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Principles for
margin squeeze tests
for fibre access
in Market 4 and 5

Bad Honnef, 9 February 2015

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Contents

1   Introduction

In the Norwegian Communications Authority's (Nkom's)[1] decision of 20 January 2014, Telenor ASA (Telenor) was designated as an undertaking with significant market power in the market for wholesale physical network infrastructure access (including shared or fully unbundled access) at a fixed location (Market 4) and the market for wholesale broadband access (Market 5). In conformity with the Electronic Communications Act Chapter 4 several obligations were imposed.[2]

In respect to Market 4, Telenor has to provide unbundled access to fibre-based networks (Fibre LLU). This includes access to co-location, information and support systems and if necessary backhaul. Considering Market 5, Telenor has to provide broadband access to fibre in the form of Virtual Unbundled Local Access (VULA). With regard to this access service, Nkom defined central characteristics which have to be met in respect to differentiated quality of service, capacity to end users, appropriate access point in the network and flexibility in the choice of network terminals/user equipment.

Telenor was also imposed an obligation of non-discrimination with regard to price and other terms for such access. The obligation of non-discrimination applies between external providers as well as between Telenor's internal operations and external buyers of access. As a way to monitor compliance with the obligation of non-discrimination on price between Telenor's own operations and external providers a margin squeeze test (MST) is going to be applied for fibre based services.

In this document we formulate principles for MSTs in Market 4 and 5, especially referring to the obliged wholesale access services that enable alternative operators to provide Next Generation Access (NGA) retail services (fibre LLU and Fibre VULA).[3] These principles should be considered as a guidance for the development of a model for the execution of margin squeeze analyses. The purpose of the model is to investigate what margin an efficient buyer of access to Telenor's fixed fibre access network will be able to achieve when offering retail products similar to key products in Telenor's product portfolio. The model will have to estimate the access buyer's margin by calculating the retail revenues that a buyer of access is expected to achieve by providing similar retail products as Telenor, and calculating the access buyer's expenses linked to providing these retail products, including access costs.

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[1]   As of 1 January 2015, the Norwegian Post and Telecommunications Authority (NPT) has changed its name to the Norwegian Communications Authority (Nkom).

[2]   See NPT/Nkom (2014a und 2014b).

[3]   See NPT/Nkom (2014a und 2014b).

The principles for MSTs in Market 4 and 5 are subject to a national consultation from 9 February to 6 March 2015.

The overall objective of the MSTs is to ensure that buyers of wholesale fibre access can replicate Telenor's fibre based retail products with a reasonable margin.

The principles are aligned with the Commission's recommendation on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment (The Recommendation)[4] and the BEREC Guidance on the regulatory accounting approach to the economic replicability test (i.e. ex-ante/sector specific margin squeeze test, 5 December 2014).[5] The Recommendation lays down the "concept" of how to run an ex-ante economic replicability test (ERT) for NGA products. From a practical point of view, the ERT can be considered as a term for an ex-ante margin squeeze test applied by national regulatory authorities (NRAs) in a NGA environment. The wordings MST and ERT will be used interchangeably in the rest of the document.

The EFTA Surveillance Authority (ESA) has commented on Nkom's notified draft decisions in Market 4 and 5 that the following aspects should be specified for the MST: relevant retail products, cost standard, downstream costs, wholesale input, time period and compliance actions in case the test is failed. Compliance actions will be treated by Nkom in a forthcoming decision regarding the use of MSTs in Market 4 and 5. In this document all other aspects noted by ESA are addressed.

The document is structured as follows: First, an ERT is further defined and thereof details and related principles (for a detailed list, see page 3) are discussed. The design of the principles must be seen in the light of the purpose of the regulation of Market 4 and Market 5 and the specific characteristics of the relevant markets.

2 Definition of a margin squeeze[6]

According to a definition of ERG "*A margin squeeze (also known as price squeeze) is a situation where a vertically integrated firm with market power in a key upstream market, supplies rival firms in associated downstream markets and sets prices for the input and the downstream service in a way that renders unprofitable the activities of its competitors in the retail market.*"[7] In a situation of a margin squeeze competitors are unable to replicate the retail prices of the SMP operator profitably.

