model may not be transparent for the other regulated firms (in terms of being understood with reference to their own costs given that network architectures and technology choices may differ).

Therefore, bottom-up approaches are more commonly used due to their increased transparency and ensuring that only efficient costs are captured.

In many cases, in practice, both approaches are used to provide a 'cross-check' and to help adjust the model. For example, a bottom-up approach may be taken in the first instance with outputs later calibrated to better reflect information from top-down data. This would also allow one to compare the model with the costs of different operators in the market and understand the difference between operators, refining the model where appropriate.

Our understanding is that, although subject to further consultation, the proposals for the FACO market would be for compliance of the cost orientation obligation to be checked with reference to both a top down and a bottom up model.⁴²

Similarly, for the regulation of FVCT and MVCT, the approach set out in the notified measure⁴³ is for cost to be modelled using a bottom-up approach. Modelled costs could then be checked against top-down data.

Such an approach is also in line with the EC 2009 Termination Rates Recommendation, which states that: "*[t]he implementation of a bottom-up model is consistent with the concept of developing a network for an efficient operator whereby an economic/engineering model of an efficient network is constructed using current costs. It reflects the equipment quantity needed rather than that actually provided and it ignores legacy costs*" and comments that where

⁴² See paragraph 9.225 of ComReg 1426.

⁴³ https://circabc.europa.eu/sd/a/41e67467-7f7b-424d-bdoc-357f4fe1c2bd/Copy_of_ComReg_Article_7_Notification_Pricing_Markets_1_and_2_-_Non-confidential.pdf

operators are compensated for actual costs incurred there would be few incentives to increase efficiency. However, recognising that the bottom-up model is based largely on derived data, the EC recommends that the results should be compared against the results from a corresponding assessment of top-down data to avoid large discrepancies between modelled and actual costs.⁴⁴

Furthermore, the EC 2013 non-discrimination recommendation⁴⁵ (which although addressing broadband, sets out a general approach to costing and treatment of costs), also recommends that where cost orientation is imposed a bottom-up approach to modelling should be taken.

These principles associated with choosing a bottom-up approach over a top-down approach outlined above apply equally to the case of NGN origination. Therefore, we consider that ComReg ought to follow a bottom-up approach to cost modelling in this case. Where possible, this could be checked against costs derived from an assessment of top-down data.

A.2 Service increment

As discussed in section 3 of the main report, given that all originating operators provide access to NGNs and that provision is largely inseparable from provision of geographic calls (and in line with the proposed retail market proposals NGNs should be treated as equivalent to all other geo-calls), we consider that the increment to be taken should ideally be for all originating voice calls originated on the network, and identifying cost of the originated leg of the call (since the objective here is to calculate the wholesale charge levied by the originating operator, hence terminating aspects of calls should be excluded).

A.3 Cost standard

In section 3.1.4 we discussed the relative advantages and disadvantages of using pure LRIC and LRAIC+ as a cost standard. We note that pure LRIC is generally used in modelling termination rates, and this approach is recommended in the 2009 Termination Rate

⁴⁴ COMMISSION RECOMMENDATION of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/EC).

⁴⁵ COMMISSION RECOMMENDATION of 11.9.2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment.

Recommendation. ComReg's approach to the modelling of termination rates is consistent with EC Recommendations.

However, we consider there are compelling reasons for the costs of NGN origination to be modelled on the basis of LRAIC+. This is because the policy arguments for pure LRIC relevant to geographical voice call termination are not directly relevant in the context of non-geographical voice call origination.

A LRAIC+ methodology is consistent with recommendations in the context of general costing methodologies, for example as outlined in the 2013 Non-Discrimination Recommendation. LRAIC+ is also used by ComReg in other access pricing modelling, including for FVCO. As discussed above, at present, eir is regulated for fixed calls to NGNs (and geographic numbers). We understand that eir's Fixed Voice Call Origination (FVCO) charge is capped at cost, on the basis of TD LRAIC+.

Using LRAIC+

If non-geographic call originators were forced down to a WOR that gives them only LRIC, then this could make a geo-linked (i.e. same retail pricing as geo) NGN call cheaper on an end-to-end basis than a geo call⁴⁶ given that FVCO is regulated at LRAIC+.⁴⁷ If this were the case, then originating operators may take steps to further discourage calls to these numbers through, for example, taking steps to affect the quality of service to discourage the diversion of traffic away from geographic numbers (for which they would be permitted to recover a larger share of the costs of provision). It is difficult to anticipate exactly what measures might be taken to discourage calling but given this possibility it is prudent to avoid creating such incentives by ensuring that originators earn similar margins on non-geographical calls as they do originating geographic calls.

We want to avoid any such distortions to service provision and further reductions in the perception of quality and therefore usage of valuable NGNs. As stated in section 2 above, where we set out the principles for a wholesale regime, we must avoid regulatory-induced distortions that might affect the choice of service providers and operators regarding the treatment of different NGN number ranges and between NGNs and geo-numbers.