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[4] See European Commission (2013).

[5] See BEREC (2014).

[6] See also WIK for ILR (2013).
[7] See ERG (2009), p. 2.

A MST is passed, if the difference (the margin) between the prevailing retail price and the corresponding wholesale price is sufficient to cover the downstream cost including a competitive return on capital. If the retail and the wholesale pricing structures are complex, the relevant prices may not be represented by a single price but rather by a set of combinations of relevant revenues and relevant costs generated by the product for which the MST is conducted. The MST is passed if the relevant revenues are not lower than the sum of wholesale and downstream costs. Under this condition, the efficient operator earns (at least) a reasonable profit margin which is determined by the cost of capital (e.g. weighted average cost of capital, WACC) representing a market return on capital.

A margin squeeze test is passed if

Retail Price – Wholesale Price ≥ Downstream Cost

Downstream cost comprises own network cost, other costs (regulatory cost, number portability cost, etc.) and retail cost.

At least the following aspects have to be specified as main principles for a MST:

- the level of efficiency
- the business model (wholesale products / retail services / aggregation level / geographical footprint, the relevant market share)
- relevant retail products (e.g. flagship products) and prices (incl. promotions and temporary discounts)
- the relevant time period and methodology for running the test (period-by-period, Discounted Cash Flow (DCF) or Steady State)
- the relevant cost standard (LRIC+ or FDC, current or historical costs)
- the relevant downstream costs
- the relevant regulated wholesale inputs
- the reasonable profit, and
- the trigger for applying the test.

3 Main design principles of a margin squeeze test

3.1 The level of efficiency

A MST involves the methodological choice of the level of efficiency of the reference operator used. It must be decided if the efficiency level of the reference operator should be comparable to the scale (and implicitly the efficiency level) of the SMP operator or the scale (and implicitly the efficiency level) of a generic (alternative) operator.

In this context three different approaches are applied by NRAs and/or competition authorities to identify a margin squeeze: the equally efficient operator (EEO) test, the reasonably efficient operator (REO) test and the adjusted EEO test. Each testing approach has its merits and its limitations.

The setting of the level of efficiency in the ERT should be in line with the Recommendation. Therefore, the starting point should be relevant downstream costs which correspond to an EEO. The costs of the SMP operator should be audited and sufficiently disaggregated. Accounting separation should be imposed on Telenor to ensure that the input data which is required for conducting the MST can be generated.

In certain circumstances, adjustments for scale to the SMP operator's downstream costs can be made. Such circumstances exist when market entry and/or expansion is frustrated and/or when market circumstances render it unlikely for altnets to achieve certain scale.

Further adjustments can be made if there is evidence that the pure EEO concept would not consider cost components which however occur to an efficient altnet which relies on the SMP operator's wholesale access service. Such costs may occur for example for co-location services. If it is believed that neglecting these cost components would prevent market entry or expansion, these cost parameters are taken into account.

In the MST modelling it can also be considered whether the network design at the upstream level (e.g. aggregation level or core network) of an efficient altnet may be different compared to Telenor's network infrastructure.

Relevant input parameters will be collected from the SMP operator. However, altnets can also be asked to provide these input parameters. This enables the assessment of whether the input parameters provided by Telenor are reasonable and reflect the cost of an efficient operator or if adjustments are necessary to ensure that an efficient altnet would also recover its costs.

By means of this procedure, an adjusted EEO test approach which covers adjustments for scale and enhancements by competitor specific costs not incurred by the access

provider, will be applied. In addition, an assessment of reasonable efficiency is done for the input parameters based on information provided by Telenor and other altnets.

Principle 1

An adjusted EEO concept by making adjustments for scale, altnet specific costs and other parameters will be applied.

3.2   The business model

A MST has to be specified and should be conducted for the relevant business models. Therefore, the business models on which to apply the test has to be determined first. Each business model should be based on a particular wholesale product and not a combination of wholesale products. However, multiple business models could be tested separately. Thus we have to conduct a MST in reference to individual mandatory wholesale access products in Market 4 and Market 5.

3.2.1   (Fibre-based) Wholesale products

In the Recommendation the Commission prescribes that NRAs should identify the most relevant regulated inputs at the NGA-based wholesale layer. The wholesale services subject to an NGA MST are the mandatory wholesale services which have to be provided by Telenor according to the market analysis of Market 4 and 5. Currently, these are

- – Fibre LLU for point-to-point fibre networks, and
- – Fibre VULA for point-to-multipoint (PON) networks.

Even though Fibre VULA seems to be the most relevant regulated wholesale service due to the large share of the PON topology in Telenor's fibre network, there are areas in Telenor's fibre network with p2p topology. Therefore, fibre LLU is also regarded as relevant wholesale service to be included in the MST tool.

3.2.2   Retail services

Relying on Fibre VULA, altnets are enabled to provide a variety of retail services. This comprises combinations of broadband internet access, voice services and IPTV services. Currently, internet access is the essential retail service asked for by about 99%[8] of all subscribers to fibre-based broadband in Norway. Due to the increasing

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[8]   Source: Nkom Broadband review 2014

usage of mobile handsets for voice calls, the subscribers who order voice service services in addition to broadband are limited to about 23% of all subscribers of fibre based broadband. On the other hand, IPTV as an additional service seems to be quite popular in Norway; over 71% of fibre broadband customers have IPTV in their bundle. Nowadays, the most popular double play fibre-based product is broadband + IPTV.

Thus, from a business case point of view, it seems reasonable to assume that an efficient altnet which uses Fibre VULA (incl. multicast as an extension) would offer double and triple play services at the retail level. IPTV services are not subject to ex ante regulation in the electronic communication markets. However, BEREC expressed that revenue and cost components of IPTV services can represent a significant portion of downstream costs so these could therefore be considered as a non-regulated input in the MST[9]. Thus, we consider as a relevant business model the provision of a fibre-based triple play product (broadband internet access, voice services and IPTV)) based on fibre VULA.[10]

However, the inclusion of IPTV in retail bundles based on Fibre LLU makes less sense as altnets will not invest in MPOP equipment (ODF, OLT, including multicast server at the MPOP) in the expectation that the P2P networks will be migrated to PON networks sooner than later, for which Fibre VULA incl. multicast feature is available. Thus, we consider as a second relevant business model the provision of a fibre-based double play product (broadband internet access and voice services) based on fibre LLU.

3.2.3 Aggregation level

The Recommendation does not specify the level of aggregation (e.g. whether the MST should be conducted for each flagship product individually or for a portfolio of products identified). BEREC (2014) believes that it is appropriate for each NRA to determine what the appropriate level of aggregation should be when carrying out the MST in the light of the assessment of competition problems identified in the market analysis.

The most dominant principle, however, is that the aggregation level should cover the most important fibre-based retail services that an efficient altnet is expected to provide based on the regulatory wholesale product it uses. The MST should ensure that such an efficient altnet can operate profitably.

In the Norwegian electronic communications market altnets provide voice, broadband internet access as well as IPTV services - either as different bundles or as single standalone offers - for all kinds of customer groups and all kinds of download/upload

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[9] See BEREC Opinion, BoR (13) 41, chapter 2.2.5.2 (page 13).

[10] In a recent statement on MST for VULA Ofcom (2015) also concluded that IPTV (incl. content) should be part of the retail fibre bundle to be considered in the MST.

speeds. These customers include both residential users and those business users which subscribe to the residential marketed product or standardised business products. In contrast, the majority of business services tend to be more customised and are provided alongside other information technology communications services (for example, software packages, other connectivity services, storage, security, networking solutions, support services, etc.).[11]

Therefore, following test approach is proposed. First, the most important standardised residential and standardised business products are identified (flagship products). These flagship products will then be tested as a group (portfolio), whereby subscriber numbers are used to weight the relevance of each individual product in the group. This group of products will then be tested separately for the relevant Fibre VULA and for Fibre LLU, so for each regulated wholesale access service in Market 4 and 5. The fulfilment of these MSTs ensures that altnets can provide a complete set of the most relevant fibre based retail services to all customer segments while earning a reasonable profit.