Therefore, there are good reasons to allow for cost orientation using LRAIC+ to avoid any such distortions. This approach is not in any way inconsistent with the use of pure LRIC for the setting of regulated termination rates for geographic voice calls.

⁴⁶ This assumes that number translation is a tiny cost of NGN origination and is not significantly different from the costs of translation associated with connecting a geographic call in the case of number portability.

⁴⁷ See ComReg 1582, Market Review Wholesale Fixed Voice Call Origination and Transit Markets - Response to Consultation and Decision, 24 July 2015.

Is it appropriate to include any additional uplift?

As noted above, under the current FVCO regulation, for NGNs eir is also allowed an **additional mark up** (ie on top of LRAIC+) for “reasonable billing costs associated with the service; and an additional bad debt surcharge”.

As part of our assessment of what costs would be allowed for under the regulation on other originating operators (and any changes to the obligations/regulation applied to eir) we must consider the reasonableness of allowing for any such additional mark ups over LRAIC+. Our starting point is that the originator should be able to achieve a similar mark up over LRIC as for an off-net voice call to a geographic number. Relevant retail costs need to be considered, but for Freephone calls, this would not include costs related to bad debt.

It is reasonable for the presumption to be that the mark-up over LRAIC+ should be zero unless a clear basis for allocation of retail and billing costs can be demonstrated by operators. We note that many retail costs (such as sales and marketing, and customer acquisition/retention incentives) may not provide direct benefit to service providers, because they are to do with the provision of VAS and not with the provision of call origination. We suggest also that the ‘additional markup’ provided for in the FVCO Decision may be more relevant for premium rate numbers, which are outside the scope of this project. However, we suggest that the modellers ask operators and retail service providers if they can justify the inclusion of any additional retail costs associated with call origination to NGNs.

A.4 Cost base

Having chosen the increment to apply and the model structure, we must also consider the basis for the modelled costs. Modelled costs could consider actual operator costs, or could be based on the costs of a hypothetical efficient operator. Using actual costs of existing operators (whether a single operator or an average of several operators) may result in the inclusion of past inefficiencies of the chosen operator (and EC recommendations on approaches to modelling, including the 2009 Termination Rate Recommendation, envisage the modelling of efficient operator costs). Furthermore, the bottom-up approach recommended above should be developed to capture only the efficient costs.

Our recommendation is therefore that the costs should be based on those of a Hypothetical Efficient Operator (HEO). Given the maturity of the market for NGNs, we see no need to add further complexity by modelling the position of a new market entrant and suggest that the modelling approach should be based on a hypothetical existing operator.

A.5 Depreciation method

The model should also include assumptions about the depreciation profile of investments. There are a number of depreciation methods for defining the recovery of capital investments. However, the European Commission has stated a preference for the use of economic depreciation⁴⁸ as opposed to other methods such as Historical Cost Accounting (HCA), Current Cost Accounting (CCA) or an annuity (standard or tilted annuity).

We note that for a bottom-up (BU) modelling approach, either economic depreciation or tilted annuity could be an appropriate depreciation method to use.

Our recommendation is that the depreciation profile used should, where feasible, be based on economic depreciation, and any difference in approach would need to be justified.

This is in line with ComReg's approach to other cost modelling and EC Recommendations

A.6 Scale

The costs (per unit) of the modelled operator will be influenced by its market share, and is therefore a key parameter in defining the hypothetical efficient operator's unit costs. A hypothetical efficient operator will achieve economies of scale as its market share increases.

For the NGN market, we propose that it is assumed that a market entrant could immediately enter the market and compete i.e. that the market is contestable.

A practical approach to addressing scale effects would be to use the average of the actual number of large operators with ubiquitous coverage:

- For mobile, there are three such operators, so scale would be 33.3%;
- For fixed, use eir's scale as it is the only large operator with ubiquitous coverage.

This scale effect could also be achieved where an operator is part of larger entity (e.g. an international company) and unit costs may be lower. This might be particularly relevant for the mobile operators where, for example Vodafone and Three may be able to achieve

⁴⁸ For example, Recital 18 of the 2009 EC Recommendation on fixed and mobile termination rates recognises that it might not always be possible to develop a robust economic depreciation model, but that any other methods used should be assessed in terms of how closely they are likely to approximate an economic measure of depreciation.

greater economies of scale benefits than eir Mobile can (as it only operates in Ireland). The costs of the equipment assumed for the modelled HEO should therefore be derived from the prices paid for equipment by all of these parties.

A.7 Demand forecasts

In determining future scale, voice market forecasts should be consistent with forecasts used for other modelling ((in particular, for fixed call origination and fixed and mobile call termination), and ensure that the forecasts are consistent across the fixed and mobile networks.

A.8 Modelled period

As described by ComReg in document 18/65, the legal basis for the proposed intervention is not a full market review process, but an intervention with recourse to Article 5 of the European Access Directive (Regulation 6 of the Irish Access Regulations) and/or to Article 28 of the Universal Service Directive (Regulation 23 of the Irish Universal Service Regulations. This means that modelling the costs of origination to NGNs is not tied to other regulatory reviews.