Thus, two MSTs will be conducted:

MST 1:	Portfolio of flagship products (weighted by subscriber numbers) tested against Fibre VULA
MST 2	Portfolio of flagship products (weighted by subscriber numbers) tested against Fibre LLU.

3.2.4   Geographical footprint

The business model has to be further defined by its geographic scope. Costs should be calculated for a geographic market consistent with the market analysis of the relevant market(s). In the market analysis by Nkom (2014) Market 4 and 5 were defined as national markets. Thus, the altnet's business case also should be defined as being national. However, given the limited current fibre roll-out, 'national" effectively means the geographical footprint of Telenor's fibre network.

3.2.5   The relevant market share (number of retail subscribers of an efficient altnet).

The MST is affected by the number of estimated subscribers, and the related market share, an altnet can gain in the retail market. Relying on wholesale fibre VULA or

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11   See also Ofcom (2015), p. 91.

wholesale fibre LLU the maximum numbers of subscribers is restricted by the geographical footprint of Telenor's fibre network. Therefore the roll out of Telenor's fibre network in the coming years plays an important role. In addition the wholesale access services are only available for homes connected, meaning customers who subscribed to Telenor's retail services. Thus, the number of homes connected by fibre-based access of Telenor determines the theoretical maximum number of subscribers for an altnet. However, it is more realistic to assume that the number of subscribers depends on the relative competitive position of an altnet. NRAs often use a 20% to 25% market share[12]. Therefore, we consider the following approach to determine the altnet number of subscribers in which we assume that an efficient altnet gains a 20 % market share:

Subscriber numbers of an efficient altnet used in the MST =

(Forecasted) homes-connected in the considered years based on forecasted network rollout of Telenor for which the fibre-based wholesale access service is made available x 0.20.

3.2.6 Main characteristics of the business model

In what follows, we summarise the main characteristics of the business model that should underpin the MST in reference to the mandatory fibre-based wholesale services for Market 4 and 5 in Norway.

Principle 2

Two separate MSTs will be conducted:

- Retail broadband internet access + voice service + IPTV (triple-play) based on Fibre VULA (p2mp) (portfolio test) and
- Retail broadband internet access + voice services (double play) based on fibre LLU (p2p) (portfolio test).

Aggregation level: The retail customer segments in both cases comprise all customers who demand the residential marketed products, including the standardised business products. A total fibre portfolio approach is applied, which assesses the entire portfolio of flagship products (incl. bundles (2-play or 3-play) and standalone offers.

The geographical footprint is national, i.e. the geographical footprint of the availability of the regulated wholesale services.

The subscriber numbers of an efficient altnet used in the MST should be equal to (forecasted) homes-connected for which the fibre-based wholesale access service is

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[12] See WIK (2013), p. 7

made available to altnets by Telenor **x** 0.20. The forecasted roll-out of Telenor is considered for the relevant time period in the test.

3.3 Relevant retail products (e.g. flagship products) and prices (incl. promotions and temporary discounts)

3.3.1 Flagship Products

The Recommendation directs the ERT to the 'flagship products'. These are defined as those retail products with the highest relevance in terms of revenue, subscribers and advertising expenses[13]. Competitors should be able to replicate the SMP operator's flagship products as a portfolio. As basic reference, flagship products should be defined as those products which in sum represent a revenue market share of 70% for all retail fibre-based broadband products of the SMP operator.[14] To identify flagship products based on fibre based access, they have to be listed according to their revenue share in a descending order. Additionally, all products offered by Telenor which represent a revenue or subscriber share of at least 10% are treated as flagship products.[15]

Flagship products should be identified on the basis of their revenue and subscriber numbers of the most recent 12 month time period (for which reliable subscriber data is available) before the MST is being conducted. Each time a new retail product becomes a flagship product according to the two criteria presented before, a new MST has to be conducted related to the new portfolio of flagship products. The weighting of the individual flagship products in the portfolio is done using subscriber numbers.