In order to provide a degree of certainty to the market, we would expect that the model should be able to calculate charges for several years i.e. it should be a multi-year model. We also suggest that ComReg should seek maximum consistency with its modelling of other access and call prices in terms of the periods modelled.

A.9 Price path

Given that it is likely that under our recommended approach, the regulated wholesale origination rates will generally be lower than current rates (and in some cases significantly lower e.g. mobile rates for calls to 1800), we must consider if there should be a requirement to approach the new regulated rates in a gradual way using a price path over a set period of time.

For example, in the case of regulated termination rates, the target rate is often approached through a glide path whereby the cost model determines the price per minute and the price per minute gradually approaches this from the current rates over a pre-defined regulatory period.

The decision on whether to adopt a gradual "glide path" approach from current rates to regulated rates in this case, should take into consideration a number of factors:

- the magnitude of the change required to get from current rates to regulated rates and the scale of impact on operators' profitability;
- the practicalities of changing those rates (for example, waiting for contract renewal periods); and
- the level of harm being imposed by current rates.

For calls to 1800

As we have seen from current wholesale prices, the mobile origination rates for calls to 1800 are much higher than eir's regulated rates compared to fixed, so the change will hit them harder.

Considering the level of harm being raised by the current price levels it would not be proportionate to allow rates to remain significantly above the modelled cost. For 1800 freephone numbers, we have shown that there is real and observed damage from the existing wholesale origination rates, and that price levels should fall to regulated rates as soon as possible to ensure that the harm arising from current rates is mitigated. There is a need to ensure that end-to-end connectivity is not compromised.

There would seem to be no legitimate reason for why prices could not be set at regulated levels with relatively little notice (for example, there would be no need for revisions of contracts and there is no need for retail price adjustments).

For non-freephone numbers

Current wholesale origination rates for some of the non-freephone numbers are higher than they otherwise would be under our proposals, and in some cases would be significantly so (for example, mobile to 1850, 1890 would no longer be receiving an income from terminators in the form of negative rates).

There is already some observed harm from the current levels of wholesale origination rates for some of these numbers and there is scope for further potential harm arising from wholesale rate adjustments as the proposed retail pricing controls come into force. Therefore, we consider that the wholesale pricing controls should come into force as soon as practicable.

Our recommendation is that there is no glide path for changes to wholesale origination rates for 1800 freephone and non-freephone NGNs. Cost oriented 1800 WORs should come into force with immediate effect, but a year could be appropriate for changes to wholesale origination rates for non-freephone NGNs.

In the case of any dispute resolution (a form of intervention that would be equally applicable to this situation) a finding of excessive pricing would likely result in a penalty with imposed with immediate effect, so the parallel here would be for the new prices to come into force with immediate effect.

The question then becomes which modelled costs from the modelled period would apply? For example, one could model the costs for each and every year in the regulatory period and set the price at that level in the respective (an unaveraged approach) or set a single price across each year of a defined period based on an average of the annual modelled cost (an unweighted or weighted average approach). One could also set a single price per minute over the regulatory period so that the net present value of the revenues is equal to the net present value of the costs recovered from the model (the levelised approach).

We understand that ComReg's existing pricing decisions adopt an approach whereby it uses unaveraged costs for individual years as the starting points for prices for the regulated rate in those years.⁴⁹

We consider that applying this unaveraged approach would represent the simplest method and would ensure consistency of application within ComReg's existing pricing decisions.

A.10 Summary of recommendations on costing approach

Table 9 below summarises our recommendations on the key parameters for the cost model

⁴⁹ This is the approach taken in FVCT: "...we recommend that the models produce nominal costs per minute of FVCT (respectively MVCT) for each of the calendar years 2017-2022" ComReg 18/19a

Table 9: Summary of recommendations on the cost modelling approach

Parameter	Recommendation
Modelling structure	BU
Cost standard	LRAIC +
Service increment	With the increment ideally taken as all originated voice calls
Cost base	Hypothetically efficient operator
Depreciation method	Economic depreciation
Scale	Using the average market share of the average number of operators in the national market
Demand forecasts	Based on voice call forecasts
Modelled period	At least 3-5 years
Price path	Immediate based on unaveraged modelled costs (no glide path)

A.11 Updates to the model

As described by ComReg in 18/65, the legal basis for the proposed intervention is not a full market review process, but an intervention with recourse to Article 5 of the European Access Directive (Regulation 6 of the Irish Access Regulations) and/or to Article 28 of the Universal Service Directive (Regulation 23 of the Irish Universal Service Regulations).

Therefore, there will be no formal requirement for regular reviews of the market and updates to the model

In any case, we do not consider there will be need for a regular review (over and above the need to update the 3-5 year modelled costs) or significant changes to the model over time because the issues being addressed are structural and based on individual originator bottleneck control that will not be affected by changes in the market, such as entry or exit of new players.

The reference modelled costs should be closely related to the cost modelling used in FVCO markets and can be updated in line with any updates on those models as part of the regular market review process in those markets.