In case of substantial changes of retail tariffs via new launched retail products (in the recent past), which may significantly affect the subscriptions and price level in the retail market, such newly launched products may be defined as flagship products. In such a case the portfolio of flagship products and their weights should be determined with a future perspective of how these new tariffs may affect Telenor's fibre-based retail subscriptions.

In addition, specific market segments not properly represented by the general concept of flagship products may be identified, for which to apply a MST.

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[13] The concept of applying the margin squeeze test for flagship products has originally been proposed by the European Commission (2013) in the context of NGA wholesale pricing.

[14] See WIK for ILR (2013), p. 5:

[15] See WIK for ILR (2013), p. 5:

Principle 3

In line with the Recommendation only 'flagship products' are considered. A flagship product can be a standalone or a bundled product based on broadband access.

As the basic reference, 'flagship products' will be determined as follows: Flagship products comprises those tariffs with the highest revenue which cover 70 % of the revenue within the relevant 12 months term before the MST is conducted. In addition, products with a market share of 10 % either with respect to subscriber numbers or revenue within this time frame will be included in the MST.

However, in case of substantial changes of retail tariffs, Nkom may deviate from this way of determining the relevant retail 'flagship products'. With a future perspective it might consider new launched retail tariffs as 'flagship products'. In such a case the weights of the individual "flagship products" as part of the portfolio will be determined with a future perspective.

In addition, products for specific market segments, not properly represented by the general concept of flagship products, may also be identified as flagship product.

3.3.2 Retail price components

All price elements of the flagship product(s) of the SMP operator for which the test is conducted form the basis of the relevant revenues. All relevant revenues have to be considered including recurring and non-recurring price elements. One-off pricing elements (e.g. connection charges) should be spread over periods which are in line with average customer lifetime of the service in question.

Depending on the business model, if voice services are part of the bundle, the (net) revenues from inbound call termination may need to be considered as part of the relevant revenues.

If weighting of relevant product elements, tariffs and/or customer groups is needed to calculate the relevant revenues, different sources might be used (e.g. profiles provided by the SMP operator, altnets or market data).

If retail (list) prices are discounted permanently or are temporarily reduced in the form of promotions, such discounts or price reductions should be taken into consideration to calculate relevant revenues. The same applies for promotions in which certain pricing elements (e.g. connection fees) are not charged or certain give-aways (e.g. routers, modems) are provided free of charge. If give-aways are provided free of charge, a net price has to be estimated and give-aways have to be considered as a retail cost valued at market or purchase price.

> **Principle 4**
>
> All price elements of the flagship product(s) of the SMP operator for which the test is being conducted form the basis of the relevant revenues. All relevant service revenues have to be considered including recurring and non-recurring price elements.
>
> If retail (list) prices are discounted permanently or are temporarily reduced in the form of promotions, such discounts or price reductions will be taken into consideration to calculate relevant revenues.
>
> Nkom will in advance define user profiles needed to determine relevant revenues. Such parameters will be based not only on profiles provided by Telenor but also by altnets.

3.4 Relevant time period and methodology for running the test (period-by-period, Discounted Cash Flow (DCF) or Steady-State)

A MST has to be carried out for a reasonable timeframe. The test can be conducted on a period-by-period approach or in a multi-period approach.

The period-by-period test can take the accounting year as a basis for analysis. The accounting year approach compares revenues and costs as they occur for this period. This means in particular that non-recurring costs and revenues are becoming part of the margin squeeze calculation in the year of payment independent of the fact that they may be economically relevant for several periods.

In a multi-period approach the test is conducted once for the relevant period. The test then requires that cost and revenues generate a positive margin over the whole period considered. According to the Recommendation NRAs should evaluate the profitability of the flagship products on the basis of a dynamic multi-period analysis, such as the DCF approach or steady-state approach.

By using a DCF approach the cash flows for the retail products under consideration will be discounted.[16] The outcome of this approach is the net present value (NPV) of the expected future cash flows of the service/product under consideration. If the NPV is positive, the provision of the service/product generates value for the operator. If the NPV is negative, then the provision of the service would result in a loss and a margin squeeze occurs. The relevant period for this test is usually being set in accordance with the estimated customer average lifetime. There is, however, also the option to use a

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[16] For comparing the pros and cons of a DCF and a period-by-period approach see ERG (2009), p.14f.

rather long period that includes the whole product lifetime or even multiple investment cycles.

In the steady-state approach, costs and revenues are also broken down to a one year period. Costs and revenues are, however, allocated according to cost causation. This means that investment costs are allocated according to their useful economic life. Non-recurring costs and revenues are also allocated according to economic cost causation according to the relevant time period, e.g. average customer lifetime. Depending on the allocation, these amounts are discounted first and then equally spend over the life time by using the annuity formula.

The period by period approach does not economically properly allocate costs and revenues over time. This approach could indicate a margin squeeze in the following period although nothing has changed regarding costs, wholesale/retail prices and distribution of customers just because of an unequal distribution of non-recurring costs and revenues over time. The steady state as well as the DCF approaches avoid such accounting distortions. This is of particular importance if large initial investments like expenditures for marketing are required. A DCF approach, on the other hand, requires an estimation of the relevant parameters over a relatively long period of time.[17]

A steady-state approach is considered as the appropriate approach to conduct the MST. The steady-state approach provides margin squeeze information for each particular period. At the same time costs and revenues are properly allocated over time and discounted where appropriate. A steady-state approach is highly transparent and practical. A periodically conducted steady-state MST appropriately takes into account market developments. It allows Nkom to adjust subscriber numbers, price changes etc. according to real market data instead of basing a calculation on uncertain forecasts.

Principle 5

A steady-state approach with following characteristics will be used to conduct the MST:

- It discounts/annualizes one-time costs and revenues.
- A steady-state approach is highly transparent and practical.
- Is conducted periodically appropriately taking into account market developments. It allows Nkom to adjust subscriber numbers, price changes etc. according to real market data instead of basing a calculation on uncertain forecasts.

Reference time

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[17] See ERG (2009), p. 15.

According to the Recommendation, NRAs should identify an adequate reference time period for the multi-period analysis. The relevant period for this ex ante economic replicability test (e.g. MST) should be set in accordance with the estimated average customer lifetime. Such average customer lifetime would be the period of time over which the customer contributes to the recovery of the (a) downstream costs that are annualised according to a depreciation method that is appropriate to the asset in question and the economic lifetime of the corresponding assets and (b) other downstream costs that are normally not annualised (typically the subscriber acquisition costs) and which the operator incurs to gain customers and should seek to recover over the latters' average lifetime.

Reliable customer life-times for fibre broadband subscriptions are actually not available in the Norwegian broadband market since this market is quite young. However, there seems to be no empirical evidence that the customer lifetime of fibre based broadband subscriptions is different compared to copper based broadband subscription. Therefore, until robust data for fibre-based subscription times can be derived, we consider it as reasonable to use the average customer life time for copper-based broadband subscriptions in Norway as a proxy for the customer life-time of fibre-based broadband subscriptions.

> **Principle 6**
>
> The adequate reference time period for the multi-period analysis of the MST in form of a steady-state analysis will be set in accordance with the estimated average customer lifetime for the fibre-based retail services.
>
> As long as there is no empirical evidence on fibre-based services, the average customer lifetime for copper-based broadband services will be used as an approximation for the fibre-based broadband customer life-time.

3.5 The relevant cost standard

The Recommendation proposes LRIC+ as the appropriate cost standard.[18] This cost standard ensures that entrants can recover their efficiently incurred costs. LRIC+ is the change in total costs resulting from the production of an increment in the quantity of output and a mark-up for common/overhead costs for the relevant service.

Just relying on variable or avoidable cost does not include an allocation of fixed costs which is a major cost component that telecom operators are facing. Only short-term price decisions can be taken on that basis. The LRIC+ standard is consistent with

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[18]   This is also in line with the recommendation of BEREC (2013), p.34.

market entry decisions which require all relevant costs to be covered in the long-term. LRIC+ data can be calculated on the basis of bottom up or top down data. However when this data is not available, notably for retail costs, fully distributed cots (FDC) may need to be use as standard based on data from the SMP operator's accounts.

Principle 7

The LRIC+ cost standard will be used to determine downstream costs where available relying on bottom up or top down data from the SMP operator. Where LRIC data is not available (eg. for retail costs), FDC will be used..

3.6 The reasonable profit

The Recommendation does not set out guidance on a reasonable profit. However, an alternative access seeker should be able to economically replicate a downstream offer by the SMP operator.

The relevant competitive return or margin in a margin squeeze context is usually identified indirectly by using a WACC approach for the downstream business. The WACC represents the opportunity cost of capital invested in the business, and therefore the return on investment required to compensate for this opportunity cost. The WACC should reflect the risk of the retail business of an efficient operator. Otherwise, the margin between the wholesale and the retail price is not sufficient for an efficient competitor to earn an appropriate return on capital in the retail market.

In its decision of 18 December 2014 on calculated interest to be used for financial reporting in fixed line markets, Nkom has concluded that the required return in fixed line markets is 8,9 %[19]. Nkom will use this value as the reasonable WACC to be applied in the MSTs.

Principle 8

An altnet should be able to earn a reasonable rate of profit. The WACC reflects the risk of the retail business of an altnet. Nkom has determined a reasonable WACC of 8,9 % for a reference operator in the Norwegian fixed line markets and this value will be used in the MSTs.

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[19] See http://www.nkom.no/marked/markedsregulering-smp/%C3%B8konomisk-regulering/kapitalkostnad-wacc

3.7   Relevant downstream costs

The relevant downstream costs are added to the costs of the relevant wholesale inputs which represent the respective business model. Basically downstream costs consist of five different cost categories:

(1) Own network cost

(2) Costs for terminating traffic in other networks

(3) Other costs (regulatory, number portability etc.)

(4) Retail costs

(5) Other common costs.

Where available, NGA network costs will be derived from Nkom's bottom up LRIC model. The other downstream costs will be derived via data requests from the SMP operator's accounts complimented with provided data from the altnets.

(1) Own network costs

Depending on the business model the competitor's own network cost with respect to fibre-based retail access services may consist of the following elements:

- Fibre equipment at customer site (OLT, ODF)

- Equipment at the point of co-location (Ethernet switch, ports)

- Maintenance & operating costs of equipment

- Backhaul and international capacity

- Operating for network services

- Capital cost of own infrastructure

- Common costs at level of network infrastructure.

Network elements have to be dimensioned such that they represent the scale of an efficient operator. Network equipment has to be depreciated according to the relevant economic lifetimes.

(2) Costs for terminating traffic in other network

Costs for terminating traffic in other networks and/or for peering and transit have to be calculated according to actual payments being made to other operators. The applicable rates can be regulated or negotiated.

(3) Other costs (regulatory, number portability etc.)

Besides the above mentioned downstream costs above and retail costs, other costs may occur that could be relevant. Examples of such costs are expenses due to

regulatory obligations or number portability. These costs will be taken into account in the MST model as well.

(4) Retail costs

According to BEREC retail costs include the following cost categories:

- Customer acquisition and retention
- Customer care
- Marketing and advertising
- Billing
- Sales Personnel salary/Sales commission
- Bad debt
- Customer Premises Equipment/Distribution of CPE
- Product development/management
- Common retail costs.

The Recommendation does not specify further the splitting of retail costs.

A category-by-category approach supported by a mandatory accounting separation requirement to the SMP operator seems to be the adequate approach. This provides detailed information to Nkom to assess whether the provided cost information is reasonable for an efficient operator providing the corresponding retail service.

(5) Other common costs

Other common costs are costs on the level of administration and management that cannot be allocated to individual services. Equi-proportional mark-up (EPMU) is the methodology that is commonly adopted in relation to LRIC cost modelling. The percentage is calculated as the ratio of total common costs to total incremental costs. Utilising this method, costs are spread across all relevant services by the same percentage.

> **Principle 9**
>
> The following five kinds of cost categories - own network cost, costs for terminating traffic in other networks; other costs (regulatory, number portability etc.), retail costs and common costs will be considered in the MST.
>
> For retail costs a category-by-category approach will be in line with the categorisation

> presented by BEREC.
>
> An EPMU approach will be employed for marking up other common costs.

3.8 Relevant regulated wholesale inputs

In most cases the pricing structure of wholesale products is complex. All elements of the pricing structure which an access seeker has to pay for purchasing the relevant elements of the wholesale input have to be taken care of. This includes recurring and non-recurring charges, charges for termination of the service, service provision, service cancellation if applicable. Non-recurring charges have to be depreciated (or discounted) over a relevant time period. Volume discounts and/or long-term access pricing agreements[20] should be taken into account in case they are representative for the business model of access seekers and/or they are in line with a competitive market structure.

> **Principle 10**
>
> All elements of the pricing structure which an access seeker has to pay for purchasing the relevant elements of the wholesale input have to be taken care of. This includes recurring and non-recurring charges, charges for termination of the service, service provision, service cancellation if applicable.
>
> Non-recurring charges have to be depreciated (or discounted) over a relevant time period. Volume discounts and/or long-term access pricing agreements will be taken into account in case they are representative for the business model of access seekers and/or they are in line with a competitive market structure.

3.9 Trigger for applying the margin squeeze test

A MST calculation creates administrative work causing costs to all participants, the SMP operator, altnets as well as the regulatory authority Nkom. The occasions in which a MST is conducted should strike the right balance between the following aims:

– Altnet's should be enabled to operate a profitable business case by using mandatory fibre-based wholesale access services provided by Telenor.
– Retail pricing flexibility for Telenor should be ensured.

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[20] Criteria to assess long-term access pricing in case of FTTH are specified in Section 7 and 8 of the NGA Recommendation (2010).

- Price, cost and demand changes over time should be covered in MST calculations within reasonable time periods.
- MST calculations should be transparent and predictable for the market players directly affected by the wholesale products and their prices.
- The administrative work of conducting a MST should be limited.

Thus, the following three triggers for conducting a margin squeeze test are foreseen:

- The MST will be conducted each time a new wholesale price in Market 4 or 5 is determined and/or a new wholesale product is being introduced.
- A MST for each relevant wholesale service will be conducted periodically, every 6 months, in line with the existing 6 month collection of subscriber data for Nkom's statistics report.
- Additional MSTs may be conducted under reasonable and proportionate circumstances. This may in particular be the case if competitors make justified reasoning of major market changes related to costs, prices, and customer distribution which would lead to different results compared to the original ex ante MST.

According to the Recommendation, the test procedure can be started at any time but no later than three months after the launch of the relevant retail product. Since the MST is restricted to 'flagship products', this requires that a 'flagship product' is identified. Thus in case there is strong evidence that a new flagship product is launched, the test should be conducted within three months.

Principle 11

Three triggers for conducting a MST are identified:

- The ex-ante MST will be conducted each time a new wholesale price in Market 4 or 5 is determined and/or a new wholesale product is introduced.
- A MST for individual wholesale products will be conducted periodically, every 6 months, in line with the existing 6 month collection of subscriber data for Nkom's statistics report.
- Additional MSTs may also be conducted under reasonable and proportionate circumstances. This may in particular be the case if competitors make justified reasoning of major market changes related to costs, prices, and customer distribution which would lead to different results compared to the original ex ante margin squeeze test.

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